HEXAGON
PPM

Smart Instrumentation Administration

User's Guide

Version 2018 (12.00.)
June 2018

Copyright

U.S. Government Restricted Rights Legend

Hexagon PPM
305 Intergraph Way
Madison, AL 35758

Documentation

Documentation shall mean, whether in electronic or printed form, User's Guides, Installation Guides, Reference Guides, Administrator's Guides, Customization Guides, Programmer's Guides, Configuration Guides and Help Guides delivered with a particular software product.

Other Documentation

Other Documentation shall mean, whether in electronic or printed form and delivered with software or on Intergraph Smart Support, SharePoint, or box.net, any documentation related to work processes, workflows, and best practices that is provided by Intergraph as guidance for using a software product.

Terms of Use

a. Use of a software product and Documentation is subject to the Software License Agreement ("SLA") delivered with the software product unless the Licensee has a valid signed license for this software product with Intergraph Corporation. If the Licensee has a valid signed license for this software product with Intergraph Corporation, the valid signed license shall take precedence and govern the use of this software product and Documentation. Subject to the terms contained within the applicable license agreement, Intergraph Corporation gives Licensee permission to print a reasonable number of copies of the Documentation as defined in the applicable license agreement and delivered with the software product for Licensee's internal, non-commercial use. The Documentation may not be printed for resale or redistribution.

b. For use of Documentation or Other Documentation where end user does not receive a SLA or does not have a valid license agreement with Intergraph, Intergraph grants the Licensee a non-exclusive license to use the Documentation or Other Documentation for Licensee’s internal non-commercial use. Intergraph Corporation gives Licensee permission to print a reasonable number of copies of Other Documentation for Licensee’s internal, non-commercial use. The Other Documentation may not be printed for resale or redistribution. This license contained in this subsection b) may be terminated at any time and for any reason by Intergraph Corporation by giving written notice to Licensee.

Disclaimer of Warranties

Except for any express warranties as may be stated in the SLA or separate license or separate terms and conditions, Intergraph Corporation disclaims any and all express or implied warranties including, but not limited to the implied warranties of merchantability and fitness for a particular purpose and nothing stated in, or implied by, this document or its contents shall be considered or deemed a modification or amendment of such disclaimer. Intergraph believes the information in this publication is accurate as of its publication date.

The information and the software discussed in this document are subject to change without notice and are subject to applicable technical product descriptions. Intergraph Corporation is not responsible for any error that may appear in this document.

The software, Documentation and Other Documentation discussed in this document are furnished under a license and may be used or copied only in accordance with the terms of this license. THE USER OF THE SOFTWARE IS EXPECTED TO MAKE THE FINAL EVALUATION AS TO THE USEFULNESS OF THE SOFTWARE IN HIS OWN ENVIRONMENT.

Intergraph is not responsible for the accuracy of delivered data including, but not limited to, catalog, reference and symbol data. Users should verify for themselves that the data is accurate and suitable for their project work.

Limitation of Damages

IN NO EVENT WILL INTERGRAPH CORPORATION BE LIABLE FOR ANY DIRECT, INDIRECT, CONSEQUENTIAL INCIDENTAL, SPECIAL, OR PUNITIVE DAMAGES, INCLUDING BUT NOT LIMITED TO, LOSS OF USE OR PRODUCTION, LOSS OF REVENUE OR PROFIT, LOSS OF DATA, OR CLAIMS OF THIRD PARTIES, EVEN IF INTERGRAPH CORPORATION HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

UNDER NO CIRCUMSTANCES SHALL INTERGRAPH CORPORATION'S LIABILITY EXCEED THE AMOUNT THAT INTERGRAPH CORPORATION HAS BEEN PAID BY LICENSEE UNDER THIS AGREEMENT AT THE TIME THE CLAIM IS MADE. EXCEPT WHERE PROHIBITED BY APPLICABLE LAW, NO CLAIM, REGARDLESS OF FORM, ARISING OUT OF OR IN CONNECTION WITH THE SUBJECT MATTER OF THIS DOCUMENT MAY BE BROUGHT BY LICENSEE MORE THAN TWO (2) YEARS AFTER THE EVENT GIVING RISE TO THE CAUSE OF ACTION HAS OCCURRED.

IF UNDER THE LAW RULED APPLICABLE ANY PART OF THIS SECTION IS INVALID, THEN INTERGRAPH LIMITS ITS LIABILITY TO THE MAXIMUM EXTENT ALLOWED BY SAID LAW.

Export Controls

Intergraph Corporation's commercial-off-the-shelf software products, customized software and/or third-party software, including any technical data related thereto ("Technical Data"), obtained from Intergraph Corporation, its subsidiaries or distributors, is subject to the export control laws and regulations of the United States of America. Diversion contrary to U.S. law is prohibited. To the extent prohibited by United States or other applicable laws, Intergraph Corporation software products, customized software, Technical Data, and/or third-party software, or any derivatives thereof, obtained from Intergraph Corporation, its subsidiaries or distributors must not be exported or re-exported, directly or indirectly (including via remote access) under the following circumstances:

a. To Cuba, Iran, North Korea, the Crimean region of Ukraine, or Syria, or any national of these countries or territories.
b. To any person or entity listed on any United States government denial list, including, but not limited to, the United States Department of Commerce Denied Persons, Entities, and Unverified Lists, the United States Department of Treasury Specially Designated Nationals List, and the United States Department of State Debarred List (https://build.export.gov/main/ecr/eg_main_023148).
c. To any entity when Customer knows, or has reason to know, the end use of the software product, customized software, Technical Data and/or third-party software obtained from Intergraph Corporation, its subsidiaries or distributors is related to the design, development, production, or use of missiles, chemical, biological, or nuclear weapons, or other un-safeguarded or sensitive nuclear uses.
d. To any entity when Customer knows, or has reason to know, that an illegal reshipment will take place.

Any questions regarding export/re-export of relevant Intergraph Corporation software product, customized software, Technical Data and/or third-party software obtained from Intergraph Corporation, its subsidiaries or distributors, should be addressed to PPM's Export Compliance Department, 305 Intergraph Way, Madison, Alabama 35758 USA or at exportcompliance@intergraph.com. Customer shall hold harmless and indemnify PPM and Hexagon Group Company for any causes of action, claims, costs, expenses and/or damages resulting to PPM or Hexagon Group Company from a breach by Customer.

Trademarks

Intergraph®, the Intergraph logo®, Intergraph Smart®, SmartPlant®, SmartMarine, SmartSketch®, SmartPlant Cloud®, PDS®, FrameWorks®, I-Route, I-Export, ISOGEN®, SPOOLGEN, SupportManager®, SupportModeler®, SAPPHIRE®, TANK, PV Elite®, CADWorx®, CADWorx DraftPro®, GTSTRUDL®, and CAESAR II® are trademarks or registered trademarks of Intergraph Corporation or its affiliates, parents, subsidiaries. Hexagon and the Hexagon logo are registered trademarks of Hexagon AB or its subsidiaries. Microsoft and Windows are registered trademarks of Microsoft Corporation. MicroStation is a registered trademark of Bentley Systems, Inc. Other brands and product names are trademarks of their respective owners.

Contents

SECTION 1

Working with the Administration Module

- ★IMPORTANT Due to security changes in Windows 10, users who require access to INIT/Backup, upgrade, import, and Administration functions, must have windows administrative privileges for this functionality to work correctly.

The Administration module provides you with administrative tools for keeping track of your resources and maintaining user access security.

There are two mutually exclusive levels of administration – System Administration and Domain Administration – that provide you with a more control over security and resource management.

The System Administrator

The system must first be set up at the System Administration level before resources can be allocated at the Domain Administration level.

The System Administrator is responsible for managing the database, infrastructure, creating and defining a working environment and for setting up the database security, for example password encryption, whether user names must be unique, how the software reacts to a user who tries to log on with the wrong password, and so forth. The System Administrator also creates and manages user profiles (including the Domain Administrator), setting up audit trail options, generating certain reports and managing user sessions on multi-user versions of the software. Another important aspect of the System Administrators responsibility is the initialization, backup, and even the deletion of a domain.

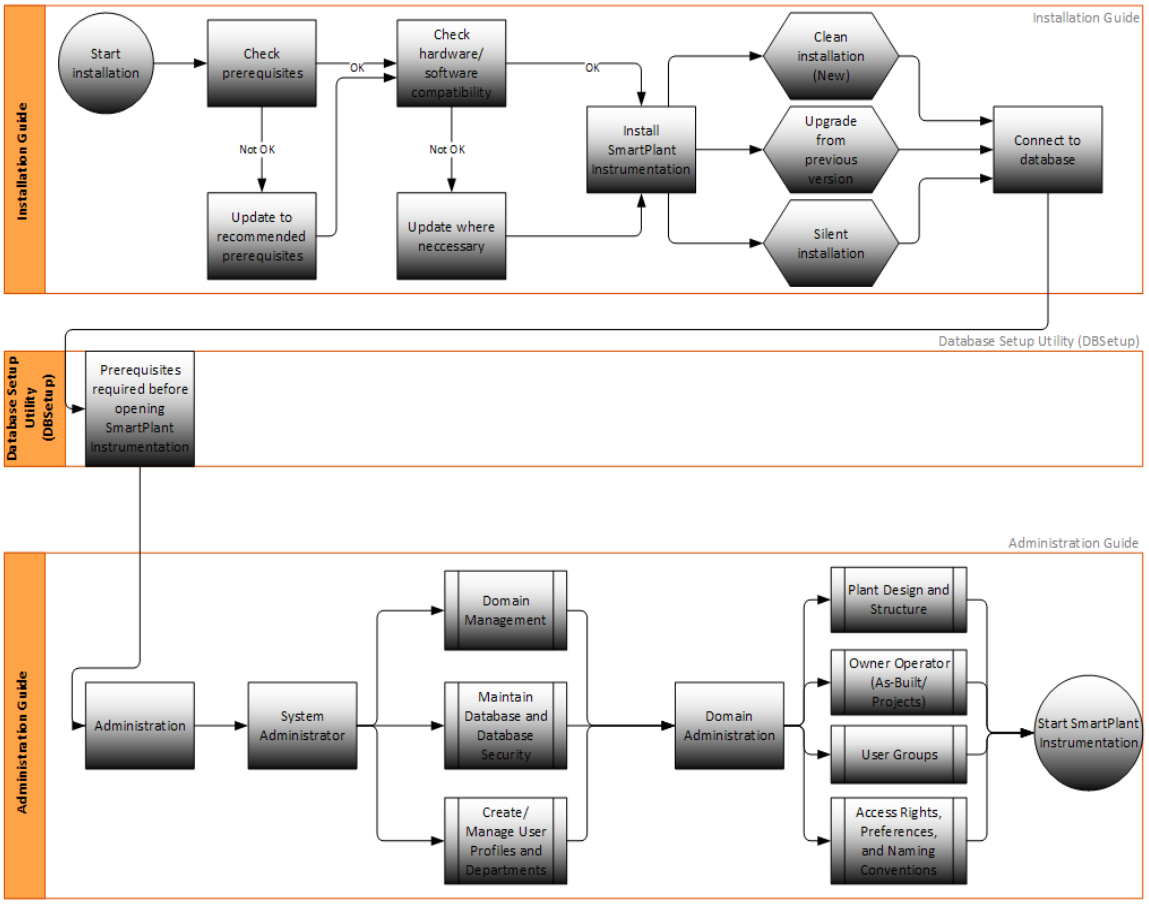
The Domain Administrator

The Domain Administrator is responsible for managing the resources that have been set up by the System Administrator. The responsibilities of the Domain Administrator include defining projects when the domain type is **Owner operator**, or manage a working environment which of an engineering company domain. The Domain Administration can grant access privileges for users, define item naming conventions, set plant structure, set preferences, create custom tables, custom fields, and so forth.

From Installation to Administration

The following flowchart shows the steps required to install the Intergraph Smart® Instrumentation software and perform the initial administration tasks prior to opening Smart Instrumentation for the first time.

NOTE If you are viewing this flowchart from the Installation Guide or Administration Guide .pdf then none of the links available in the flowchart are active. If you are viewing this chart from the Administration help, then you can click on some of the text boxes in the Administration section to open the relevant documentation.



IMPORTANT

In 32 and 64bit environments with UAC on, to perform administrative tasks in Smart Instrumentation, the Windows user must be allocated Read/Write permissions in the installation folder (by default %systemdrive%\Program Files\SmartPlant - for 32-bit machines and %systemdrive%\Program Files (x86)\SmartPlant - for 64-bit machines).

The following special characters cannot be used in passwords, database names, file names, and so forth:

/ \ [ ] =

; # : " !

The Help Documentation

The help documentation is supplied in two formats:

- **On-line help** — A that is an integral part of the software. Accessed by clicking , clicking a **Help** button that appears in a dialog box, pressing F1 on your keyboard, or clicking the menu item **Help** > <**application name**> **Help**. The Online help contains information for the application, including "how to" topics, introductory and conceptual topics, and context sensitive (dialog box) help. Individual topics can also be printed.
- **PDF file** — Also supplied with the software, the PDF file can be viewed on a monitor but is displayed as one single document and is more suitable for printing than the Online help. Accessed by clicking the menu item **Help** > **Printable Guides** and then clicking the link for the relevant help file, the PDF file contains most of the content that appears in the Online help.

Certain parts of the Online help include expandable texts. Expandable text may contain additional information that some users do not want to read. For example, in many of the **Find Items** dialog boxes, information on customizing a search is hidden in an expandable text section. Another usage is where a topic splits to two different paths. See, *Initialize a Domain* (on page 18) for an example.

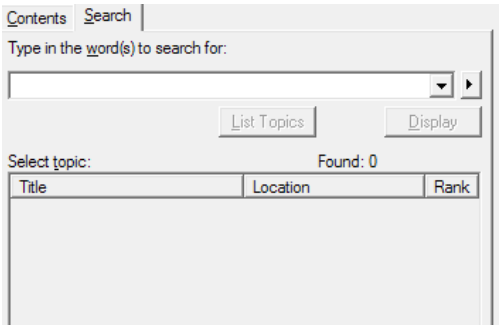
To display the contents of an expandable text section, click the triangular pointer or the name of the section.

NOTE This functionality is for the on-line help only. In PDFs the entire text is displayed. For an example see this topic in the *Administration Guide* PDF file.

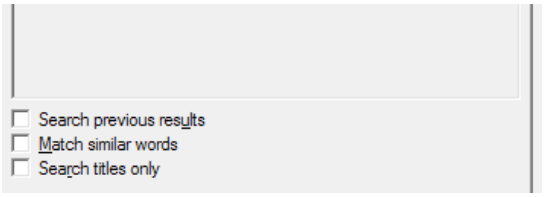
On-Line Help

Using Search in the On-line help:

- Use the **Contents** tab to select a section of interest and then drill down, by clicking the plus sign or click on the section name, until reaching a topic you are looking for.
- Use the **Search** tab to enter search values and parameters when searching for specific word or phrase. When you click the **Search** tab the following is displayed.



- Top section of **Search** tab

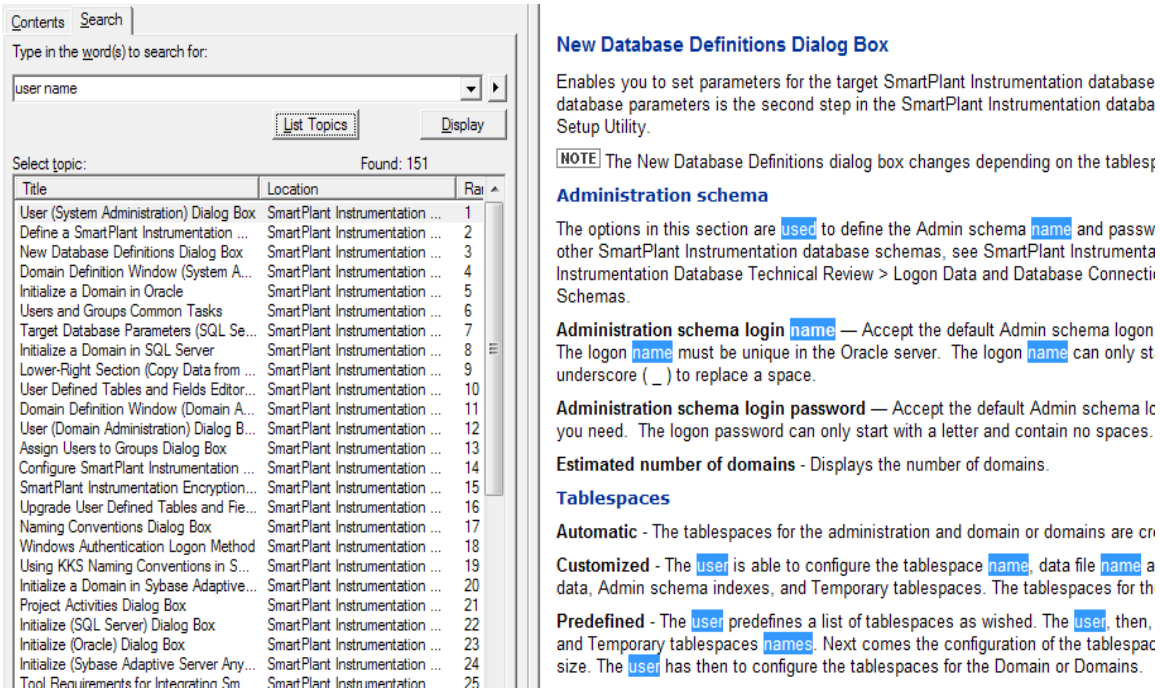


- Bottom section of **Search** tab

1. Type your search string in the **Search** field and click **List Topics**.
2. Select a topic and click **Display** to view the topic.

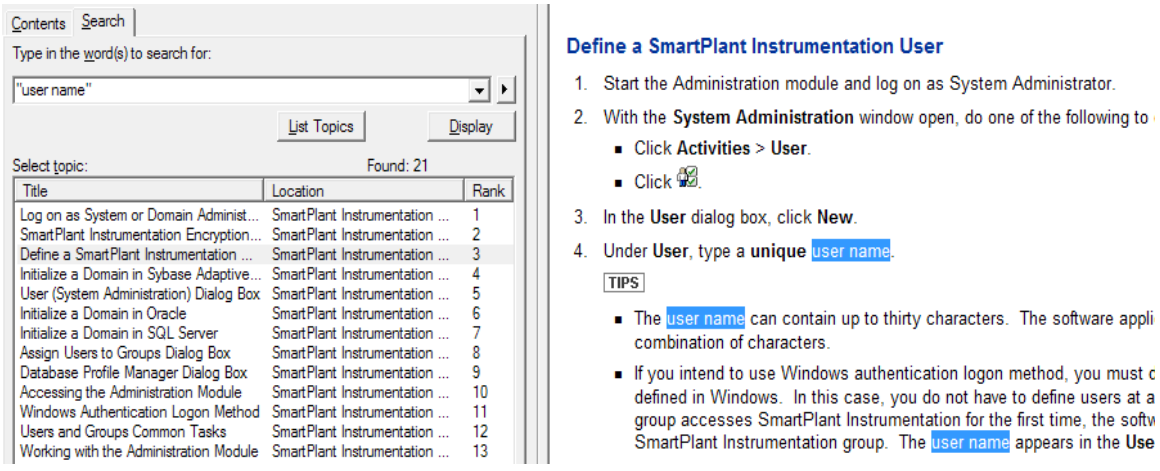
   TIP You can also double-click the topic name to display.

There are several methods to type a string. The method used influences the results of the search.
For example, just typing the string *user name* returns the following:



The search has found 151 topics in the help file where the words *user* or *name* appears.

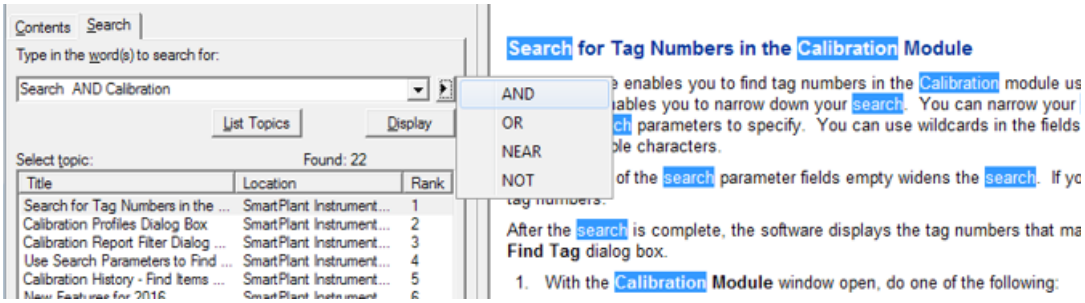
Inserting *"user name"* in quotation marks, returns only those results that match the exact phrase.



The search has found 21 topics in the same help file, where the complete phrase *user name* appears.

Apply Operators

You can also apply operators to you search string as shown in the following example:



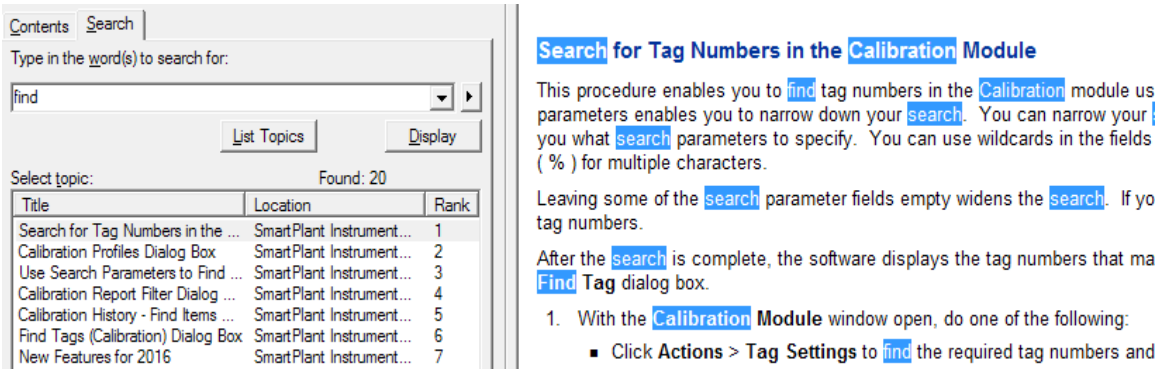
Here the search has found 22 topics that contain both the words *search* and *calibration.*

Apply Filters

Filters can be applied to the search results. You apply a filter by selecting a check box at the bottom of the **Search** tab There are three available filters:

- Search previous results
- Match similar words
- Search titles only

Applying the **Search previous results** filter to your previous search and changing the search string to *find*, produced the following result:



Only the 22 results from the search for *Search AND Calibration* had the new search parameter applied to them returning 20 results containing, *Search, Calibration, find*.

TIPS

- The search is not case sensitive.
- Click the down pointing arrow at the end of the search field to display previous search strings.

PDF Help

As well as using the Table of Contents, Bookmarks, and Page Thumbnails to "search", the electronic version has a search engine similar to the on-line help.

To access the basic find/search:

1. With the PDF file open press CTRL+F on the keyboard.

2. In the search field type your search string.
3. Click one of the arrow buttons.

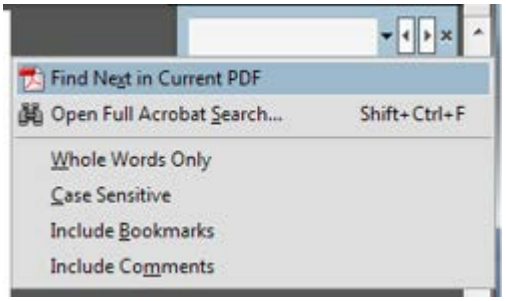
TIPS

- The left arrow searches from where the cursor is positioned backwards. The right arrow searches forward.
- Each time the search finds a matching string the search stops until you click on one of the arrow buttons again.
- A message is displayed when the end of the search is reached.
- By default, the search is not case-sensitive.

Advanced Options

To open the advanced options:

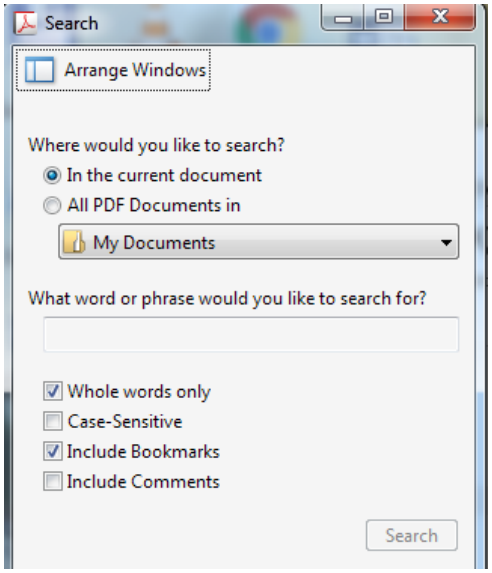
1. In the search dialog box, click the down arrow.
2. From the menu select the required option.



- **Find Next in Current PDF** — Continues the search to the next instance of your search string.
- **Open Full Acrobat Search** — Opens the advanced search dialog box.
- **Whole words only** — Acrobat searches for the whole word and not part of it. For example, *starts*, the search only displays *starts* not *start* as well.
- **Case Sensitive** — Searches for the string exactly as written, uppercase and lower case.
- **Include Bookmarks** — Includes the text in the Bookmarks as well as the help topics in the search.

- **Include Comments** — Any comments made in the document as well as the help topics are included in the search.

Full Acrobat Search



Include the same functionality as the **Advanced Options** menu plus the option to search all PDFs in a specified location.

SECTION 2

Accessing the Administration Module

To access the Administration Module, you need to Log on as a System or Domain Administrator.

Log on

Every user is required to log on to the application using a designated user name and password. Only a user designated as System or Domain Administrator can have access to the Administration Module. This procedure explains how to start the Administration module with System or Domain Administrator privileges.

Switch between Administration Functions

Where the same person is responsible for both System Administration and Domain Administration activities, it is possible to switch between the two functions (if the user has an identical user name and password for both functions) without exiting the Administration module.

In This Section

Log on as System or Domain Administrator

1. Start the **Administration** module.
2. In the **Logon Information** dialog box, from the **Database** list, select the database you want to connect to.
3. In the **User name** and **Password** text boxes, enter your System or Domain Administrator's user name and password.

   TIPS

   - The list of databases appears in the intools.ini file. For each database, you need to define a database profile.
   - The System Administrator user name and password are defined per installation. **DBA** is the default user name and password that you use to log on to Smart Instrumentation for the first time. The password is entered in upper case characters, regardless of the keyboard setting. After you log on for the first time, you should change your password.
4. In the **Open Administration Module** dialog box, select **System Administrator** or **Domain Administrator**.

   TIP If you have both system and domain administration privileges using the same user name and password then both options are available. If your user name and password are for just the system administration or just the domain administration, then the option is already selected.
5. Click **OK**.

NOTE If you are currently logged on as the Domain Administrator, you can switch to the system administration level without the need to log on again. You can do this only if the System Administrator user name and password are the same as the Domain Administrator's.

See Also:

Switch Between Administration Functions

1. Click  to close the current window.
2. Click  .
3. In the **Open Administration Module** dialog box, select **System Administrator** or **Domain Administrator**.

See Also

System Administration (on page 15)

SECTION 3

System Administration

System Administration is a set of activities that provide for the management of the database infrastructure. These activities include creating and defining a working environment including defining and managing a domain, creating and managing user profiles (including the Domain Administrator), setting audit trail options, setting up the security definitions, for example, password encryption, whether user names are required to be unique, and how the software responds to users who log on with incorrect passwords. Generating certain reports, and managing user sessions on multi-user versions.

IMPORTANT The following special characters cannot be used in passwords, database names, file names, and so forth:

/	\	[	]	=
;	#	:	"	!

As System Administrator, you can perform the following sets of tasks:

- Define and manage the Smart Instrumentation domains.
- Manage database security
- Create and manage user profiles and departments
- Manage accounting, contractors and clients
- Import new interface languages
- Generate reports
- Maintain the database

In This Section

Domain Initialization

In Smart Instrumentation, the working environment for your instrumentation activities is known as a domain. The domain type can be either **Engineering Company** or **Owner operator**. The System Administrator is responsible for initializing (creating) domains. After initializing a domain, it is possible to define users, access rights, naming conventions, and so forth. When initializing a domain, the software creates the Domain schema, which contains all the database objects that allow you to work with Smart Instrumentation.

On Oracle or SQL Server, you can initialize a domain only after completing the Smart Instrumentation database setup. You can create several domains (one domain at a time). These domains share the Admin schema, created during the database setup. The Admin schema already contains the Smart Instrumentation database tables, but you cannot use these tables until the software creates a Domain schema, with various object references necessary for working in Smart Instrumentation. For example, the Admin schema contains the table USERS but you cannot create users, assign them to groups, and grant access rights until a Domain schema exists because you can only perform these activities at a domain level. When initializing a domain, the Domain schema, receives the INTOOLS_ENGINEER role, which is created during the database setup. This role has system privileges and privileges for database objects included in the Admin schema. These objects are shared for all domains you initialize.

You can initialize a domain in one of the following ways:

- Initialize an empty domain. When initializing an empty domain in Oracle or SQL Server, you can perform the initialization procedure without using the Administration module options of Smart Instrumentation. For details, see *Initialize a Domain from the Command Line* (on page 22).
- Initialize a new domain using another domain as a source. This way, in the target database, you restore a domain with all existing data.

Topics

Prerequisites for Domain Initialization

Before initializing a domain, familiarize yourself with the following prerequisites:

General Prerequisites for Initializing a Domain Using Another Domain as a Source

- When initializing a domain using another domain as a source, run the DB Checker Utility for the source domain.
- Make sure the database type and version of the source domain is the same as the database type and version where you want to initialize a new domain. If not, you must upgrade the source domain, or the target Admin schema to the same version of your Smart Instrumentation® software.

- When initializing a domain using another domain as a source, in the source domain, make a list of all user-defined database views that are used in the source domain. You need to log on as Domain Administrator to add user-defined database views in the list. When initializing a domain, the software only creates those user-defined views that the Domain Administrator added in the list.
- When initializing a domain in Windows Vista and Windows 7, you might need to temporarily turn off the User Account Control in Windows 7 64-bit and Windows 10. For details, see *Workaround for an Initialization Problem in Windows 7 and 10* (on page 25).

Domain Initialization in Oracle

- If your Oracle client language environment is other than English, Far Eastern, Middle Eastern, or Spanish (Latin American), you must configure the **NLS_NUMERIC_CHARACTERS** parameter in the client registry prior to initializing a domain in Oracle. For details, see *Numeric Character Settings for Oracle* (on page 25).

Domain Initialization in SQL Server

- Regardless of the source domain platform, make sure that in the INtools.ini file, the [Database] section has the following statement:
  AutoCommit=TRUE

See Also

Domain Backup and Deletion (on page 33)

Domain Initialization Common Tasks

As the System Administrator you need to initialize an empty domain, or initialize a domain using a DDTI seed file (backup file) as a source. The common tasks involved in initializing a domain include:

- Initialize an empty domain or initializing a domain using a DDTI seed file (backup file).
- Initialize a domain from the command line — initialize a domain without using the Smart Instrumentation Administration module options.
- Add User-Defined Database Views — Create a list of user-defined database views prior to initializing another domain when using the current domain as a source. The user-defined database views that appear in the list that you make also appear in the target domain after the domain initialization.

Topics

Initialize a Domain

The following topic guides you through the task of initializing (creating) a domain for use in Smart Instrumentation. There are various ways to initialize a domain:

- Initialize an empty domain.
- Initialize a new domain from a DDTI seed file. (Restore a domain backup.)

★IMPORTANT

- Before initializing a domain, familiarize yourself with domain initialization prerequisites. For details, see *Prerequisites for Domain Initialization* (on page 16).
- In the INtools.ini file, located in the SmatPlant Instrumentation home folder, in the [Database] section, add the following statement: `AutoCommit=TRUE`

1. Start the Administration module to open the **Logon Information** dialog box with **DBA** displayed in the **User name** box. This is the default user name that enables you to log on to the Admin schema.
2. In the **Password** box, type **DBA**, the default password you use to log on to the Admin schema.
3. Click **OK** to open the **System Administration** window.
4. Click **File** > **Initialize**.
5. On the **Initialize** dialog box, in the **Domain** box, type the domain name, which must be unique in the current database, start with a letter, and contain only alphanumeric characters without spaces. You can use an underscore (_) to indicate a space.

   TIPS

   - You can use a name of previously deleted domain.
   - You can modify the domain name after completing the initialization. For details, see *Make Domain Definitions* (on page 29).
6. In the **Domain schema name** box, type the logon name of the domain schema, which must be unique in the current database, start with a letter, and contain only alphanumeric characters without spaces. You can use an underscore (_) to indicate a space. The software needs to use this name internally to connect to this domain.
7. In the **Domain schema password** box, type the logon password of the Domain schema, which must be unique in the current database, start with a letter, and contain only alphanumeric characters without spaces. You can use an underscore (_) to indicate a space.

   TIP The schema password must be different from the domain name. We recommend that you write down the schema password and keep it in a safe place. When initializing a domain, the software changes all the password characters to upper case. This means that if the Domain schema name is **MY_DOMAIN**, you cannot use **my_domain** as the password string.
8. In the **View-Only Domain schema** password box, accept the default password of the View-Only Domain schema or change it as appropriate, provided the setting is unique in the current database, starts with a letter, and contains only alphanumeric characters **without** spaces. You can use an underscore (_) to indicate a space.

TIP The default password and the characters that you type when changing the password appear masked.

9. Proceed to the relevant section.

Empty Database

a. Under **Target Domain type**, to determine the type of the domain that you want to initialize, select one of the following options:

- **Owner operator** — Allows you to initialize the domain as a domain with As-Built functionality. The database is partitioned into several schemas: a single schema for As-Built and separate schemas for projects.
- **Engineering company** — Allows you to initialize the domain as a domain contracted to design and build plants based on process information. A domain of the **Engineering company** type usually involves one set of data which may be revised extensively during the life cycle of the plant. In this case, the data for each project is maintained within a single database schema. Once a plant is operational, the domain type can be changed to **Owner operator** if required, and the owner can perform the necessary maintenance and modernization.

TIP During the initialization process, the software might display various error message that do not cause the initialization process to fail. If you want to prevent the software from displaying these message, select the **Do not display error messages** check box. After completing the initialization process, you can view the error messages recorded in the InitLog.txt file, which appears in the Smart Instrumentation home folder.

DDTI Seed File

a. Under **Target Domain type**, to determine the type of the domain that you want to initialize, select one of the following options:

- **Owner operator** — Allows you to initialize the domain as a domain with As-Built functionality. The database is partitioned into several schemas: a single schema for As-Built and separate schemas for projects.
- **Engineering company** — Allows you to initialize the domain as a domain contracted to design and build plants based on process information. A domain of the **Engineering company** type usually involves one set of data which may be revised extensively during the life cycle of the plant. In this case, the data for each project is maintained within a single database schema. Once a plant is operational, the domain type can be changed to **Owner operator** if required, and the owner can perform the necessary maintenance and modernization.

TIP During the initialization process, the software might display various error message that do not cause the initialization process to fail. If you want to prevent the software from displaying these message, select the **Do not display error messages** check box. After completing the initialization process, you can view the error messages recorded in the InitLog.txt file, which appears in the Smart Instrumentation home folder.

b. Click **Source**.

c. In the **Source Data Connection** dialog box, from the **Database type** drop-down select list, select the required source type.

d. Click **Browse**.

e. In the **Select Source Seed File Path** dialog box, locate and select the required seed file.

f. Click **Connect**.

g. From the **Domain** select list, select the required domain.

h. If initializing a project for working with As-Built, from the Project select list, select the required project.

i. Select any required optional feature:

- Save last ID for merging renamed items.
- Copy users & departments to target domain.

a. Click **OK**.

1. Click **OK** to start the initialization process.

★IMPORTANT After completing the initialization process, it is strongly recommended that you update the current database statistics for the initialized domain. Updating statistics improves the database performance. For details, see *Update Statistics* (on page 60).

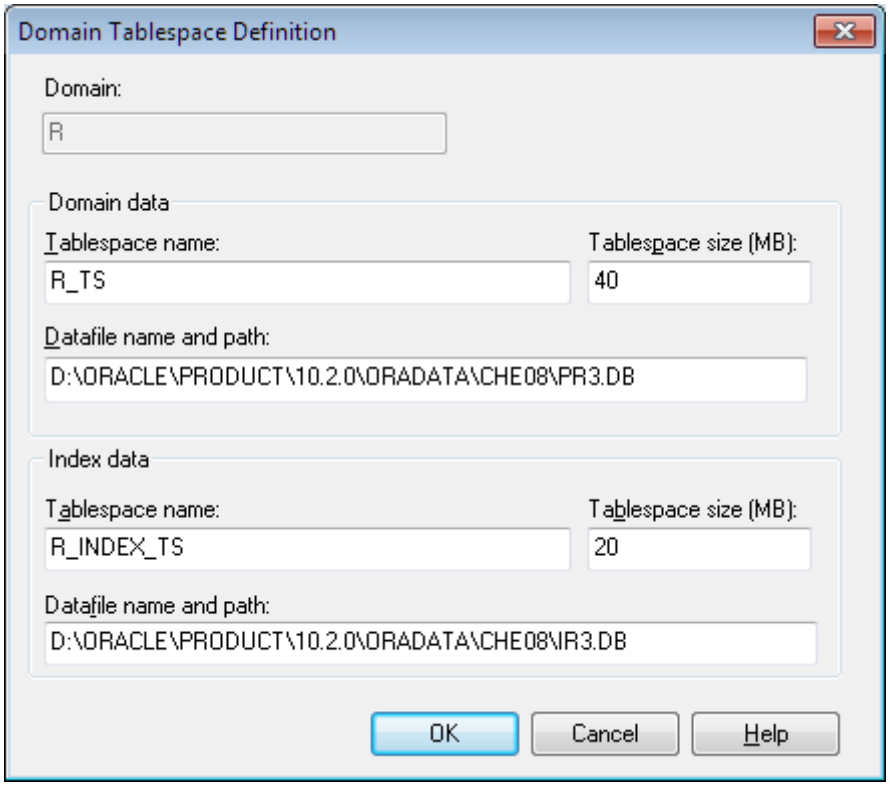
Defining Domain Tablespaces in Oracle

The user now defines the domain tablespaces, required for each domain, in Oracle. The definition modes match the tablespaces creation modes as described in section Set Up a Smart Instrumentation Database for Oracle.

Automatic/ Customized modes of Domain tablespaces definition

The user continues either the Automatic or the Customized modes of tablespaces creation with the following process:

1. Start the **Administration** module.
2. Log on as **System Administrator**.
3. Click **File** > **Initialize**.
4. On the **Initialize** dialog box, in the **Domain** box, type the domain name.
5. Click **OK** to open the **Domain Tablespace Definition** dialog box.



