# Merger Utility

## Overview

The Merger Utility provides you with the means of transferring a selected data entity (for example, domain, plant, and so forth) from a source domain to the same type of data entity in an **existing** target domain. The source and target domains can be a part of the same database or part of different databases. You can also merge source and target data entities within the same domain.

You run the Merger Utility in any of the following scenarios:

- You need to transfer all the data from a **source domain** to a **target domain**.
- You need to transfer all the data from a **source plant hierarchy item** to a **target plant hierarchy item** at the same level.

**Notes**

- Only the Domain Administrator has access to the Merger Utility.
- The source and target domains must be of the same SmartPlant Instrumentation version. If they are not the same version, the Merger Utility displays an appropriate message. In this case, you need to upgrade the domain that belongs to the earlier version.
- The Merger Utility only supports domains of type Engineering company when merging plant data. For configuration data, the Merger Utility supports Engineering company and Operating owner (AsBuilt) domains.
- The Merger Utility changes the contents of your target database. Therefore, we recommend that you backup your target database before proceeding with the merge process. (To learn how to backup your database, see Installation Guide, Backup and Restore.)

## Database Platform Support

The Merger Utility provides you with inherent support of the following database platforms:

- Oracle Server
- Microsoft SQL Server
- Sybase Adaptive Server Anywhere

You can use any of the above database platforms after you configured that database platform to work with SmartPlant Instrumentation.

You can also import data from database platforms other than those specified above. To do this, you need to install the appropriate drivers manually and configure the appropriate configuration files.

**Note**

- SmartPlant Instrumentation uses a database engine developed by Sybase for SmartPlant Instrumentation repository. This engine is called Sybase Adaptive Server Anywhere.

## Starting the Merger Utility

To start the Merger Utility you must comply with the following requirements:

- You must have a previously defined source and target domains with at least one plant hierarchy item at the lowest level of the hierarchy (by default, this is a unit).
- Both the source and target domains must be of the same SmartPlant Instrumentation version and sub-version.

See Installation Guide, SmartPlant Instrumentation Setup Maintenance and Database Selection, Installing SmartPlant Instrumentation Components to learn more about SmartPlant Instrumentation programs and utilities.

### ➢ To start the Merger Utility

1. Select **Merger Utility** from the **SmartPlant Instrumentation** program group in the Windows **Start** menu.
2. In the **Login** dialog box, type the Domain Administrator name and password.
3. In the **Open** dialog box, expand the hierarchy as needed by clicking ⊞ and select the desired <unit>.

**Notes**

- Whenever you start the Merger Utility, the software prompts you to select a target <unit>. If you have already started a merge process in a previous Merger Utility session, you are prompted to resume that merge process.
- You need to select a **single** target <unit> before starting the merge process, the same way you do when you enter every SmartPlant Instrumentation module. You can select additional target data entities as you proceed through the merge process. (See Merging Data Overview to learn how to select additional target data.)

# Preparing to Merge Data

## Working with Log Files

Log files allow you to keep track of all operations during a merge process.

When you start the Merger Utility for the first time, you create a new log file. The log file keeps growing as you continue merging data unless you decide to change the current log file. The information in the log file describes chronologically the events which have taken place during the merge process. This information includes:

The date and time in which the merge process started.

- Details of the selected source and target entities:
  - The database platform (for example, Oracle)
  - The domain name
  - The plant hierarchy item name on the level at which data has been transferred
- The starting ID of each table (see Setting the Merger Comparison Criteria to learn how to set the starting ID).
- The total number of updated target rows (where the software overwrites data).
- The total number of inserted rows (new rows that were appended in the target domain).
- The total number of rejected source rows: source rows which were not transferred).
- The transferring results: whether the merge process was successful if the user stopped it or if it stopped due to merge failure.

If you start the merge process with no log file defined, the software prompts you to define a log file when you are about to start the data transfer.

**Note**

- SmartPlant Instrumentation uses Notepad to view the log file; however, Notepad is limited by file size that it can handle. If your log file becomes too large for Notepad, an appropriate message appears. In this case, you can view your log file using Windows Write or another appropriate utility.

## Creating a New Log File

It is advisable to create a new log file each time you perform an important import operation. You should also create a new log file if your existing log file has become too long.

### ➢ To create a new log file

1. On the **Log File** menu, click **New**.
2. In the **New Log File** dialog box, type the name of your new log file, select the desired path, and click **Save**.

**Tip**

- The Merger Utility opens a new (empty) log file automatically (even though you do not see it).

## Opening an Existing Log File

It is advisable to open a log file before you perform an import procedure so that you have a record of the import process.

### ➢ To open an existing log file

1. On the **Log File** menu, click **Open**.
2. In the **Open Log File** dialog box, select the name of the log file you want to open and click **Open**.

**Note**

- After you create a new log file or open an existing one, it stays open even though you do not see it displayed. The log file remains active until you close the Merger Utility. (See Closing the Current Log File to learn how to close the current log file manually.) When you exit the Merger Utility, the log file closes automatically and reopens when you restart the Merger Utility.

## Viewing a Log File

You can view the current log file to review the previous import process information. You can also view any other existing log file.

### ➢ To view the current log file

- Do one of the following:
  - Click  .
  - On the **Log File** menu, click **View**.

  The **current** log file opens for viewing in Notepad.

  **Note**

  - SmartPlant Instrumentation uses Notepad to view the log file. However, Notepad is limited by file size that it can handle. If your log file becomes too large for Notepad, you will get an appropriate message. In this case you can view your log file using Windows Write or another appropriate utility.

## Closing the Current Log File

You can also import data without a log file. If you choose to do this and there is a current log file, you can close it.

### ➢ To close the current log file

- On the **Log File** menu, click **Close**.

  The Merger Utility immediately closes the current log file. After you close the current log file you need to define a new log file to resume tracking the import process (see Creating a New Log File to learn how to define a new log file).

## Deleting an Existing Log File

You can delete a log file when the information in it becomes unimportant.

**Caution**

- This action deletes the selected log file from your hard disk and cannot be reversed.

### ➢ To delete an existing log file

1. On the **Log File** menu, click **Delete**.
2. In the **Open Log File Name** dialog box, select the name of the log file you want to delete and click **Open**.

   **Note**

   - On clicking **Open**, the software deletes the specified log file from your hard disk.

## Setting the Merger Comparison Criteria

You can control the way the Merger Utility identifies the source data as identical to the target data during the merge process. This is important, because when the Merger Utility encounters identical source and target rows, it can overwrite the target row or leave it intact, depending on the **comparison criteria** settings. You can therefore control the merge results by selecting the appropriate comparison criteria.

In SmartPlant Instrumentation, the database is organized in tables, for example: CABLE, COMPONENT, CONTROL_VALVE, and so forth. These tables contain data arranged in columns that represent various data entities such as tags, cables, panels, and so forth.

For example:

The COMPONENT table contains all the tags together with the appropriate links to other tables, which utilize tags, such as: COMPONENT_MFR (Manufacturers table), CABLES (Cables table), and so forth.

You can use one or **more** data columns in each table as the **primary key** fields of this table. The value of the primary key of each table is unique in this table. For example, the primary key of the COMPONENTS Table is CMPNT_ID. This means that each row in the COMPONENT Table has a different value in the CMPNT_ID field.

Note that the primary keys are not accessible to you when you work in SmartPlant Instrumentation. The primary keys are designed only for SmartPlant Instrumentation internal use.

When comparing rows, the Merger Utility treats the source and target rows as identical **only if both the source primary key and target primary key contain the same value**. For example, if the COMPONENT table in both source and target rows contains the same values in the columns defined as primary keys, then the software considers both rows as being identical.

In this case, the Merger Utility can either replace the **entire** target row with the source row or leave this target row intact, depending on the merge process settings.

You can select the appropriate primary key of every table in the database. This way you can create a different comparison criterion for each table.

**Caution**

- Changing the settings in the **Target Definition** dialog box alters the relations between the tables. We therefore recommend that you do not change these settings unless you find it necessary and only if you are familiar with the SmartPlant Instrumentation database structure. In most cases when you merge data, you do not have to modify the Merger Utility comparison criteria. If you decide to modify the comparison criteria, make sure you enter the appropriate data, as this feature changes the contents of the target data entity.

# The Merging Process

## Merging Data Overview

Before you can merge data, you must create a merge session, within which you select the source data, match the source and target data, and set the merging options.

After selecting the source data, you match the source and the target <units>. You need to do this because the source and target domains may differ in the domain hierarchy. For example, there may be more <units> in the selected source area than in the target area.

The next stage is to select the data to be merged. There are two ways you can select the data to be merged:

- Transfer all the data of selected modules or sub-modules using the **module list** feature. When you select this option, the software transfers the **entire** data for the selected entities.
- Transfer only the data that you select using the **comparison list** feature. With this option, you can generate comparison reports which help you to identify exactly which data needs to be merged. We recommend that you save the comparison reports as .psr files. The advantage of having the comparison reports in the .psr format is that you can re-use them in other Merger Utility sessions if needed. There are, however, some limitations:
  - PSR files reflect the situation at the time they were created. If the data has changed during the time between the report creation and its restoration, you cannot be certain that the data contained in the report is up-to-date.
  - Restore only supporting tables and main entity reports (loops, tags, cables, panels, and so forth). Do not composite tables such as tag and block relations.