6. Under **Domain data**, **Index data**, insert the parameters and click **OK**.

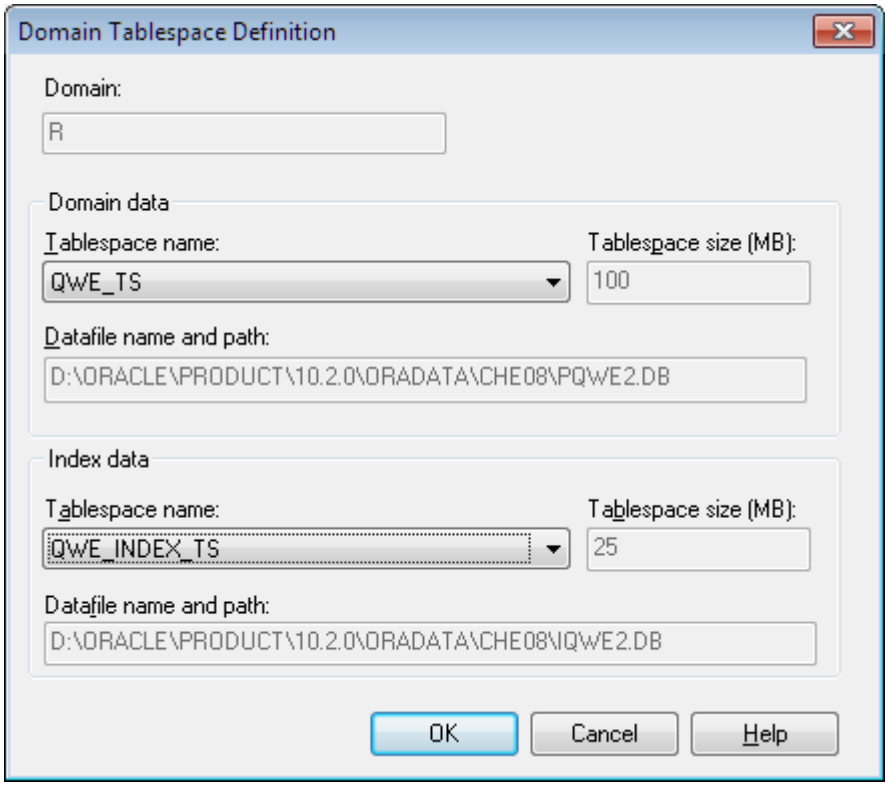
   ★ IMPORTANT Path names for tablespaces in Oracle must be no greater than 60 characters.

Predefined mode of Domain tablespaces definition

The user now creates the two tablespaces required for each domain.

1. Start the **Administration** module.
2. Log on as **System Administrator**.
3. Click **File** > **Initialize**.
4. On the **Initialize** dialog box, in the **Domain** box, type the domain name.

5. Click **OK** to open the **Domain Tablespace Definition** dialog box.



6. Under **Domain data**, from the **Tablespace name** drop-down list, select the Tablespace name as configured in the Domain Schema configuration process and click **OK**.

Initialize a Domain from the Command Line

You can initialize a domain without using the Administration module options of Smart Instrumentation. To do so, you, you need to specify additional parameters.

When initializing a domain without using Smart Instrumentation, you do not use any source domain, and, therefore, the software creates a new empty domain in your database platform (that is, Oracle or SQL Server).

Parameter String for Initialization

```
Init.exe INT,<new domain name>,<new Domain schema name>,<new Domain schema password>
```

NOTES

- You must only use commas as parameter separators.
- The parameters are not case-sensitive.

The following table describes the parameters in the order of their appearance in the parameter string.

Parameter	Description	Possible Settings
Init.exe	The initial parameter, which allows you to start the database engine.	INIT.EXE
INT	Stands for the name of the operation	INT
<New domain name>	The name of your target domain	DEMO
<New Domain schema name>	The name of the target Domain schema	DEMO
<New Domain schema password>	The password of the target Domain schema	DEMO **IMPORTANT** For initialization of an SQL database the password cannot be the same as the domain schema name.

Example

```
INIT.EXE INT,DEMO,DEMO,DEMO
```

NOTE After completing the initialization process, you can check the InitLog.txt file for errors that might have occurred during the domain initialization. The InitLog.txt file appears in the Smart Instrumentation home folder. In this log file, the software automatically records errors that do not cause the initialization process to fail.

See Also

Troubleshooting Domain Initialization Common Tasks (on page 24)

Add User-Defined Database Views

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **User-Defined Database Views**.
3. In the dialog box that opens, click **Add**.
4. In the **Add Database Views** dialog box data window, select one or more views and click **Apply**.

   TIP Prior to initializing a target domain by using the current domain as a source, you can add or remove user-defined database views any time you need.

NOTE After you click **Apply** in the **Add Database Views** dialog box**,** the software allocates the database views that you selected to the data window of the **User-Defined Database Views**. These database views become available in a target domain after initializing that domain using the current domain as a source.

Initialization Log Files

During the initialization process, the software generates the following log files:

InitLog.txt — Contains information about errors that occurred when inserting data into the Domain schema. The software creates this file in the Smart Instrumentation home folder automatically, on completion of the initialization process. When you initialize another domain in the same database, the software appends the new initialization session details in the file. If the initialization process completes without any errors, the file only contains information about the database platform and the session date.

<number indicating the order of domain initialization>.log — Contains information about database structure-related problems found during the initialization process. You should expect a 4.5 MB file to be created as a log file. The file name comprises the number of the domain and the .log extension. The number of the domain designates the order of domain initialization in your Smart Instrumentation database. For example, if you initialize your first domain, the software creates the log file with name 1.LOG. In the event of any problem occurring during the domain initialization, you must provide this file to Customer Support with your request for assistance.

This file is not created automatically. If you want to create this file, add the following line of the [Database] section of the INtools.ini file (located in the Smart Instrumentation home folder):

```
TRACE=1
```

See Also

Troubleshooting Domain Initialization Common Tasks (on page 24)

Troubleshooting Domain Initialization Common Tasks

The following tasks allow the System Administrator to troubleshoot initialization in case of an error occurring during the initialization process or handle initialization failure. For a complete list of tasks, click the appropriate topic on the **Contents** tab and then click the procedure that you want.

In the case of a problem occurring during the initialization of a domain, there are several tasks that can be used to troubleshoot the problem.

- Handle an initialization failure — If the software is unable to finish a specific initialization process
- Workaround for an initialization problem in Windows 7 64-bit or Windows 10 — enables you to resolve an initialization problem in Windows 7 or Windows 10. This problem occurs if the User Account Control in Windows 7 is set to **On**. To resolve this initialization problem, you need to temporarily set the User Account Control in Windows 7 or Windows 10 to **Off**.
- Numeric character settings for Oracle — enables you to prevent occurrence of **ORA-01722** error messages when initializing a domain in Oracle. You must complete this procedure if your Oracle client language environment is other than English, Far Eastern, Middle Eastern, or Spanish (Latin American). This procedure involves creating and configuring the **NLS_NUMERIC_CHARACTERS** parameter in the client registry. We recommend that you perform this procedure before you start domain initialization to prevent any occurrence of the **ORA-01722** error. It is possible, however, to perform this procedure after you come across this error message. In this case, you must cancel the current domain initialization process, complete the procedure, and then initialize a new domain.

Topics

Handle an Initialization Failure

In the event of an initialization failure, do the following.

NOTE When restarting the initialization process, you cannot define the same domain name because it is in use in the domain that became invalid when the previous initialization session was interrupted. If you want to use the same domain name, you must first delete the invalid domain. For details, see *Domain Deletion Common Tasks* (on page 41).

1. Re-start the initialization process.
2. If, during the initialization process, you receive the same error that caused the process to stop previously, press the Print Screen key. You must make a screen capture of both the **Initialize** dialog box, and the error message.
3. Send the screen capture and the InitLog.txt file, located in the Smart Instrumentation home folder, to Customer Support.

Workaround for an Initialization Problem in Windows 7 and 10

When initializing a domain in Windows 7 or 10, it is not possible to select a source domain if the User Account Control in Windows 7 or 10 is set to **On**. To resolve the initialization problem, temporarily set the User Account Control in Windows 7 or 10 to **Off**.

1. Before initializing a domain, in your Windows 7 or 10 **Control Panel**, click **User Accounts**.
2. Click **Turn User Account Control on or off**.
3. Clear **Use User Account Control (UAC) to help protect your computer**.
4. Restart the computer.
5. Initialize the domain.
6. Turn the UAC on if needed.

NOTE Instead of turning UAC off, it is also possible to manually update the content of the PATTERN_wat key in your Windows Registry. In the Registry Editor, the key appears in the path HKEY_LOCAL_MACHINE\SOFTWARE\ODBC\ODBC.INI. You need to define the correct source domain parameters in the key strings.

Numeric Character Settings for Oracle

When initializing a domain in Oracle, **ORA-01722** error messages is likely to occur on a client machine belonging to any of the following language groups:

- French
- Slav — Russian, Polish, and so forth

- Western European and Scandinavian — German, Dutch, Norwegian, and so forth
- Spanish — Spanish of Spain
- Portuguese
- Italian
- Baltic — Latvian, Lithuanian, and so forth

If you ignore **ORA-01722** error messages and complete the domain initialization, the domain does not initialize correctly. To prevent the problem from occurring or to resolve the problem if it has already occurred, do the following:

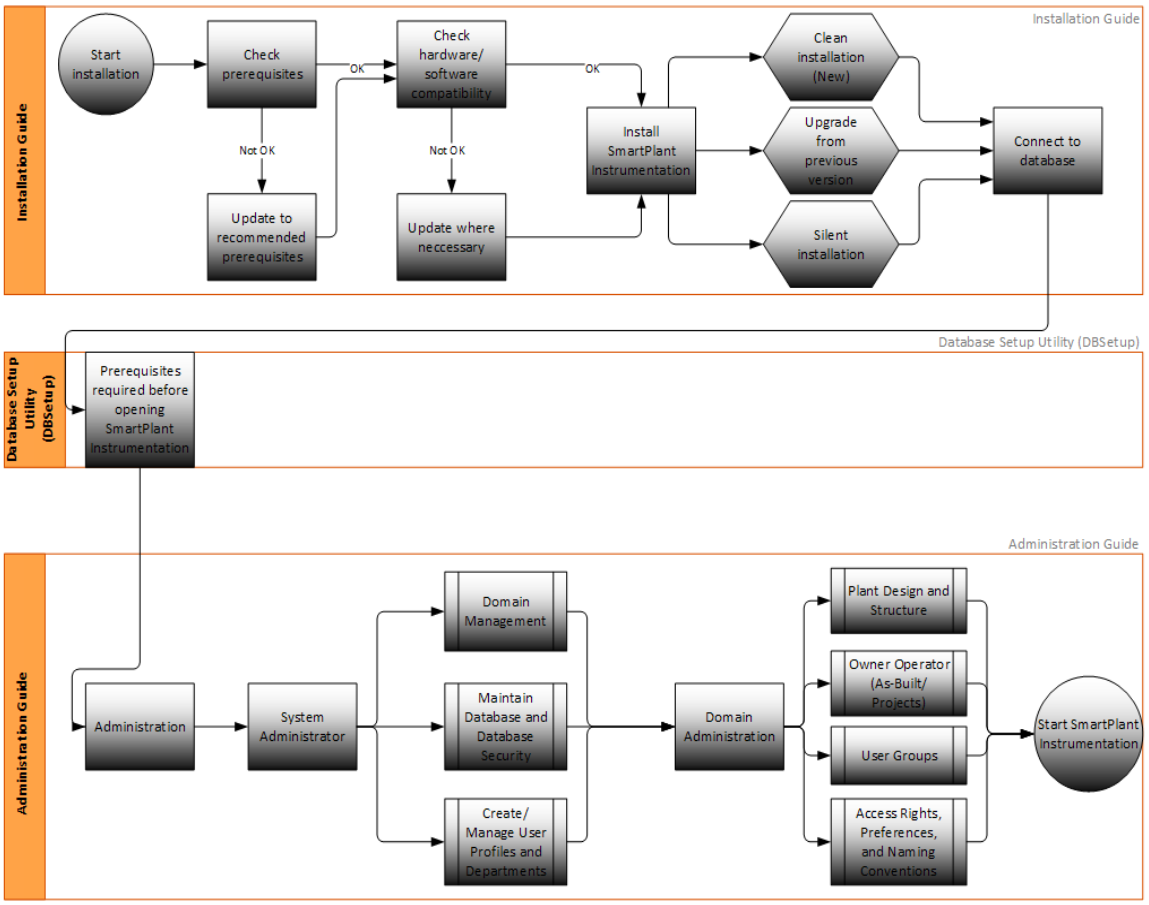
1. In the Registry Editor, under **My Computer**, expand the **KEY_LOCAL_MACHINE** folder hierarchy.
2. Expand the **SOFTWARE** folder hierarchy.
3. Expand the **ORACLE** folder hierarchy.
4. Right-click the **KEY_OraDb12Home1** folder.
5. On the pop-up menu, point to **New** and click **String Value**.
6. Under **Name**, type the parameter **NLS_NUMERIC_CHARACTERS**.
7. Right-click the **NLS_NUMERIC_CHARACTERS** parameter string and then, on the pop-up menu, click **Modify**.
8. In the **Edit String** dialog box, under **Value data**, enter the following values: **.,** (dot and comma)
9. Click **OK**.

NOTE If you performed this workaround after you have received an **ORA-01722** error message, when you try to run the interrupted initialization process again, the software might prompt you to resume or restart the process. For details about resuming or restarting the process, see *Handle an Initialization Failure* (on page 25).

Domain Management Common Tasks

The following flowchart shows the steps required to install the Intergraph Smart® Instrumentation software and perform the initial administration tasks prior to opening Smart Instrumentation for the first time.

NOTE If you are viewing this flowchart from the Installation Guide or Administration Guide .pdf then none of the links available in the flowchart are active. If you are viewing this chart from the Administration help, then you can click on some of the text boxes in the Administration section to open the relevant documentation.



The following set of procedures deal with creating, defining, and managing a Smart Instrumentation domain. You can perform the following actions:

- **Make domain definitions** — After initializing and associating a domain, you can set the definitions of the new domain in the **Domain Definition** window. Later, if required, you can change some of these definitions. For example, you can change the domain type, activate or deactivate the audit trail options, set the workflow option, set a plant hierarchy separator, and so forth.
- **Manage activity tracking**— The domain activity tracking feature monitors the usage of every module in the domain (except for the Administration module).

- **Activate the audit trail functionality** — This option allows the System Administrator to activate the audit trail mechanism. As a result, the Domain Administrator will be able to trim and load audit trail records. The System Administrator, however, can switch the audit trail functionality on or off as required at any stage of the plant life-cycle.
- **Enable cable type dependency** — This procedure allows the System Administrator to enable cable type dependency in a specific domain. Cable type dependency is a method of managing cable data in the Wiring module. Using this method, it is possible to create plant cables in the **Domain Explorer** only by dragging reference cables from the **Reference Explorer**, where each cable represents a specific cable type. As a result, certain cable properties are fixed because they are cable type-dependent.
- **Enable workflow** — This procedure explains how to activate the Smart Instrumentation workflow setup. When activated, the software displays the Workflow Browser in Smart Instrumentation to enable instrument engineers to implement the workflow setup.
- **Specify a global path** — The System Administrator can use this procedure to specify a global path in Smart Instrumentation. It is useful to specify a common global path for all users if you want the software to retrieve data from different users when performing a domain backup. The System Administrator can set or change the global path any time, at any stage of the plant life-cycle.

Topics

Create an Owner Operator Domain

1. Start the Administration module and log on as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
3. From the **Domain** list, select a domain.
4. Click  .

   TIP The domain schema name and domain schema password values are set only once, when you initialize the domain; therefore, you cannot edit these values.
5. Under **Domain type**, click **Owner operator**.

   IMPORTANT The options under **Owner operator** become permanently fixed in the current domain after creating the first project.
6. Do one of the following:
   - Select **Exclusive claim mode** to enable Smart Instrumentation users to work in exclusive claim mode.

- Clear **Exclusive claim mode** to enable Smart Instrumentation users to work in non-exclusive claim mode.

7. Set or update the remaining domain definitions as you require.
8. On the window toolbar, click  .

See Also

Owner Operator Domain (As-Built and Projects) (on page 78)

Make Domain Definitions

1. Start the Administration module and log on as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
3. From the **Domain** list, select the domain.
4. Click  .

   TIP The domain schema name and domain schema password values are set only once, when you initialize the domain; therefore, you cannot edit these values.
5. Do one of the following to specify the domain type:
   - Click **Owner operator** to set the domain type as **Owner operator** and enable users to work in projects or in As-Built. For further information, see Create an Owner Operator Domain.
   - Click **Engineering company** to define the domain as an engineering company if you do not need the As-Built functionality.
6. Under **Domain features**, enable or disable the available domain features.
7. Under **Workflow**, select an option. For more information, see *Enable Workflow* (on page 31).

   TIP Workflow options are available only when the domain type is defined as **Engineering company**. For an owner operator domain, the workflow is defined at the level of the projects in the domain.
8. Under **Specification title block**, from the **Custom title block assignment method**, select one of the following methods:
   - **Standard (used in all modules)** — Allows the Domain Administrator to select one specific custom title block to be assigned to all specifications. After selecting this option, the software hides all the title block assignment options that are available in the **Specifications** module.
   - **Special (used in Specifications module only)** — Allows users to assign individual title blocks to any specification, using the title block assignment options available in the **Specifications** module.

9. In the **Plant hierarchy separator** box, enter a single- character separator for all or part of a plant hierarchy is displayed as a string. For example, if the separator character is **&**, and you have plant hierarchy items **My Plant**, **My Area**, and **My Unit**, in the **Properties** dialog box for the **My Unit** item, the software displays the parent hierarchy as follows:
My Plant&**My Area**
10. Under **Global path**, click **Browse** to navigate to a folder which you want to set as a global path folder. For more information, see *Specify a Global Path* (on page 32).
11. On the window toolbar, click  .

See Also
Title Block Descriptions (on page 136)

Enable Cable Type Dependency

IMPORTANT

- Selecting the **Cable type dependency** option makes it impossible to duplicate internal connections when duplicating cables or copying cables from **Domain Explorer** to **Reference Explorer** in Smart Instrumentation.
- After enabling cable type dependency, it is only possible to create new cables in the **Reference Explorer**. To create plant cables, you will need to drag reference cables from the **Reference Explorer** to the **Domain Explorer**.
- The **Cable type dependency** option becomes unavailable if a Smart Instrumentation user selected the **Copy internal connections** preference option on the **Copy Items** page of the Wiring module preferences.
- Cable type dependency requires that all plant cables in the **Domain Explorer** have the same structure as reference cables in the **Reference Explorer**. Therefore, before enabling cable type dependency in a domain, we recommend that you initialize a new empty domain and then let Smart Instrumentation users create all the required cables for that domain.

1. Start the Administration module and log on as Domain Administrator to the target domain.
2. With the **Domain Administration** window open, on the menu bar, click **Reports > Cable Type Dependency Validation** and make sure that the report is empty.

   TIP It is only possible to enable cable type dependency if all reference cables comply with the dependency requirements. The Cable Type Dependency Validation report displays only those reference cables that do not comply with the dependency requirements. If the report displays such cables, you must delete them in Smart Instrumentation from the **Reference Explorer**.
3. Log off from the Domain Administration and then log on as System Administrator.
4. With the **System Administration** window open, do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
5. From the **Domain** list, select a domain.
6. Do one of the following:
   - Click **Options** > **Edit**.

- Click  .

7. Under **Domain features**, select the **Cable type dependency** check box.
8. Click  to save the current domain data to the database.

Enable Workflow

★ **IMPORTANT** Your Domain Administrator needs to define access rights at the level of individual instrument tags to implement workflow. For details, see *Workflow Access Rights* (on page 112).

1. Start the Administration module and log on as System Administrator.
2. With the **System Administration** window open, do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
3. From the **Domain** list, select a domain.
4. Do one of the following:
   - Click **Options** > **Edit**.
   - Click  .
5. In the **Workflow** section, from the **Instrumentation and Process Data** list, select the required workflow from the following:
   - **Full** - the software activates all the workflow options, and marks instrument tags for release as a formal issue in a binder package. The **Release to Spec** option becomes available in the Document Binder module and in the **Spec Change Notification Options** dialog box.
   - **Without Document Binder** - the software activates all the workflow options except for the option to release instrument tags as a formal issue in a binder package.
   - **None** - No workflow options are activated.
6. Click  to save the current domain data to the database.

See Also

Log on as System or Domain Administrator (on page 13)

Activate the Audit Trail Functionality

1. Start the Administration module and log on as System Administrator.
2. With the **System Administration** window open, do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
3. From the **Domain** list, select a domain.

4. Click  to enable editing of the domain definitions.
5. Under **Domain features**, select **Audit trail options**.
6. Click  .

Specify a Global Path

IMPORTANT If you change the existing global path, all user-defined paths remain linked to the previous global path. For example, if you change the global path from \\APP_SERVER\SmartPlant\Instrumentation to \\APP_SERVER_1\SmartPlant\Instrumentation, and a user has already specified a path to the PSR folder, in the appropriate box, the user-defined path is displayed as a full path \\APP_SERVER\SmartPlant\Instrumentation\PSR.

1. Start the Administration module and log on as System Administrator.
2. With the **System Administration** window open, do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
3. From the **Domain** list, select a domain.
4. Do one of the following:
   - Click **Options** > **Edit**.
   - Click  .
5. In the **Global path** group box, click **Browse** to navigate to the folder which you want to set as a global path.

   TIPS

   - We recommend that you specify a path that complies with universal naming conventions (that is, it starts with \\). If you want to use mapped drives, make sure that all Smart Instrumentation users have the same drive mapping.
   - A global path does not apply to individual temporary folder settings.
   - Select **Allow to overwrite the global path** if you want to allow users to set user-defined paths in addition to the specified global path. When this check box is selected, users are not restricted to setting new paths in Smart Instrumentation only within the global path folder.
6. Click  to save the current domain data to the database.

Domain Backup and Deletion

It is possible to back up an entire Smart Instrumentation domain to a folder of your choice. The backup file is created as an encrypted seed file. The backup seed file uses the format, <Domain Name.DDTI_Date/time created (MMDDYYhhmmss) > for the backup seed file name. Creating a backup seed file enables you to back up a domain and then use it as a source for restoring the domain or initializing another domain in Oracle or SQL Server. This way, you can restore your backed-up data to another domain in your database platform.

If your domain type is **Owner operator**, and you want to create an off-site project, you must back up the entire owner operator domain.

★ IMPORTANT When backing up a domain, the software does not back up the audit trail data from the CHANGES_LOG table. Therefore, before performing the domain backup, you must make sure that you trimmed all the audit trail data. Then, you can back up the trimmed audit trail data manually. For details, see *Backing up Files Containing Audit Trail Data.* (see "*Backing Up Files Containing Audit Trail Data*" on page 38)

When you back up a domain, the software records the backup session information in a log file. The software creates the log file in the same folder as the backup zip file using the same naming convention as the back-up file with the suffix .log.

The backup procedure involves the following sequence of operations:

1. Selecting a folder for the backup seed file.
2. Connecting to the database containing a domain you want to back up.
3. Selecting a domain for backup.
4. Backing up the domain.

   ★ IMPORTANT The following special characters cannot be used in passwords, database names, file names, and so forth:

   / \ [ ] =

   ; # : " !

Topics

Domain Backup Common Tasks

As System Administrator, you are responsible for backing up a domain to a chosen folder. It is only possible to back up one domain at a time.

Back Up a Domain — This procedure enables the System Administrator to select an existing domain on the server database on SQL Server or Oracle and then back up this domain to a chosen folder.

Back Up a Domain from the Command Line — This topic explains how to back up a domain without using the Administration module options of Smart Instrumentation.

Back Up a Domain in Thin Client Mode — This topic explains domain backup parameters that you need to include in a batch file for backing up a domain when working with Smart Instrumentation in thin client mode (via Citrix). After defining the appropriate parameters, you run the batch file on the Citrix server to back up the target domain. You do not have to use the Administration module options of Smart Instrumentation when backing up a domain in thin client mode.

Topics

Back Up a Domain

★ IMPORTANT

- If you work in thin client environment, for example, Citrix, you must copy the INtools.ini file to the Smart Instrumentation home folder on the server machine to be able to perform a backup procedure. On backup completion, remove the Intools.ini file from the server machine.

1. With the **System Administration** window open, click **File** > **Backup**.
2. On the **Backup Repository** dialog box, click **Browse** to select the folder where you want to create your backup file.
3. Click **Select**.
4. On the **Back Up Domain** dialog box, from the **Domain** list, select the domain you want to back up.
5. If required, select **Save last created ID for merging renamed items** to save the ID of the last item that was created in the domain. You can select this option if you later intend to merge items in the Merger Utility.
6. If required, select **Copy users & departments to target domain**.

   TIP The software can only copy those users and departments who are assigned to groups.

7. Click **OK** to start the backup process and monitor the progress on the **Backup Information** dialog box.

   TIPS

   - The name of the backed-up domain is <DomainName_MMDDYYHHMMSS.DDTI>. You cannot change these settings.
   - The software records errors that do not let the backup start or minor errors that do not cause the backup process to fail in a log file. This log file is located in the same folder as the backup file and uses the same name as the backup but with the suffix .log.
   - In the target database, the domain type is the same as in the source database.

8. Click **Close** after the backup is completed.

See Also

Managing Audit Trail Data (on page 159)

Back Up a Domain from the Command Line

You can perform a domain backup without using the Administration module options of Smart Instrumentation. To do so, you need to specify additional parameters.

Parameter String for Backup

```
Init.exe BKC,<Copy users and departments flag>,<Save last created ID
flag>,<Source Domain name>,<path to the target database>
```

NOTES

- You must only use commas as parameter separators.
- Use upper case for the Y and N flag settings.

The following table describes the parameters in the order of their appearance in the parameter string.

Parameter	Description	Possible Settings
Init.exe	The initial parameter, which allows you to start the database engine.	INIT.EXE
BKC	Stands for the name of the operation	BKC
<Copy users and departments flag>	The Yes/No parameter for copying user and departments definitions from the source domain to the target backup database file. The software can only copy those users and departments who are assigned to groups.	Y or N

Parameter	Description	Possible Settings
<Save last created ID flag>	The Yes/No parameter for saving the ID of the last item that was created in the domain. Set this parameter to Y (yes) if you later intend to merge items in the Merger utility. Set this parameter to N (no) if you previously backed up the domain and you want to merge data that was modified since this previous backup.	Y or N
<Source Domain name>	The name of the domain that you use as a source for backup.	IN_DEMO
<Path to the target database>	The full path to the folder where the backup seed file is created.	c:\Program Files\SmartPlant\ Instrumentation\ Backup

Example

```
Init.exe BKC,Y,N,IN_DEMO,
c:\Program Files\SmartPlant\Instrumentation\Backup
```

NOTE The software records errors that do not let the backup start or minor errors that do not cause the backup process to fail in a log file. This log file is located in the same folder as the backup file and uses the same name as the backup but with the suffix .log.

Back Up a Domain in Thin Client Mode

If you work with Smart Instrumentation in thin client mode (via Citrix), you can perform a domain backup without using the Administration module options of Smart Instrumentation. To do so you need to create and run a batch file on the Citrix server, for example Batch_Backup.bat and define specific parameters in this file.

Parameter String for Backup in Thin Client Mode

Init.exe BKC,<Copy users and departments flag>,<Save last created ID flag>,<Domain name of the source domain>,<Path to the target folder for the seed file on the Citrix server>,<path to the Intools.ini file on the thin client>

NOTES

- You must only use commas as parameter separators.
- Use upper case for the Y and N flag settings.

The following table describes the parameters in the order of their appearance in the parameter string.

Parameter	Description	Possible Settings
Init.exe	The initial parameter, which allows you to start the database engine.	INIT.EXE
BKC	Stands for the name of the operation	BKC
<Copy users and departments flag>	The Yes/No parameter for copying user and departments definitions from the source domain to the target backup database file. The software can only copy those users who are assigned to groups.	Y or N
<Save last created ID flag>	The Yes/No parameter for saving the ID of the last item that was created in the domain. Set this parameter to Y (yes) if you later intend to merge items in the Merger utility. Set this parameter to N (no) if you previously backed up the domain and you want to merge data that was modified since this previous backup.	Y or N
<Source Domain name>	The Domain name of the schema that you use as a source for backup.	IN_DEMO
<Path to the target folder for the seed file>	The full path to the folder on the Citrix server where the backup seed file is created.	d:\Program Files\SmartPlant\ Instrumentation\Backup
<Path to the target database>	The full path to the Intools.ini file located on the thin client.	u:\Program Files\SmartPlant\ Instrumentation

Example

```
Init.exe BKC,Y,N,IN_DEMO,
d:\Program Files\SmartPlant\Instrumentation\Backup\u:\Program
Files\SmartPlant\Instrumentation\Backup
```

NOTE The software records errors that do not let the backup start or minor errors that do not cause the backup process to fail in a log file. This log file is located in the same folder as the backup file and uses the same name as the backup but with the suffix .log.

Backing Up Files Containing Audit Trail Data

The Smart Instrumentation System Administrator can trim audit trail data and save the data to external files. The format, location and path configuration of these files depends on the platform you are using (Oracle or SQL Server).

- When using Oracle, these files appear as .sql files on your Windows server.
- When using SQL Server, these files appear as .txt files on your Windows server.

You need to back up these files to enable loading of the trimmed audit trail data to the CHANGES_LOG table of a domain. The software records the audit trail data in the CHANGES_LOG table that exists in each domain. To learn more about trimming and loading audit trail data, see, *Managing Audit Trail Data* (on page 159).

The external file containing audit trail data has a filename made up of the date range within which the data was trimmed, the domain name, the CHANGES_LOG table name, and the filename which the System Administrator has defined in the Administration module before trimming. The following is an example of an external file with audit trail data:

20010614_20011015_<domain name>#CHANGES_LOG#<user-defined filename>.

The audit trail period segment displays the date range in the following order: year, month, and day.

Topics

Backing Up Audit Trail Data on Oracle

Trimmed audit rail data is stored in .sql files located on your Windows server in a predefined folder. For example, <drive>:\INTOOLSTORAGE\ORC1, where ORC1 is your Oracle server database name. You have set the path and specified the INTOOLSTORAGE folder when creating a new Oracle instance.

NOTE When creating additional Oracle instances, we recommend that you do not change the name INTOOLSTORAGE for any of the Smart Instrumentation databases.

To enable loading of the audit trail data saved to the SQL files in the <drive>:\INTOOLSTORAGE\ORC1 folder, you must create a backup of these files on your Windows server in the following cases:

- When moving a Smart Instrumentation database from one Oracle server to another.
- When creating a new Smart Instrumentation database on the same Oracle server.

See Also

Managing Audit Trail Data (on page 159)

Back Up Files on an Oracle Server

You can back up your files when creating a new database on the same Oracle server or when moving a database from one Oracle server to another.

Back up files when creating a new database on the same Oracle server

1. On your Windows server, create a sub-folder <drive>:\INtoolStorage\<name of new Oracle database>.

   TIP The name of the new Oracle database appears as the value of the db_name parameter in the Oracle Instance Configuration file, for example, **orc2**.
2. In the target Oracle database, open the Oracle Instance Configuration file init.ora.
3. In the Oracle Instance Configuration file, add the following parameter line:

   `utl_file_dir=<drive>:\INtoolStorage\orc2`
4. Copy the content of the folder orc1 in the path <drive>:\INtoolStorage\ to the folder orc2.
5. Restart your computer.

Back up files when moving a database from one Oracle server to another

1. On your target Windows server, select a disk drive with 300 MB free disk space for the storage of about 1 million records.
2. Create a folder INtoolStorage.
3. Create a subfolder <drive>:\INtoolStorage\<name of new Oracle database server>.

   TIP The name of the new Oracle database appears as the value of the db_name parameter in the Oracle Instance Configuration file. For example, orc2.
4. Open the Oracle Instance Configuration file init.ora.
5. In the Oracle Instance Configuration file, add the following parameter line:

   `utl_file_dir=<drive>:\INtoolStorage \orc2`
6. Copy the content of the folder orc1 in the source path <drive>:\INtoolStorage to the folder orc2 in the target path <drive>:\INtoolStorage.
7. Restart your computer.

See Also

Managing Audit Trail Data (on page 159)

Backing Up Audit Trail Data on SQL Server

The software allows you to back up the files containing trimmed audit trail data for SQL Server database server in your Windows environment.

The file with the audit trail data is a .txt file that appears on your Windows server in a path that depends on your SQL Server version as follows:

- When using a SQL Server with a Smart Instrumentation database created in a **default instance**, the system creates the file in the following path: <drive>:\INtoolStorage\>default instance name>\<Smart Instrumentation database name>

  For example: e:\INtoolStorage\Develop1\INtools1 - where the default instance name Develop1 corresponds to your source Windows server name.

- When using a SQL Server with a Smart Instrumentation database created in a **named instance**, the system creates the file in the following path: <drive>:\INtoolStorage\<SQL Server name>\<named instance name>\<Smart Instrumentation database name>

  For example: e:\INtoolStorage\Develop1\INtools53\INtools1, where the SQL Server name Develop1 corresponds to your source Windows server name.

To enable loading of the audit trail data after moving a Smart Instrumentation database from one SQL Server database to another, you must make a backup of the .txt files with the trimmed audit trail data on your Windows server.

See Also

Managing Audit Trail Data (on page 159)

Back Up Files Containing Audit Trail Data on SQL Server

1. On your target Windows server, select a disk drive with 300 MB free disk space for the storage of about 1 million records.
2. Create a folder INtoolStorage.
3. Do one of the following:
   - On the SQL Server with a Smart Instrumentation database created in a **default instance**, create the following path: <drive>:\INtoolStorage\<default instance name of the new SQL Server server>\<Smart Instrumentation database name>.

     For example: e:\INtoolStorage\Develop2\SPI_1 - where the default instance name **Develop2** corresponds to your target Windows server name.

   - On the SQL Server with a Smart Instrumentation database created in a **named instance**, create the following path: <drive>:\INtoolStorage\<new SQL Server name>\<named instance name of the new SQL Server>\<Smart Instrumentation database name>.

     For example: e:\INtoolStorage\Develop2\SPI2009\SPI_1 - where the new SQL Server name **Develop2** corresponds to your target Windows server name.
4. Do one of the following:
   - When using SQL Server with a Smart Instrumentation database created in a **default instance**, copy the content of the folder **SPI_1** in the source path e:\INtoolStorage\Develop1\ to the folder **SPI_2** in the target path e:\INtoolStorage\Develop2\.

- When using SQL Server with a Smart Instrumentation database created in a **named instance**, copy the content of the folder **SPI_1** in the source path e:\INtoolStorage\Develop1\SPI2009 to the folder **SPI_2** in the target path e:\INtoolStorage\Develop2\SPI2009.

5. Restart your computer.

See Also

Managing Audit Trail Data (on page 159)

Domain Deletion Common Tasks

The System Administrator can use the following set of procedures to delete Smart Instrumentation domains. Domain is a term used in Smart Instrumentation to define the working environment for various instrumentation activities. When deleting a domain, the software deletes the Domain schema, which was created during the domain initialization. The Domain schema contains Smart Instrumentation domain data. When deleting a domain, the software deletes all the database tables and views associated with the current Domain schema. It is only possible to delete one domain at a time. For a complete list of tasks, click the appropriate topic on the **Contents** tab and then click the procedure that you want.

- Delete a Domain — Deletes a domain that is no longer in use. When deleting an owner operator domain, the software deletes all the project schemas and the As-Built schema. You do not have to delete the projects first.
- Delete an Invalid Domain on SQL Server — An invalid domain is a domain whose initialization process failed to complete. You can use this option to delete an invalid domain and automatically delete all database files associated with this domain. You must exercise an extreme caution when performing this procedure.
- Delete an Invalid Domain on Oracle — An invalid domain is a domain whose initialization process failed to complete. You can use this option to delete an invalid domain.

Topics

Delete a Domain

⚠ CAUTION Deletion is an operation you should consider very carefully before attempting to perform it. If you delete a domain, the software deletes the Domain schema with all the database objects associated with it. Since this operation is irreversible, you should consider backing up your domain first.

1. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click  .
2. Do one of the following
   - Click **Options** > **Delete**.

- Click ✕.

NOTES

- When deleting a domain in Oracle, if the software detects a rollback segment problem, an appropriate message appears. In this case, click **OK** and then click **Delete** again. If this kind of message reappears, click **OK** each time and then restart the deletion process until you receive a message notifying you that the domain has been deleted successfully. The possible problems that cause the occurrence of the error messages are insufficient disk space, non-optimal storage clause, or insufficient number of rollback segments.
- After deleting a domain in Oracle, a message is displayed with a list of physical tablespace data files you need to delete manually.
- In SQL Server, deleting a domain automatically deletes the filegroup and data files associated with the domain.

Delete an Invalid Domain on Oracle

CAUTION If an initialization process fails to complete, this domain becomes invalid (cannot be used). We recommend that you delete the invalid domain before initializing a new one.

1. With the **System Administration** window open, click **DBA** > **Delete Invalid Domain**.
2. In the **Delete Invalid Domain** dialog box, from the **Domain Name** list, select the invalid domain.

   TIP If the list is empty, there are no corrupted domains in the current database.
3. Click **OK**.

NOTES

- After you click **OK**, you cannot stop the deletion process.
- The duration of the deletion process depends on the stage at which the domain initialization failed: the later the stage, the longer the deletion process.
- On Oracle, Smart Instrumentation does not automatically delete all the data files associated with a deleted domain. You need to delete the remaining data files manually. You can view and print out the list of these data files in the **Data Files to Delete Manually** dialog box, which opens after Smart Instrumentation completes the invalid domain deletion.

Delete an Invalid Domain on SQL Server

⚠ CAUTIONS

- If an initialization process fails to complete, this domain becomes invalid (cannot be used). We recommend that you delete the invalid domain before initializing a new one.
- In addition to displaying invalid domains, the **Delete Invalid Domain** dialog box displays all valid schemas of other databases residing in your database server. Smart Instrumentation cannot verify whether you selected an invalid domain or a valid schema of another database. If you selected an invalid domain schema, you can safely proceed with the domain deletion. Deleting a schema that does not part of Smart Instrumentation results in deleting data in the database to which the schema belongs.

1. With the **System Administration** window open, click **DBA > Delete Invalid Domain**.
2. In the **Delete Invalid Domain** dialog box, from the **Domain Name** list, select the invalid domain.

   TIP If the list is empty, there are no corrupted domains in the current database.
3. Click **OK**.

NOTES

- After you click **OK**, you are prompted to verify your selection to make sure you have selected a schema of an invalid domain and not a schema that is not part of Smart Instrumentation.
- The duration of the deletion process depends on the stage at which the domain initialization failed: the later the stage, the longer the deletion process.
- In SQL Server, Smart Instrumentation automatically deletes all the data files associated with an invalid domain.

Database Security and Maintenance

The following section deals with the system administrator's responsibilities for database security and maintenance.

Topics

Managing Database Security

As System Administrator, you are responsible for setting up the general security definitions, for example, password encryption, whether user names are required to be unique, and how the software responds to users who log on with incorrect passwords. You are also responsible for managing multiple user connections and database locking options for multi-user platforms.

Topics

Smart Instrumentation Encryption Mechanism

Encryption Levels

There are four levels in the encryption mechanism of Smart Instrumentation:

1. Security schema password encryption.
2. Admin schema user password and Admin schema user logon name encryption (applicable for Oracle and SQL Server databases only).
3. Domain schema password encryption.
4. Smart Instrumentation user password encryption.

Logon Process

The logon process in Smart Instrumentation operates at the following levels:

1. The intools.ini file — holds the security schema password that provides access to the intools_login schema.
2. The intools_login schema — holds the INTOOLS_Login table, which holds the Admin schema user password and logon name.
3. The Admin schema — holds the PROJECT table, which in turn holds the names of the existing domains and all the passwords of Smart Instrumentation users.

Encryption Functionality per Database Platform

The following tables show the availability of the encryption functionality according to database platform.

Oracle:

Schema	**Password Change**	**Encryption**
Security Schema	Yes	The encrypted password is saved in the intools.ini file. This file must be distributed to all client machines.
Admin Schema	Yes	The encrypted password and user name are saved in the INTOOLS_LOGIN table. The password and user name are deleted from the intools.ini file.
Domain Schema	Yes	Encrypts all passwords in the following tables: project, engineering_project, sap_project. These are all the domain passwords.
Smart Instrumentation Users	Yes	Encrypts all passwords in Intools_login table (the table that holds all the SI usernames & their passwords).

SQL Server:

Schema	**Password Change**	**Encryption**
Security Schema	Yes	The encrypted password is saved in the intools.ini file. This file must be distributed to all client machines. Note that this password is same for all the databases in an instance that is hosted on a given server.
Admin Schema	Yes	The encrypted password and user name are saved in the INTOOLS_LOGIN table. The password and user name are deleted from the intools.ini file.
Domain Schema	Yes	Encrypts all passwords in the following tables: project, engineering_project, sap_project. These are all the domain passwords.

Schema	Password Change	Encryption
Smart Instrumentation Users	Yes	Encrypts all passwords in Intools_login table (the table that holds all the SI usernames & their passwords).

Encryption Results

Security Schema:

Unencrypted	Encrypted
In the intools.ini file: SecuritySchemaPassword=intools_login	In the intools.ini file: SecuritySchemaPassword=#2f###RG##T

Admin Schema:

Unencrypted	Encrypted
In the intools.ini file: The LogId, LogPass, and Dbparm parameters display these values. The intools.ini file is accessible by all users.	In the intools.ini file, the LogId, LogPass, and Dbparm parameters no not display any values. The LogId and LogPass values are encrypted in the INTOOLS_LOGIN table.

Domain Schema:

- All the Domain schema passwords are encrypted in the PROJECT, ENGINEERING_PROJECT, and SAP_PROJECT tables.
- All the user passwords are encrypted in the INTOOLS_USER table. Consequently, none of the passwords are visible to employees with database access rights.

Smart Instrumentation User Passwords:

- All the user passwords are encrypted in the INTOOLS_USER table. Consequently, none of the passwords are visible to employees with database access rights.

Topics

Change the System Administrator Password

After logging on to Smart Instrumentation for the very first time, it is recommenced that you change the default System Administrator login password, which is *DBA*.

1. With the **System Administration** window open, click **File** > **Change Password**.
2. In the **Current password** field, type the current System Administrator logon password.
3. In the **New password** field, type the new System Administrator logon password.
4. In the **Confirm new password** field, retype the new password, and click **OK**.

NOTES

- The passwords that you type appear masked.
- The System Administrator logon password is case-sensitive.

Change a Domain Schema Password

This procedure allows you to change the logon password of an existing Domain schema.

1. With the **System Administration** window open, click **DBA** > **Security Options** > **Change Domain Schema Password**.
2. From the **Domain** list, select the domain for which you want to change the schema password.
3. In the **Current Domain schema password** field, type the current password.
4. In the **New Domain schema password** field, type the new password.
5. In the **Verify password** field, retype the new password and click **Apply**.

NOTES

- The passwords that you type appear masked.
- The password is not case-sensitive.

Change the Security Schema Password

When working with Oracle or MS SQL Server databases, the System Administrator can change the initial logon password. Note that for MS SQL Server databases, this password is shared by all the databases that reside on a particular host.

IMPORTANT After completing this procedure, make sure that you distribute the new intools.ini file among all the client machines.

1. With the **System Administration** window open, click **DBA** > **Security Options** > **Change Security Schema Password**.
2. On the **Change Security Schema Password** dialog box, type the current security schema password.
3. Under **New Security Schema password**, type a new password.

4. Under **Verify password**, retype the new password and click **OK**.

NOTES

- The passwords that you type appear masked.
- The password is not case-sensitive.
- Make sure that the modified intools.ini file is distributed among all the client machines.

Encrypt the Admin Schema Logon Password

This procedure allows the System Administrator to encrypt the Admin schema logon password to prevent unauthorized connections to the Admin schema. After you encrypt the password, users who do not know the Admin schema logon password cannot connect to the Admin schema to view names and passwords of other users, modify or delete data in the Admin schema tables. It is impossible to revert to non-encrypted method of password storage.

- With the **System Administration** window open, click **DBA** > **Security Options** > **Encrypt Admin Schema Password**.

NOTES

- After you select to encrypt the Domain schema logon password the values of the LogId and LogPassword are automatically cleared from the [Database] section of intools.ini file on the System Administrator's workstation. For example, where the parameters are displayed as shown:
  `LogId=IN_DBAMN`
  `LogPassword=IN_DBAMN`
  you should delete the string `=IN_DBAMN` in each of the lines.
- After the encryption, the System Administrator also must distribute the intools.ini file among all the client machines.
- The encryption process is irreversible.

IMPORTANT Changing the Admin Schema password also changes the **View-Only Domain schema password** generated when the domain was Initialized **(File > Initialize)**. For more information, see*Initialize a Domain* (on page 18).

Encrypt All Domain Schema Passwords

This procedure allows you to encrypt all the Domain schema logon passwords in the current database. If the domain type is owner operator, the software also encrypts all the Project Schema logon passwords. After encryption, the password values remain in the appropriate table columns but appear encrypted. This procedure affects all the existing and new domains in the current database. After completing this procedure, if you initialize a new domain, the Domain Schema logon password value appears encrypted in the appropriate tables. It is impossible to revert to the non-encrypted method of password storage.

- With the **System Administration** window open, click **DBA** > **Security Options** > **Domain Schema Password Encryption**.

NOTE The encryption process is irreversible.

Encrypt the Security Schema Password

This procedure allows you to encrypt the logon password of the Smart Instrumentation database schema that stores the encrypted Admin schema password. It is impossible to revert to non-encrypted method of password storage. Depending on the database platform, the security schemas are as follows:

- **INTOOLS_LOGIN** is a Smart Instrumentation database schema created only in Oracle during the database setup. This schema stores the encrypted Admin schema password in the database. The schema logon name and password are both **intools_login**. The logon name is set permanently in the software. The System Administrator can change and encrypt the **intools_login** password if needed.
- **SPI_login** is a Smart Instrumentation database schema (database user) created only in SQL Server during the database setup. Each SPI_login schema stores the encrypted Admin schema password in the database. This schema login is shared for all databases you create in a SQL Server instance. For example, if you create SPI1 and SPI2 databases in the same instance, each database contains the SPI_login schema but, at the instance level, both schemas share the same login, whose name is **SPI_login** and password is **spi_login_pwd** (lower case). The login name is set permanently in the software. The System Administrator can change and encrypt the **spi_login_pwd** password if needed.

1. With the **System Administration** window open, click **DBA** > **Security Options** > **Encrypt Security Schema Password**.

   TIP The password characters appear masked.

2. Click **OK** to encrypt the password in the intools.ini file.

NOTE The encryption process is irreversible.

Encrypt All User Passwords

This procedure allows you to encrypt all user passwords and prevent other users, including the System Administrator or any other database super user, from logging on other than under their own logon name.

1. With the **System Administration** window open, click **DBA** > **Security Options** > **Encrypt All User Passwords**.
2. Click **OK** to encrypt all Smart Instrumentation user passwords.

NOTE The Database System Administrator or any user with the appropriate database access rights can access the users' logon information stored in the USERS table. See your database platform user guide for further information about the available facilities to access the database tables.

Set Security Options

You can increase security when logging on to Smart Instrumentation by ensuring that every user logs on using a unique password. You can also specify a minimum length of five characters for passwords.

1. With the **System Administration** window open, click **Activities** > **Security Options**.
2. On the **Security Options** dialog box, select the check boxes as required.

NOTE If you want to select or clear the **Enable Windows authentication logon method** check box, we strongly recommend that you read the *Windows Authentication Logon Method* (on page 90) topic. Enabling or disabling this option can prevent certain users from accessing Smart Instrumentation.

Database Locking Mode (for Multi-User Versions)

This option enables you to work faster in a multi-user version of Smart Instrumentation by disabling database locking. Normally, when working in a multi-user environment such as Oracle or SQL Server, all database objects, for example, triggers, stored procedures, and so forth, become automatically locked. Locking objects prevents sharing violation problems from occurring when several users try to access the same instrumentation data item at the same time. Note that this locking mechanism slows down your work.

In multi-user versions of Smart Instrumentation (Oracle and SQL Server), all database objects are locked by default. However, depending on the way you manage your database, you can unlock all database objects, thus making the software work faster. You can also revert to the default mode and lock the database objects any time you need.

To learn how to set your database locking mode, see *Set Database Locking Mode* (on page 51).

NOTE Remember that once you unlock your database objects, there is no mechanism which prevents sharing violation problems from happening. In this case database problems can occur when more than one user tries to work on the same item.

Set Database Locking Mode

This option enables you to work faster in a multi-user version of Smart Instrumentation by disabling database locking.

1. Start the **Administration** module and enter as System Administrator.
2. In the **System Administration** window, do one of the following:
   - Click **File** > **Domain Definition**.
   - Click  .
3. In the **Domain Definition** window, from the **Domain** list, select the domain whose locking mode you want to change.
4. Click 
5. Under **Domain features**, select **Single mode** to enable locking of items and to switch to multi-user mode.
6. Click  .

Maintaining the Smart Instrumentation Database

As System Administrator, you are required to deal with certain tasks that keep the integrity of your database intact. Maintenance tasks differ from database platform to database platform. However, there are several procedures are common to all platforms. The maintenance procedures are grouped according to the following categories.

Topics

General Database Maintenance Common Tasks

The following tasks are used frequently when you need to perform general database maintenance tasks.

Define databases for logging on to Smart Instrumentation — Use this procedure to enable Smart Instrumentation users to select a database when logging on to Smart Instrumentation. After performing this procedure, users can select a database from the **Database** list on the **Logon Information** dialog box and connect to this database. All the databases that you want to make available for connection must belong to the same database platform: Oracle or SQL Server.

Switch between databases — Use this procedure to switch from one database to another using the Database Profile Manager.

Rebuild default views in domains — Use this procedure to rebuild the default views of all the database objects for a specific domain. You must rebuild the default views after upgrading SmartPlant Instrumentation to Version 2016 SP1. This is because during the upgrade, the software makes changes to certain tables, and as a result, the default views associated with these tables might become invalid.

Rebuild stored procedures and triggers — This procedure is used by the System Administrator for the following purposes:

- To identify abnormal database behavior and solve it by rebuilding the stored procedures and triggers in the database if the software displays inappropriate SQL messages when using Smart Instrumentation.

You can rebuild stored procedures either for the Admin schema or for a specific Domain schema.

Rebuild catalog tables — Use this procedure to rebuild the catalog tables, which enable users to work with multi-tag specifications in the Specifications module. The software creates the catalog tables during the Smart Instrumentation database setup. If the software encounters a database problem when creating the catalog tables, you can try to rebuild them to resolve the problem. If such a problem occurs, the software displays a message notifying you that you cannot work with multi-tag specifications due to a problem with the catalog tables.

Topics

Define Database Profiles for Logging onto Smart Instrumentation

You define your database logins in the Database Profile Manager. You can create a login profile for each database you want to connect to Smart Instrumentation. After selecting your profile, the software automatically creates the Intools.ini file with the correct database parameters to enable the software to connect to your database. For more information; see the *Smart Instrumentation Installation Guide* > *Installing Smart Instrumentation* > *Connecting Smart Instrumentation to a Database*

Switch Between Databases

You use the Smart Instrumentation Database Profile Manager to switch between your databases.

1. Do one of the following to open Smart Instrumentation Database Profile Manager:
   - In the folder where you installed Smart Instrumentation double-click on dpprofilemanager.exe.
   - On the Start menu click **All Programs** > **Intergraph Smart Instrumentation** > **Smart Instrumentation DBProfileManager**.
2. From the **Profile** select list, select the required database.

   TIP Select the **Set as default profile** check box if you want the software to connect to this database every time you open Smart Instrumentation.
3. Click **OK**.

Rebuild Default Views in Domains

★IMPORTANT

- When initializing a domain, a View-Only Domain schema password is created using the format <Domain schema logon name>_VIEW, for example: Red Plant_VIEW. If you then change the Domain name, you must still use the original View-Only Domain schema password to rebuild the default views.
- You can only rebuild the default views supplied with the Smart Instrumentation database. You cannot rebuild any user-defined views.
- Make sure that all users have logged out of the database before starting this procedure.

1. With the **System Administration** window open, click **DBA** > **Rebuild Default Views in Domains**.
2. From the **Domain** list, select the domain whose database views you want to rebuild.

3. In the **View-Only Domain schema password** box, enter the logon password of the View-Only Domain schema. The password characters appear masked.

   TIP You can change the password only once, when initializing a new domain. If you did not change the password when initializing the selected domain, enter the default logon password, which is <Domain schema logon name>_VIEW.

4. If working on SQL Server, type the SQL Server System Administrator's password.
5. Click **OK** to start rebuilding the views of the selected domain.

Before Rebuilding Stored Procedures and Triggers

Prior to rebuilding the stored procedures and triggers the user must set the User Account Control in Windows 7 and Windows 10 to OFF. This is to enable access to the IN_TEMPL.DDTI file required to perform the rebuild.

1. Click the **Start** button and in the Search box type **UAC**.
2. Click **Change User Account Control Settings**.
3. Move the slider down to the **Never notify** position to set the UAC OFF or up to select when you want to be notified to turn the UAC ON.
4. Click **OK**. When setting the UAC to OFF you will need to restart the computer and when setting the UAC to ON you will need to insert a password and provide a confirmation.
5.

NOTES

- Instead of turning UAC off, it is also possible to manually update the content of the PATTERN_wat key in your Windows Registry. In the Registry Editor, the key appears in the path HKEY_LOCAL_MACHINE\SOFTWARE\ODBC\ODBC.INI. You need to define the correct parameters for the Intools_backup.ddti database in the key strings.
- When the User Account Control in Windows 7 or 10 is set to On, you cannot initialize a domain either. The same workaround applies.

Rebuild Stored Procedures and Triggers

CAUTIONS

- This procedure should only be carried out when you are specifically instructed to do so by Customer Support.
- Make sure that all users have logged out of the Smart Instrumentation database before starting this procedure. When you start rebuilding stored procedures and triggers, no users should attempt to log on to Smart Instrumentation.

Create a Batch Rebuild File

As in batch upgrade, you can create a .bat file that rebuilds stored procedures and triggers for multiple domains simultaneously. The following procedure describes how to create a batch rebuild file.

1. In **Notepad**, create a batch file (for example, **BatchRebuild.bat**).

2. Enter a line for each domain you are asked to rebuild stored procedures and triggers for, as shown in the example below:

```
Upgrade -9999              //rebuild stored procedures and triggers
for admin schema
Upgrade -<proj_id>         //rebuild stored procedures and triggers
for a specific domain
```

3. Double-click the batch file to run it and rebuild stored procedures and triggers for the defined domains.

   TIP You can schedule the batch file to run at a convenient time using Windows scheduler (for example, during the night or over the weekend).

Rebuild Stores Procedures and Triggers Manually

1. With the **System Administration** window open, click **DBA** >**Rebuild Stored Procedures and Triggers**.
2. Do one of the following:
   - Click **Admin schema** to rebuild stored procedures and triggers of the Admin schema.
   - Click **Domain schema** and then, under **Domain**, select a domain for which you can rebuild stored procedures and triggers.
3. Click **OK**.

   TIPS

   - When rebuilding stored procedures and triggers of the Admin schema, the **Domain** list is redundant**.**
   - If the process stops for any reason, you can restart the process and the process continues from where it stopped. If you get an error that cannot be corrected, contact Intergraph Support with the error description. It is recommended that you have your log file available when contacting Intergraph Support.
4. On the **Rebuild Stored Procedures** dialog box you can click **Browse** to specify the log file path and filename, if you do not want to use the default **Log.txt** file. This file contains information of the current session and any errors that may have occurred in previous sessions. The log file is concatenated, if you use the same log file name.
5. Click **OK** to start rebuilding the stored procedures and triggers of the selected schema.

At the end of the process, an appropriate message is displayed and an additional log file **Logerror.txt** is generated in the Smart Instrumentation home folder. The data in the **Logerror.txt** file is incremented between sessions. Send the **Logerror.txt** file to Intergraph Support after you complete the process.

Rebuild Catalog Tables

★ IMPORTANT Make sure that all users have logged out of the Smart Instrumentation database before starting this procedure.

1. With the **System Administration** window open, click **DBA** >**Rebuild Catalog Tables**.
2. Click **OK** to start rebuilding all the catalog tables.

Database Maintenance on SQL Server Common Tasks

SQL Server uses data files which are resized automatically as the data grows, until the disk is full. When this happens, you can add another data file on a different disk. The following tasks are used frequently when you need to perform database maintenance tasks on SQL Server.

Add a filegroup — Filegroups are used as containers for datafiles. A filegroup can be connected to one database only. Usually, two filegroups are used for each domain: one for data tables and the other for table indexes. You can backup and restore data for a filegroup. A primary filegroup contains stored procedures and triggers. When deleting a domain, the entire filegroup and the datafiles it contains are deleted, resulting in cleaner data, without causing damage to the database.

Print filegroup information — This procedure explains how the System Administrator can display the list of all the existing SQL Server filegroups and print out the filegroup information.

Add a log file — The database log file is used internally by SQL Server to backtrack aborted user sessions. This way you can resume any previous sessions that you stopped or canceled. This procedure explains how to add a log file.

Add a datafile to the TEMPDB database — This procedure enables you to add a datafile to the SQL Server TEMPDB Database. This database is used internally by the SQL Server to make all the required temporary operations. Such operations are needed when Smart Instrumentation brings data in a certain order, and the database needs to sort this set of data after retrieving it.

Optimize indexes — This procedure enables you to optimize fragmented SQL Server indexes. The SQL Server indexes become fragmented during the domain lifetime and contributes to database under-performance. In this case you can rearrange your SQL Server indexes to optimize them. As you keep storing and deleting domain data, the SQL Extents become disordered thus slowing down SQL command execution. Smart Instrumentation solves this problem by reordering the indexes stored in these Extents.

Topics

Add a Filegroup

1. With the **System Administration** window open, click **DBA** > **Add Datafiles**.
2. Click the **Filegroup** tab.
3. In the **New file information** section, type the datafile name, the datafile location, and the initial size (in MB).
4. Click **Apply** to add the filegroup.

Print Filegroup Information

1. Start the Administration module and log on as System Administrator.
2. With the **System Administration** window open, click **DBA** > **Filegroup List**.
3. In the **Filegroup List** dialog box, review the existing filegroup information.
4. Click **Print** to print out the information displayed in the data window of the **Filegroup List** dialog box.
5. Click **Close**.

Add a Log File

⚠ **CAUTION** You should exercise caution when adding a log file, as doing so affects the entire SQL Server.

1. With the **System Administration** window open, click **DBA** > **Add Datafiles**.
2. Click the **Log** tab.
3. In the **New file information** section, type the datafile name, the datafile location, and the initial size (in MB).
4. Click **Apply** to add the filegroup.

Add a Datafile to the TEMPDB Database

★ **IMPORTANT** On SQL Server, TEMPDB is automatically incremented and depends on a disk size. If TEMPDB reaches the disk limit, you can increase the TEMPDB database size by adding a datafile to another disk.

1. With the **System Administration** window open, click **DBA** > **Add Datafiles**.
2. Click the **Temporary Database** tab.
3. In the **New file information** section, type the datafile name, the datafile location, and the initial size (in MB).
4. Click **Apply** to add the datafile to the TEMPDB database.

Optimize Indexes

IMPORTANT Before starting the optimization process, make sure that no other user is using the currently selected domain. If you attempt to optimize the indexes of a domain which is currently being used by another user, the software displays a message warning you that the domain is currently in use.

1. With the **System Administration** window open, click **DBA** > **Optimize Indexes**.
2. From the **Domain** list, select the required domain.
3. Do one of the following to define the tables you want to include in the optimization process:
   - Click **All tables** to optimize the indexes of all the existing tables in the defined domain.
   - Click **Selected tables** to display the database indexes in the **Table Name** data window and optimize the indexes of the highlighted tables in the defined domain.
4. Do one of the following to define the index source on which you base the optimization:
   - Click **Current database** to optimize indexes using the current database indexes.
   - Click **Template database** to optimize indexes using the IN_TEMPL.DDTI template database indexes. Use the **Template database** option if your current database indexes have been deleted or become unusable.
5. Click **OK**.

NOTE To enable better performance after completing the index optimization process, you need to update statistics. Start the Query Analyzer and run the SP_UPDATESTATS procedure.

Database Maintenance on Oracle Common Tasks

The following tasks are used frequently when you need to perform database maintenance tasks on Oracle.

View tablespace data — Tablespaces are database domains where Oracle keeps your Smart Instrumentation database information. The tablespace data is physically stored in one or more files. This option allows you to view a list of tablespaces in which there is still free space to store data.

Add datafiles to tablespaces — If your system reports that you ran out of space in the database tablespaces or if the system fails to perform, you can use this option to increase the database tablespace by attaching additional datafiles to an existing tablespace.

Optimize indexes **—** You can use this option to optimize fragmented Oracle database indexes. Oracle database indexes become fragmented during the domain lifetime and contribute to database under-performance. In this case, you can rearrange your database indexes to optimize them. The domain index data is generated during the initialization phase. The index data is grouped into one or more Extents which may account for the index fragmentation level. As you keep storing and deleting domain data, the Oracle Extents become disordered thus slowing down SQL command execution. Smart Instrumentation solves this problem by reordering the indexes stored in these Extents.

Update statistics — This option enables you to improve the Oracle SQL command processing performance, especially after a large data import or after optimizing indexes, or after initializing a domain on Oracle. During updating the statistics, Smart Instrumentation executes an ANALYZE SQL command that retrieves the statistical data for the Smart Instrumentation tables. That statistical information is later used by the Oracle Cost-based Optimizer to optimize SQL command execution.

Topics

View Tablespace Data

- With the System Administration window open, click **DBA > Tablespaces List** to display the data for all filegroups that have free space for storing data.

Add Datafiles to Oracle Tablespaces

★IMPORTANT This procedure enables you to add a datafile to a tablespace. Therefore, make sure you have enough free disk space on the drive where the tablespace is stored.

1. With the **System Administration** window open, click **DBA** > **Add Datafiles**.
2. From the **Tablespace** list, select the tablespace you want to resize.
3. In the **Datafile name** box, type the full path and name of a new additional datafile that you want to attach to the currently selected tablespace.

   TIPS

   - Ensure that you select a datafile that is not currently in use.
   - The datafile format must be .ddti.
4. In the **Datafile size** box, type the size of the additional datafile.
5. Click **OK** and make sure the software displays a message notifying you that the selected tablespace was increased successfully.

Optimize Indexes

★IMPORTANT

- Before optimizing indexes in Smart Instrumentation tables, make sure that in the Oracle Instance Configuration file, the OPTIMIZER_MODE parameter value is either CHOOSE (default) or COST. This way, you activate the Oracle Cost-based Optimizer, which determines the quality of the Smart Instrumentation database performance.
- Before starting the optimization process, make sure that no other user is using the currently selected domain. If you attempt to optimize the indexes of a domain which is currently being used by another user, the software displays a message warning you that the domain is currently in use.

1. With the **System Administration** window open, click **DBA** > **Tuning** >**Optimize Indexes**.
2. From the **Domain** list, select the domain in which you want to optimize indexes.

   TIPS

   - The **Fragmentation** column displays the number of Extents of each index.
   - It is recommended to optimize all database indexes whose fragmentation level is higher than 4.
3. Do one of the following:
   - Click **All tables** to optimize the indexes for all the tables in the selected domain.
   - Click **Selected tables** to display in the data window all the tables in the current domain and optimize the indexes for the required tables.
4. Click **OK** to start the optimization process.

NOTE To enable better performance after completing the index optimization process, you need to update statistics. Without updating statistics, the Oracle Cost-based Optimizer cannon use the reordered indexes.

Update Statistics

- With the **System Administration** window open, click **DBA** > **Tuning** > **Update Statistics**.

  NOTE This option is available to both System and Domain Administrator when using Smart Instrumentation on Oracle.

SECTION

Users, Departments, and Groups

As System Administrator, you are responsible for the creation of all Smart Instrumentation users and for the management of their profiles. Also, you assign them to various departments and determine who of the users will function as the Domain Administrator.

You can perform the following tasks:

Create and manage departments — Departments are used to provide extra information about your users. Department names appear in the **Users** dialog box only.

Create and manage user profiles — The System Administrator must define all the users that can work in Smart Instrumentation. The System Administrator can also assign users to departments and edit the user profile information, including user passwords.

Assign a domain administrator — As System Administrator, you must assign a Domain Administrator when associating a new domain. You can change the Domain Administrator later if required.

Topics

Create and Manage Departments

1. Start the Administration module and log on as System Administrator.
2. With the **System Administration** window open, do one of the following to open the **Domain Definition** window:
   - Click **Activities > Department**.
   - Click  .
3. Click **New**.
4. Under **Department**, **Description**, and **Note**, type the appropriate values.
5. Click **Apply**.
6. To edit or delete an existing department, from the **Department** list, select a department.
7. Click **Edit** or **Delete** as you require.
8. Click **Close** when done.

NOTE The software creates a default department with each new domain. If required, you can assign all your users to this department.

Define a Smart Instrumentation User

1. Start the Administration module and log on as System Administrator.
2. With the **System Administration** window open, do one of the following to open the **Domain Definition** window:
   - Click **Activities** > **User**.
   - Click  .
3. In the **User** dialog box, click **New**.
4. Under **User**, type a **unique** user name.

   TIPS

   - The user name can contain up to thirty characters. The software applies upper case to all alphabetic characters. You can use any combination of characters.
   - If you intend to use Windows authentication logon method, you must define a user group with the same name as a user group defined in Windows. In this case, you do not have to define users at all. Then, whenever a user that belongs to the Windows group accesses Smart Instrumentation for the first time, the software logs on this user and assigns the user to the Smart Instrumentation group. The user name appears in the **User** dialog box automatically.

5. Under **User initials**, type the appropriate initials. The software uses this value to identify the reviewer in all the revisions created in the software.
6. From the **Department** list, select a department to which you want to assign the user.
7. Under **Password**, type a unique login password for the user.

   TIP A password can contain up to 15 characters (not case-sensitive). The password that you type appears masked.
8. Under **Verify new password**, retype the password you just entered.
9. Select the **System Administrator** check box if you want to grant System Administrator rights to the new user.

   TIP In Smart Instrumentation, there can be more than one user with System Administrator access rights.
10. Select the **IDEAL user** check box if you want this user to generate reports using IDEAL. After defining an IDEAL user, the software can make a connection between the Smart Instrumentation Server and the Smart Instrumentation database.

    TIPS

    - You must log on to Smart Instrumentation using the IDEAL user name and password to be able to set the preferences for IDEAL report generation that the software can recognize.
    - Only one IDEAL user can be defined per domain.
11. Under **Note**, type a brief note as required.
12. Click **Apply**.

NOTES

- To edit the profile of an existing user, select the required user from the **User** list and click **Edit.**
- To delete a user from the system, select the required user from the **User** list and click **Delete**.
- Deleting a user means that this individual will no longer be able to access Smart Instrumentation. However, the history and activity tracking information associated with that user will continue to exist in the database. For this reason, every user should have a name that is unique in the system.
- If you want to delete a user who is a System Administrator or Domain Administrator, you must first assign a different user as the System or Domain Administrator.

Assign a Domain Administrator

1. Log on to the Administration module as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - On the menu bar, click  .
3. From the **Domain** list, select a domain.
4. On the toolbar, click  .
5. From the **Administrator** list, select a user you want to set as Domain Administrator for the current domain.

   TIP The Domain Administrator name password remain the same that you have set in the **User** dialog box when you created that user's profile.
6. Repeat steps 2 through 4 to assign additional Domain Administrators if needed.
7. On the toolbar, click  .

Accounting, Contractors, and Clients Common Tasks

As System Administrator, you can create lists of accountants, contractors, and clients.

NOTE This information is used for the administrator's reference only and is not accessed or used by any functionality in the software.

You can perform the following tasks:

Add and manage accounting information — This option allows you to manage accounting information.

Add and manage contractors — This option allows you to add and manage accounting information.

Add and manage clients — This option allows you to add and manage accounting information**.**

Associate accounting, client, and contractor information with a domain — This procedure deals with associating client, accounting, and contractor information with a domain.

Topics

Add and Manage Accounting Information

1. Start the Administration module and log on as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain**.
   - Click  .
3. From the **Domain** list, select the required domain.
4. Click **Options** > **Add Accounting**.
5. Click **Accounting**.
6. Click **New**.
7. Type in the accounting name, number, and note as required.
8. Click **Apply**.
9. Click **Close** when done.
10. To associate an accounting item with the current domain, in the **Add Accounting** dialog box, select the required accounting in the **General list** and drag it to the **Domain list**.

NOTES

- To edit the properties of existing accounting information, select the required accounting from the **Accounting name** list and click **Edit.**
- To delete existing accounting information from the system, select the required accounting from the **Accounting name** list and click **Delete**.

Add and Manage Contractors

1. Start the Administration module and log on as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain**.
   - Click  .
3. From the **Domain** list, select the required domain.
4. Click **Options** > **Add Contractor**.
5. Click **Contractor**.
6. Click **New**.
7. Type in the contractor name, number, and note as required.
8. Click **Apply**.
9. Click **Close** when done.

10. To associate a contractor with the current domain, in the **Add Contractor** dialog box, select the required contractor in the **General list** and drag it to the **Domain list**.

NOTES

- To edit the properties of existing contractor, select the required contractor from the **Contractor** list and click **Edit.**
- To delete existing contractor from the system, select the required contractor from the **Contractor** list and click **Delete**.

Add and Manage Clients

1. Start the Administration module and log on as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain**.
   - Click  .
3. From the **Domain** list, select the required domain.
4. Click **Options** > **Add Client**.
5. Click **Client**.
6. Click **New**.
7. Type in the client name, number, and note as required.
8. Click **Apply**.
9. Click **Close** when done.
10. To associate a client with the current domain, in the **Add Client** dialog box, select the required client in the **General list** and drag it to the **Domain list**.

NOTES

- To edit the properties of existing client, select the required client from the **Client** list and click **Edit.**
- To delete existing client from the system, select the required client from the **Client** list and click **Delete**.

Associate Accounting, Client, and Contractor Information with a Domain

1. Start the Administration module and log on as System Administrator.
2. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain**.
   - Click  .
3. From the **Domain** list, select the required domain.
4. Click **Options** > **Add Accounting** (or **Add Contractor** or **Add Client**).
5. In the **General list** pane, select an item and drag it to the **Domain** pane.
6. Click **Apply**.

NOTE To dissociate an accounting, client, or contractor item from a domain, select the item in the **Domain** pane and drag it back to the **General list** pane.

Activity Tracking Management Common Tasks

The domain activity tracking feature monitors the usage of every module in the domain (except for the Administration module). You can perform the following actions:

Set the activity tracking mode — You can use the activity tracking functionality to log user activity, that is, to show which modules users have worked in and the length of time for which they were logged on. You can also switch off activity tracking to obtain faster performance.

Clear activity tracking data — You can delete some or all the activity-tracking data, if required. You can delete the activity-tracking according to a selected length of time, user, domain, or module.

Generate a grid-style activity tracking report — This option enables you to generate a report in tabular format showing usage of Smart Instrumentation according to domain, module, and user.

Generate a graph-style activity tracking report — This option enables you to generate a report in graphical format showing usage of Smart Instrumentation according to domain, module, and user.

Topics

Set the Activity Tracking Mode

1. With the **System Administration** window open, do one of the following:
   - Click **File** > **Domain Definition**.
   - Click  .
2. From the **Domain** list, select the required domain.
3. Do one of the following:
   - Click **Options** > **Edit**.
   - Click  .
4. Under **Domain features**, select or clear the **Activity Tracking** check box.
5. Click  to save the current domain data to the database.

Clear Activity Tracking Data

1. With the **System Administration** window open, click **DBA > Clear Activity Tracking**.
2. To delete the activity tracking data according to a selected length of time, select the **Period** check box to include the time period in the deletion criteria.
3. In the **From** and **To** data fields, type the appropriate date range.
4. To delete the activity tracking data according to a selected user, select the **User** check box to include a user in the deletion criteria. (Clearing the **User** check box allows you to delete the activity tracking data for all users.)
5. From the **User** list, select the user whose activity tracking data you want to delete.
6. To delete the activity tracking data according to a selected domain, select the **Domain name** check box to include the domain name in the deletion criteria. (Clearing the **Domain name** check box allows you to delete the activity tracking data for all domains.)
7. From the **Domain name** list, select the domain whose activity tracking data you want to delete.
8. To delete the activity tracking data according to a selected module, select the **Module** check box to include the module name in the deletion criteria. (Clearing the **Module** check box allows you to delete the activity tracking data for all modules.)
9. From the **Module** list, select the module whose activity tracking data you want to delete.

   TIP To clear activity tracking, you must select at least one check box.
10. Click **OK**.

Generate a Grid-Style Activity Tracking Report

1. Click **Report** > **Activity Tracking - Grid**.
2. From the **Main category** list, select the main category according to which you want to display the information.
3. From the **Secondary category** list, select the secondary category according to which you want to display the information.
4. In the **Period** section, type the range of dates (**From**, **To**) for which you want to generate the report.

   ★IMPORTANT The date format must comply with the one defined in your system. See your Windows User Guide for additional information about the date format supported by your system.
5. In the **Deleted domains** section, do one of the following:
   - Click **Ignore** to display only current domains in the report.
   - Click **Include** to display deleted domains in the report.
6. In the **Terminated activities** section, do one of the following:
   - Click **Include** to display terminated activities (these are activities where the software closed due to a power failure or restarting the workstation by pressing CTRL + ALT + DELETE).
   - Click **Exclude** to exclude terminated activities from the report.
   - Click **Only** to display only terminated activities in the report.
7. Click **OK** to open the **Print Preview** dialog box, from where you can view and print the report.

NOTE If **Domain** and **User** are selected as the main and secondary categories, the hours shown in the third column are divided per module. In all other cases, only the total number of hours is shown.

Generate a Graph-Style Activity Tracking Report

1. Click **Report** > **Activity Tracking - Graph**.
2. From the **Main category** list, select the main category according to which you want to display the information.
3. From the **Secondary category** list, select the secondary category according to which you want to display the information.

   TIPS
   - Selecting the **Domain** option from either of the category lists enables you to select up to ten domains to show in the report.
   - Selecting the **User** option from either of the category lists enables you to select up to ten users to show in the report.

- For the secondary category, selecting the **General** option means that the activities will be divided according to the main category only.

4. In the **Period** section, type the range of dates (**From**, **To**) for which you want to generate the report.

   ★IMPORTANT The date format must comply with the one defined in your system. See your Windows User Guide for additional information about the date format supported by your system.

5. In the **Deleted domains** section, do one of the following:
   - Click **Ignore** to display only current domains in the report.
   - Click **Include** to display deleted domains in the report.
6. In the **Terminated activities** section, do one of the following:
   - Click **Include** to display terminated activities (these are activities where the software closed due to a power failure or restarting the workstation by pressing CTRL + ALT + DELETE).
   - Click **Exclude** to exclude terminated activities from the report.
   - Click **Only** to display only terminated activities in the report.
7. In the **Graph type** section, select one of the following graph types:
   - **Area** - filled-area graph.
   - **Bar** - horizontal bar graph.
   - **Column** - vertical graph.
   - **Pie** - pie graph.
8. Click **OK** to open the **Print Preview** dialog box, from where you can view and print the report.

Print Database Connection Information

1. Start the Administration module and log on as System Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Active Database Connections**.
3. Click **Print**.

Report Generation (System Administration)

As System Administrator, you can generate domain and activity reports.

The following table describes the reports that are available on the **Report** menu.

Report	Description
Domain Information	Accounting, client, and contractor information.
Domain List	Information about every domain in the database as shown in the **Domain Definition** window.
User List per Department	Smart Instrumentation users listed according to departments.
Activity Tracking Grid	A tabulated print-out of activities of a given user based on each domain or each module where that user works, a given domain or module. The system tracks the time between the user entering and leaving a module.
Activity Tracking Graph	A graphical print-out of activities of a given user based on each domain or each module where that user works, a given domain or module. The system tracks the time between the user entering and leaving a module.

NOTE The Administration module is not included in the Activity Tracking report options.

See Also

Generate a Grid-Style Activity Tracking Report (on page 68)
Generate a Graph-Style Activity Tracking Report (on page 68)
System Administration (on page 15)

SECTION 4

Domain and Project Administration

The Domain Administrator is responsible for managing the resources that have been set up by the System Administrator. The responsibilities of the Domain Administrator include defining projects when the domain type is **Owner operator**, or manage a working environment which of an engineering company domain. The Domain Administration can grant access privileges for users, define item naming conventions, set plant structure, set preferences, create custom tables, custom fields, and so forth.

★ IMPORTANT The following special characters cannot be used in passwords, database names, file names, and so forth:

/ \ [ ] =

; # : " !

▪

In This Section

Domain Administration Common Tasks

The Domain Administrator is responsible for managing the resources that have been set up by the System Administrator. The responsibilities of the Domain Administrator include defining projects when the domain type is **Owner operator**, or manage a working environment which of an engineering company domain. The Domain Administration can grant access privileges for users, define item naming conventions, set plant structure, set preferences, create custom tables, custom fields, and so forth.

As Domain Administrator, you can perform the following sets of tasks:

Plant design and structure — As the software organizes all the information in Smart Instrumentation on a very specific hierarchy level, users must access a unit when they start Smart Instrumentation. The Domain Administrator is responsible for setting up and organizing the plant hierarchy that constitutes the structure of every plant.

Owner operator domain (as-built and projects) — The owner operator domain is a domain with As-Built and projects. The database is partitioned into several schemas: a single schema for As-Built and separate schemas for projects. An operational plant exists and most of the activities are concerned with routine maintenance or plant modernization (revamps). To facilitate plant modernization, you can create a number of projects within an owner operator domain. Each project is defined for one plant only, and a plant can have several associated projects.

Naming conventions — This set of procedures deals with naming conventions. Naming conventions define the parameters which will be the rule for building tag, loop, device panel, and device cable names.

Copying <Unit> data — This set of procedures explains how to copy data from one <unit> to another.

Users and groups — This set of procedures deals with creating and managing user groups in a domain. Also, there are topics that deal with Windows authentication log-on method.

Access Rights — After assigning users to groups, one of the key roles of the Domain Administrator is to define user access rights. This set of procedures deals with setting and managing access rights for all the users in the current domain on the appropriate access rights level.

Preferences management — This set of procedures deals with the management of preferences in Smart Instrumentation. The Domain Administrator can control the management of preferences in the current domain as well as in all the projects if the domain type is **Owner operator**.

Report management — This set of procedures deals with tasks like associating a new title block with a report, selecting archiving options, and defining revision management settings.

Working with add-ins — This set of procedures deals with various add-ins that are available after purchasing the appropriate license. The add-ins include various libraries that contain item resources, such as hook-ups, DCS hardware, DDP data for PDS, and so forth.

Miscellaneous tasks — This set of topics deals with various miscellaneous tasks that are performed by the Domain Administrator.

Managing audit trail data — The software provides for the ability to mark history changes and save information about various user operations. These actions comprise the audit trail activities.

Clearing locking — This option enables the Domain Administrator to clear locking in multi-user databases SQL Server or Oracle.

Item registry — This set of procedures deals with item registry activities for the integrated environment.

Topics

Plant Design and Structure

As the software organizes all the information in Smart Instrumentation on a very specific hierarchy level, users must access a unit when they start Smart Instrumentation. The Domain Administrator is responsible for setting up and organizing the plant hierarchy that constitutes the structure of every plant.

The software provides you with the flexibility of specifying your working environment so that, whether you are designing and building an entirely new plant, or modernizing an existing plant, you can use the software to maximum effect when managing data.

In Smart Instrumentation, the working environment is known as a domain, which the System Administrator is responsible for setting up in the Administration module. The type of domain depends on the starting point for your activities:

- New plant design and construction — The System Administrator selects the domain type engineering company, and you can create as many plants as required within each domain.
- Plant modernization — The System Administrator selects the domain type Owner Operator that includes As-Built. Within the domain, you define projects for modifying the data in each plant. For details, see *Owner Operator Domain (As-Built and Projects)* (on page 78).

Once the System Administrator has set up the working environment, the Domain Administrator is responsible for performing the activities.