**Note**

- If you want to delete data that is present in the target but not in the source, you can do so only through the comparison list option.

You can manipulate, view, and print a .psr file from both InfoMaker and SmartPlant Instrumentation. SmartPlant Instrumentation provides the best interface to deal with the .psr files, as there are built-in features to filter, sort and column selection. If you edit a .psr file outside SmartPlant Instrumentation, the hidden columns become visible. This is a technical limitation that you should be aware of.

If you intend to merge data based on saved PSR files, do not save any changes made through InfoMaker (you can make changes temporarily in order to adjust the layout of the printed document, but do not save it).

Generate and save the comparison reports as PSR files. If there is a lot of data in the source and target databases, consider doing this on a per <unit> basis for the basic engineering. In this case, save the comparison reports in different folders.

If you use InfoMaker, set it so it does not retrieve the data from the database when the document is opened. To set it, follow this procedure:

1. Open the .psr file in InfoMaker in design mode.
2. On the **Design** menu, click **Options**.
3. Clear the **Retrieve on Preview** option.
4. Make sure that the **Retain Data to Design** option is selected.

In order not to run out of resources during the different comparisons, run this process in different sessions as recommended.

To improve performance, make sure that the **Build table list for merging data** check box in the **Compare Source-Target Data** window is cleared (there is no need to build a table list for merging if you do not intend to use it at that time).

The next stage is to set the Merger Utility settings which include the general options, setting the date from which to start merging the data, and selecting the tag custom field data to be merged.

When you start to merge data, you can monitor the transfer process in the **Merger Progress** window.

The merge process includes the following major steps:

1. Selecting the source data; that is, the plant hierarchy item.
2. Matching the source data with the target data.
3. Selecting the source data to be transferred to the target domain.
4. Setting the general Merger Utility options.
5. Setting other Merger Utility options: date, user-defined fields, and log file.
6. Transferring the selected source data to the target data.

## Selecting the Target

When merging data, the Merger Utility treats the database identified in the current INTOOLS.INI file as the target database and refers to your current plant hierarchy item as the target. This means that the source data will be merged data in that <unit>. SmartPlant Instrumentation connects to the current (target) database when you start the Merger Utility. After the Merger Utility starts, the **Open** dialog box appears, where you can select the desired target <unit>.

### ➢ To select the target item

1. On the **File** menu, click **Select Plant Hierarchy Item for Target**.
2. In the **Open** dialog box, expand the hierarchy as needed by clicking ⊞ and select the desired <unit>  .

## Creating a New Merger Session

### ➢ To create a new merger session

1. On the **Actions** menu, click **New Session**.
2. In the text box, type a unique name for the session.
3. On the **Actions** menu, click **Open Session**.
4. Make your definitions for the session as you require.
5. When done, on the **Actions** menu, click **Save Session**.

## Opening a Merger Session

➢ **To open a merger session**

1. In the **Merger Session Manager** window, select the session that you want to open.
2. Do one of the following:
   - On the **Actions** menu, click **Open Session**.
   - Right-click the session, and on the shortcut menu, click **Open Session**.
3. Make any changes to the session as you require.
4. When done, on the **Actions** menu, click **Save Session**.

## Renaming a Merger Session

➢ **To rename a merger session**

1. In the **Merger Session Manager** window, select the session that you want to rename.
2. Do one of the following:
   - On the **Actions** menu, click **Rename Session**.
   - Right-click the session, and on the shortcut menu, click **Rename Session**.
3. In the text box, type a new name for the session.

## Duplicating a Merger Session

➢ **To duplicate a merger session**

1. In the **Merger Session Manager** window, select the session that you want to duplicate.
2. Do one of the following:
   - On the **Actions** menu, click **Duplicate Session**.
   - Right-click the session, and on the shortcut menu, click **Duplicate Session**.
3. In the **Duplicate Session** dialog box, do one of the following:
   - Click **New** and type a new session name.
   - Select an existing session to overwrite it with the new session data.

## Deleting a Merger Session

➢ **To delete a merger session**

1. In the **Merger Session Manager** window, select the session that you want to delete.
2. Do one of the following:
   - On the **Actions** menu, click **Delete Session**.
   - Right-click the session, and on the shortcut menu, click **Delete Session**.
3. At the prompt, confirm the deletion.

## Selecting the Source Domain

After you have opened a session or defined a new session, the next step in the merge process is to select the source domain and/or its appropriate entity. To do this you have to select a domain or any plant hierarchy item within the domain.

The source domain can be:

- The same as the target domain (for details, see Selecting the Same Source Domain as the Target Domain).
- Different from the target domain but belonging to the same database. For details, see Selecting a Source Domain from the Same Database as the Target Domain (ODBC Database).
- A domain from a database or a database platform other than the target domain database. For details, see Selecting a Source Domain from a Database Platform Other than ODBC.

**Note**

- You can select multiple <units> to be merged with the target.

During this stage you can also:

- Select the appropriate source modules.
- Select the appropriate source tables.

## Selecting the Same Source Domain as the Target Domain

You can select identical source and target domains if required.

➢ **To select the same source domain as the target domain**

1. Open a Merger Utility session.
2. Do one of the following:
   - Expand the tree and click  **Connect**.
   - On the **Actions** menu, click **Connect to Source**.
3. In the **Connect to Source** dialog box, select **Use target domain as source**.

    **Note**

   - Whenever you open a new Merger Utility session, the source domain is the same as the target domain by default. Therefore the details of the current target domain (the domain that you selected when you started this merge session) appear under **Information**.

4. Click **Domain Entity**.
5. In the **Select Source Domain Entity** dialog box, select a source entity which can be the entire domain or any plant hierarchy item within the domain. (See Matching the Source Data with the Target Data to learn how to continue the merge process.)

## Selecting a Source Domain from the Same Database as the Target Domain (ODBC Database)

You can select a different source domain than the target domain, but from the same database as the target domain. You do this by selecting ODBC as your database and Sybase Adaptive Server Anywhere as your database platform.

**Notes**

- The Merger Utility does not support source databases that have the AsBuilt functionality.
- Make sure you have the proper access rights (login name and password) required to connect to the source domain. See Installation Guide, Appendixes > Appendix C > SmartPlant Instrumentation Database Technical Review > Login Data and Database Connection Security to learn more about database access rights.

You start this procedure as described in the procedure above. Then you establish the connection to the required domain, as described in the steps that follow:

### ➢ To select a source domain from the same database as the target domain

1. In the **Merger Session Manager** window, open the desired Merger Utility session.
2. Do one of the following:
   - Expand the tree and click **Connect**.
   - On the **Actions** menu, click **Connect to Source**.
3. In the **Connect to Source** dialog box, clear **Use target domain as source**.
4. Click **Database**.
5. In the **Connect to Database** dialog box, from the **DBMS** list, select ODBC as the database platform.

6. From the **Profile name** list, select the source database profile.

   **Note**

   - If you select ODBC as your database platform you can select only a Sybase Adaptive Server Anywhere database profile (for example, IN_DEMO, SP_INSTRUM, and so forth) from the **Profile name** list.

7. In the **Login name** and **Login password** boxes, type the login name and password to connect to the selected database.

8. Click **Domain Entity**.

9. In the **Select Source Domain Entity** dialog box, select a source entity which can be the entire domain or any plant hierarchy item within the domain. (See Matching the Source Data with the Target Data to learn how to continue the merge process.)

## Selecting a Source Domain from a Database Platform Other than ODBC

You can select a source domain from a database platform other than ODBC. In order to establish a connection to the required database platform:

- Make sure you have all the correct DLL files and the right settings in the appropriate INI files and/or registry. See Internal Setup Utility, to learn more about configuring the database settings.
- Make sure you have the proper access rights (login name and password) required to connect to the source database. See Installation Guide, Appendixes > Appendix C > SmartPlant Instrumentation Database Technical Review > Login Data and Database Connection Security to learn more about database access rights.

**Note**

- The Merger Utility does not support source databases that have the AsBuilt functionality.

You start this procedure as described in the section above. Then you establish the connection to the required database, as described in the following steps.

### ➢ To select a source domain from a database other than ODBC

1. In the **Merger Session Manager** window, open the desired Merger Utility session.
2. Do one of the following:
   - Expand the tree and click **Connect**.
   - On the **Actions** menu, click **Connect to Source**.
3. In the **Connect to Source** dialog box, clear **Use target domain as source**.
4. Click **Database**.
5. In the **Connect to Database** dialog box, from the **DBMS** list, select the database platform that you require.
6. Click **OK** to open the additional part of the **Connect to Database** dialog box.
7. In the **Server name** box, type the name of the database server.
8. From the **Login name** list, select the required login name to connect to the selected source database.

9. In the **Login password** box, type the required password to connect to the selected source database.

10. In the **Connect to Database** dialog box, click **Domain Entity**.

11. In the **Select Source Domain Entity** dialog box, select a source entity which can be the entire domain or any plant hierarchy item within the domain. (See Matching the Source Data with the Target Data to learn how to continue the merge process.)