The Domain Administrator is responsible for defining plant hierarchy levels and then setting up and organizing the plant hierarchy level items. For example, on the Plant level, it is possible to create several items such as Plant1, Plant2, Plant3, and so forth.

When you enter a domain for the first time, and open the **Plant Hierarchy Explorer**, the software only displays the plant DEFAULT, if the System Administrator has enabled the use of the default plant. The System Administrator has rights to switch the default plant on or off until you create a plant hierarchy with more than three levels.

When a user starts a module to access information, such as loops or tag numbers in the Instrument Index module, the information is grouped on a per <unit> basis. For this reason, users must select a <unit> before entering a module. Instrument tags are therefore unique on the <unit> level. Wiring data, for example, equipment, line, and so forth, are defined per <plant> and are usable in all <units> that belong to that <plant>. These items are, therefore, unique on the <plant> level.

NOTES

- When working in an integrated environment, there are certain requirements relating to As-Built and projects. For a description of these and other requirements, see *Tool Requirements for Integrating Smart Instrumentation* (on page 183).
- It is recommended that you back up your database before performing any engineering activities.
- You must be granted full access rights for the ENGINEERING PROJECT DEFINITION activity to be able to perform engineering activities. To learn how to grant access rights, see *Grant Access Rights for Selected Items or Activities* (on page 110).

Topics

Create a Plant Hierarchy

A plant hierarchy consists of a minimum of three levels, to which you can assign as many items as you require. For example, you can create a level **My_Unit** and then, using the Plant Hierarchy Explorer, create items **Unit1**, **Unit2**, **Unit3**, and so forth, and assign these items to the **My_Unit** level.

Creating a plant hierarchy is the first stage of your plant structure design. This is because after creating a first <plant> in the **Plant Hierarchy Explorer**, you cannot change the plant hierarchy levels until you delete that plant.

1. With the **Domain Administration** window open, click **Activities** > **Plant Hierarchy**.
2. Using the options in the **Plant hierarchy** dialog box, set up the number of hierarchy levels and name the levels as needed. You can set up your plant hierarchy using the options as follows:
   - Click **Add** to add the lowest level in the plant hierarchy (the default lowest level is Level 3).
   - Select a level, and then click **Insert** to add a new level above the selected level.
   - Select a level, and then click **Delete** to delete the level that you do not require.
   - Under **Name**, change or enter a new name for the level. The name that you enter appears as the name of the appropriate folder in the **Plant Hierarchy Explorer**.

   TIPS

   - You can delete any levels as long as three levels remain in the dialog box after deletion. Three levels in the minimum number of plant hierarchy levels.
   - You can add or insert levels only before creating the first plant in the **Plant Hierarchy Explorer**.
   - You can change the level names at any stage of your domain life cycle.

Define a <Plant> Owner

You define owners of <plants> prior to creating plant hierarchy items in the **Plant Hierarchy Explorer**. When creating a new <plant> on the highest plant hierarchy level, you need to assign this <plant> to an owner.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, do one of the following:
   - Click **Activities** > **Owner**.
   - Click  .
3. Click **New**.
4. In the boxes, for the new owner profile, enter data as required.
5. Click **Apply** to save the new owner profile in Smart Instrumentation.

NOTES

- To edit the profile of an existing owner, from the **Owner** list, select an owner and click **Edit**.
- To delete an owner, from the **Owner** list, select an owner and click **Delete**.

Create a Plant Hierarchy Item on the Highest Level

This procedure deals with creating and modifying a plant hierarchy item on the highest level using the **Plant Hierarchy Explorer**. Plant is the default highest level in a hierarchy that has three levels.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click  .
3. Right-click **Plant Hierarchy Explorer**.
4. Click **New**.

   TIPS

   - To modify properties of an existing highest-level item, right-click the item itself, which is indicated by the icon  , and then, on the shortcut menu, click **Properties**.
   - To delete an item, right-click the item itself, and then, on the shortcut menu, click **Delete**. To delete an item that has child items, you must first delete the child items.
5. In the **General** tab of the **Plant Properties** dialog box, in the **<Plant>** box, type the new <plant> name.

   TIP The name must contain at least one character that is not space. The maximum name length is fifty characters.
6. From the **Owner** list, select the appropriate owner for the new <plant>.
7. In the boxes, enter data as required.

Create a Plant Hierarchy Item on an Intermediate Level

This procedure deals with creating and modifying a plant hierarchy item on an intermediate level using the **Plant Hierarchy Explorer**. Area is the default intermediate level in a hierarchy that has three levels.

The number of intermediate levels depends on the level definitions you made in the **Plant Hierarchy** dialog box. For example, if your plant hierarchy has four levels, both Level 2 and Level 3 are intermediate levels. You can create items on any of these levels. However, only on Level 3, which is the lowest intermediate level item, you can create multiple <units>.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click .
3. In the **Plant Hierarchy Explorer**, right-click any level under which the software displays the icon .
4. Click **New**.

   TIPS

   - To modify properties of an existing intermediate level item, expand the plant hierarchy, right-click the appropriate item, which is indicated by the icon , and then, on the shortcut menu, click **Properties**.
   - The highest plant hierarchy level items are indicated by the icon .
   - To delete an item, right-click the item itself, and then, on the shortcut menu, click **Delete**. To delete an item that has child items, you must first delete the child items.
5. From the **Plant** list, select a plant.
6. Click **New**.
7. In the **<Area>** data field, type a new <area> name.

   TIPS

   - The intermediate level item name must be unique within the current node of the parent level.
   - The name must contain at least one character that is not space. The maximum name length is fifty characters.
8. In the boxes, enter data as required.

Create a Plant Hierarchy Item on the Lowest Level

This procedure deals with creating and modifying an item on the lowest plant hierarchy level using the **Plant Hierarchy Explorer**. Unit is the default lowest level in a hierarchy that has three levels. This procedure allows you to create a <unit> with no module data.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click .
3. In the **Plant Hierarchy Explorer**, expand the plant hierarchy until you display the lowest level icon .
4. Right-click the intermediate level immediately above the icon .

   TIPS

   - Intermediate level items are indicated by the icon .
   - To modify properties of an existing item, right-click the item itself, and then, on the shortcut menu, click **Properties**.
   - To delete an item, right-click the item itself, and then, on the shortcut menu, click **Delete**. To delete an item that has child items, you must first delete the child items.

   CAUTION Make sure you select the appropriate plant hierarchy node before you click **New**. After creating a <unit>, you cannot move it to another plant hierarchy node.
5. On the shortcut menu, click **New**.
6. In the **General** tab of the **<Unit> Properties** dialog box, in the **Name** box, type a unit name which is unique within the current node of the parent level.

   TIP The name must contain at least one character that is not space. The maximum name length is fifty characters.
7. In the **Number** field, type a unit number that is unique within the current node of the parent level.

   TIPS

   - The value you type in the **Number** data field is generally used in the prefix part of the tag number naming conventions. You do not have to define the unit number if you plant to define naming conventions without using the <unit> number segment. However, you must define the <unit> number if you want to copy data from another <unit> even if in the source <unit>, naming conventions do not include the <unit> number segment.
   - If you change the unit number of a unit which already has naming conventions with the unit number segment, the new naming convention applies to existing items as well as for new items.
8. Click **OK** to create the empty unit and display it in the **Plant Hierarchy Explorer**.

Delete a Plant Hierarchy Item

Use this procedure to delete a plant hierarchy item.

1. In the tree view pane, expand the hierarchy.
2. Select and right-click a plant hierarchy item.
3. On the shortcut menu, click **Delete**.

TIP You can only delete a plant hierarchy item that does not have child items.

Owner Operator Domain (As-Built and Projects)

An owner operator domain is a domain with As-Built functionality. Such a domain is partitioned into several schemas: a single schema for As-Built and separate schemas for projects. An operational plant exists and most of the activities are concerned with routine maintenance or plant modernization (revamps). To facilitate plant modernization, you can create one or more projects using existing instrumentation data for the operating plant as a starting point for plant modernizations (revamps). Each project is defined for one plant only, and a plant can have several associated projects. Plant modernization may involve the modification of a single instrument tag or loop or hundreds of loops or any other item in Smart Instrumentation.

The System Administrator can create an owner operator domain on the fly, when initializing a new domain in the database platform (Oracle, or SQL Server). Also, the System Administrator can convert an existing engineering company domain to an owner operator domain using the **Domain Definition** window options. When making domain definitions, the System Administrator sets the claim mode (exclusive or non-exclusive). After creating the first project, these definitions become fixed in the current domain. When creating an owner operator domain, As-Built is created automatically. Then, the Domain Administrator needs to create project schemas and assign Project Administrators to each project. After that, Smart Instrumentation users can define As-Built data and then claim this data for the existing projects.

When users complete working in a project, the Project Administrator can merge the project data back with As-Built and then delete the project. This needs to be performed in Smart Instrumentation. It is not possible to delete As-Built. After merging project data with As-Built, you cannot reverse the process. For this reason, at all stages of plant modernization, you should ensure that there is full coordination of engineering activities between As-Built and other projects within your owner operator domain, to avoid inadvertent loss of data.

Topics

Flow of Activities for Defining a Project Administrator

This topic describes the primary flow of activities that allows Domain Administrator to define a Project Administrator in an owner operator domain and assign the Project Administrator to a specific project. It is possible to define more than one Project Administrator for a project but you can assign only one Project Administrator per project. You can use the same flow of activities to define other Project Administrators for the same project, or define Project Administrators for any other projects that exist in the current domain.

1. Create a Project

In your owner operator domain, create a project, with or without the project schema. For details, see *Create a Project* (on page 81).

2. Create a User

Create a new user you want to define as Project Administrator for the project the Domain Administrator created. A procedure for creating a Project Administrator user is the same as for any other user. User creation is performed by System Administrator. For details, see *Define a Smart Instrumentation User* (on page 61).

3. Create a User Group

Create a new group that you can then use for assigning your Project Administrator. If you intend to define several Project Administrators in your domain, it is sufficient to create one user group and then assign all the Project Administrators to this group. For details about a user group creation, see *Create a New Group* (on page 88).

4. Assign the User to the Group

You need to assign the Project Administrator to the group that you created. For more information, see *Assign Users to Groups* (on page 89).

5. Grant Full Access Rights for Project Definition to the User Group

Project Administrators in the user group that you created must have full access rights for project definition. In the **Access Rights** window, the **Project Definition** access right setting appears at the domain level. For details about granting access rights, see *Grant Access Rights for Selected Items or Activities* (on page 110).

6. Assign the User Group to the Project

This procedure enables you to display your Project Administrator in the **Project Administrator** list of the **Project Activities** dialog box. For details, see *Assign User Groups to a Project* (on page 82).

See Also

Users and Groups Common Tasks (on page 87)

Owner Operator Domain (As-Built and Projects) Common Tasks

The following tasks are used frequently when working in an owner operator domain:

Create a project — After System Administrator creates an owner operator domain, the first stage of revamping an owner operator facility is defining a project within which the revamping engineering activities will take place. Each project must be defined within a specific plant, but may overlap several areas and units. More than one project can be defined for the same plant, and several projects may cover the same areas or units. In projects, you can create new items and claim As-Built items. Prior to creating a project, your System Administrator needs to define a domain and specify the domain type as **Owner operator**.

Assign user groups to a project — After creating a project, the Domain Administrator needs to assign user groups to the project. By assigning user groups to the project, the Domain Administrator determines whether certain users can only work in the project or also perform project maintenance activities. We recommend that one of the user groups only contains Project Administrators. After assigning such a group to a project, the names of Project Administrators become available in the **Project Administrator** list of the **Project Activities** dialog box.

Select a logo for the project — Use this procedure to define a logo for a selected project when the domain type is **Owner operator**. You can select a .bmp format graphic file that you want to appear as the logo in most printed documents, such as some reports and specifications. When your owner operator domain contains more than one project, you can assign a distinctive logo for each project. In this case, when you switch from one project to another, the logo assigned to that project is retrieved from the Smart Instrumentation database. For details.

Make as-built definitions — After the System Administrator has defined a domain as an owner operator domain, the Domain Administrator can make several definitions that include assigning a Project Administrator, selecting a work-flow option, and adding notes. For more information.

Display item colors — Use this feature when viewing or claiming items in the Project scope, and when merging items to As-Built. The software allows you to specify the colors used to display the status of the claimed items selected for a project, or of items merged with As-Built, or of Inactive Items.

Rebuild a project — Use this procedure to rebuild a project after performing any of the following activities:

- Initializing an owner operator domain.
- Upgrading an owner operator domain.
- Restoring an owner operator domain from an Oracle .dmp file or SQL Server .bak file.

Rebuilding projects is also required when an existing project is damaged or there is a change in a process that requires the original basic project.

Topics

Create a Project

IMPORTANT You may also want to define a <plant> before creating a project. For details, see *Create a Plant Hierarchy Item on the Highest Level* (on page 75).

1. Start the Administration module and log on as Domain Administrator.
2. Do one of the following:
   - Click **Activities** > **Project Activities**.
   - Click  .
3. In the **Project Activities** dialog box, click **New**.
4. Type a name and description for the project as required.
5. From the **Project Administrator** list, select a user you want to set as Project Administrator.

   TIP By default, the **Project Administrator** list displays users belonging to the ADMINISTRATORS group because only such a user can create the first project. Before starting to scope data for this project, you may want to create a special user group that only includes Project Administrators. After you assign this group to the project, the Project Administrator users become available for selection the **Project Administrator** list. Therefore, before you create such a group, you can consider the currently selected Project Administrator as temporary. For details about defining Project Administrators, see *Flow of Activities for Defining a Project Administrator* (on page 79).
6. From the **Plant** list, select a plant to which the project is to be assigned.
7. If required, select a workflow option for the project.

   NOTE Once you create the project schema you cannot change this selection.
8. Do one of the following:
   - Select the **Do not propagate wire tag names** check box if you want to suppress the tag number name propagation along the signal path – this way you will be able to customize wire tag names along the propagated signal path.
   - Clear the **Do not propagate wire tag names** check box to propagate wire tag names – this way, all the wires along the propagated signal path will be named according to the tag number from which the signal originates.
9. If needed, click **Logo** to select a logo for the current project.
10. Click **Scope**.
11. At the prompt, click **Yes**.
12. When prompted to copy user groups from As-Built, do one of the following:

- Click **Yes** to copy all the As-Built user groups to the current project.
- Click **No** to create the project with only one user group (that is, the group to which the current Project Administrator belongs).

13. The software creates the Project Schema, at the prompt click **OK**.

    TIP Creation of the project schema can take a considerable time, therefore, if you do not need to implement your project right away, click **No** when prompted. You can then create the project schema when you claim items for the project.

14. In the **Scope Definition** dialog box, select the As-Built plant units you want to include in the scope of your project.

    TIP The As-Built units you select are the source material for claiming items to your project, and for merging your project back to.

15. Click **OK.**
16. At the prompt, click **OK**.
17. Click **Close**.

Assign User Groups to a Project

1. Start the Administration module and log on as Domain Administrator.
2. On the **Domain Administration** window menu bar, click **Activities** > **Assign Groups to Project**.

   NOTE Only a user who is a Project Administrator, or a Database Administrator, is authorized to assign user groups to a project.

3. From the **Project** list, select a project you created using the **Project Activities** dialog box options.
4. From the **Group list** pane, drag a group to the **Project groups** pane.

   TIPS

   - To remove a group from the selected project, drag this group from the **Project groups** pane to the **Group list** pane.
   - By default, all users of the ADMINISTRATORS group are assigned to As-Built and projects. This is because only a user belonging to the ADMINISTRATORS group can create the first project. After creating projects using the **Project Activities** dialog box options, you can remove the ADMINISTRATORS from the **Project groups** if needed.

5. Click **OK**.

   TIP After you click **OK**, users of a group with full access rights for project activities become available on the **Project Activities** dialog box, in the **Project Administrator** list. You can select a specific user and assign this user to the project as Project Administrator.

See Also

Users and Groups Common Tasks (on page 87)
Flow of Activities for Defining a Project Administrator (on page 79)

Select a Project Logo When the Domain Type is Owner Operator

1. On the **Project Activities** dialog box, do one of the following:
   - From the **Project** list, select a project for which you want to assign a logo and click **Edit**.
   - Click **New** to create a new project.
2. Click **Logo**.

   TIP The first time you open the **Select Logo** dialog box the **Logo Preview** data window displays a message notifying you that no logo is currently assigned to the selected project.
3. Click **Browse** to open the **Select Logo File** dialog box.

   TIP You can select only the .bmp file format. You can create a .bmp file using a graphic editing application such as Windows Paintbrush. Since most reports are printed out in black-and-white, we recommend that you select Bitmap files in black-and-white to save system resources.
4. Navigate to the required .bmp file that you want to assign as the project logo and click **OK**.
5. On the **Select Logo** dialog box, click **OK** to assign the selected bitmap to the current project and save the new project logo to the database.

Make As-Built Definitions

1. Start the Administration module and log on as Domain Administrator.
2. Do one of the following:
   - Click **Activities** > **Project Activities**.
   - Click  .
3. On the **Project Activities** dialog box, select **As-Built**.
4. Click **Edit**.
5. From the **Project Administrator** list, select a Project Administrator.

   TIP The **Plant** box displays **All Plants**. This option is view-only because As-Built is always associated with all the plants that exist in the current domain.
6. If needed, select a workflow option for As-Built.

   NOTE Once you create the project schema you cannot change this selection.
7. If needed, type additional information in the **Notes** box.
8. Click **Apply**.

Modify the Colors for an Item

1. In the **Project Activities** dialog box, from the **Project** list, select one of the following:
   - Select **As-Built** to indicate in As-Built those items that you claim for projects.
   - Select a project in which you want to set the display format for inactive items. Also, for users working in the current project with As-Built items displayed, you can set the display format for As-Built items and project items.
2. Click **Edit**.
3. Click the **Colors** button.
4. In the **Colors** dialog box, select from the **Item Category** column, click **Change** in the **Display Format** column.
5. In the **Set Color** dialog box, click **Bold** or **Italic** (or both) to format the text.
6. Click the **Color** button**,** to open the Windows Color pallet dialog box.
7. Click **OK,** to close the Set Color dialog box.

Copy the Display Format from Another Project

1. On the **Project Activities** dialog box, click **Colors** to open the **Color Display Options** dialog box.
2. Click **Copy From**.
3. Select the source project from the list and click **OK**.
4. Click **Apply** to accept the changes.

Rebuild a Project

1. As Domain Administrator, enter the owner operator domain.
2. Click **DBA** > **Rebuild Projects in Domain**.
3. In the data window, select **As-Built** and those projects for which you want to rebuild the schemas.
4. Click **OK** to rebuild the selected projects.

Project Deletion Common Tasks

In an owner operator domain, the Domain Administrator or Project Administrator can delete empty projects. Also, the Domain Administrator can delete projects along with the project data or just delete project data without deleting the project. The Domain Administrator might want to delete the projects that contain corrupted data or projects for which the Project schema creation process failed to complete.

The actions that you perform are:

Delete a single project — This procedure allows the Domain Administrator or Project Administrator to delete an empty project in an owner operator domain. It is only possible to delete a project after merging all the project items with As-Built. If the target project no longer contains any data but Smart Instrumentation users previously deleted claimed items from the project, the Project Administrator must still perform a merge process to delete these items from As-Built as well. If System Administrator set the software to merge items without deleting them from the project, view-only copies of merged items remain in the project. Although it is not possible to delete these copies or update their properties, existence of view-only copies does not prevent you from deleting the project.

Delete data from a single project — Use this procedure to delete project data without deleting the project. This can be useful if you want to use the same project schema when creating new engineering data.

Delete projects or project data in batch mode — This procedure deals with deleting several projects at a time or deleting engineering data from several projects without deleting the projects themselves.

Topics

Delete a Single Project

NOTE You can perform the following procedure if you have Project Administrator rights in the current domain. Or, you can perform the following procedure if you have Domain Administrator rights in the current domain and the Project Administrator cannot perform this operation due to a technical problem.

1. On the **Domain Administration** toolbar, click .
2. On the **Project Activities** dialog box, under **Project**, select an empty project you want to delete.
3. Click **Delete**.
4. On the **Domain Administration** window menu bar, click **DBA > Delete Projects**.
5. On the **Delete Projects** dialog box, select the **Delete project schema** check box.
6. Under **Project List**, select the project that you want to delete.
7. Click **OK**.

Delete Data from a Single Project

NOTE If you delete project data using this procedure, the software deletes all data from the project, including items you claimed for the project. However, after deleting project data using this procedure, you cannot use this project to run a merge process to delete previously claimed items from As-Built. If you want to delete project data and then run a merge process, you must delete the data manually from Smart Instrumentation. Then, you can run a merge process to delete claimed items from As-Built. After that, you can delete the project itself on the **Project Activities** dialog box (**Activities** > **Project Activities**). From the **Project** list, select a project and click **Delete**.

1. With the **Domain Administration** window open, click **DBA** > **Delete Projects**.
2. On the **Delete Projects** dialog box, clear the **Delete project schema** check box.
3. Under **Project List**, select the project for which you want to delete project data.
4. Click **OK**.

Delete Projects or Project Data in Batch Mode

CAUTION When deleting project data together with the Project schema, the software permanently deletes the projects from your Smart Instrumentation database.

1. With the **Domain Administration** window open, click **DBA** > **Delete Projects**.
2. On the **Delete Projects** dialog box, do one of the following:
   - Select the **Delete project schema** check box to delete project data together with the project schema.
   - Clear the **Delete project schema** check box if you only want to delete the engineering data and be able to use the same projects for creating new data.
3. Under **Project List**, select the projects you want to delete.
4. Click **OK**.

User Groups

A Smart Instrumentation user group is a group in which all users share the same access rights. After the System Administrator defines new users, the Domain Administrator needs to assign the users to groups so that they can be granted access rights to various items or activities. As access rights are defined at the level of a group, the Domain Administrator needs to define user groups and then assign appropriate users to these groups. A user can belong to several groups with different access rights.

In a project of an owner operator domain, access rights granted on the domain level do not apply. If you want to grant access rights to a group assigned to a project, you must also assign this group to As-Built.

When you or back up an existing domain or initialize a domain using another domain as a source, you can set the software to copy the source domain users. The software only copies those users who are assigned to groups.

If the System Administrator enables the use of Windows authentication logon method, the software can create and assign users to groups automatically. For more information, see *Windows Authentication Logon Method* (on page 90).

Topics

Users and Groups Common Tasks

The Domain Administrator can perform the following tasks to manage user groups:

Create a new group — Access rights are defined at the level of a group; therefore, for each access rights profile that you can assign to users, you need to define a group and then assign the appropriate users to one or more groups.

Create a group for windows authentication logon method — A group for Windows authentication logon method is a user group that exists in Windows and is associated with a Smart Instrumentation group. The names of the Windows and Smart Instrumentation groups must be identical. All users defined in a Windows domain who belong to this Windows group can access Smart Instrumentation without having to provide any logon information, such as user name and password. When such a user starts Smart Instrumentation, the software detects the user's Windows group settings, matches the Windows group name to the corresponding Smart Instrumentation group name, and assigns the user to the Smart Instrumentation group automatically.

Modify the profile of a group— This option explains how you can edit the profile of an existing group.

Assign users to groups — In the current domain, the Domain Administrator can assign an existing user to one or more groups. Assigning users to groups is needed because access rights to the domain items are granted per group. Therefore, users who are not assigned to any group have no access rights to the domain.

Remove users from groups — This procedure enables the Domain Administrator to remove users from a group.

Remove deleted windows users from Smart Instrumentation user groups — This procedure enables the System Administrator to remove from Smart Instrumentation those users who have been deleted from their Windows groups. Such users remain assigned to the Smart Instrumentation group but can no longer access Smart Instrumentation if the Windows authentication logon method is switched on.

Delete a group — This procedure enables the Domain Administrator to delete a group that has no users.

Topics

Create a New Group

1. With the **Domain Administration** window open, click **Activities** > **Group**.
2. In the **Group** dialog box, click **New**.
3. Type the new group name, description and note as you require.
4. Click **Apply**.
5. When prompted whether to copy access rights from another group, do one of the following:
   - Click **No** to create a new group in which all members have full access rights to all Smart Instrumentation features.
   - Click **Yes** select a source group for copying access rights to the group that you are creating.

See Also

Access Rights (on page 92)

Modify the Profile of a Group

1. With the **Domain Administration** window open, click **Activities** > **Group**.
2. In the **Group** dialog box, from the **Smart Instrumentation group** list, select the group you require.
3. Click **Edit**.
4. Make all the changes that you need.
5. Click **Apply** to save the changes you have made.

NOTE When modifying the profile of a group, the group access rights remain unchanged.

Delete a Group

IMPORTANT You can only delete a group that has no users.

1. Start the Administration module and log on as Domain Administrator.
2. Click **Activities** > **Group**.
3. From the **Group** list, select the group that you want to delete.
4. Click **Delete**.

Assign Users to Groups

IMPORTANT If you created groups for Windows authentication logon method, you do not need to add any users to the groups. Whenever a new user with Windows authentication logon method credentials starts Smart Instrumentation for the first time, the software assigns this user to the appropriate Smart Instrumentation group automatically. For more information, see *Create a Group for Windows Authentication Logon Method* (on page 90).

1. Start the Administration module and log on as Domain Administrator.
2. Click **Activities** > **Assign Users to Groups**.
3. From the **Group** list, select the group to which you want to assign the required user.

   TIP The users who have already been assigned to the selected group appear in the **Group** users pane.
4. In the **User** list pane, select the user you want to assign to the selected group.
5. Drag the selected user from the **User list** pane to the **Group** users pane.
6. Repeat steps 3 through 5 in this procedure for each user you want to assign to a group.
7. Click **Apply** to save the selections.
8. Click **Close** to close the dialog box.

NOTE If a user does not see the plant hierarchy after starting Smart Instrumentation, this means that this user is not assigned to any group in the domain.

See Also

Access Rights (on page 92)

Remove Users from Groups

CAUTIONS

- If you remove a user who belongs to a group that is also a Windows group, you cannot prevent this user from accessing Smart Instrumentation using Windows authentication logon method. For more information, see *Create a Group for Windows Authentication Logon Method* (on page 90).
- Users who are not assigned to any group have no access rights in the domain.

1. Start the Administration module and log on as Domain Administrator.
2. Click **Activities** > **Assign Users to Groups**.
3. From the **Group** list, select the group from which you want to remove the required user.
4. In the **Group users** pane, select the user you want to remove from the selected group.
5. Drag the selected user from the **Group users** pane to the **User list** pane.
6. Repeat steps 3 through 5 in this procedure for each user you want to remove from a group.
7. Click **OK** to save changes.

Create a Group for Windows Authentication Logon Method

1. With the **Domain Administration** window open, click **Activities > Group**.
2. In the **Group** dialog box, click **New**.
3. Under **Smart Instrumentation group**, type the new group name.
4. Type the group description and note as you require.
5. Under **Windows group**, using case-sensitive characters, enter the group name exactly as it appears in your Windows domain.
6. Click **Apply**.
7. When prompted whether to copy access rights from another group, do one of the following:
   - Click **No** to create a new group in which all members have full access rights to all Smart Instrumentation features.
   - Click **Yes** select a source group for copying access rights to the group that you are creating.

NOTE The System Administrator can enable or disable the use of Windows authentication logon method at any stage of the domain life-cycle. For more information, see *Switching to a Different Logon Method* (on page 91).

See Also

Access Rights (on page 92)

Windows Authentication Logon Method

Windows authentication logon method allows the software to create Smart Instrumentation users automatically and assign them to existing Smart Instrumentation groups as soon as these users start Smart Instrumentation.

First, in a specific domain, the Domain Administrator must associate a global group that exists in Windows with a Smart Instrumentation group. To do so, the Domain Administrator creates a Smart Instrumentation group and assigns to this group an existing Windows group (the group name characters are case-sensitive).

After that, any user who belongs to this Windows group can access this Smart Instrumentation domain automatically without having to provide any logon information. This is because the user's Windows and Smart Instrumentation logon information is the same. When such a user starts Smart Instrumentation, the software bypasses the **Logon Information** dialog box, and displays directly the **Open** dialog box, where you select a <unit>. To access Smart Instrumentation, in the **Open** dialog box, the user needs to select a domain in which the Domain Administrator has associated the user's Windows group with the Smart Instrumentation group.

NOTES

- The System Administrator can enable or disable the use of Windows authentication logon method when setting security options. After switching from the Windows authentication logon method back to the Smart Instrumentation logon method, all the users remain in Smart Instrumentation but each user must provide a personal Smart Instrumentation user name and password when logging on.
- To be able to access Smart Instrumentation using Windows authentication logon method, a user must be connected to the appropriate Windows domain. Only after the user receives

the Windows group privileges can the software match the user's Windows domain name with the Smart Instrumentation domain name.

- Users who do not belong to any Windows user group or who are not defined in any Smart Instrumentation group cannot access the domain.
- After the software creates users in a Smart Instrumentation group by using Windows authentication logon method, these users remain in the Smart Instrumentation group even if they are removed from the Windows group. These users can no longer access Smart Instrumentation. The System Administrator needs to remove deleted Windows users from Smart Instrumentation.

See Also

Access Rights (on page 92)

Remove Deleted Windows Users from Smart Instrumentation User Groups

NOTE You can only perform this procedure if the **Enable Windows authentication logon method** check box is selected on the **Security Options** dialog box.

1. Start the Administration module and log on as System Administrator.
2. Click **Activities > Remove Deleted Windows Users**.
3. Do one of the following:
   - Select **Remove** for those users you want to remove from Smart Instrumentation.
   - Select **Remove all** if you want to remove all the users displayed on the dialog box.

   TIP The dialog box only displays those users who have been deleted from their Windows groups.
4. Click **OK**.

Switching to a Different Logon Method

Switching to Windows Authentication Logon Method

Use this workflow if you already have user groups in Smart Instrumentation and want to enable the existing users to log on to Smart Instrumentation using the Windows authentication.

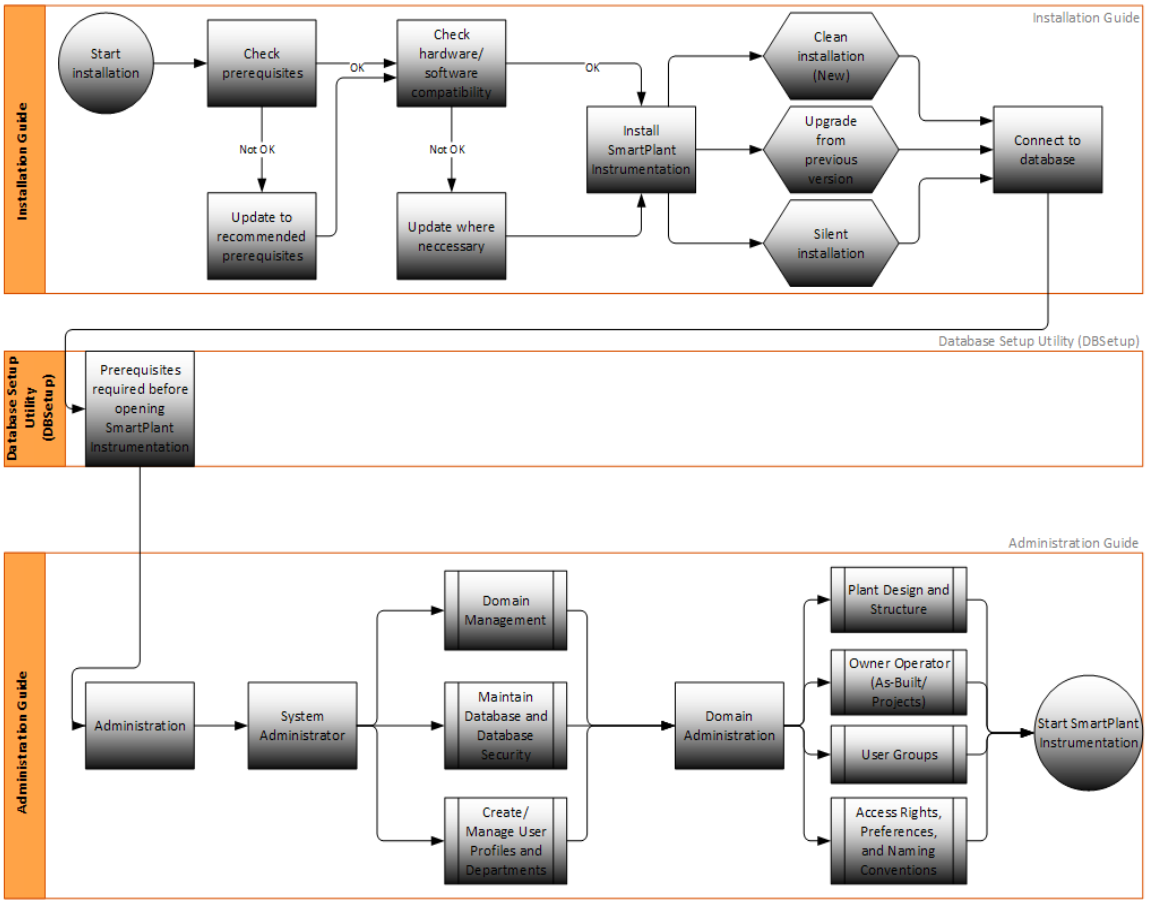
1. Log on to the Administration module as System Administrator and do the following:
2. On the menu bar, click **Activities** > **Security Options**.
3. Select **Enable windows authentication logon method** check box.
4. Click **OK**.
5. Log on to the Administration module as Domain Administrator and do the following:
6. On the menu bar, click **Activities** > **Group**.
7. For each group in the list, including the default **ADMINISTRATORS** group, define the corresponding Windows group as defined in your Windows domain.
8. Click **OK**.

Switching to Smart Instrumentation Authentication Logon Method

Use this workflow to switch from Windows Authentication logon method back to Smart Instrumentation logon method.

1. Log on to the Administration module as System Administrator and do the following:
2. On the menu bar, click **Activities** > **Security Options**.
3. Clear **Enable windows authentication logon method** check box.
4. Click **OK**.
5. Open the **User** dialog box and specify Smart Instrumentation logon name and password for every user.

Access Rights



One of the key roles of the Domain Administrator is to define user access rights. In an owner operator, domain, access rights are also defined at the level of individual projects.

To grant access rights to each Smart Instrumentation user group, the Domain Administrator chooses the items and activities, and the level of access granted. If the domain type is **Owner operator**, in a project, access rights granted on the domain level do not apply. If you want to grant access rights to a group assigned to a project, you must also assign this group to As-Built. For the description of the items and activities, see *Access Rights Descriptions* (on page 94).

In Smart Instrumentation, items (for example, tags, cables, loops, and so forth) and activities (for example, modules) are defined on a specific level: highest or lowest plant hierarchy level (for example, plant or unit), or on the level of the entire domain. If data is defined on a specified level, it contains data which is unique on the specified level.

For example:

The cable item type is defined per <plant>. This means that any cable data is described in the current domain on the <plant> level. This is so because tag numbers associated with wiring can propagate to more than one <unit> or <area>.

On each level you can grant to a group one of the following access rights:

- **Full** — users in the corresponding group can add, delete, and update the data of the selected item type.
- **Modify** — users in the corresponding group can only add or update the data of the selected item type (deletion is prohibited).
- **View Only** — users in the corresponding group can only view the data of the selected item type without being able to modify it.
- **Access Denied** — users in the corresponding group cannot access the data of the selected item type.

NOTES

- If you assign a user to more than one group, you can specify whether to grant maximum or minimum access rights for that user over all the groups, by respectively selecting or clearing **Grant maximum access rights**.
- If you do not have access rights (**Access Denied**) for a specific module or activity, for example; **Calculation**, **Hook-Ups**, or **Wiring**, you cannot generate an EDE and view its data from a query. Preview a query and see the data, or open an EDE from the EDE Explorer and view its data.

Topics

Access Rights Common Tasks

The Domain Administrator can perform the following tasks to define and manage access rights:

Access rights descriptions — This topic describes the items and activities for which the Domain Administrator can grant access rights.

Grant access rights for selected items or activities — This option enables the Domain Administrator to grant access rights for selected items/activities to a specific group.

Grant the same access rights for all items— This option allows the Domain Administrator to grant the same access right to a group of users on a specified level of the plant hierarchy in the current domain. The Domain Administrator can also grant the same access rights to all user groups on a specified level. If you select the plant or unit level, you can also grant the same access rights to all plants or units or only to the selected plant or unit. The selected access right mode will then apply to the selected user group or to all the user groups in the current domain.

Copy access rights — The Domain Administrator can use this procedure to copy access rights from a source group to a target group for Smart Instrumentation items at the required level. The Domain Administrator can copy access rights at a domain level, at the highest level of the plant hierarchy, or at the lowest level of the plant hierarchy. In an owner operator domain, the Domain Administrator can only copy access rights from one project to another.

Workflow access rights — In addition to defining access rights at the module level, you can also define access rights at the level of individual instrument tags for use with the workflow option.

View the items in the current domain — This option enables you to open the **Items** pop-up window to view the items in the current domain and the levels on which they are defined. Only those items for which you can grant access rights are displayed. Note that you cannot edit the displayed item data.

Generate access rights report — You can generate a report that displays access rights granted to user groups that you select. You can either generate a report on a specific plant hierarchy level or on the domain level, or on all levels.

Topics

Access Rights Descriptions

The following table describes the items and activities for which the Domain Administrator can grant access rights. The **Parent** column displays an access right entry whose setting overrides the setting defined for the current item type or activity. All access rights that apply at the module level automatically apply to the appropriate options available in the **Domain Explorer**.

For example, the entry **Instrument Index Module Access** is the parent of **Tag Definition**. If the **Tag Definition** access right definition is **Full**, and the **Instrument Index Module Access** is **Access Denied**, you cannot create, modify, or delete tag numbers in the Instrument Index module.