## Matching Source and Target Projects

You can match source and target projects if you have selected to merge configuration data and the source domain is of type Operating owner. In this way, the Merger Utility transfers data from the selected source projects to the selected target projects which you are going to link.

**Note**

- You must perform this procedure when you select the User Group or Access Rights entities for merging the data.

### ➢ To match the target projects to the source projects

1. In the **Connect to Source** dialog box, click **Match Projects**.

2. In the **Match Projects** dialog box, match each target project individually to the required source project by selecting in the **Target** (left) data window, the row that represents the required target project and dragging it to the required cell under **Connected to Target Project** in the **Source** data window.

   **Notes**

   - If projects in the source and target have the same names, you can connect them automatically by clicking **Match Names**.

   - You cannot map a project onto itself.

3. Click **OK** to return to the **Connect to Source** dialog box.

## Matching the Source Data with the Target Data

After connecting to a database and selecting the source domain entity, you match the source and the target <units>. In this way, the Merger Utility transfers data from the selected source <units> to the selected target <units> which you are going to link. This procedure applies where you have selected a source entity other than a <unit>.

### ➢ To match the target data with the source data

1. In the **Connect to Source** dialog box, click **Match Plant Items**.

   **Note**

   - If the **Match Plant Items** command button is not available, first click **Domain Entity** to open the **Select Source Domain Entity** dialog box where you have to select the domain, a plant, or an area as the source. This action automatically opens the **Match Plant Hierarchy Items** dialog box.

2. In the **Match Plant Hierarchy Items** dialog box, match each target <unit> individually to the desired source <unit> by selecting in the **Target** (left) data window, the row that represents the required target <unit> and dragging it to the required cell under **Connected To** in the **Source** data window.

   **Notes**

   - You can map multiple source <units> to the same target <unit>.
   - If <units> in the source and target have the same names, you can connect them automatically by clicking **Match Names**.
   - You cannot map a <unit> onto itself.

3. Click **OK** to return to the **Connect to Source** dialog box.

   **Tip**

   - If you need to merge the entire plant data; that is, matching all the source and target <units>, you should consider merging the data in several separate sessions. Merging the entire plant data in one session may take a long time because it increases the time required to generate the comparison reports. Also, a single merge session requires more client and server computer resources.

## Matching Source and Target Naming Conventions

After mapping source and target <units>, you can match the loop and tag naming conventions for those <units>. In most cases, if the source and target <units> use the same naming convention type, you do not need to match the segment names. However, under certain circumstances, for example, if the target naming convention is the Flexible standard, you may need to match individual segments between the source and target or map segments automatically when the source and target segment names are identical.

**Note**

- After matching naming conventions, it is recommended that you run the comparison list to view loop and tag names before merging the data

### ➢ To match source and target naming conventions

1. In the **Connect to Source** dialog box, click **Match Conventions**.
2. In the **Match Naming Conventions** dialog box, under **Target plant hierarchy**, expand the hierarchy and navigate to the desired <unit>.

   **Note**

   - If a source <unit> is mapped to the selected <unit>, the plant hierarchy of the source <unit> appears beside the target <unit> name.

3. Under **Naming convention type**, do one of the following:
   - Click **Tag** to map a tag naming convention.
   - Click **Loop** to map a loop naming convention.
4. If required, click **Clear** to clear the mapping between the naming convention segments in the source and target <units>. This action clears all the data in the **Source Segment** column.

   **Note**

   - You can clear the loop and tag naming convention mapping for all <units> in the domain by clicking **Clear All**.

5. Do one of the following:

   - Under **Source naming convention**, select a row representing the segment you want to match, and drag it to the **Source Segment** column under **Target naming convention** for the required target segment.

   - Under **Target naming convention**, type in the **Source Segment** column for the required target segment the required source segment name.

   
   **Notes**

   - If segments in the source and target have the same names, you can connect them automatically by clicking **Match Segments**.

   - When you drag the source name, the software displays the number of the source segment in the **Source Segment** column instead of copying the full string. You can add a substring and include fixed text in the source segment name. For example:

     ```
     #2 (1,3) + 'DD'
     ```

     This means that the name of the second segment in the source is used. The segment itself consists of the first three characters of the source segment name, and has suffix 'DD' (without the quotes).

## Defining Merger Utility Settings

Before merging data in a session, you need to set the Merger Utility options.

You can determine whether to do any of the following:

- Overwrite the target rows with identical source rows.
- Stop data merging if a source row fails to be transferred to the target.
- Use tag names for wiring entities, and use the same source and target tag and loop convention names.

### ➢ To define Merger Utility settings

1. Open a Merger Utility session.
2. On the **Actions** menu, click **Options**.
3. Click each tab folder as required and specify your settings. The available tab folders are:

   **Notes**

   - The **Comparison Action** tab folder becomes available only after running a comparison list.
   - The **Update Mode** tab folder becomes available only after you select **Update existing data** in the **General** tab folder.
   - When merging configuration data items, you must select **Update existing data** if you want to merge data for the Custom Field Definitions and Custom Table Definitions items. These items include tables that contain a fixed number of existing rows, and for this reason, these rows can only be updated; it is not possible to insert new rows.

4. After defining all the settings, proceed with the selection of the entities to merge by performing one of the following procedures:
   - Select the entity types that you want to merge.
   - Compare the source and target data.

## Selecting the Source Modules

You use this option if you want to transfer **all** the data of selected modules or sub-modules to the target domain. You can select entire modules and/or expand the appropriate modules to select the required module data. At this stage, you can also select specific loops that you want to merge.

For example, you can select the entire Instrument Index module or you can double click the Instrument Index module icon to expand it and select the required module data (for example, Line, Equipment, and so forth). You can also expand any Instrument Index module data, such as supporting tables.

**Note**

- You cannot proceed with the merge process until you select the source module and/or module data. The data window in the **Select Items** dialog box does not contain module data entitled Tags. This is because the source tags are automatically selected when you select the Instrument Index module. Therefore, to merge the source tags, select the source Instrument Index module without expanding it.

### ➢ To select the source modules and module data

1. Open a Merger Utility session.
2. On the **File** menu, click **Preferences**.
3. Click the **Item Type** tab.
4. Under **Merge data for**, do one of the following:
   - Click **All plant items** to select all entities in the plant for merging data. This option is available only if you have connected to a database that is an Engineering company domain.
   - Click **Configuration data items** to select configuration data items only for merging. Configuration data is background data that includes default panels and cables, specification forms, instrument types, and various supporting table data. This option is available for any database connection, whether it is part of an Operating owner domain or an Engineering company domain. This option is useful where you need to populate several domains with basic data from the same source.

**Note**

- When merging configuration data items, you must select **Update existing data** if you want to merge data for the Custom Field Definitions and Custom Table Definitions items. These items include tables that contain a fixed number of existing rows, and for this reason, these rows can only be updated; it is not possible to insert new rows.

5. Return to the **Merger Session Manager** and do one of the following:

   - Expand the tree and click **Select**.
   - On the **Actions** menu, click **Select Items**.

6. In the **Select Items** dialog box, select the module data that you want to transfer from the source domain to the target domain.

   A check mark appears beside everything that you select.

   **Note**

   - Using the **Select all** check box to select items is not the same as selecting all the items in the data window. If you select the **Select all** check box, the software selects all plant items and all configuration data items (excluding User Group and Access Rights), regardless of which items appear in the data window.

7. To make a more precise selection of the source data by selecting the required source table (applies only if you selected **All plant items**):

   a) Click **Advanced**.

   b) In the **Advanced Selection** dialog box, select the source table to be merged to the target domain (see the following section to learn how to select the source tables).

8. Click **OK** to save the Merger Utility settings.

9. At the prompt, click **Yes** to confirm your selection of the source data.

## Selecting the Source Tables

You can make a more precise selection of the source data. You do this by selecting the source tables to be merged (for example, Manufacturers Table, Status Table, I/O Table, and so forth) in the **Advanced Selection** dialog box.

You open the **Advanced Selection** dialog box by clicking **Advanced** in the **Select Items** dialog box.

The **Advanced Selection** dialog box consists of the following sections:

- **Filter**: Select the criteria that are used to filter the displayed tables.
- **Sort**: Select whether to sort the tables by name or by merge order.
- **(Table data)**: Select the required source table to transfer to the target domain. You can also type additional data to append to the target domain during the transfer process.

**Note**

- If you resume a previous merge session, you see in the **Advanced Selection** dialog box the source tables which were selected in that merge session.

Now you can:

- Select the source tables that you want to merge.
- Specify data which will be appended to the target domain during the data transfer.
- Specify an insertion condition for the required source tables.
- View the displayed source tables according to your required filtering and sorting options.

### ➢ To select the source tables to be merged

1. Do one of the following:
   - Under the **Select** column, select the check box for each table you require to include in the merge process.
   - Select the **Select all** check box to select all the available source tables.

   Selected source tables are displayed in red; unselected source tables are displayed in black.

**Tip**

- To locate a table by name, click **Search** and type the table name in the text box.

2. Select the check box in the **Insert Only** column if you want to specify an insertion condition for the selected table — any updated data in the table does not get merged in this case.

3. To merge the reference tables of any selected source table, click **Reference Tables**.

**Note**

- All the reference tables associated with the selected source table are automatically selected for merging.