Item or Activity	Description	Level	Parent
Access Rights Management	Manage access rights for the current domain (Domain Administrator activity).	Domain	

Item or Activity	Description	Level	Parent
Add-Ins	Access rights for the add-in options available in the current domain that is importing catalogs, EDE views, system interfaces, external libraries, and so forth.	Domain	
Administration Reports	Access rights for various reports that can be generated in the Administration module.	Domain	
Assign Groups to Projects	Access rights for the assignment of user groups to As-Built and projects existing in the owner operator domain (Domain Administrator or Project Administrator activity).	Domain	
Assign Users to Groups	Access rights for the assignment of users to groups. (Domain Administrator activity, or Project Administrator activity when the domain type is **Owner operator**).	Domain	
Auto Cross Wiring	Access rights for the **Automatic Cross-Wiring** feature in the Wiring module.	Plant	Wiring Module Access
Auto Wiring	Access rights for the auto wiring tasks in the Wring module.	Plant	
Binder Package Deletion	Access rights to delete binder packages in the Document Binder module.	Plant	

Item or Activity	Description	Level	Parent
Browser/EDE Manager	Access rights for the **Browser/EDE Manager.** controls the access to the EDE management, not the data retrieved. ▪ **Modify access rights** – The user can generate an EDE from a query (only to the **Private View Type** in the EDE Explorer). Open EDEs from the EDE explorer. Duplicate EDEs. Make changes to the EDE and its properties (except to the EDE Type which will be locked for editing), but cannot delete the EDEs. ▪ **View Only access rights –** allows the generation of EDEs from a query (only to the **Private View Type** in the EDE Explorer). Opens EDEs from the EDE Explorer. Allows to edit the EDE retrieved data. Opens the properties of the EDE but does not allow to change the properties. Deleting EDEs is also not allowed. ▪ **Access Denied** – only allows for the opening of existing EDEs from the EDE explorer and viewing of its data. NOTE EDE Views in the **Private View Type** folder in the EDE Explorer have full access rights independent of the access rights applied in the Administration module.	Plant	
Cable Routing and Drums	Access rights for the Wiring module **Associations** menu commands related to cable routing and cable drum, and for the appropriate supporting tables accessible on the **Tables** of the Wiring module. These access rights do not apply to the **Cable Routing Options** command available on the **Associations** menu.	Plant	
Cable Routing Options Command	Access rights for **Cable Routing Options** command available on the **Associations** menu of the Wiring module.	Plant	

Item or Activity	Description	Level	Parent
Calculation Activities	Access rights to perform calculations. To enable calculations, set this option to **Full** (Add / Delete / Update) and the 'Calculation Module Access' option to **Full** (Add / Delete / Update) or **Modify** (Add / Update).	Unit	Calculation Module Access
Calculation Module Access	Access rights for the Calculation module.	Unit	
Calibration History Editing	Access rights for editing data in the **Calibration History** window of the Calibration module. To grant full access rights, under **Mode** in the **Item or activity** section of the **Access Rights** window, select **Full** (Add / Delete / Update). To grant view-only access rights, select **View Only**. Note that the **Modify** (Add / Update) option functions as full, while the **Access Denied** option functions as view- only.	Unit	Calib. Options & Maint. Events
Calib. & Maint. Event Supervisor	Access rights for the calibration supervisor activities in the Calibration module and for completing and deleting maintenance even records in the **Instruments** folder of the **Domain Explorer**.	Unit	Calib. Options & Maint. Events
Calib. Options & Maint. Events	Access rights for the Calibration module and for creating and editing maintenance event records in the **Instruments** folder of the **Domain Explorer**.	Unit	
Calibration Result Modify.	Access rights to modify calibration results or enter calibration data.	Unit	Calib. Options & Maint. Events

Item or Activity	Description	Level	Parent
Claim Entities for Project	Access rights for claiming items from Smart Instrumentation when the domain type is **Owner operator**. These access rights do not apply to claiming options available in the Administration module.	Domain	
Clear Locking	Access rights for the **Clear Locking** option on the **DBA** menu (Oracle and SQL Server only).	Domain	
Connection Type	Access rights for the definition of connection types in the Wiring module.	Plant	Wiring Module Access
Construction Module Access	Access rights for the Construction module.	Unit	
Construction Revision - Cables	Access rights to define **Formal Issue** for project cables in the Construction module.	Plant	Construction Module Access
Construction Revision - Instr.	Access rights to define **Formal Issue** for project instruments in the Construction module.	Plant	Construction Module Access

Item or Activity	Description	Level	Parent
Construction Revision - Panels	Access rights to define **Formal Issue** for project panels in the Construction module.	Plant	Construction Module Access
Construction Revision - Wires	Access rights to define **Formal Issue** for the project wires in the Construction module.	Plant	Construction Module Access
Construction Supporting Tables	Access rights for the Construction module supporting tables.	Domain	Construction Module Access
Control System Tag Operations	Access rights for all **I/O assignment** options in the Wiring module and for modifying information associated with control system tags in the Instrument Index module.	Plant	
Custom Field Definition	Access rights for the **Custom Fields** option in the **Domain Administration** window (Domain Administrator activity).	Domain	
DDP Module Supporting Tables	Access rights for the Dimensional Data for Piping module supporting tables.	Plant	Dimensional Data Module Access

Item or Activity	Description	Level	Parent
Define User Groups	Access rights for the **Group** option in the **Domain Administration** window.	Domain	
DeltaV Data	Access rights for the DeltaV interface options.	Domain	
Dimensional Data Module Access	Access rights for the Dimensional Data for Piping module.	Unit	
Document Binder Module Access	Access rights for the Document Binder module.	Plant	
Domain Definition Notes	Access rights for the **Notes** section in the **Domain Definition** window - Domain Administrator activity.	Domain	
Drawing Block Management	Access rights to create block types and group CAD drawing blocks in these block types.	Domain	Loop Drawings Module Access

Item or Activity	Description	Level	Parent
Enhanced Report Chg. (Layout)	Access rights for changes to enhanced reports at the layout level (macro attributes, redlining). Enhanced reports are reports generated by the Enhanced Report Utility.	Plant	
Enhanced Report Chg. (Report)	Access rights for changes to enhanced reports at the report level (repositioning of drawing objects, SmartText, redlining). Enhanced reports are reports generated by the Enhanced Report Utility.	Plant	
Equipment Supporting Table	Access rights for the **Equipment** supporting table in the Instrument Index module.	Plant	
Field Personnel	Access rights for the **Field Personnel Profile** option in the **Domain Administration** window.	Domain	
Fieldbus Segments	Access rights for creating and managing fieldbus items in the **Fieldbus Segments** folder of the **Domain Explorer**.	Plant	Wiring Module Access
Form Data Templates	Access rights for managing form data templates in the Specifications module.	Domain	

Item or Activity	Description	Level	Parent
Frequency	Access rights for managing the **Frequency** supporting table (available within **Power Supply**).	Domain	Instr. Index Supporting Tables
Function Blocks	Access rights for managing the **Function Blocks** supporting table.	Domain	Instr. Index Supporting Tables
Global Revision Management	Access rights to manage global revisions using the options of the **Global Revisions** dialog box.	Unit	
General Function SubCategories	Access rights for managing the **General Process Function Sub-Categories** supporting table.	Domain	Instr. Index Supporting Tables
Hook-Up Definition	Access rights to create, edit, or modify hook-ups in the **Domain Explorer**.	Plant	Hook-Ups Module Access
Hook-Up Item Management	Access rights to create and manage hook-up items in the **Reference Explorer** and to associate hook-up items with hook-ups. These access rights also apply when you create and manage item manufacturers on the **Tables** menu of the Hook-Ups module.	Plant	Hook-Ups Module Access

Item or Activity	Description	Level	Parent
Hook-Ups Module Access	Access rights for the Hook-Ups module.	Unit	
I/O Types	Access rights for managing the **I/O Types** supporting table.	Domain	Instr. Index Supporting Tables
Import Utility Access	Access rights for the Import utility. NOTE For importing table data, access rights are also subject to the access rights applied in the target plant breakdown structure for the imported item types.	Domain	
Install Index Manager	Access rights for the Installation Index Manager in the Construction module.	Domain	
Instr. Index Supporting Tables	Access rights for the Instrument Index module supporting tables that allow you to modify information associated with tag numbers. These access rights also apply to typical loop management. These access rights do not apply to the supporting tables **Lines**, **P&ID**, and **Equipment**.	Domain	Instrument Index Module Access
Instrument Certification	Access rights for managing the **Instrument Certification** supporting table.	Domain	Instr. Index Supporting Tables
Instrument Criticality	Access rights for managing the **Instrument Criticality** supporting table.	Domain	Instr. Index Supporting Tables
Instrument Index Module Access	Access rights for the Instrument Index module.	Unit	
Instrument Locations	Access rights for managing the **Instrument Locations** supporting table.	Domain	Instr. Index Supporting Tables
Instrument Manufacturers	Access rights for managing the **Instrument Manufacturers** supporting table.	Domain	Instr. Index Supporting Tables

Item or Activity	Description	Level	Parent
Instrument Models	Access rights for managing the **Instrument Models** supporting table.	Domain	Instr. Index Supporting Tables
Instrument Statuses	Access rights for managing the **Instrument Statuses** supporting table.	Domain	Instr. Index Supporting Tables
Instrument Types	Access rights for managing the **Instrument Types** supporting table and the **Telecom Device Types** supporting table (available within **Telecom**).	Domain	Instr. Index Supporting Tables
Instrumentation Workflow Flag	Access rights to define selected users as instrumentation engineers who will work in the workflow mode if the System Administrator has selected the **Instrument/Process Data Workflow** check box in the **Domain Definition** window.	Unit	
Intrinsic Safety Definition	Access rights for intrinsic safety definition in the Wiring module.	Plant	Wiring Module Access
Line Definition	Access rights to create, edit, or modify lines in the Instrument Index and Process Data modules.	Plant	
Linearity Types	Access rights for managing the **Linearity Types** supporting table.	Domain	Instr. Index Supporting Tables
Logo Definition	Access rights for the domain logo definition (Domain Administrator activity), or a project log definition if the domain type is **Owner operator**.	Domain	
Loop - External Macro Source	Access rights to connect to an external macro source and use external macros during loop drawing generation.	Unit	Loop Drawings Module Access
Loop Definition	Access rights to create, modify, or delete a loop number in the Instrument Index module.	Unit	Instrument Index Module Access
Loop Drawings Module Access	Access rights for the Loop Drawings module.	Unit	

Item or Activity	Description	Level	Parent
Loop Functions	Access rights for managing the **Loop Functions** supporting table.	Domain	Instr. Index Supporting Tables
Loop Measured Variables	Access rights for managing the **Loop Measured Variables** supporting table.	Domain	Instr. Index Supporting Tables
Loop Types	Access rights for managing the **Loop Types** supporting table.	Domain	Instr. Index Supporting Tables
Macro Definitions	Access rights for managing macro definitions for loop drawings and hook- up drawings.	Domain	
Maintenance Module Access	Access rights for the Maintenance module.	Unit	
Maintenance Supporting Tables	Access rights for modifying information associated with the Maintenance module supporting tables.	Plant	Maintenance Module Access
Management of Local Revisions	Access rights for adding, updating, and deleting revisions in a **Revisions** dialog box. These access rights do not apply to revision management options available in the **Global Revisions** dialog box.	Unit	
Naming Convention Definition	Access rights for defining and managing item naming conventions (Domain Administrator activity).	Domain	
Number of Phases	Access rights for managing the **Number of Phases** supporting table (available within **Power Supply**).	Domain	Instr. Index Supporting Tables
Operating Modes	Access rights for managing the **Operating Modes** supporting table (available within **Power Supply**).	Domain	Instr. Index Supporting Tables
P&ID Supporting Table	Access rights for the P&ID drawing number supporting table in the Instrument Index module.	Plant	
Plant Cable Management	Access rights for managing cables in the **Domain Explorer**.	Plant	Wiring Module Access

Item or Activity	Description	Level	Parent
Plant Hierarchy Management	Access rights for creating and managing plant hierarchy items in the **Plant Hierarchy Explorer** (Domain Administrator activity).	Domain	
Plant Panel Management	Access rights for managing panels in the **Domain Explorer**.	Plant	Wiring Module Access
Plant Owner Definition	Access rights for the **Owner** option in the **Domain Definition** window - Domain Administrator activity.	Domain	
Prevent. Maint. - Supervisor	Access rights for the Preventive Maintenance supervisor activities in the Maintenance module.	Unit	Maintenance Module Access
Prevent. Maint. - Technician	Access rights for the Preventive Maintenance technician activities in the Maintenance module.	Unit	Maintenance Module Access
Process Data Change in Specs	Access rights to change process data values in an instrument specification. (Specifications module.)	Unit	
Process Data Definition	Access rights to create, modify, or delete a process data sheet.	Unit	Process Data Module Access
Process Data Module Access	Access rights for the Process Data module.	Unit	
Process Data Supporting Tables	Access rights for the Process Data module supporting tables, that is, **Cases**, **Insulation Types**, **Pipe/Orifice Materials**, and **Fluid Components**.	Domain	Process Data Module Access
Process Data Workflow Flag	Access rights to define selected users as process engineers who will work in the workflow mode if the System Administrator has selected the **Instrument/Process Data Workflow** check box in the **Domain Definition** window.	Unit	

Item or Activity	Description	Level	Parent
Project Definition	Access rights that apply to all activities that you can perform on the **Project Activities** dialog box in the Administration module. For example, project creation, scope definition, tag and loop number reservation (not available in this version), merging items with As-Built, and so forth. These access rights also apply when claiming or merging items using the command line parameters.	Domain	
Publish	Access rights for publishing documents.	Plant	
Query Layout	Access rights for Query Builder definition layout. Determines to what level you can create, edit, and delete query definitions.	Domain	
Rated Voltage	Access rights for managing the **Rated Voltage** supporting table (available within **Power Supply**).	Domain	Instr. Index Supporting Tables
Reference Cable Management	Access rights for managing reference cables in the **Reference Explorer**.	Domain	
Reference Panel Management	Access rights for managing reference panels in the **Reference Explorer**.	Domain	
SmartPlant Registration	Access rights that enable the Domain Administrator to register plants. This option enables or disables the **Register** menu command on the **SmartPlant** menu on the **Domain Administration** window menu bar.	Domain	
Repair - Supervisor	Access rights for the Repair Maintenance supervisor activities in the Maintenance module.	Unit	Maintenance Module Access
Retrieve	Access rights for retrieving documents.	Plant	
Repair - Technician	Access rights for the Repair Maintenance technician activities in the Maintenance module.	Unit	Maintenance Module Access
Revision Deletion	Access right to delete saved revisions.	Unit	
SAP Interface Access	Access rights for the SAP interface.	Domain	

Item or Activity	Description	Level	Parent
Segment-Wide Parameters	Access rights for creation of segment-wide parameter profiles of fieldbus items in the Wiring module.	Unit	
Signal Types	Access rights for managing the **Signal Type** supporting table.	Domain	Instr. Index Supporting Tables
Smart Electrical Interface	Access rights for Smart Electrical interface options.	Unit	
Specification Definition	Access rights to create, modify, or delete item specifications.	Unit	Specifications Module Access
Specification Form Access	Access rights to create, delete, or modify specification forms in the Specifications module.	Domain	
Specifications Module Access	Access rights for the Specifications module.	Unit	
Tag Category Definition	Access rights for the **Tag Category** feature in the Instrument Index module.	Domain	
Tag Definition	Access rights to create, modify, or delete tag numbers.	Unit	Instrument Index Module Access
Telecom Field Equipment	Access rights for managing the **Telecom Field Equipment** supporting table (available within **Telecom**).	Domain	Instr. Index Supporting Tables
Telecom Line Numbers	Access rights for managing the **Telecom Line Numbers** supporting table (available within **Telecom**).	Domain	Instr. Index Supporting Tables
Telecom Panel Management	Access rights for the creation, deletion, and editing of telecom panels in the **Domain Explorer** and **Reference Explorer**.	Plant	
Telecom Signal Levels	Access rights for managing the **Telecom Signal Levels** supporting table (available within **Telecom**).	Domain	Instr. Index Supporting Tables
Telecom Supporting Tables	Access rights for the telecom supporting tables in the Wiring module.	Plant	

Item or Activity	Description	Level	Parent
To Do List	Access rights for running tasks in the **To Do List** after retrieving a document.	Domain	
Units of Measure Definition	Access rights for the options available in the **Units of Measure and Accuracy** dialog box in Smart Instrumentation.	Domain	
Update Statistics (Oracle)	Access rights for the **Update Statistics** option on the **DBA** menu (System Administrator activity).	Domain	
Wire Group	Access rights for signal re- propagation.	Plant	Wiring Module Access
Wiring Connections	Access rights for the connection options in the Wiring module, including batch connection and cross-wiring.	Plant	Wiring Module Access
Wiring Module Access	Access rights for the Wiring module. These access rights also disable various wiring options that you can access from without the Wiring module, for example, when right-clicking an instrument in an EDE of the Instrument Index module.	Unit	
Wiring Supporting Tables	Access rights for wiring supporting tables accessed using the **Tables** menu of the Wiring module. These rights do not affect telecom, cable routing and cable drum options available on the **Tables** menu.	Domain	Wiring Module Access
Work Request - Supervisor	Access rights for the **Work Request** supervisor activities in the Maintenance module.	Unit	Maintenance Module Access
Work Request - Technician	Access rights for the **Work Request** technician activities in the Maintenance module.	Unit	Maintenance Module Access

Grant Access Rights for Selected Items or Activities

This topic describes the process in which the Domain Administrator grants access rights for selected items/activities to a specific group. Unit access rights are granted per unit and if you are logged to one unit, the access rights of any unit other than the one you are currently logged to (accessed unit) are limited to View Only or Access Denied. This regards the accessed unit's Process Data, Specifications, and Calculation documents. If the accessed unit's documents access rights were defined as either Full, Modify, or View Only your access will be limited to View Only. When the accessed unit's documents access rights were defined as Access Denied your access rights will also be defined as Access Denied. To change the status of the accessed unit rights, log to the accessed unit to change its access rights as required.

1. With the **Domain Administration** window open, do one of the following:
   - Click **File** > **Domain Definition**.
   - Click  .
2. In the **Domain Definition** window, do one of the following:
   - Click **Options** > **Access Rights**.
   - Click  .
3. In the **Access Rights** dialog box, in the **Group list** pane, select the user group for which you want to define access rights.
4. Double-click the group to expand the tree.
5. Select the level at which you want to grant access rights (**Domain level**, **Plant level**, or **Unit level**). If selecting at the plant or unit level, expand the tree further to select a specific plant or unit.
6. In the **Item or activity** pane, click the **Mode** field next to the item or activity in the **Name** column to open a list of available modes of access rights.
7. Select the required access rights mode from one of the following:
   - **Full (Add / Delete / Update)**
   - **Modify (Add / Update)**
   - **View Only**
   - **Access Denied**
8. Repeat steps 5 through 7 to grant access rights to the same group for another item or activity. Repeat steps 3 through 7 grant access rights to another group for the required item or activity.
9. Click  to save your selection to the database.

NOTE Certain items or activities at the domain level relate to Domain Administration. The access rights mode for these items is set for all users to Access Denied by default. The Domain Administrator always has full access rights to these items, regardless of the access rights mode set for them in the group to which the Domain Administrator belongs.

Grant the Same Access Rights for All Items

1. With the **Domain Definition** window open, do one of the following:
   - Click **Options** > **Access Rights**.
   - Click .
2. Do one of the following:
   - Click **Options** > **Global Access Rights**.
   - Click .
3. In the **Global Access Rights** dialog box, in the **Access mode** list, select the access mode that you require.
4. From the **Group name** list, select a user group to which you want to apply the access rights.

   TIP To apply the access rights to all the groups, select **All**.
5. To choose the level at which the software grants access rights, select the appropriate **Enable item selection** check boxes.

   TIPS
   - At the Domain level, you can grant the selected access rights for all the items at the domain level for the current domain.
   - At the <Plant> level, you can grant the selected access rights for all the items at the <plant> level for a selected <plant>, or for all <plants> in the domain.
   - At the <Unit> level, you can grant the selected access rights for all the items at the <unit> level for a selected <unit>, or for all <units> in the domain.
6. If you selected the <Plant> or <Unit> level, from the <Plant> an <Unit> lists, select as specific <plant> or <unit>.

   TIP To apply the access rights an entire plant hierarchy level, from the <Plant> or <Unit> lists, select **All**. The labels <Plant> and <Unit> change dynamically according to your highest and lowest plant hierarchy level definitions.
7. From the **Item or activity** list, make a selection.

   TIP To apply the access rights to all the items at a particular level, from the **Item or activity** list, select **All**.
8. Click **Apply**.
9. Repeat steps 3 through 7 for each item or activity whose access rights you want to define.
10. Close the **Global Access Rights** dialog box and then, in the **Access Rights** window, click .

NOTE You can also modify any selections you make in the **Access Rights** window.

Workflow Access Rights

★ IMPORTANT Workflow can only be implemented in Smart Instrumentation after being enabled by your System Administrator.

1. Start the Administration module and log on as Domain Administrator.
2. Define two engineering groups, one for instrumentation, and one for process data with their users.
3. Do one of the following to open the **Domain Definition** window:
   - Click **File** > **Domain Definition**.
   - Click .
4. Click to open the **Access Rights** window.
5. Select the instrument engineering group in the left area and expand the tree by double-clicking it.
6. Double-click the **Unit** level icon to expand the list of units and select the unit where you want to grant workflow access.
7. From the **Name** column, select **Instrumentation Workflow Flag**.
8. From the **Mode** column, select **Full (Add / Delete / Update)**.
9. From the **Name** column, select **Process Data Workflow Flag**.
10. From the **Mode** column, select **Access Denied**.
11. Select the process engineering group in the left area and expand the tree by double-clicking it.
12. Double-click the **Unit level** icon to expand the list of units and select the required unit where you want to grant access.
13. From the **Name** column, select **Process Data Workflow Flag**.
14. From the **Mode** column, select **Full (Add / Delete / Update)**.
15. From the **Name** column, select **Instrumentation Workflow Flag**.
16. In the **Mode** column, select **Access Denied**.
17. When done, do one of the following:
    - Click **Options > Save**.
    - Click .

Copy Access Rights

1. Start the Administration module and log on as Domain Administrator for the required domain.
2. On the **Domain Definition** toolbar, click to open the **Access Rights** window.
3. On the **Access Rights** window toolbar, click to open the **Copy Access Rights** dialog box.
4. Under **Project and group selection**, select source and target groups.

   TIP If the domain is an owner operator domain, select source and target projects before selecting groups. To copy access rights within one project, from the **Source project** and **Target project** lists, select the same project.
5. Under **Access rights level**, do the following:
6. Select a check box to specify the level at which you want to copy access rights.
7. According to your level selection, select source and target domains, highest plant hierarchy level items, or lowest plant hierarchy level items.
8. Click **Apply**.

View the Items in the Current Domain

- With the **Access Rights** window open, do one of the following:
  - On the menu bar, click **Options** > **Items**.
  - On the toolbar, click .

Generate Access Rights Report

1. With the **Domain Administration** window open, on the **Reports** menu, click **Access Rights**.
2. Do one of the following:
   - To generate a report on all levels of the plant hierarchy, on the domain level, and, if the domain type is **Owner operator**, on the project level, click the **All Levels** tab.
   - To generate a report on a specific level, click any tab other that **All Levels**.
3. Under **Group Name**, select user groups that you want to include in the Access Rights report.

Naming Conventions

Naming conventions define the parameters that the software uses when creating tags, loops, device panels, cables, or other items in Smart Instrumentation. Each of these items has its own instrument type to which you manually set the naming conventions from the Admin module. The naming conventions are flexible and follow no limitations, so you can build and maintain the instrumentation data according to your specific instrumentation needs. The maximum length of a naming convention is 50 characters.

Before you start defining naming conventions, we recommend that you familiarize yourself with the following general guidelines:

- You define naming conventions on a per <unit> basis. Therefore, if you want certain items (for example, panels) to share naming conventions on the highest plant hierarchy level, for example, you can define a naming convention for panels in a specific <unit>, and then, copy this convention to all other units available in the same <plant>.
- The naming is performed according to item types. For an item type, it is only possible to define one naming convention. You set the naming for each item type and thus affect the creation of new items in Smart Instrumentation. All items inherit the naming convention of the item type they belong to. Examples for item types are; **Instrument**, **Loop**, **Cabinet**, **DCS**, **Control System Tag**, and so forth.
- You can define the naming convention freely without any limitation, or set it to include different segments, separators, dashes and any other character that serves your purposes. The maximum length of a naming convention is 50 characters, including separators. This length applies for all naming convention standards.
- You can copy naming conventions only on the lowest plant hierarchy level, for example, from **Unit1** to **Unit2**, within the same domain.
- When defining a naming convention for wiring equipment, note the following limitation: you cannot include a slot name or an I/O card name together with the rack name. The software can only retrieve the name of the actual parent item. For example, when a card is a child item of a slot, only the slot name can be retrieved but not the rack name.

Compatibility with Instrumentation Standards

Smart Instrumentation allows you to freely set your own standards and naming convention. This way you can build and maintain the instrumentation data according to your specific instrumentation needs.

The tag and loop number naming convention options depend on the standard that the Domain Administrator has selected in the **Naming Conventions** dialog box. The default standard is the Flexible standard which allows the Domain Administrator complete flexibility when setting up unit naming conventions. However, the Domain administrator can use traditional ISA or Loop standards to set the naming conventions automatically and then modify the conventions as required.

NOTES

- The ISA standard is based on the Instrument Society of America ANSI/ISA-S5.1-1975 standard as published in the: Instrument Society of America. Standards and Practices of Instrumentation, Instrumentation Symbols and Identification. 7th ed. NC, 1983.
- You can use some parts of the Flexible standard with the Power Station Designation System (KKS) standard.

Topics

Naming Conventions Common Tasks

The following tasks are used when you need to define naming conventions for a <unit> in Smart Instrumentation:

Define naming conventions — This procedure enables you to define naming conventions in a <unit>.

Copy naming conventions from another <Unit> — This procedure explains how you can copy the naming conventions from a selected source <unit> in the current domain to the current <unit>. You can use this procedure after creating a new <unit> for which no naming convention definitions have been made yet. The software does not let you copy naming conventions to a <unit> that already contains instrument tag numbers.

Copy naming conventions to other <Units> — This procedure explains how you can copy naming conventions to <units> that exist in the current domain but have no naming convention definitions yet. Also, you can use the procedure tips if you want to set the software to copy naming conventions automatically to all new <units> on creating the <units> in the **Plant Hierarchy Explorer**. The software does not let you copy naming conventions to a <unit> that already contains instrument tag numbers.

Document number naming convention examples — The following topic provides examples of document number naming conventions:

Generate naming convention reports — This procedure enables you to generate and print a naming convention report. This report contains information about the naming conventions for each item in all the <units> of the current domain.

Topics

Define Naming Conventions

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window or **Domain Definition** window, do one of the following:
   - Click **Activities** > **Naming Conventions**.
   - Click  .
3. Beside **Parent hierarchy**, click **Browse** to specify a <unit> for which you want to define naming conventions.

   TIP Naming conventions are always defined per <unit>.
4. From the **Convention** list, select the item for which you want to define a naming convention.

   TIPS
   - If you modify either tag or loop naming conventions in a <unit> which already contains tags or loops, the software prompts you to confirm the naming convention change.
   - When you duplicate a loop in Smart Instrumentation, the duplicated loop inherits the naming convention from the original loop.
5. Click **Add** as many times as the number of segments you want to specify for the naming convention.

   TIP The **Insert** button allows you to insert an empty row above the cell that you click. If you do not click any cell, the **Insert** button functions like the **Add** button: the software adds an empty row at the bottom.
6. From the **Segment Category** list, select a segment category in each of the data rows.
7. From the **Segment** list, select a segment for each category.
8. In the **Separator** box, type a character to separate the current segment from the next.

   TIPS
   - By default, the software assigns the **C-** prefix to all the device cable names. However, when you select device cable from the **Convention** list, the **Separator** data field is empty. If you define new naming conventions for the device cable but do not type any separator in the **Tag Number** row, cable names appear without the **C-** prefix. You need to type **C** in the **Separator** field of the **Tag Number** row to make the **C-** prefix available again.
   - If a separator is the last character in the control system tag name, the software retains the separator when applying the control system tag naming convention.
   - If a separator is the last character in the name of an item that is not a control system tag, the software removes the separator from the name. For example, if your instrument naming convention includes a / separator before the **COMPONENT SUFFIX** segment, the **FT-100** tag number with the **A** suffix appears as **FT-100/A** and without any suffix as **FT- 100**.
   - If you want a separator to appear at the end of the item name, add another data row and select **Free Segment** as both segment category and segment, define a separator, and then, define the **Free Segment** length as **0**.

9. In the **Start** data field, type the starting position of the current segment, that is, the leftmost character of the description that appears in the segment descriptor.
10. In the **Length** data field, type the total number of characters (from the starting character) which appears in the segment descriptor.

    TIPS

    - You can select a part of a segment by specifying the appropriate **Start** and **Length** values.
    - When defining naming conventions for instruments or loops, if you want to use the ISA or Loop standard, click **ISA Standard** or **Loop Standard** to load the naming convention segments that comply with the ISA or Loop standards.

    CAUTION If you already defined a naming convention for instrument tags or loops and want to modify an existing convention, do not click the **ISA Standard** or **Loop Standard** button again. Clicking any of these buttons resets your instrument or loop naming convention to the default settings for the current standard.
11. When defining a naming convention for wiring items, control system tags, or document numbers, do one of the following:

    - Select **Remove trailing spaces in each segment** to set the software to remove trailing spaces from each segment of an item name created according to the naming convention if the actual number of characters in a segment is smaller than the segment length.
    - Clear **Remove trailing spaces in each segment** to set the software to add trailing spaces to match the segment length.

    TIPS

    - The software does not remove spaces that are part of separators or appear at the beginning or in the middle of a segment.
    - When a wiring item or control system tag naming convention includes free segments, the software removes spaces only from the first and last free segment.
12. When defining a naming convention for a document number, for documents you intend to save as files, do one of the following:

    - Select **Remove spaces in file names** to removes spaces from the name of the document files.
    - Clear **Remove spaces in file names** to save documents with the name of the source document item.

    TIP A document file has spaces if the source document item has spaces. For example, when you generate a loop drawing without opening the drawing, the software automatically saves the drawing file with the name of the source loop number. If the source loop number has spaces and you selected this check box, the software removes the spaces from the drawing file name when saving the drawing as a file.
13. If you are prompted to change the naming convention (if a naming convention already exists for the unit), do one of the following in the displayed message:

    - Click **Yes** to modify the current unit naming conventions.
    - Click **No** to retain the current unit naming conventions without modifying them.
14. When done, click **Apply** to save the naming conventions to the database.

15. Click **Close** to close the dialog box.

Copy Naming Conventions to Other <Units>

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window or **Domain Definition** window, do one of the following:
   - Click **Activities** > **Naming Conventions**.
   - Click  .
3. Beside **Parent hierarchy**, click **Browse** to specify a source <unit>.

   TIPS
   - Naming conventions are always defined per instrument type in a specific unit. Select the types and their appropriate conventions in the **Conventions** list.
   - You can select **Copy all conventions from the current <unit>** to copy all the naming conventions that exist in the current <unit> to every new <unit> that you create using the **Plant Hierarchy Explorer**. This option does not apply to units that already exist in your domain.
4. Click **Copy To**.
5. In the **Copy Naming Conventions** dialog box, select a check box beside the target <units> to which you want to copy the naming conventions of the source <unit>.
6. Click **Copy** and then **Close**.
7. In the **Naming Conventions** dialog box, click **Apply** and then **Close**.

Copy Naming Conventions from Another <Unit>

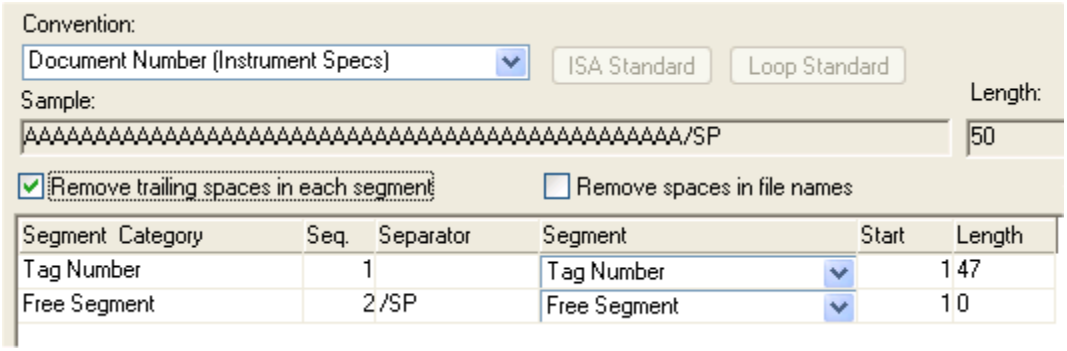
1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window or **Domain Definition** window, do one of the following:
   - Click **Activities** > **Naming Conventions**.
   - Click  .
3. Beside **Parent hierarchy**, click **Browse** to specify a target <unit>.
4. Click **Copy From** to select a source <unit>.
5. In the dialog box **Copy Naming Conventions From**, expand the plant hierarchy and select a source <unit> from which you want to copy the naming conventions.
6. Click **OK** to return to the dialog box where you can view the naming conventions you copied.
7. In the **Naming Conventions** dialog box, click **Apply** and then **Close**.

Document Number Naming Convention Examples

In Smart Instrumentation, it is possible to assign a document number to a process data, dimensional data, or calculation sheet, item specification, loop drawing, or panel- strip report. In the Administration module, you can define a document number naming convention individually for each document type available in Smart Instrumentation. On the **Naming Conventions** dialog box, the document types appear in the **Convention** list, in parenthesis beside the **Document Number** string. This topic provides examples of document number naming conventions for instrument specifications and loop drawings.

★ **IMPORTANT** To set the software to update document numbers when renaming instruments in Smart Instrumentation, your document number naming conventions must include instrument naming convention segments that users can rename.

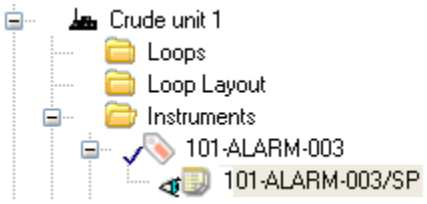
Segment Definition Example for the Instrument Specification Document Number



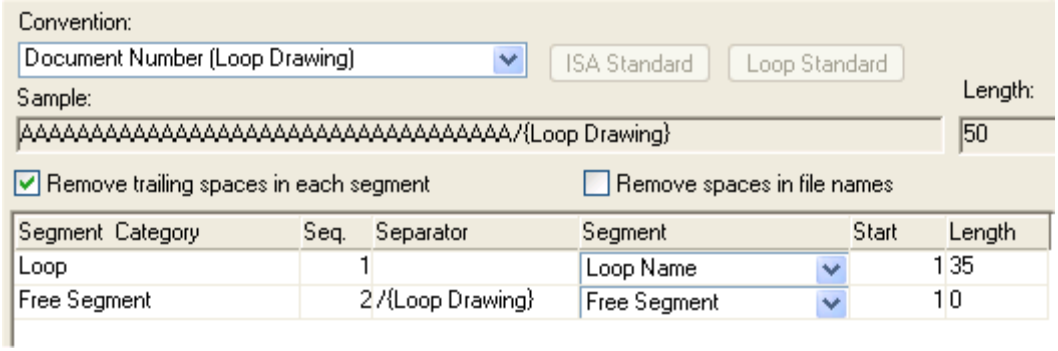
Implementation Example in Smart Instrumentation

The following example shows a spec document number in the **Domain Explorer**. The software created this number according to the naming convention that you defined. After you set the appropriate instrument type profiles to include specification data, the software applies the convention when you do any of the following:

- Create a new instrument specification — the software displays the document number automatically in the **New Specification** dialog box.
- Edit properties of an existing loop or tag, and then, on the **Tag Number Properties** dialog box, select the **Update document numbers** check box.



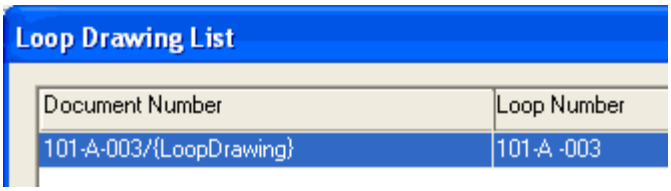
Segment Definition Example for the Loop Drawing Document Number



Implementation Example in Smart Instrumentation

The following example shows a loop drawing document number in the **Loop Drawing List** dialog box, which displays various properties of loop drawings that you can generate. The software created this number according to the naming convention that you defined. The software applies the convention when you do any of the following:

- Create a new loop — the software assigns automatically the document number to the drawing that you can generate for the loop.
- Edit properties of an existing loop, and on the **Loop Number Properties** dialog box, select the **Update document numbers** check box.



NOTES

- If you do not define a naming convention for instrument specification document numbers, the software creates the default document number <tag number>-SP.
- If you do not define a naming convention for calculation sheet document numbers, the software creates the default document number <tag number>-CL.
- If you do not define a naming convention for process data sheet document numbers, the software creates the default document number <tag number>-PD.
- If you do not define a naming convention for document numbers of dimensional data sheets, the software creates the default document number <tag number>-DDP.
- If you do not define a naming convention for loop drawing document numbers, the software creates the default document number LD <loop number>.
- For other documents, the software only creates document numbers when naming conventions exist.

- In Smart Instrumentation, it is always possible to change the document number associated with a document, for example, on the **Revisions** dialog box.
- If needed, when editing properties of a tag or loop number, you can update the document number for the associated documents. In this case, the software assigns document numbers according to the document number naming conventions.

★ IMPORTANT Unlike user-defined naming conventions, default naming conventions of document numbers cannot be updated automatically in Smart Instrumentation when users rename instruments. Suppose you want to rename a tag number **FT-100** to **FT-101** and the source tag has a spec **FT- 100-SP**. After renaming, the default document number of the renamed instrument specification remains as **FT-100-SP**, even though this number contains the **100** segment, which was renamed for the instrument.

Generate Naming Convention Reports

- With the **Domain Administration** window open, click **Report > Naming Convention**.

Wire End Naming Conventions

Smart Instrumentation users can assign a wire end naming convention to the ends of one or more wires belonging to a cable. A convention can consist of free segments as well as segments that designate properties of certain wiring items. A convention can also have separators between segments. The total length of a wire end naming convention can be up to 50 characters.

The Domain Administrator is responsible for defining and managing wire end naming conventions. Also, the Domain Administrator has rights to enable or disable the use of the wire end naming conventions in the Wiring module.

To enable the definition of wire end naming conventions, start the Administration module as the Domain Administrator and then with the **Domain Administration** window open, click **Activities** > **Wire End Naming Conventions**.

★ IMPORTANT On the **Wire End Naming Conventions** dialog box, you must select the **Enable using wire end naming conventions** check box, to enable the definition of wire end naming conventions.

Topics

Wire End Naming Conventions Common Tasks

The following tasks are used when you need to access the Administration module.

Enable the use of wire end naming conventions — Use this procedure to allow users to assign naming conventions to wire ends in the Wiring module.

Define wire end naming conventions— You can use this procedure to define new wire end naming conventions.

Duplicate wire end naming conventions — This procedure describes how to duplicate wire end naming conventions.

Modify wire end naming conventions — You can use this procedure to modify wire end naming conventions.

Delete wire end naming conventions — This option you to delete wire end naming conventions.

Notes for Creating Naming Conventions for Wiring Items

General Note

Naming conventions of wiring items do not depend on the naming convention standard set by the System Administrator per domain. You define a naming convention for wiring items (apart from wire ends) using the options available in the **Naming Conventions** dialog box. In this dialog box, a complete list of wiring items for which you can define naming conventions appears in the **Convention** box.

When applying a naming convention that includes a rack segment, a slot segment or both to a wiring item that does not have a rack or a slot as its immediate parent item, the software omits this segment.

Wire End Naming Conventions

Options for defining wire end naming conventions are available in the **Wire End Naming Conventions** dialog box.

Panel Naming Conventions

If your panel naming convention segments contain levels of panel locations, the software does not display the lowest level in Smart Instrumentation in the following scenario:

1. In the **Panel Location Levels** dialog box, create several levels, for example, **Building**, **Floor**, and **Room**.
2. In the **Naming Conventions** dialog box, define a naming convention for a panel, for example, for a DCS. For the naming convention, use the panel location segments, for example, **Building\Floor\Room\XX**, where XX represents a free segment.
3. In Smart Instrumentation, create a new DCS at the Floor level. When creating the DCS name, the software automatically replaces the **Room** segment with spaces so that the new DCS name appears as follows: **Building\Floor\ \XX.** If, when defining the naming convention, you selected the **Remove trailing spaces in each segment** check box, the name appears as follows: **Building\Floor\\XX**

Enable the Use of Wire End Naming Conventions

- With the **Wire End Naming Conventions** dialog box open, select **Enable using wire end naming conventions**.

Define Wire End Naming Conventions

1. In the **Wire End Naming Conventions** dialog box, click **New**.
2. In the **Wire End Naming Convention Properties (New)** dialog box, under **Convention**, type a unique name.
3. Under **Description**, type a description, if needed.
4. Click **Add** to add a new row in the data window.
5. Under **Segment definitions**, in the data window, select a segment from the list.

   TIP A segment can be either free or can designate properties of certain wiring items. If you select a free segment as part of a naming convention, in the Wiring module, Smart Instrumentation users can type any string up to the length allocated for the free segment.
6. To determine all or part of the naming convention string by the actual name of the item that appears in the segment that you selected under **Trim Trailing Spaces**, select the check box.
7. To define the start position and length of segments, under **Start** accept or modify the value that designates the starting character in the segment from which the segment appears in the naming convention.
8. Under **Length**, accept or modify the default number of characters allocated for the selected segment string in the naming convention (starting from the position defined in the **Start** box).

   TIP When you select a segment, the software automatically displays the maximum length that can be used for the segment. If the total length exceeds the maximum permitted value of 50 characters, the software automatically truncates the number of characters in the segment to maintain the permitted total length or displays a message if the total length of the segment has already reached the maximum value.
9. If you need to define a separator between the segments in the naming convention string, in the **Separator** column, type separator characters (up to 30 characters of any kind).
10. Repeat steps 4 through 9 for each segment that you want to define.

    TIPS

    - You can change the sequence of segments in the naming convention using the **Up** and **Down** buttons.
    - The **Sample** box shows a preview of the naming convention. The value that appears in the **Total length** box represents the total value of characters in the naming convention segments, including the separator characters. All naming convention strings can have a maximum length of 50 characters.
11. Select **Remove spaces from wire end names** if you defined your naming convention in any of the following ways:

- You used a naming convention segment that includes spaces, for example, panel name 101-FT -200.
- You increased the default length of a segment. For example, if the default segment length is 20 characters and you changed it to 30 characters, the software automatically adds the additional characters to the naming convention as trailing spaces, if the entire naming convention does not exceed 50 characters.

12. Click **OK**.

Duplicate Wire End Naming Conventions

1. In the **Wire End Naming Conventions** dialog box, select a naming convention to be used as a source.
2. Click **Duplicate**.
3. In the **Wire End Naming Convention Properties (Duplicate)** dialog box, type a unique name for the target convention.

NOTE You can modify any existing segment definitions as you need. These settings only apply to the target naming convention.

Modify Wire End Naming Conventions

1. In the **Wire End Naming Conventions** dialog box, select a naming convention.
2. Click **Properties**.
3. In the **Wire End Naming Convention Properties** dialog box, modify the settings as you need.

NOTE If the convention is already in use in Smart Instrumentation, you can modify only the convention name and description.

Delete Wire End Naming Conventions

1. In the **Wire End Naming Conventions** dialog box, select a naming convention.
2. Click **Delete**.

NOTE You can delete only those conventions that are not in use in Smart Instrumentation.

Using KKS Naming Conventions in Smart Instrumentation

★IMPORTANT You must initialize a KKS domain using a KKS database. Smart Instrumentation supplies an empty KKS database (IN_KKS.ddti found in the folder where you installed Smart Instrumentation. In addition, you must select the **KKS mode** check box in the **Domain Definition** window.

For the KKS naming convention to function the Rule Manager option must be selected in the Domain Definitions. You then, in Rule Manager using the **KKS Cable Name** rule, set the number of segments to be used in the calculation of the unique suffix number in the KKS name.

Smart Instrumentation supports KKS naming conventions for process-related identification of the following item types:

- Instruments (including functional requirement tags and virtual tags)
- Loops
- Lines
- Process equipment
- Control system tags
- Panels (plant panels only, belonging to panel categories available in the **Convention** list in the **Naming Conventions** dialog box)
- Cables (plant cables only)

For each of these item types, the following KKS segment properties are available:

KKS Level Name	Property	Description
Total Plant	Total Plant	Single character (numeric or alphabetic).
System Code	System Code Prefix (optional)	Single digit.
	System Classification	Three-character alphabetic key, selected from a standard list, that represents the type of system in use the plant.
	System Numbering	Two-digit number with leading zeros.
Equipment Unit Code	Equipment Unit Classification	Two-character alphabetic key, selected from a standard list that represents the type of equipment within the system used for measuring or monitoring the system, or the type of measurement circuit (level, flow, and so forth).
	Equipment Unit Numbering	Three-digit number with leading zeros.

KKS Level Name	Property	Description
	Equipment Unit Additional Code	Optional character (alphabetic).
Component Code	Component Classification	Two-character alphabetic key, selected from a standard list that represents the type of component.
	Component Numbering	Two-digit number with leading zeros.
Numbering Element (for cables only)	Application Area	Single digit (0-9) representing the application area of a cable (voltage levels).
	Cable Number (digits 2 and 3)	Two-digit number.
	Cable Suffix	The fourth position of the cable number, a numeric character, mostly used for grouping purposes.

IMPORTANT

NOTES

- Smart Instrumentation does not auto-increment the numbering of the various segments in the process identification.
- The software does not automatically add leading zeros to imported items whose names include spaces. You must manually add the leading zeros to the source before importing KKS data.

Process Identification Prefix and Notation Characters

Process Identification usually uses the equal (=) character as a prefix. Identification may include space (" ") or pipe (|) characters.

Examples

For a medium voltage panel (excluding device panels), only the System Code segments are required in most cases. Thus, a suitable KKS name would be 1 0BBA01, where the values are designated as follows:

Property	Value	Description
Total Plant	1	
System Code Prefix	0	
System Classification	BBA	MV distribution board
System Numbering	01	

Property	Value	Description
Equipment Unit Classification	(Not used)	
Equipment Unit Numbering	(Not used)	

For a flow transmitter, the KKS identification 1 0PAE01 CF013 –B01 could be used, where the values are designated as follows:

Property	Value	Description
Total Plant	1	
System Code Prefix	0	
System Classification	PAE	Circulating (main cooling) water pump system
System Numbering	01	
Equipment Unit Classification	CF	Open flow loops
Equipment Unit Numbering	001	
Component Classification	-B	Transducer
Component Numbering	01	

NOTES

- When creating a new instrument, the associated loop inherits the relevant segments of the instrument names and vice versa. Also, KKS naming is propagated to cables when you connect them to panels that already have KKS naming. Cables inherit the KKS naming of the panel whose system code is first in alphabetic order.
- Not all items use all the described segments. For example, DCS and PLC panels do not use equipment unit code and component code segments. Marshaling racks, junction boxes, process equipment, and lines do not use component code segments.
- When editing a name using the KKS naming conventions, do not remove any segments from the name. Removing segments from the KKS name causes problems when creating new instruments. You can though add more segments to the KKS name created in Smart Instrumentation.
- You can change the terminology of a key on a project-specific basis provided that the contents remain unchanged. Make sure that you do not select a code that is designated as **Blocked**. Blocked coding letters are reserved for future technologies and new systems engineering configurations. They may only be allocated and released by the VGB Technical Committee on Technical Classification Systems.

Topics

Flow of Activities for Working in KKS Mode

To work in KKS mode in Smart Instrumentation, you must use the Administration Module. This ensures that the software populates the target database with KKS segment code lists and representative KKS instrument types.

Domain Administrator Activities

1. Log on as Domain Administrator, and on the **Administration** dialog box, select the domain that you initialized.
2. Define the plant hierarchy and add plant groups (for details, see the appropriate topics in the Administration Module Online Help).
3. Click **Activities** > **Naming Conventions**.
4. On the **Naming Conventions** dialog box, copy the naming conventions from the Default lowest plant group of the Default plant and make necessary adjustments to define the naming conventions using KKS segment properties. For details, see *Define KKS Naming Convention Using KKS Segments* (on page 128).

Import Utility Activities

When importing line data to the Instrument Index module, you need to perform the following procedure to enable the use of KKS segments in the import link.

1. In the Import Utility, select the import link and open the **Link Properties** dialog box.
2. Click the **Style** tab.
3. Select the **Display all fields** check box.

Define KKS Naming Convention Using KKS Segments

⚠ CAUTION If you already created instrument tags or loop numbers in Smart Instrumentation according to KKS naming conventions, you must not change the KKS segments to free segments or add free segments to the existing instrument or loop naming conventions.

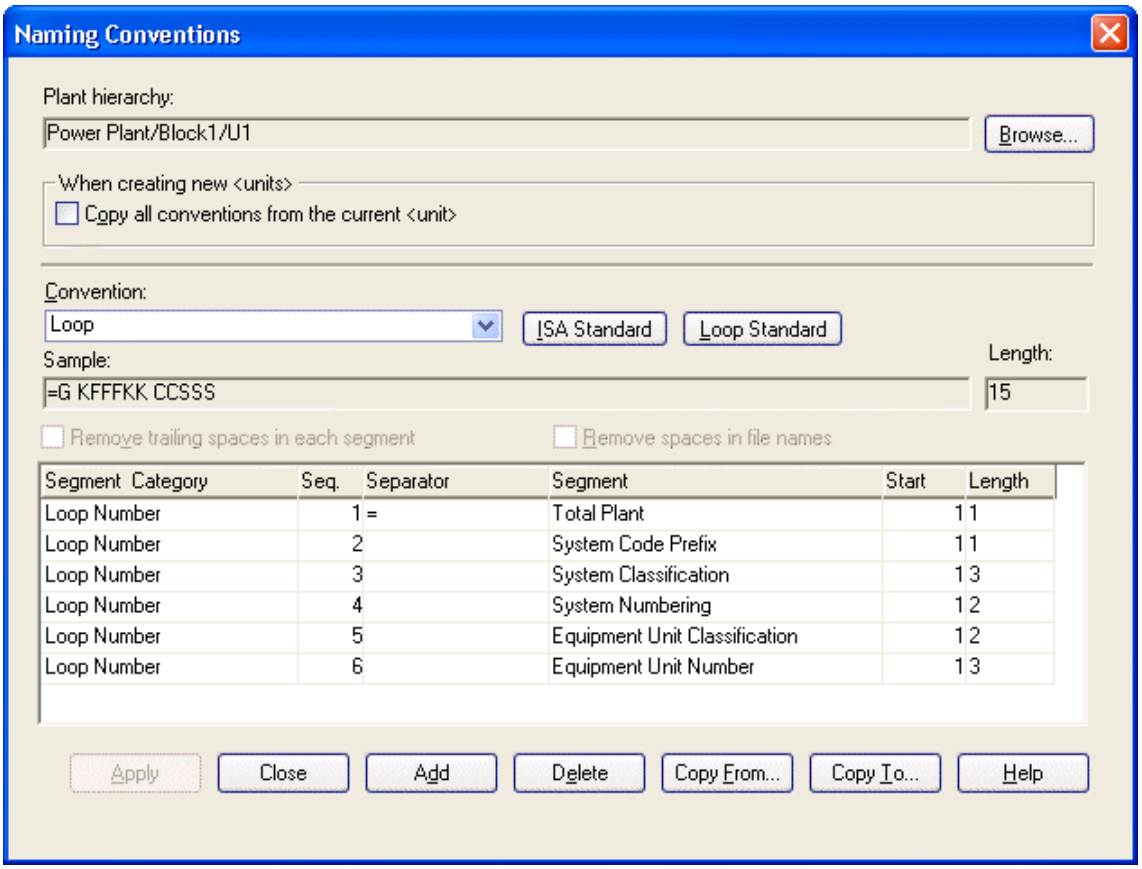
1. On the **Naming Conventions** dialog box, copy the naming conventions from the Default lowest plant group of the Default plant and make necessary adjustments to define the naming conventions using KKS segment properties.
2. On the **Naming Conventions** dialog box, from the **Convention** box, select an item type.
3. Accept the default segment definitions or change them as appropriate.
4. Define the separators as you require.

TIPS

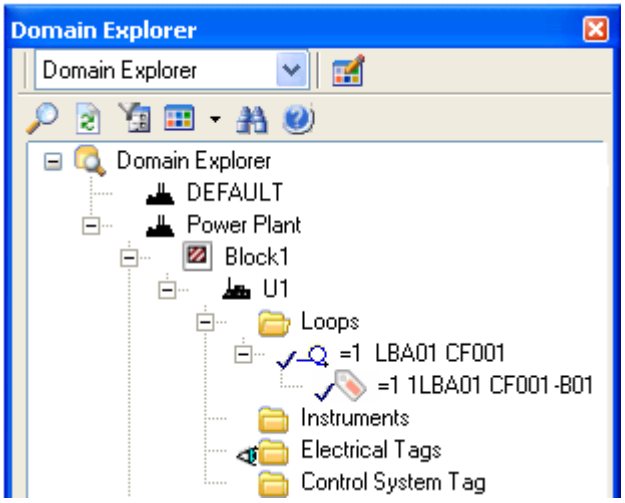
- The **Naming Conventions** dialog box opens with the KKS naming conventions already defined. You can delete segment properties that you do not require or add freeform properties in addition to the KKS segments; however, note that in KKS mode, Smart Instrumentation does not propagate properties of non-KKS segments.
- If you have an existing KKS naming convention in another plant hierarchy that you want to copy, click **Copy From** to copy that naming convention to your domain.

- When the value of a numeric or optional segment is less than the maximum length, the software adds leading zeros in the segment. An optional segment is a segment in which you do not have to enter the value.

Example of a KKS Naming Convention for Loops



Loop Number Representation in the Domain Explorer of Smart Instrumentation



NOTE When creating a loop, you can also create instrument tags on the fly, using the loop naming as a source. Also, when you connect a cable to a panel, the cable inherits the naming from the panel according to KKS convention rules. In both cases, the software copies the naming from the source item segments to the appropriate target item segments. For these reasons, in the naming convention of a target item, you should not delete segments that are likely to receive values by propagation. Non-relevant segments in the target item are left blank or not displayed.

Preferences Management

The software allows the Domain Administrator to manage Smart Instrumentation preferences in the current domain, or in As-Built and projects in an owner operator domain.

Topics

Managing Preferences Common Tasks

The Domain Administrator can perform the following tasks when managing preferences:

Set domain preferences — This option enables the Domain Administrator to set Smart Instrumentation preferences in the current domain. By setting domain preferences you determine which preferences can be set by individual users and which preferences become default preferences that are shared by all users and cannot be modified in Smart Instrumentation.

Set project preferences — This option enables the Domain Administrator to set Smart Instrumentation preferences in As-Built and projects in your owner operator domain. By setting project preferences you determine which preferences can be set by individual users and which preferences become default preferences that are shared by all users and cannot be modified in Smart Instrumentation.

Copy project preferences — This option enables the Domain Administrator to copy preferences from one project to one or more projects at a time, within your owner operator domain. Also, you can copy the default preference settings that you have defined in the **Preferences Management** dialog box.

Export preferences — Use this procedure to export domain preferences (or project preferences when the domain type is **Owner operator**) to an external .dmp file.

Import preferences — Use this procedure to import preferences from an external .dmp file to the current domain or a specific project if the domain type is **Owner operator**.

Topics

Set Domain Preferences

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Preferences Management**.
3. Click the tabs in the **Preferences Management** dialog box to define various default preference settings.

   TIP To learn more about Smart Instrumentation module preferences, click **Help** in the in the **Preferences Management** dialog box on the appropriate tabs.
4. Click **Advanced**.

   NOTE The advanced preferences cannot be applied to actions performed by the Import and Export preferences of Smart Instrumentation.

5. On the **Advanced Domain Preferences** dialog box, for the preferences that you modified and want to set as default, clear the **Enabled** check box.

   TIPS

   - Clearing the **Enabled** check box for an option prevents new and existing users from modifying this preference in Smart Instrumentation.
   - Selecting **Enable all** allows you to make all the domain preferences available for customization in Smart Instrumentation.

   CAUTION We recommend that you do not disable the temporary folder path option. This is because in the temporary folder, the software creates temporary files during various activities that users perform in Smart Instrumentation, for example, when creating specifications, generating CAD drawings, hook-up drawings, reports, and so forth. If you prevent users from specifying individual temporary folder paths, the temporary folder path becomes shared among several users. This can cause problems with data display when users perform the same activity at the same time, for example, when creating two specifications at the same time.

6. Click **OK** to save the settings and close the **Advanced Domain Preferences** dialog box.

Set Project Preferences

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Preferences Management**.
3. On the **Preferences Management** dialog box, select a project, from the **Project** list.

   TIP If you have not created any projects yet, select the **DEFAULT PREFERENCES** option from the **Project** list and set the default preferences, which the software then copies automatically to every project that you create.

4. Click the tabs on the **Preferences Management** dialog box to define various preference settings.

   TIP To learn more about Smart Instrumentation module preferences, click **Help** in the in the **Preferences Management** dialog box on the appropriate tabs.

5. Click **Advanced**.

   NOTE The advanced preferences cannot be applied to actions performed by the Import and Export preferences of Smart Instrumentation.

6. On the **Advanced Project Preferences** dialog box, for the preferences that you modified and want to set as default, clear the **Enabled** check box.

   TIPS

   - Clearing the **Enabled** check box for a particular option prevents project users from modifying this preference in Smart Instrumentation.
   - Selecting **Enable all** allows you to make all the project preferences available for customization in Smart Instrumentation.

7. Click **OK** to save the settings and close the **Advanced Project Preferences** dialog box.

Copy Project Preferences

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Preferences Management**.
3. On the **Preferences Management** dialog box, from the **Project** list, select a project.

   TIP You can also select the **DEFAULT PREFERENCES** option from the **Project** list and set the default preferences which you can use when copying preferences to existing projects or As-Built. When you create a new project, it automatically receives the default preferences.
4. Click **Advanced**.

   NOTE The advanced preferences cannot be applied to actions performed by the Import and Export preferences of Smart Instrumentation.
5. On the **Advanced Project Preferences** dialog box, do the following:
   - To allow users to set a preference for a Smart Instrumentation option in the current project, select **Enabled** next to the appropriate preference option.
   - To prevent users from setting a preference for a Smart Instrumentation option in the current project, clear the **Enabled** check box next to the appropriate option.
   - Select the **Enable all** check box to make all the preference options available for customization in the current project.
6. Do one of the following:
   - **Copy To** — to copy the current project preferences to other projects in the owner operator domain.
   - **Copy From** — to overwrite the preferences in the project you have selected in the **Preferences Management** dialog box.
7. Click **Copy**.
8. Click **OK** to save the settings and close the **Advanced Project Preferences** dialog box.

Export Preferences

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Preferences Management**.
3. If the domain type is **Owner operator**, from the **Project** list, select a source project.
4. Click **Export**.

5. On the dialog box that opens, enter the name of the target .dmp file, and then, click **Save** to export the current preferences to the .dmp file.

NOTES

- It is only possible to export preferences to a .dmp file.
- In the created .dmp file, you can modify preferences as you require, and then, import them to a domain or project residing in another database.

Import Preferences

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Preferences Management**.
3. If the domain type is **Owner operator**, from the **Project** list, select a target project.
4. Click **Import**.
5. On the dialog box that opens, select the .dmp file that contains previously exported preferences, and then, click **Open**.
6. On the **Preferences Management** dialog box, click **OK** to save the settings.

Report Management

The Domain Administrator can manage Smart Instrumentation reports. This activity involves associating a customized title block with a report, and setting archiving options for report comparison within the Smart Instrumentation environment. Using these options, you manage all the available reports in most of Smart Instrumentation modules. When managing reports, you filter and sort the report data as needed.

Also, you can define revision management settings. In the database, each report is assigned to the report type, which can be list or non-list. The report type determines how Smart Instrumentation users can manage revisions created for a specific report, for an item, or a group of items. For list-type reports, the Domain Administrator can enable users to manage revisions either per document or per item.

In accordance with the revision management setting, users can either create a revision whose document number and revision number become shared for a specific item and for reports generated for that item (when the setting is per-item), or create a unique revision for a particular report (when the setting is per-document).

NOTE Depending on the revision management settings defined by the Domain Administrator, after creating a document (drawing or report), you can save it as a revision.

When saving a revision, the software assigns a revision number to the saved document and saves the revision in the archive (backup), allowing you to compare the current document with the archived document.

After opening a document (that has been saved previously with a revision) and then making changes, saving (or refreshing) the document without saving as a new revision displays a prompt. **Do you want to re-archive? Yes** or **No**.

Click **Yes**, to overwrite the document without creating a new revision, retaining the last revision number of the document you opened and saving the document to the archive (re-archiving). If you now compare the current document with the archived document there are no differences.

Click **No** to save the document changes without a change in the revision number, but without saving the changes to the archive. If you now compare the current document with the archived document the differences are displayed.

Topics

Report Management Common Tasks

The Domain Administrator can perform the following tasks when managing reports:

Associate a new title block with a report — The Domain Administrator can associate a default title block supplied with Smart Instrumentation, or a custom title block created in InfoMaker and added to Smart Instrumentation using the options in the **Title Blocks** dialog box (this dialog box is only accessible from Smart Instrumentation).

The software filters the title blocks that you can associate with a certain report according to the report units of measure (PB units or inches).

Set archiving options for report comparison — This feature allows the Domain Administrator to set archiving options for Smart Instrumentation reports. A revision archive enables users to view a backup copy of a report with the information contained in that report at the time of revision. Users can compare an archived report with a previewed report or with another archived report.

You set an archiving option for each report. This way you determine how users save report revisions, and from what source the software retrieves the archived report revisions for report comparison.

Define report revision management settings — For most reports, revision management setting are set automatically and fixed in the database. However, for certain non-list-type reports, using the options in the **Report Management** dialog box, the Domain Administrator can change the revision management setting. When the domain type is **Owner operator** domain, you can only change the revision management settings for reports available in As-Built.

Topics

Associate a New Title Block with a Report

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Report Management**.

   TIP In the **Report Management** dialog box, sort and filter the report data if needed.
3. Select the **Title Block** check box for each report want to associate with a title block.
4. From the **Title Block Customization** list, select a title block for each relevant report. For details on the available title blocks, see *Title Block Descriptions* (on page 136).

   TIPS

   - For specifications, the System Administrator has rights to select a title block assignment method when setting the domain options. If in the **Report Name** column, you selected **Specification** but the **Title Block Customization** column options are disabled, this means that Smart Instrumentation users can associate different title blocks with specifications using the options available in the **Specifications** module itself (as in Smart Instrumentation versions prior to Version 7).
   - If you want to associate a custom title block with all specifications, make sure that in the **Domain Definition** window, the selected custom title block assignment method is **Standard (used in all modules)**.

Title Block Descriptions

This topic describes the title blocks that are available in the **Title Block Customization** column of the **Report Management** window. The Domain Administrator can select the appropriate title block and assign it to a Smart Instrumentation report.

Template Title Blocks

Template title blocks come shipped with Smart Instrumentation. The users need to associate template title blocks with Smart Instrumentation manually, as any custom title block. The default location of the template title blocks is <Smart Instrumentation home folder>\Psr. After users associate the template title blocks with Smart Instrumentation, they become available for selection in the **Title Block Customization** column of the **Report Management** dialog box.

The following template title blocks are available:

DEFAULT — Associated by default with a Smart Instrumentation report. You can use this title block in any module.

Default TB with IN units — This title block is the file Default TB with IN Units.psr, created using 1/1000 inch units. You can use this title block in any module.

Default TB with IN units (with signed By field) — This title block is the file Default TB with IN Units (with Signed By field).psr, which contains the **Signed By** field for revisions. This title block is created using 1/1000 inch units. You can use this title block in any module.

Default TB with PB units — This title block is the file Default TB with PB Units.psr, created using PowerBuilder units. This title block is not suitable for specifications.

Default TB with PB units (with Signed By field) — This title block is the file Default TB with PB Units (with signed By field).psr, which contains the **Signed By** field for revisions. This title block is created using PowerBuilder units. This title block is not suitable for specifications.

Specs Default TB with PB units — This title block is the file Specs Default TB with PB Units.psr, created using PowerBuilder units. This title block is only suitable for specifications, after the System Administrator, when making or modifying the current domain definitions, selects the **Standard** title block assignment method. If you print specs using the A4 sheet size, this title block is fully compatible with all the library forms and does not require any manual adjustments. Note, however, that if you want to print specs using the Letter sheet size, you must first modify the **Specs Default TB with PB Units.psr** title block in InfoMaker by reducing the title block height. Removing two revision rows from the title block is enough to make it appear correctly in a printout of any spec based on a library form.

Custom Title Blocks

These are title blocks that users created using InfoMaker, and then added to Smart Instrumentation using the options in the **Title Blocks** dialog box. You can use custom title blocks in any module. You can assign a custom title block to a particular report only when the units of measure with which the selected title block has been created are the same as the units of measure defined for that report. Title blocks whose units of measure are different from the units of measure defined for the report do not appear in the **Title Block Customization** list. When creating a title block in InfoMaker, you can use either 1/1000 inch units, or PowerBuilder units.

Some reports do not support custom title blocks. For these reports, the value **Default** appears in the **Title Block Customization**, and the option to select a custom title block from this list is disabled.

NOTES

- As a basis for custom title blocks, it is recommended to use the supplied template title blocks.
- If in the **Plant Hierarchy** dialog box, you define too long names of the plant hierarchy levels (up to 50 characters are allowed), in the default title blocks, truncation may occur in the fields that display the names of the plant hierarchy levels and the specific level items. If you must use long name strings, to prevent truncation, we recommend that users create custom title blocks and provide enough room in the PLANT_NAME, AREA_NAME, and UNIT_NAME fields.

Set Archiving Options for Report Comparison

The following archiving options are available:

- **Do not save** (not available for the Document Binder module reports) — Sets the software not to keep a revision archive. After saving the report revision, Smart Instrumentation users cannot see the information contained in that report at the time of revision, and the report comparison is not available.
- **Save to database** — Sets the software to keep a revision archive in the database. This way you eliminate the need for file sharing and management. Note, however, that this option can slow down your work.

- **Save as File** — Sets the software to keep a revision archive as an external .psr file (or as a .sma file when using the Enhanced Report Utility and adding revisions to an open report, not with global revisions). Selecting this option can speed up your work.
- **Compress as ZIP file** — Sets the software to keep a revision archive as an external .psr file — in a compressed .zip format. This feature is useful, for example, before backing up a database when you have made a large number of report revisions. Selecting this option reduces the size of the backup database.

NOTE

- When changing an archiving option for a Document Binder module report, the software assigns the same archiving option to all the other Document Binder reports as well. This is because in the Document Binder module, you can only create revisions for the entire binder package). You can, however, apply a different custom title block to any Document Binder module report.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Report Management**.
3. In the **Report Management** dialog box, under **Sort by**, select one of the following options to sort the reports in the **Report Name** column:
   - **Report** — sort the reports in the data window by the report names.
   - **Module** — sort the reports in the data window by modules.
4. To filter the reports by specific module, under **Filter by**, select a module.
5. Select **Apply** to view the reports belonging to the specified module.

   TIP To return from the filtered view to the normal view, clear the **Apply** check box.
6. For a specific report displayed in the **Report Name** column, select the archiving option from the list in the **Archiving Options** column.

   TIPS
   - If you have selected the **Save to database** or **Do not save** option, skip this step.
   - To use the **Save as File**, or **Compress as Zip** file options, you need to set an archive path (as described in the next step).
7. To define the default archive path for all the report revisions to be saved as files or compressed as .zip files, click  next to the **Path** field in the **Default archive path** group box, and enter the required path.

   TIP If needed, you can define a different path for a report by entering the required path in the **Archive Path** field of the data window.

Define Report Revision Management Settings

1. With the **Domain Administration** window open, click **Activities** > **Report Management**.
2. If the domain type is **Owner operator**, from the **Project** list, select **As-Built**.
3. In the **Revision Management** column, beside a non-list- type report, select one of the following settings:

Setting	Description	Example
Per Item	Allows users to share the document number and revision in documents created for a specific item and in all reports generated for that item. This means that the document number and the revision number that users apply to an item in the item properties dialog box are the same as in a print preview of any report generated for this item.	In the Wiring module, after creating a revision for a specific strip from the item properties dialog box, the document number and revision number are assigned to the revision opened from a print preview of any report generated for this strip (panel-strip report with or without adjacent connections, I/O assignment report, and so forth).
Per Document	Allows users to apply a unique document number and revision to a specific report generated for a specific item, and allows to make global revisions.	After creating two reports for a particular strip: a report with adjacent connections and a report without adjacent connections, the document and revision numbers of the two reports cannot be shared. Likewise, after creating two panel-strip reports for two different strips, each report has a unique document number and revision. As a result, the document number and revision added from the report print preview is different from the document number and revision added in the **Revisions** dialog box opened from the item properties dialog box.

NOTE A revision management setting of all list-type reports is always per document. A revision management setting of certain non-list-type reports is set permanently as per item, while for other non-list-type reports you can define the revision management setting as either per item or per document

Add-Ins

After the System Administrator initiates a domain, a number of item resources (for example, hook-up items, links, and so forth) become available in the software. These items allow you to get started with building your domain without having to create all the required items from scratch. However, these resources are rather limited and do not provide for all your needs. You can enhance your item resources by appending add-ins to your domain. Add-ins are available on purchasing the appropriate Smart Instrumentation license. Contact your local Smart Instrumentation dealer or Customer Support for further information.

Topics

★ IMPORTANT This functionality is not available in this version of Smart Instrumentation.

You can import a hook-up item library from an external database file to your database. After you import the hook-up item library, you can assign the new imported items to your existing hook-ups from the **Hook-Up Item List**. You can also use prepared hook-up drawings which are stored in the HOOK-UP sub-folder of your Smart Instrumentation home folder.

You import the required hook-up library first by connecting to a catalog database file and then by importing the required hook-up libraries to the appropriate plant in your database. You can only import the link groups that you purchased the appropriate license for.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Add-Ins** > **Import Hook-Up Library**.
3. In the **Import Hook-Up Library** dialog box, under **Source database**, locate the database file in one of the following ways:
   - In the **File name and path** box, type the path and filename of the required database file (the default file is IN_CTLOG.DDTI).
   - Click **Browse** to navigate to the required database file.
4. Click **Connect** to retrieve the libraries available in the database file.

   ★ IMPORTANT If you get a message stating that the connection has failed, make sure you typed in the correct path and filename of the database file (see step 3 of this procedure).
5. Do one of the following:
   - Click **Standard** to select the library that contains standard compatible hook-ups.
   - Click **SHELL** to select the library that contains Shell International compatible hook-ups.
6. In the **Hook-up drawing path** box, do one of the following:
   - Type the drawing path for the items in the imported library (the default location is <Smart Instrumentation home folder>HOOK-UP). This is useful if you do not want to type the path every time you retrieve a drawing from this library.
   - Leave the data field empty. This way you will have to type the path when retrieving each drawing. For this option, you will still be able to assign a path to the drawings in the Hook-Ups module in batch mode.

7. In the **Plant Name** data window, select the name of the plant in which the appended hook-up items will be used.
8. Click **Import** to append the selected hook-up item library to the database.

NOTE The software does not allow you to import a hook-up item library that already exists in the database. If you attempt to import such a hook-up item library, the software displays an appropriate message.

IMPORTANT This functionality is not available in this version of Smart Instrumentation.

You can import link groups from an external database file to the Smart Instrumentation database. After you import these linked groups you can use them in the Import utility to import data from external databases. You import the required external links first by connecting to a database file and then by importing the required link groups to your database. After that, you can prepare and run the links in the Import Utility.

System interfaces are available for the following link groups:

- PDS/Smart P&ID
- Fisher
- Performance Spec #1
- Performance Spec #71
- Masoneilan Spec #1
- Masoneilan Spec #75

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Add-Ins** > **Import System Interfaces**.
3. Under **Source database**, locate the database file in one of the following ways:
   - In the **File name and path** box, type the path and filename of the database file In_ctlog.DDTI.
   - Click **Browse** to navigate to In_ctlog.DDTI.
4. Click **Connect** to connect to the source database file.

   IMPORTANT If you get a message stating that the connection has failed, make sure you typed in the correct path and filename of the database file (see step 3 of this procedure).
5. Under the **Select link group** section, select one or more of the link groups to import.
6. Locate the source path of all the links in the imported group in one of the following ways:
   - In the **Source file path** data field, type the source path.
   - Click **Browse** to navigate to the required source path.
7. Clear the **Import only source codes** check box if it was selected.
8. If you are importing the **PDS/Smart P&ID link**, select or clear the **Import typical instruments** check box as required.
9. Click **Import** to add the selected link group to the database.

IMPORTANT This functionality is not available in this version of Smart Instrumentation.

This option enables you import DCS hardware I/O data from the Foxboro - I/A FBMs library.

1. With the **Domain Administration** window open, click **Add-Ins** > **Import DCS Hardware I/O Library**.
2. Under **Source database**, locate the database file in one of the following ways:
   - In the **File name and path** box, type the path and filename of the required database file (the default file name is IN_CTLOG.DDTI).
   - Click **Browse** to navigate to the required database DDTI file.
3. Click **Connect** to retrieve the Foxboro - I/A FBMs library.

   TIP If you get a message stating that the connection has failed, make sure you typed in the correct path and filename of the database file (see step 3 of this procedure).
4. Under **Select panel library**, select **Foxboro - I/A FBMs**.
5. Click **Import** to import the process connection data to your database.

NOTE The software does not allow you to import the same connection data more than once. If you attempt such an import, the software displays an appropriate message stating that the data import has failed because at least some of the connection data already exists.

IMPORTANT This functionality is not available in this version of Smart Instrumentation.

This option enables you to import PDS or Smart 3D process connection data for the Dimensional Data for Piping (DDP) module.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, do one of the following:
   - Click **Add-Ins** > **Import DDP Library Data** > **From PDS**.
   - Click **Add-Ins** > **Import DDP Library Data** > **From Smart 3D**.
3. Click **Connect** to retrieve the libraries available in the database file.
4. Click **Import** to import the process connection data to your database.

NOTE You can import data from the same DDP library more than once. Only those groups, in the source file, that do not exist in the DDP module are imported.

Export Macros

This option enables you to export macros from a current Smart Instrumentation database or domain to a text file. Then, from another database or domain, you import data contained in this file. Note that you can also include all the existing typical tags in the target text file.

★IMPORTANT Exporting macros requires the existence of a sppid_macro component table in the source database or domain, Domain Administrator access rights, and a database target .txt file.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Add-Ins** > **Import/Export Macros> Export Macros**.
3. In the **Export Macros** dialog box, click **Browse**.
4. In the **Select file for Export** dialog box, select a target .txt file from the list or create a new file.
5. Click **Save** to return to the **Export Macros** dialog box.

   TIP If there are typical tags in the current source database or domain, you can select **Include typical tags** to export all typical tags to their target .txt files. Clearing **Include typical tags** results in just the loop data being exported.
6. Click **OK** in the **Export Macros** dialog box.
7. Click **OK** in the notification box that appears if macros have been exported successfully.
8. Click **Close** in the **Export Macros** dialog box.

Import Macros

This option enables you to import macros into Smart Instrumentation from a predefined intermediate text file that already contains macros exported from another database or domain to the current database or domain. When importing macros, this text file serves as the source file. Note that you can also import all the typical tags that have been included in the text file.

★IMPORTANT Importing macros requires the existence of a sppid_macro component table in the target database or domain, Domain Administrator access rights, and a predefined source .txt file.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Add-Ins** > **Import/Export Macros> Import Macros**.
3. In the **Import Macros** dialog box, click **Browse**.
4. In the **Select file for Export** dialog box, select a .txt file from the list.
5. Click **Save** to return to the **Export Macros** dialog box.

   TIPS

   - Select the **Include typical tags** check box to import all typical tags to the current database or domain from the source .txt file, if required.

- Before selecting **Include typical tags**, ensure that the source .txt file contains the required typical tags; otherwise, the macro import process will fail.

6. Click **OK** in the **Import Macros** dialog box.
7. Click **OK** in the notification box that appears if macros have been imported successfully.
8. Click **Close** in the **Import Macros** dialog box.

IMPORTANT This functionality is not available in this version of Smart Instrumentation.

This feature allows you to import spec forms into your database. After the import, these spec forms become available in the **Form Editor** and **Page Editor** in the Specifications module.

You import the required spec forms first by connecting to a database file and then by importing them to your database.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Add-Ins** > **Import Spec Forms**.
3. Under **Source database**, locate the database file in one of the following ways:
   - In the **File name and path** box, type the path and filename of the required database file (the default file is IN_CTLOG.DDTI).
   - Click **Browse** to navigate to the required database file.
4. Click **Connect** to retrieve the libraries available in the database file.

   IMPORTANT If you get a message stating that the connection has failed, make sure you typed in the correct path and filename of the database file (see step 3 of this procedure).
5. In the **Import** group box, click **Browse** to set the import folder path. Make sure that the path includes the appropriate filename.
6. In the **Available forms for import** data window, do the following:
   a. Click the appropriate **Select** check boxes for the spec forms that you want to import.
   b. Under **New Form**, accept the displayed form number or type in a new number for the imported spec form.
   c. Under **New Form Name**, type the name of the new spec form that will be imported into your database.

      NOTE The new spec form names and numbers must be unique in your plant.
7. Click **Import** to append the selected views to the database.

NOTES

- After importing the spec forms, you must rebuild the catalog tables. Switch to System Administration and then click **DBA** > **Rebuild catalog tables**.
- You can import only those spec forms for which you purchased an appropriate license.
- To use these forms in Smart Instrumentation, you must regenerate the specifications that are based on these forms. You can do it for a single specification page or for multiple ones in batch mode. For more information, see the *Smart Instrumentation Help*, *Specifications* > *Specification Pages* > *Regenerate a Specification Page* or *Regenerate Pages in Batch Mode*.

Miscellaneous Domain Administration Tasks

This set of topics deals with various miscellaneous tasks that are performed by the Domain Administrator.

Define Panel Location Levels

You can define multiple levels for your panel locations. For example, you can define three levels with Building as the highest level (Level 1), Floor as the second level, and Room as the lowest level (Level 3). Then, in the **Domain Explorer**, users can create specific locations on any of the levels and assign panels to the locations. Panel location is defined per domain; therefore, all the panel location definitions that you make become available throughout the entire current domain. For more information, see *Define Panel Location Levels* (on page 146).

Assign Icons to Telecom Device Types

Use this procedure to assign icons to telecom device types available in the current domain. This way the software can indicate the telecom device type of specific device panels displayed in the **Domain Explorer** (or **Wiring Explorer**, accessible from the Wiring module). For more information, see *Assign Icons to Telecom Device Types* (on page 147).

User-Defined Fields

User-defined fields are database fields for which the Domain Administrator defines default labels at the domain level in the **User-Defined Tables and Fields** Editor. User-defined fields enable users to define characteristics for Smart Instrumentation items according to their own needs.

For calibration user-defined fields, the user enters values in the Calibration module. If the Domain Administrator enables process data user-defined fields, the user can then enter values for these fields in process data sheets. For all other user-defined fields, the user enters values in the relevant EDE views, and can also edit the default labels. For more information, see *User-Defined Tables and Fields Editor* (see "*User Defined Tables and Fields Editor*" on page 148).

User-Defined Tables

A user-defined table is an additional supporting table that holds user-defined information for an instrument tag. The Domain Administrator uses this procedure to define user-defined tables for tag numbers at Domain level. You can define up to sixteen user-defined tables. User-defined tables enable Smart Instrumentation users to set additional attributes for tag numbers in the Instrument Index module. You can add the **Name** field of a user-defined table to a specification page. For more information, see *User Defined Tables and Fields Editor* (on page 148).

Generate Domain Administration Reports

This topic deals with the various reports that a Domain Administrator can generate. For more information, see *Generate Domain Administration Reports* (on page 156).

Select a Logo

You can select a .bmp format graphic file that will appear as a logo in most printed documents such as some reports and specifications.

You can build a number of domains in your database, each having a different logo. In this case, when you switch to a domain, the software retrieves the logo assigned to that domain from the database. If all your domains use the same logo, you can make the logo retrieval operation faster by selecting the PROJLOGO.bmp file located in the <Smart Instrumentation home folder>\Temp folder as the default source logo file for all domains in the database. This file is automatically generated by the software during the Setup process. For more information, see *Select a Logo* (on page 157).

Define Field Personnel Profiles

This procedure enables you to maintain a list of employees who are in-charge of carrying out the actual instrument field-maintenance. For more information, see *Define Field Personnel Profiles* (on page 157).

Modify Domain Notes

This topic explains how to modify your domain notes. Note that this option is available to both System and Domain Administrators. For more information, see *Modify Domain Notes* (on page 158).

Topics

Define Panel Location Levels

1. Start the Administration module and log on as Domain Administrator.
2. In the **Domain Administration** window, click **Activities** > **Panel Location Levels**.
3. For the first location level, enter a location level name and an optional separator to indicate the highest level of the hierarchy.
   For example, create the level **Building** and enter a back-slash separator (\ ).