## Selecting Entity Types to Merge

You can select specific entities in the source that you want to merge:

- **Wiring entities**: All source wiring entities, Default entities, or Plant (user-created) entities.
- **Drawings**: All drawings or just P&ID drawings.

### ➢ To select the source entities to be merged

1. With the **Advanced Selection** dialog box open, click **Entity Types**.
2. In the **Entity Type Selection** dialog box, under **Wiring**, select source wiring entities by doing one of the following:
   - Click **All** to select all the source domain wiring entities to be merged with the target domain.
   - Click **Default** to select only the source **default** wiring entities to be merged with the target domain.
   - Click **Plant** to merge the **plant** (user-created) entities from the source domain with the target domain.
3. To select the source drawings, in the **Drawings** section, do one of the following:
   - Click **All** to select all the source drawings to be merged with the target domain.
   - Click **P&ID** to select only source P&ID drawing names to be merged with the target domain.

    **Note**

   - When merging P&ID drawings, associated data such as specifications, tags, and so forth, is **not** transferred.

4. Click **OK** to close the **Select Entity Type** dialog box and return to the **Advanced Selection** dialog box after accepting the values.

## Specifying an Insertion Condition

You can specify an insertion condition for every selected source table. This way you instruct the Merger Utility to insert every selected source row of the selected source table, which complies with the table's insertion condition. Note that the insertion condition will affect only the source tables which you have selected to be merged. (See Selecting the Source Tables in this section, to learn how to select the source table to be merged.)

The insertion condition can contain any combination of the following:

- Source columns
- Operators or functions
- Alphanumeric values

### ➢ To specify an insertion condition

1. In the **Advanced Selection** dialog box, select the check box under the **Insert Only** column for the selected table. Use the horizontal scroll bar to display the pertinent section of the dialog box.

   This causes the Merger Utility to insert any source rows (of the selected source table) which comply with the condition specified in the adjacent **Condition** column.

2. Under the **Condition** column, type the appropriate insertion condition.

   **Caution**

   - Make sure you type the appropriate condition, as this will affect the merge process results.

The Merger Utility provides you with the following **inherent** operators and functions.

| Operator / Function | Descriptions | Example |
|---|---|---|
| = | Equal to | cpmnt_mfr = 'Shell' |
| > | Greater than | cmpnt_name > '101' |
| < | Less than | item_price < 100 |
| >= | Greater or equal to | num >= 10 |
| =< | Less than or equal to | item_price =< 30 |
| <> | Not equal to | prefix <> 'AA' |
| AND | Include the following expression in the filter combination | name AND num <> 0 |

| Operator / Function | Descriptions | Example |
|---|---|---|
| OR | Accept either the previous or the following expression in the filter combination | Loop OR line = ‘’ |
| NOT | Select the value opposite to the following expression | NOT (item_price = 0) |
| LIKE | Select a value that is similar to the one in the ‘%[value]%’ field | cmpnt_name LIKE ‘%AA%’ |
| IN | Select a value that is equal to one of those specified in the parentheses | cpmnt_name = IN (‘101’,’103’) |
| BETWEEN | Select a value which is within the following interval | item_price BETWEEN 100 AND 500 |
| IS NULL | Equal to NULL | Loop IS NULL |
| IS NOT NULL | Not equal to NULL | line IS NOT NULL |

**Tip**

- The above operators and functions are those used in the **WHERE** SQL statement. (See the User Guide of your database platform to learn more about database statements.)

You can also use special functions which are native to the source database.

The following table describes some of the most common functions. The source databases which provide each function are specified beneath the function name (in italics) in the **Function** column. The function output is described beneath the syntax example (in italics) in the **Example** column.

| Function | Descriptions | Example |
|---|---|---|
| LTRIM (<value>)<br><br>dBase<br>Sybase Adaptive Server Anywhere 7.0<br>Oracle 8i, 9i<br>SQL Server | Remove all leading spaces in the field indicated in the parentheses | LTRIM(cmpnt_mfr)<br><br>cmpnt_mfr = ‘ Shell’<br><br>⇓<br><br>LTRIM(cmpnt_mfr)=‘Shell’ |
| RTRIM(<value>)<br><br>dBase<br>Sybase Adaptive Server Anywhere 7.0<br>Oracle 8i, 9i<br>SQL Server | Remove all trailing spaces in the field indicated in the parentheses | RTRIM(cmpnt_num) IS NULL<br><br>cmpnt_num = ‘108-FT 100 ‘<br><br>⇓<br><br>RTRIM(cmpnt_num)=‘108-FT 100’ |
| SUBSTRING(<value>,<begin>,<count>)<br><br>dBase<br><br>Sybase Adaptive Server Anywhere 7.0<br><br>Oracle 8i, 9i | Retrieve a part of the field indicated in the [value] data field from the [begin] position for the number of characters | SUBSTRING(cmpnt_mfr,1,4)<br><br>cmpnt_mfr = ‘Shell’<br><br>⇓<br><br>SUBSTRING(cmpnt_mfr,1,4)=‘Shell’ |

| Function | Descriptions | Example |
|---|---|---|
| SUBSTR(<value>,<begin>,<count>)<br><br>SQL Server | indicated in the [count] field | SUBSTR (cmpnt_mfr,1,4)<br><br>cmpnt_mfr = 'Shell'<br><br>⇓<br><br>SUBSTR(cmpnt_mfr,1,4)='Shel' |
| UCASE(<value>)<br><br>DBase<br>Sybase Adaptive Server Anywhere 7.0 | The upper case format of the contents of the field | UCASE(cpmnt_name)<br><br>cmpnt_name = '101-aa'<br><br>⇓<br><br>UCASE(cmpnt_name)='101-AA' |
| UPPER(<value>)<br><br>Sybase Adaptive Server Anywhere 7.0<br>Oracle 8i, 9i<br>SQL Server | indicated in the [value] data field | UPPER(cpmnt_name)<br><br>cmpnt_name = '101-aa'<br><br>⇓<br><br>UPPER(cmpnt_name)='101-AA |
| LCASE(<value>)<br><br>dBase<br>Sybase Adaptive Server Anywhere 7.0 | The lower case format of the contents of the field | LCASE(Loop_name)<br><br>Loop_name = '101-AA'<br><br>⇓<br><br>LCASE(Loop_name)='101-aa |
| LOWER(<value>)<br><br>Oracle 8i, 9i<br>SQL Server | indicated in the [value] data field | LOWER(Loop_name)<br><br>Loop_name = '101-AA'<br><br>⇓<br><br>LOWER(Loop_name)='101-aa |

**Note**

- When a table is defined on a specified level, it contains data which is unique on that specified level. For example, the CABLE Table is defined per area. Therefore, the CABLE Table contains data which is unique only on the area level of the domain.

## Filtering and Sorting the Displayed Source Table List

You can filter and sort the displayed source tables. You do this by selecting the options in the appropriate parts of this dialog box.

**Note**

- Filtering and sorting the source data in this dialog box does not affect the results of the merge process.

### ➢ To filter and sort the displayed source table list

1. To sort the table list which is displayed in the **Advanced Selection** dialog box, do one of the following:

   - Click **By name** to list the source tables by table name
   - Click **By merger order** to list the source tables by the order in which they will be merged during the transfer process (the merging order).

   **Note**

   - You cannot change the merge order because it is automatically determined by the Merger Utility.

2. To filter the data which is displayed in the **Advanced Selection** dialog box, specify the filter conditions by doing one of the following:

   - Select **All** to display tables at all levels in the domain.
   - Select **Selected** to display only tables that were selected for merging.
   - Select **Per domain** to display only tables that relate to the domain level.
   - Select **Per plant** to display only tables that relate to the plant level.
   - Select **Per area** check box to display only tables that relate to the area level.
   - Select the **Per unit** check box to display only tables that relate to the unit level.

## Selecting Source Data Using the Comparison List

This option enables you to compare the source and target data before you select it to be merged. You can select entities to be compared either in batch mode (group mode) or one by one. If you use group mode, the Merger Utility allows you to save the comparison list in a number of file formats (PSR, DBF, XLS, and so forth). If you do not select group mode, the Merger Utility displays the comparison data in a special dialog box for each entity that you select in the **Compare Source-Target Data** window.

After running the comparison list, you should examine the comparison results carefully and select the required data transfer mode and transfer parameters. For example, you can determine whether you want to delete target data that does not exist in the source or whether you want to delete all the tags associated with a deleted loop, and so forth. You can also access specific comparison data, such as Specs, Process Data, Cross Wiring, Signals, and so forth, depending on the entity you selected to compare. Furthermore, you can customize the comparison list data display by filtering and/or sorting the data according to your needs.

## Defining Comparison List Options

Before comparing data in a session, you need to set the comparison list options.

You can determine whether to do any of the following:

- Include or exclude wiring data when comparing tag data.
- Include or exclude connections when comparing wiring data.
- Include or exclude complementary data in the comparison.

### ➢ To define comparison list options

1. With the **Merger Session Manager** window open, click  to display the **Compare Source-Target Data** window.

2. On the **Actions** menu, click **Options**.

3. In the **Merger Compare Data Options** dialog box, do the following to specify how the Merger Utility auto-selects and merges wiring information:

   a) If you selected **Tag** in the **Compare Source-Target Data** window, click one of the following settings under **Wiring selection by tag** to merge wiring data:

   - **No wiring** — The software includes no wiring data with the selected tags during the transfer: the wiring information of the target tags remains intact.

   - **Instrument wiring** — The software includes all the device panel and device cable data relevant to the selected tag be included, that is, only the field device panels and cables are created for the selected tags. If you select this option, make sure that you also select **Without connections** under **Selection by panel/cable**.

   - **All wiring** — The software includes the entire signal data that is relevant to the selected tag.

   b) If you selected the **Cable, Set, Wire (Plant)** and/or **Panel, Strip, Terminal (Plant)** options in the **Compare Source-Target Data** window, select one of the following settings to merge wiring data:

   - **Without connections** — The software includes no connection data with the selected entity during the transfer, that is, when selecting panels and/or cables, only their structure is selected. This is useful when merging or moving cables or panels from one domain to another. You can access the connection information by clicking **1 Side** in the comparison list and select the relevant rows.

- **With connections** — The software includes the relevant connection data during the transfer, that is, when selecting cables or panels, their connections are also selected. This option instructs the Merger Utility to select all the relevant panels, cables, tag numbers, loop numbers, and all the rest of the required data. You can refine the selection by canceling the selected connections.

c) Under **Complementary data**, beside each item, select the **Select** check box to merge complementary data (specifications, process data, hook-ups, loop module data, calibration data, custom field data, and other items).

## Defining a Comparison List Style

When displaying comparison data for an entity, you can specify which properties of that entity you want to appear in the comparison list by defining a style. By means of a style you can determine which columns are available, the order of the columns, column widths, column header text, and the appearance of the column header: border, background color, and overall height.

### ➢ To define a comparison list style

1. With the **Merger Session Manager** window open, click  to display the **Compare Source-Target Data** window.
2. Select an entity from the **Comparison Item Tree** and do one of the following:
   - On the **Actions** menu, click **Create Style**.
   - On the toolbar, click  .
   - Right-click the entity, and on the shortcut menu, click **Style**.
3. Specify the comparison list layout as follows:
   - Change the column sequence by dragging the column header to the required position.
   - Change the column widths by dragging the right border between the columns to the left or right as needed.
   - Adjust the overall column header height by dragging the lower border of the header up or down.
4. To change the header text, double-click inside the header to open the **Edit Column Name** dialog box and edit the text as required.
5. Do one of the following:
   - On the **Actions** menu, click **Style Properties**.
   - On the toolbar, click  .
6. In the **Comparison List Style Properties** dialog box, from the **Border** list, click the border type that you require for the header.

7. Select **View** beside each column that you want to appear in the style.

   **Tip**

   - To display all the columns, select **View all**; to display none of the columns, clear **View all**.

8. To choose a background color for the comparison list header, click **Color** to open the Windows **Color** dialog box, where you can specify the color that you require.

9. When done, click **OK** to accept the values and close the **Comparison List Style Properties** dialog box.

10. On the **Actions** menu, click **Save** to save the style for the selected entity.

11. On the **Actions** menu, click **Close** to return to the **Compare Source-Target Data** window.

## Comparing Data

You can compare data between the source and the target by opening a comparison list for a selected entity. You can then select which data items to merge. You can also specify the items that you want to display and print a report for the displayed items.

### ➢ To compare source and target data

1. With the **Merger Session Manager** window open, click  to display the **Compare Source-Target Data** window.
2. Select an entity from the **Comparison Item Tree** and do one of the following:
   - On the **Actions** menu, click **Compare Data**.
   - On the toolbar, click  .
   - Right-click the entity, and on the shortcut menu, click **Compare Data**.
   - Double-click the entity.
3. In the comparison list window for the selected entity, do one or more of the following:
   - To filter the data records to display, click  .
   - To sort the data, click  .
   - To specify which data columns to display, click  .
4. To create or modify a style for viewing a comparison list that is already open, do the following:
   a) Click  to return to the **Compare Source-Target Data** window.
   b) Select the entity and click  to open the **Style** window.
   c) Modify the style as required.
   d) In the comparison list window for the selected entity, click  to update the comparison list using the style properties.

5. Select the records for merging by doing one of the following:

   - Select the **Select** check box beside each data record that you want to merge.
   - To select all the data records, click  .
   - To clear the selection of all the data records, click  .
   - To select updated data records only, click  .
   - To select inserted data records only, click  .
   - To select deleted data records only, click  .

6. Select the data to display by doing one of the following:

   - To display all the data items, click  .
   - To display modified data items only, that is, where the source and target data differs, click  .
   - To display selected data items only, click  .

7. If a sub-entity comparison list is available, click the option you require on the **Reports** menu.

8. To generate a comparison list report, on the **Actions** menu, click **Report**.

9. To save the selection you made for merging, on the **Actions** menu, click **Save**.

## Working in Group Mode

Group mode enables you to make a batch selection of entities for comparison and subsequent transfer of data. You save the comparison data for subsequent inspection and analysis in an external file in a file format of your choice. After running the comparison list, you can open the saved external file to examine the data so that you can determine how to use the comparison list data.

**Caution**

- If you selected wiring entities or wiring information to be merged, do not change the settings you made in the **Merger Compare Data Options** dialog box. If you change these settings after selecting wiring entities in the comparison list, the new settings apply only to new comparison list selections. In any case, it is difficult to predict what happens when you merge data in this case, as sometimes there can be a relation between different entities that you select.

### ➢ To compare data using group mode

1. In the **Merger Session Manager** window, open the desired Merger Utility session.
2. Do one of the following:
   - On the **Actions** menu, click **Comparison List**.
   - Right-click the session, and on the shortcut menu, click **Comparison List**.
3. On the **Actions** menu, click **Use Group Mode**.
4. On the **Actions** menu, click **Group Mode Parameters**.
5. In the **Group Mode Parameters** dialog box, select **Save comparison list as report only** if you do not want to save the comparison results to the database. This saves the generated comparison reports as external files only. You have to make the appropriate selections under the **Save data in** section.
6. To automate the entity selection process, select the type of data to be selected under **Select data**:
   - **All** – This option selects all the existing entities (for example, tag, loop, panel, cable, and so forth) This option is recommended to get all the wiring and connection changes.
   - **Deleted** – This option selects the entities that appear in the target domain only.
   - **Inserted** – This option selects the entities that appear in the source domain only.

- **Updated** – This option selects the entities that exist both in the source and target and need to be updated.

- **Saved previously** – This option includes previously saved comparison data.

It is recommended selecting the **Deleted**, **Inserted**, and **Updated** options.

7. Under **Additional options**, select the required types of comparison reports to be generated based on the selections you made under **Select data**:

   - **1 Side** – This report is for cables and panels. It reports the wire and terminal connections.

   - **Cable levels** – Generate two additional reports for cables: cable sets and wires of the cable. (Not mandatory if **1 Side** is selected.)

   - **Panel level** – Generate two additional reports for panels: panel, strips, and sets and wires of the cable. (Not mandatory if **1 Side** is selected.)

   - **Jumper** – This report identifies the jumpers by listing the two terminals that the jumpers are connected to.

   - **Cross Wire** – This report identifies the crossed wires by listing the two terminals/strips and panel names that the crossed wires are connected to.

   - **2 Sides** – This report lists the connections on both sides of a terminal strip. Note that this report and the relevant comparison list data cannot be used to select connections: it is for your information only.

   - **Signal** – This report lists the connections for the selected tag numbers. Note that this report and the relevant comparison list data cannot be used to select connections – it is for your information only.

   - **Specs** – This report lists the differences in specifications. This is a generic report that displays the changed data only. You cannot select single attributes for an update.

   - **Process Data** – This report lists the differences in process data. This is a generic report that displays the changed data only. You cannot select single attributes for an update.

   - **For all data** – Generate comprehensive comparison reports for selected entities under **Additional options** (recommended).

   - **For selected data** – Generate comparison reports based on your selections under **Select data** for the entities selected under **Additional options**.

8. Click  to specify the path and format of the file in which you will save the comparison data. Several file formats are available, for example: .psr, .dbf, .xls.

   **Caution**

   - Make sure that you select the .psr format so that you can use the report in the merge process!

   After you make your selection, the **Group Mode Parameters** dialog box displays the information in the **Save data in** section.

9. Click **OK** to accept your selections and to return to the **Compare Source-Target Data** window.

10. Make your selections in the data window by clicking on the required entity. The selected entity changes its icon to  . All the sub-entities belonging to the selected entity are also selected automatically. You can select or deselect individual sub-entities if required as follows:

    a) Double-click an entity to expand it. (Some sub-entities may contain other sub-entities.)

    b) Click on the required entity to select or deselect it. Selected entities display  ; the entities that are not selected display their appropriate icons. Entities that display  have already been used in a previous run of the comparison list.

    **Caution**

    - To ensure correct merging of specification data, make sure that you select all the tag numbers associated with multi-tag specifications, especially the **master tag number**. If you do not do so, the specification information will not be updated.

11. On the **Actions** menu, click **Build Item List** if you want make additional source selections in the module list after running the comparison list. Note that selecting this option will slow down the merge process. Do not select this option if you do not intend to use the module list feature.