   TIPS

   - The level separators and user-defined level names appear in the **Panel Properties** dialog box of the Wiring module.
   - The level separator can contain a single alphanumeric or special character.
   - For a panel location name, you can use any number of alphanumeric or special characters. The name can include spaces.
4. Click **Add** and then enter another location level name and a separator.
   For example, create the level **Room** and enter an ampersand separator (&).

   IMPORTANT The location level names must be unique.

5. Do one of the following:
   - Click **Add** to append another row below the **Room** level.
   - Select the row with the **Room** level and click **Insert** to add another row above the **Room** level.

TIPS

- You can insert or delete levels only before users create panel locations on the level that you select.
- At any stage of your domain life cycle, you can click **Add** to define a new lowest level in your panel location hierarchy.
- If you defined three levels, for example, **Building** as the highest level, with separator \, **Floor** as the second level, with separator —, and **Room** as the lowest level (Level 3), with separator &, in the Wiring module, in the **Panel Properties** dialog box, the location string appears as follows:

<user-defined location name on the Building level>\<user-defined location name on the Floor level>—<user-defined location name on the Room level>&.

- The level names that you define only appear in the **Domain Explorer**, and do not affect specific location names that users define. Therefore, you can change the level names any time you require.

Assign Icons to Telecom Device Types

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Telecom Device Panel Icons**.
3. For each telecom device type to which you want to assign an icon, beside **Icon File Name and Path**, click **Browse** to select an icon.

NOTES

- You can only select icon files with the extension .ico.
- Icons that you assign will appear in Smart Instrumentation instead of the default icons:  for conventional device panels, and  for plug-and-socket device panels.
- In Smart Instrumentation, a new icon can only appear after a user creates a telecom tag belonging to the device type to which you have assigned the icon.

User Defined Tables and Fields Editor

The Domain Administrator uses the **User Defined Tables and Fields Editor** to define custom tables and fields that contain properties and values that are required by users, but are not shipped with the software.

★IMPORTANT You must have System Administration rights and be the Domain Administrator for the Domain you want to apply the **User Defined Fields and Table**. If you only have System rights and are not the Domain Administrator for the Domain you want to apply the **User Defined Tables and Fields**, the **User Defined Tables and Fields** are not available for selection.

The user defined tables and fields are defined in the Administration module at the domain level so that the defined properties are common to all the plants in a domain. These user tables and fields are used with the following item types:

Area	Cable	Cable set	Calibration result
Calibration setting	Control System tag	Drawing	Electrical equipment
Equipment	Hook-Up	Hook-Up Item	Instrument
Line	Loop	Panel	Plant
Process data	Revision	Strip	Terminal
Unit	Wire		

NOTES

- User Defined Fields cannot be used for Specification data.
- You cannot add new entries to *select lists*[1] or property tables that are shipped with the software.

  ★IMPORTANT The **Number of Characters** field for certain UDFs are not available in the **User-Defined Tables and Field Editor**. The number of characters permissible in these specific UDFs is dependent on the physical space allocated to them in your database.

  The specific fields are as follows;

  - **Process Data** fields – Process Data UDF 91 to Process Data UDF 134.
  - **Instrument** > **Custom Fields**
    - Instrument Numeric UDF 01 to Instrument Numeric UDF 06 – You can set up to a maximum of 10 characters. These fields can only be of type integer (whole numbers, no decimals).

[1] Select lists allow users to select a value from a list of applicable values. For example, you can define select lists to show applicable sub-types of equipment, or list available RAL color codes for instrument paint. When you define custom fields, you can specify whether you want users to select property values from a select list or type the value directly as text.

- Instrument Numeric UDF 07 to Instrument Numeric UDF 10 – You cannot set a number of characters for these fields, this is determined by the software. The software also allows for two decimal places after the point.

Topics

Open the User Defined Tables and Fields Editor

1. Start the Administration module.
2. On the **Open Administration Module** dialog box, select **Domain Administrator** and the domain where you want to create the custom properties.
3. Click **OK**.
4. Do one of the following:
   - Click  .
   - On the **Domain Administration** menu, click **Activities** > **User Defined Tables and Fields Editor**.
   - Press the keyboard shortcut CTRL + E.

Edit a User Defined Custom Field

The **User-Defined Tables and Fields Editor**, when opened, is already populated by the software with a set of custom fields for each **Item Type** displayed in the **Custom Defined Fields** tab > **Item Types** pane. The following procedure explains how you can edit these fields to define the values you require.

★ IMPORTANT If you have upgraded from previous versions of Smart Instrumentation you could see  next to a Custom Field name. This indicates that two or more plants in the domain use the same custom field, for example **Cable UDF 001**, with different headers, captions, custom field names, or permissible number of characters for the field. This is because in previous versions of the software UDFs were assigned per plant, now they are assigned per Domain so only one name is required. It is important that you fix these inconsistencies before continuing to work with your user defined tables and fields. For more information on inconsistencies, see *Upgrade User Defined Tables and Fields from Versions Prior to 2016* (on page 154).

1. In the Administration Module >Domain Administration, do one of the following:
   - Click  .
   - From the main menu click **Activities** > **User Defined Tables and Fields Editor**.
   - Use the keyboard shortcut CTRL+ E.
2. In the **Custom Defined Fields** tab, expand the **Item Type** category where you want your custom field to be.
3. Select a custom field from the available fields.
4. In the **Definition Pane**, in the **Custom field name** field type the name for your custom field. This is the name displayed by the software whenever you use this custom field.
5. In the **Number of characters** field, type the maximum number of characters you want to allow for this field.

   NOTE When creating a custom field (UDF) for instrument numbers, it is important that you define a maximum length for the field (up to a maximum of 30 characters). If the custom field is used in an EDE without a defined maximum length, the instrument number is displayed exponentially and not as entered in the database. For example, if you enter a value of 123456789112345678911234567 89 in the custom field without defining a maximum number of characters, once it is saved to the database it is displayed in the EDE as 1.23456789112346E+28.

   IMPORTANT The **Number of Characters** field for certain UDFs are not available in the **User-Defined Tables and Field Editor**. The number of characters permissible in these specific UDFs is dependent on the physical space allocated to them in your database.

   The specific fields are as follows;

   - **Process Data** fields – Process Data UDF 91 to Process Data UDF 134.
   - **Instrument** > **Custom Fields**
     - Instrument Numeric UDF 01 to Instrument Numeric UDF 06 – You can set up to a maximum of 10 characters. These fields can only be of type integer (whole numbers, no decimals).
     - Instrument Numeric UDF 07 to Instrument Numeric UDF 10 – You cannot set a number of characters for these fields, this is determined by the software. The software also allows for two decimal places after the point.
6. From the **Field Type** select list, select **String, Numeric, Date,** or **Select List.** If you select, **Select List,** for more information see: *Assign a Select List to a User Defined Field* (on page 152).

   NOTE Only those field types applicable to the selected item type are displayed.
7. Clear or select the **Visible** check box, to hide or display in the software the custom field.
8. Clear or select the **Read-only** check box, to make the custom field a read-only field in the software.

   NOTE The **Read-only** check box is available only if you have selected **Visible**.

9. Click **Save All.**

NOTES

- Certain fields in the **Definition** pane are read-only and only contain values when relevant.
- The **Section Name** field is relevant only for Process Data UDFs and the value displayed is not editable.

Create a Custom Select List

This topic explains how to create a custom select list with custom properties and values, which are not available with the software and are specific to your needs.

1. Start the Administration module.
2. On the Open Administration Module dialog box, select Domain Administrator and the domain where you want to create the custom properties.
3. Do one of the following:
   - Click  .
   - From the main menu click **Activities** > **User Defined Tables and Fields Editor**.
   - Use the keyboard shortcut CTRL+ E.
4. In the **Select Lists** tab > **Select List** pane**,** click  , to open the **New Select List** dialog box.
5. In the **New Select List** dialog box > **Name** field, type a unique name for your select list. This is the name used in the database, not the name displayed by the software.
6. In the **Description** field, type a unique descriptive name for your select list. This is the name displayed by the software.
7. Click **OK**.
8. In the **Definition** pane, click  , to add a new row to the definition.
9. In the new row, under the column **Select List Index**, type a unique string.

   NOTES

   - The **Select List Index** can be a number, character, or a combination of both. The string, numeric or alphanumeric, affects the **Field Type** available for selection. Numeric = **Number**, Alphanumeric = **String.**
   - Each row of the select list must have a unique string, though the same string can appear in more than one select list.
   - The **Select List Index** is the value that is stored in the database and on which the software performs validation checks against the data saved in your database.
   - There must be at least one value in the **Select List Index** for the **Custom Select List** to be saved.

- If a decimal number is used in the Select List Index, then the select list is not available in a numeric UDF.

TIPS

- You can press Tab on the keyboard to move to the next cell.
- When adding values to the definition, at the end of the row you can click  or press Tab or Enter on the keyboard to start a new row.

10. In the empty cell in the column **Select List Text**, type the string you want displayed in your select list.

    NOTE The **Select list** text is the actual displayed value in the pick lists and reports.

11. Click  , to add more rows to your select list until completed.
12. When you have finished adding to your select list, switch to the **Custom Defined Fields** tab or close the dialog box to save.

Assign a Select List to a User Defined Field

This topic explains how after creating a select list in the **Select List** tab you then assign it to the UDF of your choice.

1. In the Administration Module >Domain Administration, do one of the following:
   - Click 
   - From the main menu click **Activities** > **User Defined Tables and Fields Editor**.
   - Use the keyboard shortcut CTRL+ E.
2. On the **Custom Defined Fields** tab, **Item Type** pane, expand the item type you require.
3. Select the UDF you want to assign the select list. For example, **Cable** > **Cable UDF 001**.

   IMPORTANT When converting a UDF to a select list that already has assigned values, you must make sure that the **Select List Index** value matches the index of the assigned value in the database. This is because the validation of the select list is performed on the **Select List Index** values and not on the displayed values.
4. On the Definition pane, in the **Custom field name**, type the name to be displayed.

   TIP This is the name of the column header as it appears in the software.

   NOTE If the **Existing custom field names** is available, this means that two or more plants in the domain use the same custom field under different headers, captions, or custom field names. This is because in previous versions of the software UDFs were assigned per plant, now they are assigned per Domain so only one name is required. Select from the list the UDF name you want to use in the Domain.

5. Type a value for the number of characters permissible in the **Number of characters** field. (Only available when you select **String,** or **Numeric** as your **Field type**.)

   NOTES

   - If the **Existing Values** field is available, this means that two or more plants in the domain use the same custom field where they are defined with different lengths. Select from the list the length you want to use for this field.
   - When creating a custom field (UDF) for instrument numbers, it is important that you define a maximum length for the field (up to a maximum of 30 characters). If the custom field is used in an EDE without a defined maximum length, the instrument number is displayed exponentially and not as entered in the database. For example, if you enter a value of 12345678911234567891123456789 in the custom field without defining a maximum number of characters, once it is saved to the database it is displayed in the EDE as 1.23456789112346E+28.

     IMPORTANT The **Number of Characters** field for certain UDFs are not available in the **User-Defined Tables and Field Editor**. The number of characters permissible in these specific UDFs is dependent on the physical space allocated to them in your database.

     The specific fields are as follows;

   - **Process Data** fields – Process Data UDF 91 to Process Data UDF 134.
   - **Instrument** > **Custom Fields**
     - Instrument Numeric UDF 01 to Instrument Numeric UDF 06 – You can set up to a maximum of 10 characters. These fields can only be of type integer (whole numbers, no decimals).
     - Instrument Numeric UDF 07 to Instrument Numeric UDF 10 – You cannot set a number of characters for these fields, this is determined by the software. The software also allows for two decimal places after the point.
6. From the select list in the **Field Type,** select **Select List**.
7. Click  , click this button to open the **Select List** dialog box and select the required list.

   NOTE Only those field types applicable to the selected item type are displayed.

   TIP The name of the list is displayed in the **Select list** field.
8. Select or clear the **Visible** and **Read-only** check boxes.
9. Click **Save All** and at the prompt click **OK**.

Edit a Custom Select List

1. In the Administration Module >Domain Administration, do one of the following:
   - Click  .
   - From the main menu click **Activities** > **User Defined Tables and Fields Editor**.
   - Use the keyboard shortcut CTRL+ E.
2. In the **Select List** tab > **Select List** pane, select the item you want to edit.
3. Do one of the following:

- Click  on the toolbar, to open the **Edit Select List** dialog box and edit the database or display name of the select list.
- Double-click the item name, to open the **Edit Select List** dialog box and edit the database or display name of the select list.
- In the **Definitions** pane, double-click on a **Select List Text** or **Select List Index** to edit the values of these fields.

4. Close the editor.

Delete a Custom Select List

1. In the Administration Module >Domain Administration, do one of the following:
   - Click  .
   - From the main menu click **Activities** > **User Defined Tables and Fields Editor**.
   - Use the keyboard shortcut CTRL+ E.
2. On the **Select List** tab, from the **Select List Pane** highlight the item you want to delete.
3. Click  .
4. At the prompt, click **Yes**.

NOTE You cannot delete a custom select list if it is in use in a UDF.

Upgrade User Defined Tables and Fields from Versions Prior to 2016

IMPORTANT User defined fields and tables, prior to version 2016 were defined at the plant level, now they are defined at the Domain level allowing for the same UDF or UDT to be used across different plants.

When upgrading to SmartPlant Instrumentation version 2016, the software checks for inconsistencies between the definitions of these plant level user defined fields and tables, and if none are found creates the user defined fields and tables in version 2016, at the Domain level.

When inconsistencies are found the offending fields are marked with  .

An inconsistency is caused from one of 2 reasons:

- Inconsistency in the **Custom Field Names**.
- Inconsistency in the **Number of Characters** field.

When an inconsistency is found between user defined tables and fields, from two plants, the software copies the attributes and their values to version 2016 but does not complete the Domain level user defined fields and tables definition. To finish the process, you must use the **User Defined Tables and Fields Editor**.

Also, SmartPlant Instrumentation in previous versions used calibration setting user defined fields C16 to C20 for storing specific Fluke parameters and values. These fields are now exclusively reserved for use with Fluke calibrators as part of the system and are no longer user defined fields. If in previous versions you used these fields for purposes other than Fluke, you should contact Customer support for help in transferring your data.

IMPORTANT If an upgraded select list value in the database does not match the value set in the custom defined tables and fields you cannot select that select list. For example, if you have a select list with the values A, B, and C, and try to assign this list to an upgraded user defined column which has the value of D. The software does not allow you to select the list and assign it to that column.

The following procedure explains how to complete the upgrade conversion of the custom defined tables and fields to the Domain level.

TIP You can finish the upgrade conversion of the custom defined tables and fields at any time.

1. In the Administration Module >Domain Administration, do one of the following:
   - Click  .
   - From the main menu click **Activities** > **User Defined Tables and Fields Editor**.
   - Use the keyboard shortcut CTRL+ E.
2. On the **Custom Defined Fields** tab, click  next to the **Search** field. The software filters the Item Types and their UDFs to display only those items that have an inconsistency.

   TIP To remove the filter, click  or type a search string in the **Search** field.
3. On the **Item Type Pane,** select one of the custom defined fields that has been defined as inconsistent. The properties and their values are displayed in the **Definitions Pane**.
4. On the **Definitions Pane** do one, or both the following:
   a. On the **Existing custom fields names** field, select from the list the name you want displayed.
   b. On the **Existing values** field, select a value for the maximum number of characters that can be used.

      NOTE Values are only displayed in these fields if an inconsistency exists in the database after the upgrade. If no value is displayed then there is no inconsistency that needs correction.

      IMPORTANT The **Number of Characters** field for certain UDFs are not available in the **User-Defined Tables and Field Editor**. The number of characters permissible in these specific UDFs is dependent on the physical space allocated to them in your database.

      The specific fields are as follows;

      - **Process Data** fields – Process Data UDF 91 to Process Data UDF 134.
      - **Instrument** > **Custom Fields**
        - Instrument Numeric UDF 01 to Instrument Numeric UDF 06 – You can set up to a maximum of 10 characters. These fields can only be of type integer (whole numbers, no decimals).
        - Instrument Numeric UDF 07 to Instrument Numeric UDF 10 – You cannot set a number of characters for these fields, this is determined by the software. The software also allows for two decimal places after the point.
5. Click **Save All**.

User Defined Fields in EDE — You must fix any inconsistencies in User Defined Fields (UDF) before adding data to the UDF in an EDE. If there exists an inconsistency in the number of characters permissible in the field, failure to fix the inconsistency results in the software using the permissible number of characters as set in the database. Fixing the inconsistency after adding data can result in corruption of your data.

Generate Domain Administration Reports

As Domain Administrator you can generate various domain-specific reports. The following table describes the main reports which are available to the Domain Administrator on the **Reports** menu.

Report	Description
User List	Displays a list of Smart Instrumentation users for the domains for which you have access rights (those which have been assigned to you as Domain Administrator). When you select this option, the list is printed in ascending alphanumeric sequence.
User List per Group	Smart Instrumentation users of the domains for which you have access rights, listed according to the groups to which they belong.
Domain Statistics	Displays quantities of the following items in the current domain: ▪ Instruments — instrument tags in calculation sheets, process data sheets, and specs. ▪ Records in supporting tables — I/O Type, Location, Model, Status. ▪ Wiring data — cables, panels, terminals, wires, connections, and I/O channels. ▪ Panels by categories — marshaling racks, PLCs, DCSs, junction boxes, device panels, and cabinets. ▪ Other items — loop drawings, CAD drawing blocks, P&ID drawing references, hook- ups, lines, and spec forms. ▪ Maintenance statistical data — calibration settings, and calibration results. ▪ A list of signals per largest group sequence number.
Access Rights	Displays access rights information for selected user groups. This information includes a list of selected user groups, the items for which those user groups were granted access rights, and the access type to every item. You can generate this report on the domain, plant, and unit levels.
Cable Type Dependency Validation	Displays a list of all reference cables that do not comply with the cable type dependency requirements. If the report contains any data, the System Administrator cannot enable cable type dependency in the domain. For details about cable type dependency, see *Enable Cable Type Dependency* (on page 30).

See Also

Miscellaneous Domain Administration Tasks (on page 145)

Select a Logo

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, do one of the following:
   - Click **File** > **Domain**.
   - Click  .
3. Do one of the following:
   - Click **Options** > **Select Logo**.
   - Click  .
4. Click **Browse** to open the **Select Logo File** dialog box.

   TIP You can only select the .bmp (Bitmap) file format. You can create a Bitmap file using a graphic editing application such as Windows Paintbrush. Since most reports are printed out in black-and-white, it is recommended that you select Bitmap files in black-and-white to save system resources.
5. Navigate to the .bmp file to which you want to assign as the domain logo and click **OK**.
6. In the **Browse Logo Files** dialog box, click **Assign** to assign the selected bitmap to the current domain.
7. Click  to save the new domain logo to the database.
8. Click  to close the **Domain Definition** window.

See Also

Miscellaneous Domain Administration Tasks (on page 145)

Define Field Personnel Profiles

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **Activities** > **Field Personnel Profile**.
3. Click **New** to add a new personnel profile to the current domain.
4. Type the required profile data and then click **Apply**.
5. Click **Edit** to modify a personnel profile.
6. Edit the selected personnel data and click **Apply**.
7. Click **Delete** if you want to delete a selected profile.
8. When prompted to confirm the personnel profile deletion, click **Yes** to delete the currently selected personnel profile or click **No** to retain the currently selected personnel profile.

See Also

Miscellaneous Domain Administration Tasks (on page 145)

Modify Domain Notes

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, do one of the following:
   - Click **File** > **Domain**.
   - Click .
3. Do one of the following:
   - Click **Options** > **Notes**.
   - Click .
4. In the **Notes** field, edit the text as required.
5. Click .
6. Click .

See Also

Miscellaneous Domain Administration Tasks (on page 145)

Modify Printer Settings

It is possible to modify the current printer settings. You can select a standard paper size with predefined width, height, and orientation or customize these settings as required. Furthermore, you can save your settings as default for future print sessions. You can customize your own paper width, height, and orientation and include these values in the default settings.

When saving your settings as default, the software stores the values in the [printer] section of the Intools.ini file. If you want the software to calculate the required paper size from the Windows printer driver settings, do the following:

1. Open the Intools.ini file and then, in the [printer] section, remove the semi-colon before the following parameters:

   ```
   LEFTMARGIN
   RIGHTMARGIN
   TOPMARGIN
   WIDTH
   HEIGHT
   ORIENTATION
   HRES
   VRES
   ```

2. Add a semi-colon before the PAPERSIZE parameter.

   TIP For additional information about this option, click **Help** in the **Page Setup** dialog box.

NOTES

- All your page settings apply to all reports and documents that you print and they are true on all the hierarchy levels (domain, plant, area, and unit).
- All your page settings apply to your local machine only and do not affect other users of Smart Instrumentation.

- If you want to change the page setup for the current print session only, do not click **Default**, just make your changes and click **OK**.
- Some reports have their orientation hard-coded, therefore only the hard-coded settings apply.

Managing Audit Trail Data

In Smart Instrumentation, audit trail is a mechanism that enables the Domain Administrator to mark history changes and save information about user operations such as deleting, inserting, and updating Smart Instrumentation data in the domain. As soon as a user performs one of these operations, information appears in the appropriate tables. The software records all these operations in the audit trail repository.

You can trim this information in a domain by defining the time of operation. The time of operation appears in the audit trail repository.

Also note that the System Administrator has the privileges to activate and deactivate the audit trail functionality.

★ IMPORTANT

- Audit Trail data is not backed up or passed from one domain to another via the SPI Domain Initialization from Source process. To transfer of information, you must use the Audit Trail Trim and Restore operation or external database tools.
- The **Audit trail** options will not retrieve Change Log data for updates in Index and Wiring supporting tables as these are not recorded to the database.

Topics

Managing Audit Trail Data Common Tasks

The Domain Administrator can perform the following tasks when managing audit trail data:

Trim audit trail data — This option allows the Domain Administrator to trim the excessive audit trail data contained in the audit trail repository in the current domain. When removing the audit trail data from the domain, you can save it to an external file on your Windows server if needed. If you save the audit trail data, you can then load it to the audit trail repository in a required domain.

Load audit trail data — This option allows the Domain Administrator to load the audit trail data to the audit trail repository in a selected target domain. This data has been removed from the audit trail repository in a particular domain and saved to an external file. Your target domain can be the same domain where you have trimmed this data.

External files with trimmed audit trail data — This topic explains how the Domain Administrator can define a file to which the system saves the trimmed audit trail data.

Define paths when using oracle — This topic explains how to define a path when using Oracle.

Define paths when using ms sql server — This topic explains how to define a path when using MS SQL Server.

Topics

Load Audit Trail Data

★ IMPORTANT To successfully load audit trail data trimmed in a different domain, you must ensure that the values in the primary key fields in the external source file differ from those in the audit trail repository of the current domain.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Data Maintenance** > **Load Audit Trail**.
3. In the **From** box, type the initial date of the period (month, day, and year).
4. In the **To** box, type the last date of the period (month, day, and year).
5. In the **Load from file** box, type the file name segment as it appears in the external file containing the audit trail data.

   TIPS

   - You can type all of the required variables using information contained in the complete name of the file. The following is an example of a complete file name: 20010501_20010503_<domain name>#CHANGES_LOG#<file name segment>.txt (or .sql on Oracle).
   - In the complete file name, the audit trail period is displayed in the following order: year, month, and day.
6. Click **Load**.

   TIP After loading the audit trail data, the external file remains on your server. If needed, you can load the same data onto another domain, or delete the external file manually.
7. Click **Close**.

Trim Audit Trail Data

IMPORTANT Note that the Document Binder and Construction modules use the audit trail repository to record information about previous revisions. If you generate a Change report, the information recorded in audit trail repository within the period for which the audit trail data is trimmed, will be missing in this report.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Data Maintenance** > **Trim Audit Trail Data**.
3. If your domain is an owner operator domain, from the **Project** list, a project in which you want to trim audit trail data, or select **As-Built.**
4. To define the period of the audit trail data that you want to remove from the audit trail repository in the current domain, in the **From** box, type the initial date of the period (month, day, and year).
5. In the **To** box, type the last date of the period (month, day, and year).
6. To trim the audit trail data contained within the defined period and save it to an external file, select **Save to file**.
7. In the **File name** box, type a file name segment that will become part of the name of the external file to which you are saving the defined audit trail data.
8. Click **Trim** to save the audit trail data to the defined file and remove this data from audit trail repository in the selected domain.

   TIP The external file name contains information about the initial date of the defined period (year, month, and day), the last date (year, month, and day), the domain name, and the file name segment you have typed in the **File name** box.
9. To trim the audit trail data without saving it to an external file, clear the **Save to file** check box.
10. Click **Trim** to permanently remove the audit trail data from the audit trail repository in the current domain.

External Files with Trimmed Audit Trail Data

When trimming audit trail data, the Domain Administrator can define a file to which the system saves the trimmed audit trail data. The file name contains information about the initial date of the defined period, the last date, the source domain name, and the file name segment you have typed in the **File** name field of the **Trim Audit Trail Data** dialog box.

The following is an example of a complete file name:

20010501_20010503_<domain schema>#CHANGES_LOG#<file name segment>.txt (or .sql on Oracle).

The audit trail period segment displays the period in the following order: year, month, and day.

The format, location and path configuration of files containing audit trail data depends on the platform you are using (Oracle or SQL Server).

For details, see the following Help topics:

- *Define Paths When Using Oracle* (on page 162)
- *Define Paths When Using SQL Server* (on page 162)

Define Paths When Using Oracle

When using Oracle, files containing audit trail data appear as SQL files on your Windows server. To enable saving audit trail data to an external file, you need to open the Oracle Instance Configuration file and set the path value of the parameter UTL_FILE_DIR.

For details about setting the file path value in the Oracle Instance Configuration file on your Windows server, see *Smart Instrumentation Installation and Upgrade Guide > Oracle Installation and Configuration > Creating an Oracle Instance.*

File path value example on a Windows server:

```
utl_file_dir=e:\INtoolStorage\Orc1
```

NOTES

- In the path value, the folder name Orc1 corresponds to a possible instance name. INtoolStorage is a user-defined name. For convenience, we recommend that you always use this name in the file path.
- On Oracle 9.2, the software might append numbers to the name of the Oracle Instance Configuration File init.ora. For example, the file name might be as follows:
  init.ora.2242004153249
  Prior to trimming audit trail data, you need to delete the numbers together with the dot that are appended to the init.ora file. Then, you must restart the Oracle instance manually, that is, not from the Oracle interface but using appropriate SQL commands.

Define Paths When Using SQL Server

When using SQL Server, files containing audit trail appear as .txt files on your Windows server. When trimming audit trail data for the first time, the system chooses the drive with maximum free disk space and creates a folder INtoolStorage in that drive.

If you do not want the system to choose the target drive, before trimming audit trail data, you can create the folder INtoolStorage on a different drive. After you click **Trim** in the **Trim Audit Trail Data** dialog box, the system locates the folder INtoolStorage and configures the path for the file with the audit trail data.

Depending on your SQL Server instance, the system creates the following paths for the files containing the trimmed audit trail data:

SQL Server with a Smart Instrumentation database created in a default instance:

<drive>:INtoolStorage\<default instance name>\<Smart Instrumentation database name>.
For example:
e:\INtoolStorage\Engineering1\Build3, where the default instance name Engineering1 corresponds to your Windows server name.

SQL Server with a Smart Instrumentation database created in a named instance:

<drive>:INtoolStorage\<SQL Server name>\<named instance name>\<Smart Instrumentation database name>.
For example:
e:\INtoolStorage\Engineering1\SPI2009\Build3, where the SQL Server name Engineering1 corresponds to your Windows server name.

Clearing Locking

This option enables the Domain Administrator to clear locking in Oracle databases.

Clearing locking is useful in the following cases:

- A Smart Instrumentation user has locked a certain item for use in other sessions and remains connected to the database for a long time.
- There in an inactive locking session. For example, a session where Smart Instrumentation stopped responding, or a user has closed the locking session from the Window Task Manager, or the locking session closed down as result of an application error. These session records remain on the server database and keep locking other sessions.
- There is an external application whose session is locking a Smart Instrumentation session in the current domain.

Topics

Clearing Locking Common Tasks

The Domain Administrator can perform the following tasks when clearing locking:

Clear locking per user — This option enables the Domain Administrator to clear locking per user by disconnecting a user from Smart Instrumentation and closing all the user's sessions in the current domain. You can use this option on an Oracle server database platform.

After disconnecting a user, the records of the user's sessions remain in the CURRENT_INFO table of your server database. If needed, you can manually clear the session records to improve Smart Instrumentation performance.

Clear blocked sessions on oracle — On Oracle, this procedure allows the Domain Administrator to stop the sessions in the current domain that have been blocked by other sessions in a Smart Instrumentation database, and remove the session records from the CURRENT_INFO table.

Clear locking in all sessions — This option allows the Domain Administrator to clear locking in all the sessions (inactive and active) in the current domain, and remove the session records from the CURRENT_INFO table.

Clear Smart Instrumentation session records — On an Oracle server, when a user logs out from Smart Instrumentation, the software does not clear records of the sessions which are no longer in use from the CURRENT_INFO table of the current database. These records hold the user name, the domain and session IDs, and the flags used by the sessions to activate or deactivate the Smart Instrumentation triggers. The Domain Administrator needs to clear these records manually.

Clearing Smart Instrumentation sessions manually enables the Domain Administrator to improve the performance of Smart Instrumentation.

Topics

Clear Locking per User

IMPORTANT This clearing locking option stops all at once the Smart Instrumentation application session, the Administration module session, the Import and Merger utility sessions. Clearing locking in active sessions results in losing all the data that was being imported or merged at that time. This procedure works for Oracle databases only.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Locking** > **Clear Locking in Selected Sessions**.
3. In the **Clear Locking in Selected Sessions** dialog box, from the **User** list, select the user whose Smart Instrumentation sessions you want to stop in the database.

   TIP View the current database name in the **Database** field.
4. Click **OK**.

Clear Blocked Sessions on Oracle

IMPORTANT Ending active blocked sessions and disconnecting the users from these sessions, results in the loss of all the data that was being imported or merged at that time.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Locking** > **End Blocked Sessions**.

See Also

Print Database Connection Information (on page 69)

Clear Locking in All Sessions

IMPORTANT Clearing active sessions, results in ending these sessions, disconnecting the users, and losing all the data that was being imported or merged at that time.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Locking** > **Clear Locking in All Sessions**.

NOTE This action does not affect your Administration module session.

Clear Smart Instrumentation Session Records

IMPORTANT On Oracle, the Domain Administrator can clear Smart Instrumentation session records when working with Oracle Server database version 9i or later.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Data Maintenance** > **Clear Session Records**.

Copying Data

When creating a new lowest plant hierarchy item, you can copy data from another existing lowest plant hierarchy item within the same domain. In the plant hierarchy, the lowest source item can belong to any highest item in the current domain. The default lowest plant hierarchy item is <unit>. The default highest plant hierarchy item is <plant>. When the domain is an owner operator domain, you can select a specific project to which you want to copy <unit> data from the source project.

It is only possible to copy data to a <unit> that has no naming conventions. In the target <unit>, the software creates naming conventions according to the naming convention definitions in the source <unit>. Therefore, after you copy data to a particular <unit>, it is not possible to copy any additional data to the same unit again. When copying <unit> data, the software does not copy the access right definitions set for the source <unit>.

After copying data from one <unit> to another within a <plant> that is registered with Integration, it is possible to publish data from the new <unit>. When copying data to a <unit> in another <plant>, the Integration registration information is not copied.

You copy <unit> after making source data selections on the **Copy Data from Source** dialog box. Your module data selection is retained when you reopen the **Copy Data from Source** dialog box apart from the following options:

- Selection of specification item types
- Selections on the **Wiring Item Naming Options** dialog box
- Revision copying options

The following table lists the modules and the module data available for selection on the **Copy Data from Source** dialog box.

Module	Module Data	Notes and Restrictions
Instrument Index	Tag numbers Loop numbers P&ID drawing references Lines Equipment Document associations Calibration Custom tables	Instruments belonging to Test Equipment tag class are not copied. Calibration data only includes calibration settings.
Process Data and Calculation	Process data sheets with or without revisions Calculation sheets with or without revisions	When copying revisions, you can set a different revision method for the target <unit>. Document numbers of process data and calculations sheets are not updated in the target unit even if they have been created in the source using according to naming conventions.
Specifications	All module data. You can copy specifications with or without revisions.	When copying revisions, you can set a different revision method for the target <unit>. Document numbers of specifications are not updated in the target unit even if they have been created in the source using according to naming conventions.
Wiring	Wiring items with the connection data	Cross wiring is not copied.

Module	Module Data	Notes and Restrictions
Loop Drawings	All module data, including enhanced SmartLoop drawings. You can copy drawings with or without revisions.	CAD drawing blocks associated with instrument tags or loops are not copied. CAD blocks is Smart Instrumentation are defined per <plant>. When copying Loop Drawings module data to another <plant>, if your source instruments include instrument blocks assigned manually or loop blocks, these blocks are not created in the target <plant>. On the other hand, instrument blocks associated with tags via instrument type are created in the target <plant>. When copying revisions, you can set a different revision method for the target <unit>. Document numbers of loop drawings are not updated in the target unit even if they have been created in the source using according to naming conventions.
Hook-Ups	All module data and associations	You can only copy the Hook- Ups module data in its entirety. Hook-ups are not copied to another <plant>. You can copy hook-ups to another <plant> using the Merger Utility options. Hook-u associations with instruments are not copied to another <plant>, only within the same <plant>.
Dimensional Data for Piping	All module data	You can only copy the module data in its entirety. Document numbers of dimensional data sheets are not updated in the target unit even if they have been created in the source using according to naming conventions.

Topics

Flow of Activities for Copying Data

This topic describes the flow of activities that allows Domain Administrator to copy data from one <unit> to another in the same or different <plant>. Copying data to another <unit> involves three major steps:

1. Create a Target <Unit>

Create a new <unit> in the target <plant> and make sure you define the <unit> name and number. Do not define naming conventions in the target <unit>. For details, see *Create a Plant Hierarchy Item on the Lowest Level* (on page 77).

2. Select the Source <Unit>

Select the <unit> whose data you want to copy to the new unit. For details, see *Select the Source Plant Hierarchy Item for Copying Data* (on page 169).

3. Copy All or Specific Source Data

Set the software to copy all data from the source <unit> or select only specific data. Then, copy the source data. For details, see *Copy All Module Data* (on page 171) or *Copy Specific Data* (on page 169).

Copying Data Common Tasks

The following tasks are used by the Domain Administrator to copy data from one lowest plant hierarchy item to another. The default lowest plant hierarchy item is <unit>.

Select the source plant hierarchy item for copying data — This procedure enables you to select a source <unit> for copying data to a <unit> that has no naming conventions.

Copy all module data — When copying data from one <unit> to another, you can select a module and copy all of its data to the target <unit>. You set the options for copying all module data in the upper-right section of the **Copy Data from Source** dialog box.

Copy specific data — When copying data from one <unit> to another, you can select data of a specific module, and set the options for copying the specific data in the lower-right section of the **Copy Data from Source** dialog box.

Set revisions for target plant hierarchy item — When defining settings for copying data, you can use this procedure to set drawing and document revisions to be used in the target <unit>. You can set revisions for all module documents or selected module documents. Setting revisions is available for the following modules Process Data, Calculation, Specifications, and Loop Drawings.

Set wiring naming options for target plant hierarchy item — When defining settings for copying data, you can this procedure to set naming options for wiring items in the target <unit>.

Topics

Select the Source Plant Hierarchy Item for Copying Data

1. In the **Plant Hierarchy Explorer**, open the **<Unit> Properties** dialog box. For details, see *Create a Plant Hierarchy Item on the Lowest Level* (on page 77).

   TIPS

   - If you want to copy data to an existing <unit>, in the **Plant Hierarchy Explorer**, select a <unit> that does not have naming conventions.
   - In the <unit> that you selected, you must define the <unit> number even if in the source <unit>, the naming conventions do not include the <unit> number segment.

2. Click **Copy From**.
3. In the dialog box that opens, select a source <unit>.

   TIP When the domain is an owner operator domain, select the required project from the **Source project** list, and then select the <unit> whose data you want to copy.

4. Click **OK** to open the **Copy Data from Source** dialog box.

   TIPS

   - The **Copy Data from Source** dialog box retains previous settings that you used the last time when you were copying data, apart from specification item types and wiring item naming conventions. You can use the same settings, discard some of them, or discard them all. Click **Clear All** to discard all the displayed settings.
   - Now you can either copy all data of a module or copy specific data. For details, see *Copy All Module Data* (on page 171) or *Copy Specific Data* (on page 169).

Copy Specific Data

Open the **Copy Data from Source** dialog box. For details, see *Select the Source Plant Hierarchy Item for Copying Data* (on page 169).

1. In the lower-right section of the **Copy Data from Source** dialog box, select **Copy selected data**.

   TIP The lower-right section of the **Copy Data from Source** dialog box displays only the options that are required for copying data, depending on the specific module data you select in the left section. The options that are irrelevant to the selected module are view-only.

   ⚠ CAUTION Make sure that you do not select the **Copy all module data** check box. If you do, click **Clear All**. Clicking this button discards all the settings you have made and you must start again.

2. In the **Name prefix** field, type a new name prefix to be applied to all the copied items.

3. In the **Name suffix** field, type a new name suffix to be applied to all the copied items.

   TIP Specifying a prefix, a suffix, or both is required when copying module data within the same <plant>. This way you avoid creating duplicate module item names.

4. If required, set revision copying options. For details, see *Set Revisions for Target Plant Hierarchy Item* (on page 173).

5. To avoid having duplicate module item names, in the **Char. location** data field, type the number of characters from the start of the name string where you want the substitution to start from.

6. In the **No. of chars.** data field, type the number of characters in the name string to be substituted.

7. In the **Value** field, type a new value that will substitute a part of the module item name string.

8. In the **Prefix** field, to avoid creating duplicate loop and tag number prefixes in the units of the same <plant>, type a loop or tag number prefix to be used in the target <unit>.

   TIPS

   - This option is available when copying loop or tag number data from a <unit> within the same <plant>. Also, it is available only for those items for which the prefix naming convention segment is set as COMPONENT PREFIX in the ISA or Loop standard.
   - For loop items, the option is accessible only if the ISA or Loop standard naming convention for the prefix segment description of loops is LOOP PREFIX.
   - This option is not applicable if you use Flexible naming conventions in the source <unit>. For Flexible naming conventions, you can define your target loop and tag number prefixes in the **Name prefix** field.

9. In the **Suffix** field, type a loop or tag number suffix to define a distinctive loop or tag number suffix to be used in the target <unit>.

   TIPS

   - This option is available when copying loop or tag number data from a <unit> within the same <plant>. For tag number items, the option is accessible only if the ISA or Loop standard naming convention for the suffix segment description of tags is COMPONENT SUFFIX.
   - For loop items, the option is accessible only if the ISA or Loop standard naming convention for the suffix segment description of loops is LOOP SUFFIX.
   - If, in your source <unit>, there are loop names or tag numbers that differ only in their suffix segments, these loop names and tag numbers become identical in the target <unit>. The new suffix value in the target <unit> overwrites all the suffix values of the source <unit>. For example, if in the **Suffix field**, you type 5, loop names 101-F-100\1, 101-F-100\2, 101- F-100\3 in the source <unit> become 101-F-100\5 in the target <unit>. This option is not applicable if you use Flexible naming conventions in the source <unit>. For Flexible naming conventions, you can define your target loop and tag number suffixes in the **Name suffix** field.

10. In the left section, select other specific data, and repeat this procedure.

11. If needed, click **Options** to set naming options for wiring items in the target <unit>. For details, see *Set Wiring Naming Options for Target Plant Hierarchy Item* (on page 172).