12. On the **Actions** menu, click **Generate Comparison List** to run the comparison list for the selected items.

    The Merger Utility starts the comparison procedure which may take some time depending on the size of the database tables. At the end of the comparison procedure, you can view the comparison reports by opening the appropriate PSR files.

## Running the Comparison List in Multi-Sessions

So as not to run out of computer resources, it is highly recommended that you run the comparison list in group mode in more than one session. Make sure that on the **Actions** menu, the **Build Item List** menu command is not selected (no check mark beside the command) — this speeds up the process. There is may be no need to create a table list for merging if you don't intend to use it at that time. The following table summarizes the recommendations for the multi-session procedure.

| | **Session A** | **Session B** | **Session C** | **Session D** | **Session E** |
|---|---|---|---|---|---|
| Mandatory: | No | Yes | Yes | Yes | No |
| Can be done per <unit>? | No | Yes | No | No | No |
| Long time for generation? | No | Yes | Yes | Yes | Moderate |
| Select items | Wiring Supporting Tables<br>Default Cables<br>Default Panels<br>Loop Drawings Module<br>Hook-Ups Module | Instrument Index Supporting Tables<br>Loop<br>Tag<br>Line<br>Equipment<br>P&ID<br>CS Tags | Panels (Plant) | Cables (Plant) | Restore Panel (Plant) PSR and run for Strip & Terminals Comparison List, then save |
| Group Mode Options | Select data – All<br>Cable Levels<br>Panel Levels<br>Save comparison list as report only<br>Note: Cable and panel levels are not mandatory. | Select data – All<br>Specifications<br>Process Data<br>Signal<br>Select the For all Data option<br>Save the Comparison list as report only.<br>If run on <unit> basis, save in different folders | Select data – All<br>Cross Wiring<br>2 Sides (optional)<br>Select the For all Data option<br>Save the Comparison list as report only.<br>Panel Levels (see session E) | Select data – All<br>1 Side<br>Select the For all Data option<br>Cable Levels (see session E) | The Panel and Cable Levels can be generated separately from the PSR files of the Panel & Cable to save the computer resources during the Group mode comparison. |

**Note**

- You can reduce the recommended selection of items by selecting fewer entities, depending on the comparison information required.

## Analyzing Comparison Reports

After the comparison reports are saved as PSR files (or any other type of file), you can print them out and start analyzing the data. If a field's value was changed, a U mode is assigned to this record and the changed column is highlighted with a light blue background.

The following example is for instrument type comparison.

| Select | Mode | Compone Function | Component Function Type Cmpnt Func Type Desc | Cable Cable Num | Panel Panel Name | Landing Type Landing Type Name |
|---|---|---|---|---|---|---|
| ☑ | U | FE | MASS FLOW SENSOR | | | |
| ☑ | U | FT | FLOW TRANSMITTER | 1 PAIR | DEFAULT FIELD DEVICE 2-WIRE | 2 In a row |
| ☑ | U | FT | MASS FLOW TRANSMITTER | 1 PAIR | DEFAULT FIELD DEVICE 3-WIRE | 2 In a row |

In the second row, the highlighted changes were made in the target table. In the source table, these fields do not contain data.

In the third row, the target table does not contain an entry while the source table does. That is why there are two rows. Sometimes the field is too short to display the entire record, which causes the text to auto-scroll. Note that this can also make the field appear as two rows. You can then stretch the column to make it longer.

To analyze the data, you need to print out the reports and mark changes you want to make on the printouts. In the case of the supporting tables, this is a simple task since these tables usually include two columns. All of the supporting tables are merged in one process since they are required for the main entities. Therefore, you do not need to worry about them so much.

Concentrate on the main entities:

- Loops and tags
- Instrument Type (although this is a supporting table)
- Cables
- Panels
- Analyze the changes in process data and specifications
- Connections (1 Side)
- Cross Wires
- Jumpers
- Control system tags:
  - Loop blocks
  - Hook-up drawings

Mark the reports (use color markers if possible), mainly for wiring changes.

## Checking for Duplicate Entities

Sometimes, when you create data, you can add spaces or other characters accidentally, so that what is intended to be the same record with updated data is in fact viewed by the database as a separate record. You can specify redundant characters that you want the software to ignore, and then you can run a check for duplicate entities based on the entity names without the redundant characters.

### ➢ To check for duplicate entities

1. With a **Merger Comparison List** dialog box open, on the **Actions** menu, click **Duplicates** to open the **Duplicate Entities** dialog box.
2. Click **Characters** to open the **Redundant Characters** dialog box.
3. Do one of the following:
   - Click **Add** to add a new row and type in the required character or string.
   - Select an existing character and modify it as needed.
   - Select a row and click **Delete** to remove that row from the list of redundant characters.
   - Click **Use Default** to clear all user changes and restore the default set of redundant characters.

   **Note**

   - You can type strings of up to 20 characters.

4. Click **OK** to return to the **Duplicate Entities** dialog box.

   **Note**

   - The **Identity Name** column displays the modified item name without the redundant characters, and selects any duplicate rows using background shading: the software selects the first instance using light blue shading and duplicate items using gray shading.

5. Under **View**, click one of the following options:
   - **All items** – All the entities derived from the comparison list appear.
   - **Selected items** – Only the entities you select for merging appear.
   - **Duplicate items** – Only the entities highlighted as duplicates appear.

6. Do one of the following:

- In the **Select** column, select the entities you want to include for data merging.
- Select the **Select all** check box to include all of the entities or clear the check box to include none of the entities.

**Note**

- Selecting or clearing **Select all** affects the displayed entities only.

## Restoring Saved PSR Files

Restoring .psr files enables you to avoid re-generation of the comparison list. Restore your existing .psr files if you are certain that they reflect updated data. If you are not sure that the .psr files contain updated data, re-generate the comparison lists either one at a time (not recommended) or in group mode.

### ➢ To restore a previously saved .psr file

1. In the **Merger Session Manager** window, open the desired Merger Utility session.
2. Define a new log file.
3. Define the required Merger Utility settings — the settings depend on the entities you are about to merge.
4. Do one of the following:
   - On the **Actions** menu, click **Comparison List**.
   - Right-click the session, and on the shortcut menu, click **Comparison List**.
5. In the **Compare Source-Target Data** window, highlight the entities that you want to include in the comparison.
6. On the **Actions** menu, click **Restore Comparison Data**.
7. In the **Select PSR File** dialog box, navigate to the .psr file that you want to restore.
8. On the **Actions** menu, click **Merge** to start generating the comparison lists.

## Making Individual Entity Selections

You can also select individual entities for comparison. You can expand the required entity and run the comparison list for the selected entity only. If the selected sub-entity contains other sub-entities, they will also be included in the comparison list for that entity. Expand this sub-entity and make your selections as required.

### ➢ Running the comparison list by making an individual entity selection

1. With the **Compare Source-Target Data** window open, make sure that on the **Actions** menu, the **Use Group Mode** menu command is not selected (no check mark beside the command).

2. Expand the items in the tree so that you can highlight the individual entity type for which you want to run a comparison list.

3. Do one of the following:

   - Double-click the selected entity type.
   - On the **Actions** menu, click **Generate Comparison List**.
   - Right-click the entity type, and on the shortcut menu, click **Generate Comparison List**.

   The Merger Utility starts running the comparison list. At the end of this process, the **Merger Comparison List** dialog box opens.

4. If available, select an option on the **Reports** menu to display the **Connection**, **Process Data**, and **Specifications** comparison data to facilitate the selection of rows to be merged. Note that some of these options are disabled if they are not relevant for the entity you selected in the **Compare Source-Target Data** window.

5. To customize the displayed data in the comparison list, on the **Actions** menu, point to **Display Records** and click one of the following options:

   - **All Records** — Displays all the available records.
   - **Selected** — Displays only those records selected for merging
   - **Modified** — Displays modified records only, where the source and target data differs.

6. Do one of the following:

   - Under the **Select** column, click the check box for each row you want to select to be merged.
   - Make a batch selection by right-clicking in the window, pointing to **Select Records** and clicking one of the commands: **All**, **Updated**, **Inserted**, or **Deleted** to specify the rows to include in the merge process.

7. On the **Actions** menu, click **Save**.

## Merging Supporting Tables

When merging supporting tables, note the following:

- **Instrument Index module**: When selecting tag numbers, the appropriate items from the relevant supporting tables will also be selected. Specific supporting tables can be also merged using the comparison list feature.
- **Wiring module**: Use the comparison list feature to merge specific Wiring module supporting tables. However, if a cable or a panel was selected by you or by the Merger Utility, previous selections will be ignored and the entire table will be merged. To merge data successfully, the entire entity environment must be included. This rule applies to both the Instrument Index and Wiring modules. Failure to select all the reference data may result in a chain reaction which will cause large amounts of data not to be merged. The Merger Utility makes sure that this situation does occur by selecting entire supporting tables to be merged.