⚠ CAUTION Make sure that you define the settings described in this procedure for all the required modules and module items before clicking **OK**. After you click **OK**, canceling the copying process can corrupt the data in the target <unit> and render the <unit> unusable.

12. Click **OK** to close the **Copy Data from Source** dialog box and monitor the progress of copying the source data.

Copy All Module Data

1. Open the **Copy Data from Source** dialog box. For details, see *Select the Source Plant Hierarchy Item for Copying Data* (on page 169).
2. In the upper-right section of the **Copy Data from Source** dialog box, select **Copy all module data**.

   TIPS

   - The upper-right section of the **Copy Data from Source** dialog box displays only the options that are required for copying data, depending on the module you select in the left section. The options that are irrelevant to the selected module are read-only.
   - When you define data copying settings for the Loop Drawings module, the **Copy all module data** check box does not apply to CAD drawing blocks associated with instrument tags or loops. CAD blocks is Smart Instrumentation are defined per <plant>. When copying Loop Drawings module data to another <plant>, if your source instruments include instrument blocks assigned manually or loop blocks, these blocks are not created in the target <plant>. On the other hand, instrument blocks associated with tags via instrument type are created in the target <plant> regardless of whether this check box is selected or cleared.
3. In the **Name prefix** field, type a new name prefix to be applied to all the copied items of the selected module.
4. In the **Name suffix** field, type a new name suffix to be applied to all the copied items of the selected module.

   TIP Specifying a prefix, a suffix, or both is required when copying the <unit> module data within the same <plant>. This way you avoid creating duplicate module item names.
5. To avoid having duplicate module item names, in the **Char. location** data field, type the number of characters from the start of the name string where you want the substitution to start from.
6. In the **No. of chars.** data field, type the number of characters in the name string to be substituted.
7. In the **Value** field, type a new value that will substitute a part of the module item name string.
8. If required, set revision copying options. For details, see *Set Revisions for Target Plant Hierarchy Item* (on page 173).

9. Do one of the following to define the level on which you want to copy the Wiring module data:
   - Click **Highest** when copying data from units belonging to different plants. You must select the highest plant hierarchy level when copying data from <units> belonging to different <plants>. This is required because most wiring data is defined either per <area> or per <plant>.
   - Click **Lowest** when copying the source and the target <units> belonging to the same <plant>.

   TIP When the source and the target <units> belong to the same <plant>, you can select either the highest or the lowest plant hierarchy level. However, if you select to copy data on the lowest level, you should modify the name strings to avoid duplicate names in the Wiring module (see steps 5 through 7 in this procedure to learn how to modify the name string).
10. In the left section, select another module, and repeat this procedure.
11. If needed, click **Options** to set naming options for wiring items in the target <unit>. For details, see *Set Wiring Naming Options for Target Plant Hierarchy Item* (on page 172).

    CAUTION Make sure that you define the settings described in this procedure for all the required modules and module items before clicking **OK**. After you click **OK**, canceling the copying process can corrupt the data in the target <unit> and render the <unit> unusable.
12. Click **OK** to close the **Copy Data from Source** dialog box and monitor the progress of copying the source data.

Set Wiring Naming Options for Target Plant Hierarchy Item

1. On the **Copy Data from Source** dialog box, click **Options**.
2. On the **Wiring Item Naming Options** dialog box, do one of the following to set naming options for control system tags:
   - Select **Control system tag** to name new control system tags according to target tag names.
   - Clear **Control system tag** to name new controls system tags according to source tag names.
3. Do one of the following to set naming options for device panels:
   - Select **Device panel**, and from the **Like** list, and then select **Default** to copy the device cables with the default names (identical with tag number names) or **Naming Convention** to copy the device panels with the naming convention of the target <unit>.
   - Clear **Device panel** to copy all device panels without changing the source names, according to the settings you make for copying wiring items in the **Copy Data from Source** dialog box.
4. Clear the **Device cable** check box to set the naming convention options for device cables and to copy all device cables without changing the source names, according to the settings you make for copying wiring items in the **Copy Data from Source** dialog box.
5. Select the **Device cable** check box and then select one of the following options:
   - **Default** — to copy the device cables with the default names, for example, C-<TAG NUMBER>.

- **Naming Convention** — to copy the device cables with the naming convention of the target <unit>.

6. Do one of the following to set naming options for signal names:
   - Select **Signal name** to copy signals using target tag names.
   - Clear **Signal name** to copy signals according to the settings you make for copying wiring items in the **Copy Data from Source** dialog box.
7. Do one of the following to set naming options for wire tags:
   - Select **Wire tag** to copy wire tags using target tag names.
   - Clear **Wire tag** to copy wire tags according to the settings you make for copying wiring items in the **Copy Data from Source** dialog box.
8. Click **OK** to accept the settings, and return to the **Copy Data from Source** dialog box.

Set Revisions for Target Plant Hierarchy Item

When setting revisions, you can do one of the following:

- Copy all revisions from the source <unit> to the new <unit>.
- Create new revisions for the new <unit>. This option allows you to start a new set of revisions for the copied <unit> data.
- Forgo creating any revisions for the target <unit>. This option resembles the creation of new revisions. You can assign revisions to the documents in the new <unit>.

1. In the left section of the **Copy Data from Source** dialog box, do one of the following:
   - Select **Specifications**, **Loop Drawings**, or **Process Data & Calculation**.
   - Expand **Process Data & Calculation** and select specific data (Process Data or Calculation).
2. Do one of the following:
   - If you selected a module, in the upper-right section of the dialog box, select the **Copy all module data** check box.
   - If you selected specific data, in the lower-right section of the dialog box, select the **Copy selected data** check box.
3. Do one of the following:
   - Click **Skip** not to copy any revisions.
   - Click **All existing** to copy all revisions from the selected module data to the new module data.
4. To set new revisions, click **Set new**.
5. Click **New Revisions**.
6. On the dialog box that opens, click the appropriate **Revision method** option button to select the required revision numbering, for example, P0, P1, P2,... 0,1,2,... and so forth.
7. To add a new revision line, click **New** and type the required data in the **Revision** data window.

8. To edit a revision, select the revision you want to edit and click **Edit**.
9. When done, click **OK** to return to the **Copy Data from Source** dialog box.

   ★ IMPORTANT Make sure to set the copying options for all the required modules and module items **before** clicking **OK**. After you click **OK**, canceling the copying process can corrupt the data in the target unit and render the unit unusable.
10. If you have finished setting all other copying options, on the **Copy Data from Source** dialog box, click **OK** to assign the new revision settings to the copied module data.

SECTION 5

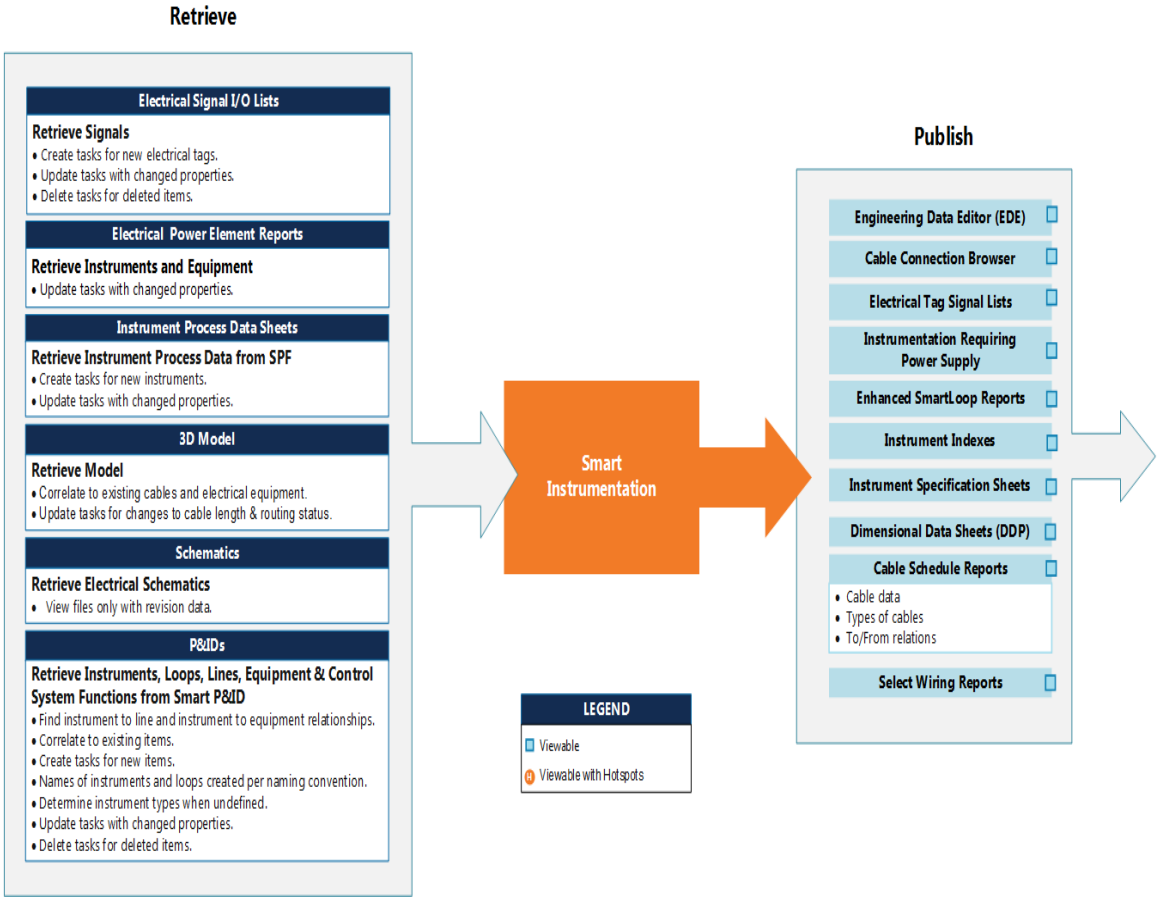
Working with Integration

The integration functionality standardizes and improves the communication among the various authoring tools you use when designing, constructing, and operating a plant. The integration functionality manages data exchange among these authoring tools, which enables sharing and re-use of plant information throughout the plant lifecycle. SmartPlant Foundation acts as a repository for data and a medium through which information is shared among other tools, such as Smart Electrical, Smart P&ID, and Aspen .

Most of the commands that provide access to the integration functionality exist in the common user interface available on the **SmartPlant** menu in Smart Instrumentation.

The following graphic displays what Smart Instrumentation publishes and retrieves and shows the flow of data and the different types of data.

Smart Instrumentation Data Exchange Example



Smart Instrumentation interacts with SmartPlant Foundation by correlating items between the plant database and the SmartPlant Foundation database, retrieving such documents as Cabinets, Electrical Signals, P&IDs, and the like from SmartPlant. Also, Smart Instrumentation creates a set of tasks in the To Do List that you can run to update the plant database. In Smart Instrumentation, you can also use the **SmartPlant** menu to publish documents and retrieve data, access SmartPlant Foundation to browse data, and subscribe to change notifications and compare documents.

NOTE You can only use the **SmartPlant** menu commands after the item registry has been activated and database items have been registered for use in an integrated environment.

In This Section

Configuring Smart Instrumentation for Integration

After installing Smart Instrumentation and the prerequisite software needed for working in an integrated environment, you must perform the following configurations on the Smart Instrumentation client machine in the Administration module.

System Administrator:

Configure Smart Instrumentation for integration — Use this procedure to configure Smart Instrumentation to enable publish and retrieve.

Domain Administrator:

Register a plant — Use this procedure as a one-time operation, to register each highest-level plant hierarchy item (for example a Smart Instrumentation plant) using the SmartPlant Registration Wizard.

Retrieve a plant hierarchy — Use this procedure to retrieve a plant hierarchy and apply it in Smart Instrumentation.

Topics

Smart Instrumentation Configuration Checklist for Integration

This checklist describes the main steps required for preparing Smart Instrumentation to work in an integrated environment after installation of the necessary software. This checklist is recommended for inexperienced users learning how to configure Smart Instrumentation, and includes:

- Initializing a domain using the seed database (INtoolsef.db)
- Specifying the XML map file path in the **Domain Definition** window
- Registering items
- Creating a plant hierarchy that matches the source plant hierarchy in SmartPlant Foundation
- Registering your working plant and correlating it with a plant in SmartPlant Foundation
- Defining naming conventions
- Defining settings in Smart Instrumentation for an integrated environment

Before you can publish and retrieve documents:

- The System Administrator must define an IDEAL user.
- The IDEAL user must subsequently log on to Smart Instrumentation and specify the output folder for published documents.
- The Domain Administrator must register, as a one-time operation using the Smart Registration Wizard, each highest-level plant hierarchy item (for example a plant) with a corresponding plant in SmartPlant Foundation. Registration makes the **SmartPlant** menu commands accessible in Smart Instrumentation.

The software maps the entire Smart Instrumentation plant hierarchy to a single SmartPlant Foundation URL that points to one SmartPlant Foundation database.

NOTES

- After configuring Smart Instrumentation, there are certain rules you must follow to enable the tool to work in an integrated environment.
- When retrieving **Electrical Signal** tags from Smart Electrical to Smart Instrumentation, it is recommended to define the naming convention in Smart Instrumentation to **Free Segment**. If you use a different naming convention for electrical signals in Smart Instrumentation, you should check that a compatible naming convention is defined in Smart Electrical.
- After upgrading Smart Instrumentation, if your XML files are stored in a folder other than the Smart Instrumentation/XML/ home folder, for example a shared folder on a server, you must manually copy from the Smart Instrumentation/XML/ home folder these files to the required folder.

Configure Smart Instrumentation for Integration

1. Log on as System Administrator to the Administration module of Smart Instrumentation.
2. On the **Open Administration Module** dialog box, select **System Administrator**.

   IMPORTANT

   - The domain to be used with integration must be initialized from the Intoolsef.db file to ensure the correct mapping of a number of supporting tables with the enumerated lists in the Smart schema.
   - On an Oracle platform, if using a single Oracle instance, the schema names, tablespace names, and user names must be unique in each tool and in SmartPlant Foundation. For example, if the schema name in SmartPlant Foundation is **Site 1**, the Smart Instrumentation domain name cannot also be **Site 1**.
3. To initialize a new domain, do the following:
   a. Click **File** > **Initialize**.
   b. Type the appropriate domain information in the **Domain**, **Domain schema name**, and **Domain schema password** text boxes. The **View Only Domain Schema password** text box is filled automatically.
   c. Click **Source**.
   d. Select the required database type from the **Database type** list.
   e. Click **Browse**.
   f. Click the Intoolsef.db database file and click **Open**.
   g. Select **INITIALTEF** from the **Domain** list.
   h. Click **OK** on the **Source Data Connection** dialog box.
   i. Click **OK** on the **Initialize Database** dialog box.
   j. On the **Domain Tablespace Definition** dialog box, change any settings if necessary and click **OK**.
4. Click **File** > **Domain Definition**.
5. In the **Domain Definition** window, select the domain.
6. On the **Module Toolbar**, click **Edit**  .
7. Beside **Path for SmartPlant XML files**, click **Browse** to navigate to the location of the Smart Instrumentation map files: ContextMap.xml and IntoolsMap.xml.

   TIPS

   - The Smart Instrumentation map files must be located in a path that all users in an integrated environment can access using the same drive letter mapping.

     NOTE After an upgrade, any XML files not located in <Smart Instrumentation home folder>\XML\ are not upgraded and must be manually upgraded.
   - By default, when you install Smart Instrumentation, these files are placed in the path <Smart Instrumentation home folder>\XML\.

- If you are using SmartPlant Foundation versions 2007 or 2008, you must replace the ContextMap.xml file in the <Smart Instrumentation home folder>\XML\ folder with the ContextMap.xml <Smart Instrumentation home folder>\XML\Backup folder. By using the ContextMap.xml in <Smart Instrumentation home folder>\XML\Backup folder, the software properly publishes documents.

8. Save the changes and then close the **Domain Definition** window.
9. Define an IDEAL user as follows:
   a. On the **Module Toolbar**, click **Department** and if no departments exist, define a new department.
   b. Click **User** and define an IDEAL user. For details, see *Define an IDEAL User* (on page 180).

   NOTE At least one valid Smart Instrumentation user must be defined as an IDEAL user to enable view files to be generated. The publish operation uses the IDEAL user information to create view files, regardless of the user who publishes the document. XML files are generated whether or not an IDEAL user is defined.
10. Click **File** > **Close**.
11. From the **Administration** window, click **File** > **Open**.
12. On the **Open Administration Module** dialog box, select **Domain Administrator** and select the domain, configured for an integrated environment.
13. Click **DBA** > **Data Maintenance** > **Register Items**.
14. Create a plant hierarchy in Smart Instrumentation to match the source plant hierarchy of each plant for which you want to retrieve or publish data. For details, see *Retrieve a Plant Hierarchy* (on page 182).
15. Register each Smart Instrumentation plant that you want to use in an integrated environment. For details, see *Register a Plant* (on page 181).

    TIP If you create a new plant, you should rename it and all its plant hierarchy items to exactly match the plant hierarchy items that you want to map to in SmartPlant Foundation (the names are case-sensitive). After that, you just need to register Smart Instrumentation, retrieve the plant hierarchy from SmartPlant Foundation, and correlate the two plant hierarchies.
16. Log on to Smart Instrumentation as the IDEAL user and define the necessary settings for working in an integrated environment. For details, see *Define Preferences Settings for an Integrated Environment* (on page 183).

Item Registry Activities

Registering items ensures that as soon as a user performs any of the item registry operations, the appropriate references appear in the item registry automatically. This way, the software keeps Smart Instrumentation data up-to-date for integration. After items are registered, users of other applications who have access to integration options can use information held in the item registry to retrieve Smart Instrumentation data.

For more details on item registration, see *Register Items* (on page 180).

Topics

Register Items

IMPORTANT

- When updating the table, the software registers all the changes that were made to the items in Smart Instrumentation.
- Prior to registering items, make sure that no users are connected to the Smart Instrumentation database. It is recommended that you clear all Smart Instrumentation sessions before performing item registration.
- The Domain Administrator must have access rights to the item registry options in order to perform this procedure.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Data Maintenance** > **Register Items**.

NOTE When registering items for use in an integrated environment, the **Obtain revision from SmartPlant Foundation** check box, in the **Administration Module** > **Domain Definition** > **Domain features,** is selected automatically even if it was not selected before registering. After the register items process is complete you must clear the **Obtain revision from SmartPlant Foundation** check box to continue to use Smart Instrumentation revision numbering. To use revision numbering from SmartPlant Foundation, leave the check box selected.

Clean Up Item Registry

When performing a clean-up, the software removes from the item registry all references to items that were deleted in the current domain.

1. Start the Administration module and log on as Domain Administrator.
2. With the **Domain Administration** window open, click **DBA** > **Data Maintenance** > **Item Registry Clean-Up**.

Define an IDEAL User

When external users need to connect to the Smart Instrumentation database, you must define an IDEAL user through which the software establishes the connections.

1. Log on to the Smart Instrumentation Administration module as System Administrator.
2. Ensure that a department is defined to which the IDEAL user may be assigned.
3. Click **Activities** > **User**.
4. On the **User** dialog box, do one of the following:
   - From the **User** list, select an existing user.
   - Click **New**, and in the **User** box, define a new user.

5. Select the **IDEAL user** check box.
6. Click **Apply**.

Registering Plants

Before you can publish and retrieve information from any of the authoring tools, you must register each plant in Smart Instrumentation with a SmartPlant Foundation database. The connection allows Smart Instrumentation to use the integration commands. A Smart Instrumentation Domain Administrator typically performs the registration.

The software maps a plant and all its projects to a single SmartPlant Foundation URL, which points to one, and only one, SmartPlant Foundation plant database and its projects. When you use the **Register** command in any of the authoring tools, you are registering an authoring tool plant with a SmartPlant Foundation URL and plant that you specify.

The Domain Administrator must register each plant in the authoring tool once; this action takes place in the Administration module. After the plant is registered, you can publish and retrieve documents.

★ IMPORTANT Tool registration information is not upgraded in SmartPlant Foundation; therefore, each tool must re-register with SmartPlant Foundation after upgrading SmartPlant Foundation. Since it is not possible to re-register a Smart Instrumentation plant using the interface options, if you must re-register a Smart Instrumentation plant, contact customer support.

Register a Plant

1. Log on as Domain Administrator and select the required domain, configured for an integrated environment.
2. Click **SmartPlant** > **Register**.

   ★ IMPORTANT You cannot unregister a plant after it is registered.
3. On the **Select Plant** dialog box, select the plant that you want to register.
4. On the **SmartPlant Foundation URL** page of the **SmartPlant Registration Wizard**, type the node name and virtual directory of the SmartPlant Foundation database to which you want to register your project. Use the following format: http://<SPFServer>/<VirtualDirectory>.

   For example: http://<SPFServer>/SPFASP.

   TIPS

   - You can click the **Browse** button to search for the node name. However, you must append the virtual directory to that node name by typing it in the **SmartPlant Foundation URL** box.
   - Replace <SPFServer> with the name of your SmartPlant Foundation Web server.
   - Replace <VirtualDirectory> with the name of the virtual directory for the SmartPlant Foundation Web Client. By default, the virtual directory for the first instance of the Web Client that you install is SPFASP. However, if you install multiple instances of the Web Client to connect to multiple databases, the virtual directory name may be different.
5. Click **Next**.

6. On the **SmartPlant Foundation Plant** page, select from the **Plant name** list the SmartPlant Foundation plant with which you want to register your Smart Instrumentation plant.
7. Click **Next**.
8. If required, select the auto-retrieve option.
9. Click **Finish** to register your plant. The registration process also compares the authoring tool's schema release number against the list of supported release numbers on the SmartPlant Foundation server. If the tool map schema is compatible, the tool is granted registration.
10. On the **Select Plant** dialog box, click **Cancel** to close the dialog box.

Retrieve a Plant Hierarchy

1. Log on as Domain Administrator and select the required domain that has been configured for an integrated environment.
2. Click **SmartPlant** > **Retrieve**.
3. On the **Select Plant to Correlate** dialog box, select the plant that you want to use as the seed plant for retrieving the plant hierarchy.
4. On the **SmartPlant Foundation Login** dialog box, type the appropriate user name and password.

   NOTE The **SmartPlant Foundation Login** dialog box would appear for SmartPlant Foundation users that have not been unauthorized.
5. On the **Retrieve** dialog box, in the **Document type** list, select **All**.
6. Under **Show**, select **All documents**.
7. Under **Documents to retrieve**, select the PBS document for the required plant.
8. Click **OK** to retrieve the document.
9. At the confirmation prompt, click **Close**.
10. On the **Select Plant** dialog box, click **Cancel** to close the dialog box.
11. Click **SmartPlant** > **To Do List**.
12. On the **To Do List** dialog box, select all the tasks that appear in the list.
13. Click **Run** to create the plant hierarchy in Smart Instrumentation.

    TIP You cannot defer tasks or view To Do List task properties when retrieving a plant hierarchy in the Administration module.
14. Click **Close** to close the **To Do List** dialog box.

Define Preferences Settings for an Integrated Environment

1. Log on to the Smart Instrumentation application as the IDEAL user.
2. Click **File** > **Preferences**.
3. On the **Preferences** dialog box tree-view pane, click **General**.
4. Beside **Output document folder**, click **Browse** to specify an output document folder in which the software places all Smart Instrumentation documents that can be published.

   TIP If you do not intend to publish documents through the Web, we recommend that you specify as the output location a sub-folder of the folder where the Intools.ini file is located.

Tool Requirements for Integrating Smart Instrumentation

The following lists include rules that must be followed when using Smart Instrumentation in an integrated environment. Following these rules allows Smart Instrumentation data to be shared correctly with other integration tools.

The software retrieves instrument data at the lowest plant hierarchy level in the plant hierarchy item that you logged on to in Smart Instrumentation, for example a unit. The software retrieves wiring data, such as panels and cables, in the highest plant hierarchy level. Provided a plant is registered, you can publish and retrieve data in Smart Instrumentation, subject to the limitations indicated in the following sections.

General Integration Requirements

The following is a list of *best practice* scenarios for using Smart Instrumentation so data will migrate correctly to the other Smart software tools.

1. As Domain Administrator, perform the following tasks:
   - Assign the access right for **SmartPlant Registration** (under **Domain Level**) to **Full (Add / Delete / Update)**.
   - Assign the access rights for **Publish** and **Retrieve** (under each registered plant) to **Full (Add / Delete / Update)**.
2. If you have installed Smart Instrumentation on a SQL Server platform, open the Intools.ini file and under the [Database] section, make sure that the **Lock** parameter has the value:

   Lock=RC

Naming Convention Requirements for Integration

Instruments, Loops, Control System Tags and other objects in Smart Instrumentation have a naming convention. The names of these objects are made of segments with predefined length and separators between the segments.

The mapping between the segments of the name and properties in the SmartPlant schema is determined by the content of the NamingConventionMap.xml file. For details, see *Naming Convention Mapping* (on page 191).

Instrument Retrieval

When you retrieve an instrument, the software populates the tag number segments from the retrieved instrument object properties according to the following mapping:

Segment	Property
1	InstrTagPrefix
2	MeasuredVariable+InstrFuncModifier
3	InstrTagSequenceNo
4	InstrTagSuffix

Segment 1 is populated with the InstrTagPrefix

Segment 2 is populated with the concatenation of MeasuredVariable and InstrFuncModifier

Segment 3 is populated with the InstrTagSequenceNo

Segment 4 is populated with the InstrTagSuffix

The segments are then trimmed and put together according to the naming convention to create the tag number.

If the naming convention in other tools (for example, Smart P&ID) does not include a prefix, the first segment length needs to be set to 0.

Loop Retrieval

When you retrieve a loop, the software populates the loop name segments from the retrieved instrument object properties according to the following mapping:

Segment	Property
1	LoopPrefix
2	LoopIdentifier
3	
4	LoopSequenceNo

Segment	Property
5	LoopSuff

Segment 1 is populated with the LoopPrefix

Segment 2 is populated with the LoopIdentifier

Segment 4 is populated with the LoopSequenceNo

Segment 5 is populated with the LoopSuff

Segment 3 is not populated and needs to be set to length 0

Instrument Publishing

When you publish an instrument, the software populates the published object properties by the naming convention segments as follows:

Property	Segment	Comment
InstrTagPrefix	1	
MeasuredVariable	2	Left side of segment 2
InstrFuncModifier	2	Right side of segment 2
InstrTagSequenceNo	3	
InstrTagSuffix	4	

The object name is populated by the tag number with all spaces removed. If the length of prefix is more than 0, the prefix will be part of the object name. Other applications that publish instruments (for example, Smart P&ID) need to be configured to publish the instrument object name with the prefix.

The MeasuredVariable and InstrFuncModifier are both populated be the second segment. If the first two characters of segment 2 are included in the TwoLetterMeasuredVariable list that was defined in the Smart Instrumentation mapping file, then the MeasuredVariable gets these two letters; if not then the MeasuredVariable gets the first character of segment 2. In both cases, the InstrFuncModifier gets the rest of the characters of segment 2. This allows correct publishing of instruments such as PDT or DPT.

TwoLetterMeasuredVariable
DP
PD
FQ
FF

TwoLetterMeasuredVariable
TD
WD
ZD
FO

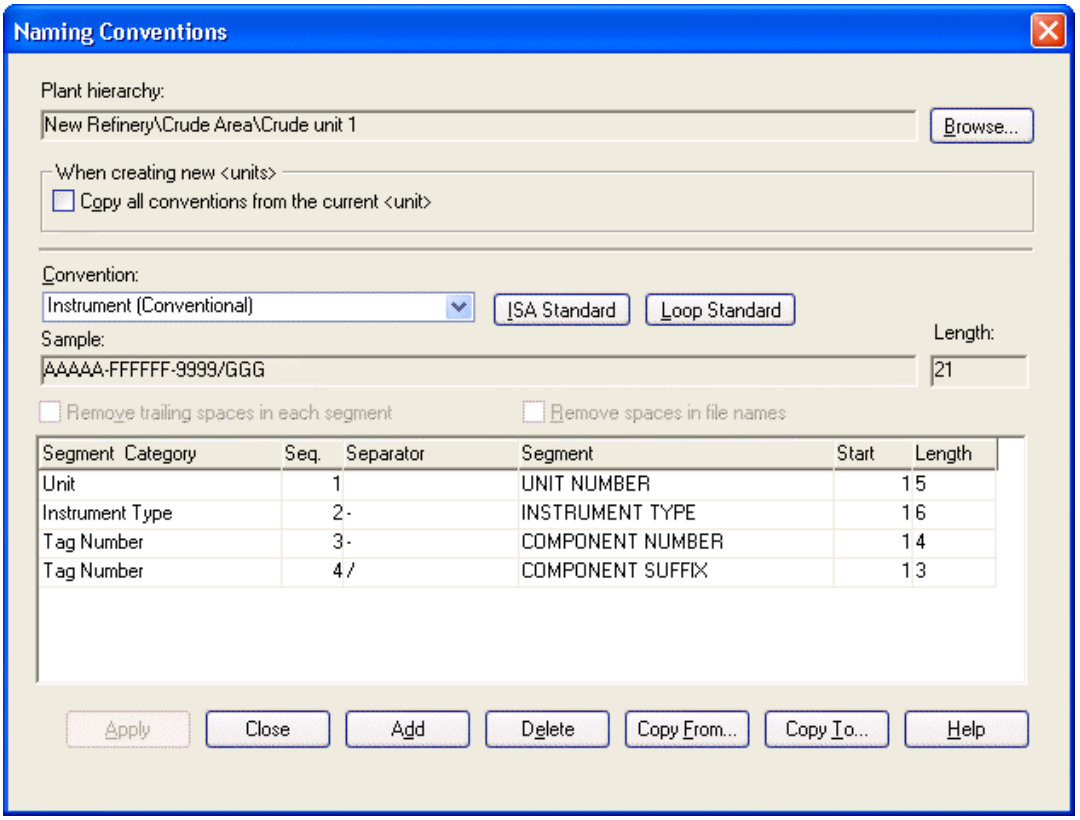
Loop Publishing

When you publish a loop, the software populates the published object properties by the naming convention segments as follows:

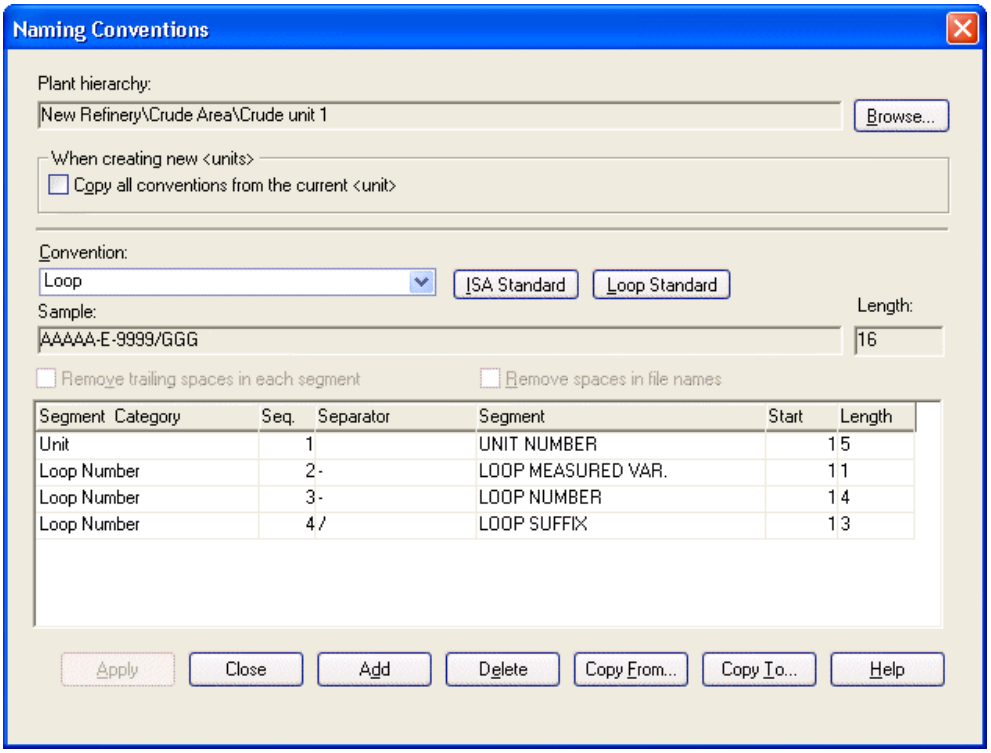
Property	Segment
LoopPrefix	1
LoopIdentifier	2+3
LoopSequenceNo	4
LoopSuff	5

The object name is populated by the loop name with all spaces removed. If the length of prefix is more than 0, the prefix will be part of the object name. Other applications that publish loops (for example, Smart P&ID) need to be configured to publish the loop object name with the prefix.

An example of an instrument naming convention:



An example of a loop naming convention:



Integration with Smart P&ID

General

- Both Smart Instrumentation and Smart P&ID must have the same plant hierarchy structure, with a minimum of three levels.
- The domain name in Smart Instrumentation must be different from the plant name in Smart P&ID.
- You cannot change the plant hierarchy template or names of plant hierarchy levels after retrieving documents from Smart P&ID for the first time. You can, however, change the names of individual plant group items, if you require.

Working with Projects

- You can edit items in the project where you are publishing or retrieving new objects, however, you CANNOT edit As-Built items unless you have claimed them to a project, other than for publishing data. In Options Manager, under **General Settings**, you can disable editing in As-Built using the **Allow Full Access to As-Built** option.
- In Options Manager, under **General Settings**, you must set the **Claim Mode** option to **Exclusive only**. As a result, you cannot claim the same items for multiple projects.

- You cannot perform a manual claim of any items belonging to the following item types that are shared between Smart Instrumentation and Smart P&ID: tag numbers, loops, lines, equipment, and control system tags. This requirement exists because Smart P&ID performs the scoping and Smart Instrumentation automatically claims scoped items when you retrieve data. You can manually claim any unshared items such as panels, strips, terminal, cables, cable sets, wires, and so forth.
- In Smart Instrumentation, the software automatically claims control systems tags for pre-assigned instruments to the project whenever the instruments are claimed. However, for unassigned instruments, you must claim the control system tags separately to assign them to these instruments in the project.
- You must merge all shared items at the same time; you cannot perform a partial merge of shared items.

Publishing Data

- You are not allowed to publish data from As-Built. Doing so results in items appearing more than once (for As-Built and for each project where the item is claimed). Instead, you must open the specific project from which you want to publish the data.

Retrieving Process Function and Instrument Type Data

While there is no requirement to specify process function and instrument type values when publishing from Smart P&ID, you should be aware of the following:

- Smart P&ID has a property, **InstrumentComponentType**, that sometimes, but not always, matches the instrument type in Smart Instrumentation. This property is part of the Smart P&ID symbol. Only by replacing the symbol can you change the value of the **InstrumentComponentType** property for in an instrument that was already placed on the drawing. If the symbol does not provide enough information to publish an instrument type that is recognized by Smart Instrumentation, on retrieving data in Smart Instrumentation, the software specifies the process function and instrument type based on the name of the instrument, where the instrument naming convention includes an Instrument Type segment. For example, if the name of the instrument is FT-100, the software assigns to it instrument type **FT** and process function **Flow**.
- If Smart Instrumentation recognizes an instrument type that has more than one description, the software assigns to the instrument the instrument type description designated as the default.
- If Smart P&ID cannot publish an instrument type, or if it publishes an instrument type that Smart Instrumentation is unable to recognize, then on retrieving the data, Smart Instrumentation does not assign an instrument type. You can then specify the instrument type manually in Smart Instrumentation.
- If you have already specified an instrument type in Smart Instrumentation and you run an update task that has a null or unrecognized instrument type, the software does not overwrite the existing instrument type.

Integration with Smart Electrical

To have a successful data exchange between Smart Instrumentation and Smart Electrical, make sure that:

- Both Smart Instrumentation and Smart Electrical have the same plant hierarchy structure, with a minimum of three levels.
- In Smart Instrumentation, instruments and I/O signals are defined on the lowest plant hierarchy level.
- In Smart Instrumentation, cabinets are defined on the highest plant hierarchy level.
- In Smart Electrical, you defined a registered report for both the I/O lists and for Instruments requiring power supply.

You must also ensure that the following Smart Electrical select lists and Smart Instrumentation supporting tables contain identical values:

- System I/0 type
- Rated Voltage
- Power Supply AC/DC Flag
- Number of Phases
- Operating Mode
- Process Function
- Frequency

Furthermore, in the Administration module, in the **Domain Definition** window, the System Administrator must clear the check box **Allow claims for multiple projects** (if working in an owner operator domain).

In the two tools, the units of measure of certain properties might be defined using a different precision accuracy. For example, 1.2 kW (one-digit accuracy of precision) in Smart Electrical corresponds to 1.23 kW (two-digit accuracy of precision) in Smart Instrumentation. This may result in inconsistencies and could be interpreted as an update when retrieving data.

These properties are:

- Rated Active Power
- Rated Reactive Power
- Rated Apparent Power
- Full Load Current
- Operating Mode Coincidence Factors (X, Y, Z, ZZ)
- Starting Current

Naming Convention Mapping

The NamingConventionMap.xml file can be edited by users. The file contains the following code format:

```
<NAMING_CONVENTIONS>
 <Publish>
  <ObjectDefName>
   <Segment Seq="N/C Segment Number"
    InterfaceDefUID="SmartPlant TargetInterface"
    PropertyDefUID="SmartPlant TargetProperty"
    StartPos="0" Length="0 - ignore, >0 length"/>
     ...
  </ObjectDefName>
 </Publish>
 <Retrieve>
  <ObjectDefName>
   <Segment Seq="N/C Segment Number"
    InterfaceDefUID="SmartPlant SourceInterface"
    PropertyDefUID="SmartPlant SourceProperty"
    StartPos="0" Length="0 - ignore, >0 length"/>
     ...
  </ObjectDefName>
 </Retrieve>
<NAMING_CONVENTIONS>
```

NOTES

- Mapping two adjacent segments to the same property results in concatenation of the values when you publish.
- If you use the value 'Exception' for the InterfaceDefUID property, the software looks for the <Exception Name> tag with a value equivalent to the PropertyDefUID attribute. For example:

```
<Instrument>
...
<Segment Seq="2"
 InterfaceDefUID="Exception"
 PropertyDefUID="INSTRUMENT_TYPE"
 StartPos="1" Length="1" />
 ...
 <Exception Name="INSTRUMENT_TYPE"
  INSTR_TYPE_SegmentSeq="2"
  A_InterfaceDefUID="INamedInstrument"
  A_PropertyDefUID="MeasuredVariable"
  B_InterfaceDefUID="INamedInstrument"
  B_PropertyDefUID="InstrFuncModifier" />
 </Instrument>
```

- The software automatically takes the prefix segment and splits it into two segments, for example AB would be split into A and B. When the prefix has more than two characters you must tell the software where you want to split the prefix. To do this you must add the following to the exception code:

  `A_Length="Numeric Value"` where the numeric value equals two or three. This tells the software how many characters from the prefix to use in the first segment. For example, if you have a prefix of **PDT** (Pressure Differential Transmitter) selecting the value two would create **PD** for the first segment and **T** for the second. Selecting three would produce **PDT** with the second segment being empty.

Configure Smart Instrumentation to Use Minor Revisions

When adding revisions to Smart Instrumentation publishable reports, the software can be configured to support major and minor revisions that are defined in SmartPlant Foundation.

1. Click **File** > **Preferences**.
2. On the **Preferences** dialog box, under **Instrument Index**, click **Custom**.
3. Under **Custom features for the Instrument Index module**, do the following:
   a. Under **Parameter**, type **major**.
   b. Under **Value** for the parameter type **rev_udf_c01**.
   c. Under **Parameter**, type **minor**.
   d. Under **Value** for the parameter type **rev_udf_c02**.