## Guidelines for Selecting Entities and Defining Merger Settings

The following tables provide some specific guidelines to help you define the settings when merging various SmartPlant Instrumentation modules. Remember to define these settings **before** you select the entities to be merged. If you run merger several times to merge different tables, click **Clear all** to reset the previous selections.

| Selected Entity | Settings | Result | Comments |
|---|---|---|---|
| Instrument Types | **General:**<br>Update existing data<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables | Imports all references as per instrument type profile:<br>Wiring supporting tables, defaults for cable, panel and connection types<br>I/O Types<br>Location<br>Hook-ups and hook-up types<br>Specification forms | |
| Equipment | **General:**<br>Update existing data | Equipment type<br>Equipment custom fields | |
| Line | **General:**<br>Update existing data<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables | Line Type<br>PD insulation<br>Line and Line custom fields | |
| Loop | **General:**<br>Update existing data<br>Identical source and tag<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables | Loop Reference Tables<br>Loop and Loop custom fields<br>Specification forms | New loops will automatically be added if new tags are added from the source. |

| Selected Entity | Settings | Result | Comments |
|---|---|---|---|
| Tag Numbers – No Wiring | **General:**<br>Update existing data<br>Identical source and tag<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables<br>**Wiring Selections**<br>**Selection by Tag**<br>No Wiring<br>**Selection by Panel/Cable**<br>Without Connections | Wiring supporting tables<br>Associated instrument types<br>Associated index and loop tables<br>Loop drawing information<br>Blocks/cells and types<br>Process Data<br>Specifications and Revisions<br>Associated custom fields<br>Associated hook-up data | Merges all associated reference tables.<br>No wiring will be merged or changed for selected tag numbers.<br>Selecting **With Connections** will not affect/add any wiring data. |
| Tag Numbers – Instrument Wiring (Field Devices only) | **General:**<br>Update existing data<br>Identical source and tag<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables<br>**Wiring Selections**<br>**Selection by Tag**<br>Instrument Wiring<br>**Selection by Panel/Cable**<br>Without Connections | Wiring supporting tables<br>Associated instrument types<br>Associated index and loop tables<br>Loop drawing information<br>Blocks/cells and types<br>Process Data<br>Specifications and Revisions<br>Associated custom fields<br>Associated hook-up data<br>Field Device cables, panels, and their connections on the instrument side | Control System tags will not be merged<br>**IMPORTANT**: If the **With Connections** option is selected, additional panels, cables, and connections will not be added (junction boxes and marshaling racks) unless these are selected from Panel/Cable lists. |

| Selected Entity | Settings | Result | Comments |
|---|---|---|---|
| Tag Numbers – All Wiring | **General:**<br>Update existing data<br>Identical source and tag<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables<br>**Wiring Selections**<br>**Selection by Tag**<br>Instrument Wiring<br>**Selection by Panel/Cable**<br>Without Connections | Wiring supporting tables<br>Associated instrument types<br>Associated index and loop tables<br>Loop drawing information<br>Blocks/cells and types<br>Process Data<br>Specifications and Revisions<br>Associated custom fields<br>Associated hook-up data<br>Field Device cables, panels, and their connections on the instrument side<br>All associated panels and cables that the signals go through | Will only connect the wires associated with the selected tag numbers.<br>**CAUTION**: If the **With Connections** option is selected, additional panels, cables, and connections will be added for all the selected panels. |
| Cable or Panel (Plant or Default) | **General:**<br>Update existing data<br>**Comparison Options:**<br>Insert/Update<br>Include all reference tables<br>**Wiring Selections**<br>**Selection by Panel/Cable**<br>Without Connections | Merges the Panel/Cable structures without connections.<br>Panel/Cable supporting tables | Connections can be merged if selected from the **Merger Comparison List - Wire Terminal** dialog box. This will include additional information as required.<br>If you select connections (by cables) with signals, field device cables will be selected to be merged but they will not be connected.<br>The **Selection by Tag** setting has no effect in this case. |

| Selected Entity | Settings | Result | Comments |
|---|---|---|---|
| Cable (with connections)<br><br>**Caution**:<br><br>Working in this mode makes Merger select more panels, cables, and connections than selected. This is due to signal relations. If you are not sure, choose the Without connections option. | **General:**<br><br>Update existing data<br><br>**Comparison Options:**<br><br>Insert/Update<br><br>Include all reference tables<br><br>**Wiring Selections**<br><br>**Selection by Panel/Cable**<br><br>With Connections | Complete cable structures (cable/set/wires) and supporting tables.<br><br>All the panels / strips / terminals that are required to connect their wires.<br><br>Instrument Index – tag numbers and their loop and supporting table records.<br><br>Specifications and Process Data.<br><br>Loop and Hook-Ups module associated data (for tag numbers).<br><br>Wire connections.<br><br>All associated custom field data. | You can cancel the selection of cable connections in the<br><br>**Merger Comparison List - Wire Terminal** dialog box.<br><br>Additional panels, cables, and all their connections will be added and processed if connections with signals are involved.<br><br>The **Selection by Tag** setting has no effect in this case. |

| Selected Entity | Settings | Result | Comments |
|---|---|---|---|
| Panel (with connections)<br><br>**Caution:**<br><br>Working in this mode makes Merger select more panels, cables, and connections than selected. This is due to signal relations. If you are not sure, choose the **Without connections** option. | **General:**<br><br>Update existing data<br><br>**Comparison Options:**<br><br>Insert/Update<br><br>Include all reference tables<br><br>**Wiring Selections**<br><br>**Selection by Panel/Cable**<br><br>With Connections | Complete panel structures (panel/strip/terminals) and supporting tables.<br><br>All the cables connected to the selected panel / strip, including the cable supporting tables.<br><br>Instrument Index – tag numbers and their loop and supporting table records.<br><br>Specifications and Process Data.<br><br>Loop and Hook-Ups module associated data (for tag numbers).<br><br>Wire connections, including jumpers and cross wires connected to the selected panels / strips.<br><br>All associated custom field data. | You can cancel the selection of cable connections in the<br><br>**Merger Comparison List - Wire Terminal** dialog box. You can cancel the selection of jumpers and cross wires in appropriate dialog boxes.<br><br>Additional panels, cables, and all their connections will be added and processed if connections with signals are involved.<br><br>The **Selection by Tag** setting has no effect in this case. |

| Selected Entity | Settings | Result | Comments |
|---|---|---|---|
| Control System Tag<br><br>**Caution**:<br><br>If **With connections** is selected, the entire wiring chain of all cables is selected (not recommended). | **General:**<br><br>Update existing data<br><br>**Comparison Options:**<br><br>Insert/Update<br><br>Include all reference tables<br><br>**Wiring Selections**<br><br>**Selection by Panel/Cable**<br><br>Without Connections<br><br>**Selection by Tag**<br><br>No Wiring<br><br>**OR**<br><br>All Wiring (not recommended) | Appropriate data will be selected to be merged depending on the setting you select in the **Selection by Tag** section: **No Wiring** and **Instrument Wiring** will select the data required for tag assignment. If a field device exists, it will be merged too. The **All Wiring** option will select the entire signal data.<br><br>Instrument Index – tag numbers and their loop and supporting table records.<br><br>Specifications and Process Data.<br><br>Loop blocks.<br><br>All associated custom field data.<br><br>Associated hook-up data. | You will not need this option in most cases. However, if you do, the software will merge basic engineering, wiring, and other associated data. |
| External Blocks | N/A | Block Types<br><br>Blocks | |
| Tag & Block Association | N/A | FOR INFORMATION ONLY.<br><br>Not selectable to be merged. | Tag and block associations are merged when merging tag numbers |
| Item List | **Comparison Options:**<br><br>Insert/Update<br><br>Include all reference tables | Item List Library<br><br>Items List | Selecting the **Include all reference tables** option in the **Comparison Options** tab folder will merge the hook-types, hook-ups, and hook-up items |
| Hook-Ups | No special settings | Hook-up type<br><br>Hook-ups<br><br>Item Library and Items | |
| Tag and Hook-Up Association | N/A | FOR INFORMATION ONLY.<br><br>Not selectable to be merged. | Tag and hook-up association is merged when merging tag numbers. |

**Important Notes:**

1. Do not change the wiring selection options before starting the actual merge process. The software processes the selected rows and carries out the merge process in accordance with the settings.

2. When selecting the **With connections** option in the **Wiring Selections** tab folder, records that appear only in the target are marked as deleted and are selected automatically by the Merger Utility. These selections, in most cases, will be wrong and you will have to clear the **Select** the check box in the appropriate comparison list dialog box (for example, after clicking on the **1 Side** button in the Comparison List).

3. Exercise caution when using the **Delete** option in **Merge Options** dialog box, **Comparison Actions** tab folder. This option instructs the Merger Utility to actually carry out delete operations. It is possible that actual deletions will not be performed if the items to be deleted are associated with other entities. Double check the selected records after merging. Delete data directly in SmartPlant Instrumentation if results are not satisfactory. In most cases, you do not need to select the **Delete** option.

4. When selecting entities to be merged, especially Wiring and Instrument Index data, it is important not to select different entities within the same merging session. This is due to the fact that the Merger Utility processes your selections differently when it comes to tag numbers, cables, panels, and connections based on the pre-selected settings.

5. The final selection of tables and entities to be merged is determined when you click **Save** to close the **Merger Comparison List** window. You can browse the selected records of different entities. Click **Close** to close the window without saving your changes.

## Merging Jumpers and Cross Wires

Jumpers and cross wires are processed differently from ordinary cables since the Merger Utility has to connect both sides of the wires when adding them. To access the cross wires or jumpers, select a panel and in the **Merger Comparison List** window, on the **Reports** menu, click **Cross Wire** or **Jumper**. The dialog box displays the wires that are connected to the selected panels. Under **Records to select**, click the appropriate check boxes for the records that need to be inserted, depending on whether you selected **With connections** or **Without connections**.

You can select or deselect records as required. It is important to have all the jumpers and cross wires existing in the Wiring module for further processing.

Note that when you select a panel using the **With connections** option, the Merger Utility automatically selects the jumpers and cross wires.

## Merging Specification Forms that Include Custom Title Blocks

When you associate custom title blocks with specification forms, two methods of association are available:

- A separate special title block definition for each form
- A common standard title block definition used for all the forms in the domain.

When merging data in update mode, you must analyze your source and target databases to determine which option they are using for specification form custom title blocks. If the options are identical in both, or if the target uses the standard option, you can merge the data without any problems.

If the source database uses the standard option, and the target uses the special option, you are likely to lose data after merging. In this case, your System Administrator must change the **Custom title block assignment method** option in the source domain from **Standard** to **Special**.

## Customizing the Comparison List Display

The Merger Utility enables you to customize the comparison list data display. You can filter and or sort the data according to your needs. You can select the columns you want to view, in which case the other columns will not be displayed. It is also possible to display only the data lines that you selected for the merge process (selected check boxes in the **Select** column). Another way of choosing the rows to display is to select the **By mode** option. In this case, you can display deleted, inserted, and or updated rows.

## Filtering the Comparison List Data

This option enables you to filter the rows displayed in the comparison list. You can specify a filtering condition that will filter the comparison list data.

Note that filtering the comparison list rows will not affect the selection and row sorting you made prior to filtering the comparison list data.

### ➢ To filter the comparison list data

1. With the comparison list open, on the **Actions** menu, click **Filter** to open the **Merger Comparison List Filter** dialog box.

2. To include a field in the filter condition, double-click the required field in the **Field list** and it will appear in the editable data window at the top of the dialog box.

3. Enter the required filter condition by either typing it in directly in the data window or by selecting the appropriate operators and functions.

4. Click **OK** to accept the filter condition and return to the comparison list.

## Displaying Specific Columns

This option enables you to select the data columns that you want to be displayed in the comparison list.

➢ **To display specific data columns in the comparison list**

1. With the comparison list open, on the **Actions** menu, click **View** to open the **Select Columns for Viewing** dialog box.

2. Under **Column list**, drag the required columns to be displayed to **Columns to view**. Only the columns that appear under **Columns to view** will be displayed in the comparison list.

3. If the comparison list currently does not display all the available rows, you can select the check boxes **Select All** to display all the columns in the comparison list, or **Include modified columns** to display only those columns that contain changed data.

4. Click **OK** to accept your selections and return to the comparison list.

## Sorting the Comparison List Data

This option enables you to sort the comparison list data. You can select any number of columns to use for sorting the data.

### ➢ To sort the comparison list data

1. With the comparison list open, on the **Actions** menu, click **Sort** to open the **Select Columns for Sorting** dialog box.

2. Under **Column list**, drag the required columns to be used for sorting to **Sorted columns**. The data will be sorted according to the columns that appear under **Sorted columns** in the order that they appear.

3. To remove a column to be used for sorting, drag it from **Sorted columns** to **Column list**.

   **Note**

   - To change the sort order, drag all the columns to **Column list**, and then drag them in the required order under **Sorted columns**.

4. Click **OK** to accept your selections and return to the comparison list.

## Displaying a Comparison List for a Sub-Entity

This option enables you to display additional detailed comparison data pertaining to a sub-entity (if available).

**Note**

- The information in the comparison list for sub-entities is not editable.

The following table indicates the entities for which sub-entities are available.

| Main Entity | Sub-entities Available for Comparison |
|---|---|
| Line | Process Data |
| Tag | Signal, Process Data, Specs |
| Panel | 1 Side, 2 Side, Cross Wire, Jumper |
| Strip | 1 Side, 2 Sides |
| Terminal | 1 Side, 2 Sides |
| Cable | 1 Side |
| Cable Set | 1 Side |
| Wire | 1 Side |

### ➢ To display a sub-entity comparison list

1. With the comparison list for the selected entity open, on the **Reports** menu, click the appropriate command to open the **Merger Comparison List** dialog box for the required sub-entity.
2. Under **View**, click **All** or **Changed data only** as required to filter the data to be displayed.
3. Click **Print** to print out the data.
4. Click **Close** to return to the comparison list.

**Note**

- When the **2 Sides** option is selected for panels, strips, or terminals, if some of the connection data was changed, the merge mode will be U (update), and both the previous and current values will appear in the same field. Fields that contain no data signify that the selected panel has no wiring on that side.

## Monitoring the Transfer Process

At this stage, you carry out the actual data transfer, after you have selected the source and target data and matched one to the other.

**Caution**

- You will not be able to change the Merger Utility process parameters after you start the data transfer.

### ➢ To start the transfer process

1. With the **Merger** dialog box open, click **Merge** to start the transfer process.
2. At the prompt, click **Yes** to start the data transfer.

   **Note**

   - If you encounter memory problems or you want to make the data transfer process faster, refer to Preliminary Configuration to learn how to speed up the transfer process or free memory resources during the transfer process.
3. In the **Merger Progress** dialog box, click **Stop** if required at any point during the transfer process to stop the current data transfer process.

   **Note**

   - If you stop the transfer process, the Merger Utility skips all the rows of the currently processed table. You can resume the transfer process in the current merge session (by clicking **Continue**) or in another merge session (after exiting the current merge session). When you resume the transfer process, the Merger Utility restarts the merge of the last table from which you left off.
4. On completion or stopping of the transfer process, click **OK** to close the notification message.
5. In the **Merger Progress** window click **Cancel** to return to the **Merger** dialog box.

You have successfully copied data from a source domain to a target domain.

Now you can:

- Start SmartPlant Instrumentation and enter the appropriate target domain to view the results of the merge.
- View the log file to examine information about the merge results of the current merge process (see Working with Log Files to learn how to view the log file contents).

## Preliminary Configuration

**Caution**

- We recommend that you do not configure the Merger Utility unless it is absolutely necessary.

This feature provides you with the means to control the data flow during the merge process. You can also use this feature to select the application to view the log file. In most cases, you do not need to use this feature. However, you can use it if you encounter the following problems:

- The merge process is slow.
- Your computer has insufficient memory resources to perform the merge process.
- The current application which is used to view the log file cannot handle the current log file (for example, due to the size of the log file).
- This procedure enables you to:
- Speed up the transfer process.
- Free memory resources for the transfer process.

### ➢ To perform a preliminary configuration

1. On the **File** menu, click **Preferences**.
2. Click the **Data Flow** tab.
3. Do one of the following to determine how fast the software merges data:
   - Leave the contents of the fields unchanged (the default values are: 1000 rows in the **Source rows to retrieve** data field, and 500 rows in the **Target rows to commit** data field).
   - Type a larger number of rows than the current default values. This way you speed up the merge process.
   - Type a smaller number of rows than the current default values. This way you free memory resources but it may slow down the merge process.

   **Note**

   - Make sure you do not exceed your memory capacity as this may cause the merge process to fail during the data transfer.

4. To see the effect of the new settings, continue with the merge process.

## Post Merging Actions

After the merge process has been completed (in one or several sessions), it is recommended to test the results. In some cases, there might be a need to do some re-propagation of tag numbers in the Wiring module (some manual adjustments may be required in the database). This is due to tag numbers that were created in one database in the field, but in the other database they originated in a DCS or PLC.

For a large quantity of data, it is recommended running the comparison lists again to verify that all new entities were inserted and there are no missing connections or cross wires.

# Appendix A

## Configuring Your Environment

When you install the software, the Merger Utility settings are automatically configured in the appropriate configuration files. See your database manual to learn more about your database configuration.

In a Windows 2000 or Windows XP environment, the database configuration settings are located in the following registry folders:

- HKEY_CURRENT_USER\Software\ODBC\ODBC.INI
- HKEY_LOCAL_MACHINE\SOFTWARE\ODBC\ODBCINST.INI

**Caution**

- Do not change the setting in the configuration files if you are not familiar with the database configuration.

# Appendix B

## Naming Convention Rules

When the Merger Utility transfers data from a source domain into a target domain, the source and target domains must have applicable naming convention standards. This is important because some naming convention standards cannot be merged into other naming convention standards.

The naming convention standards define the structure of the naming convention in the domain. The possible standards are ISA, Loop, Flexible, and Free.

The Domain Administration determines the naming convention standard when creating the domain in the Administration module.

After you select the source domain in the **Merger** dialog box, the Merger Utility automatically checks the source and target naming convention standards. If the source and target naming convention standards cannot be merged, an appropriate message is displayed, in which case you will have to select a different source/target domain. The following table describes the applicable source and target naming convention standards, which are supported by the Merger Utility.

| Source Standard | Target Standard | Is merging possible? |
|---|---|---|
| ISA | ISA | Yes |
| ISA | Loop | No |
| ISA | Free | Yes |
| ISA | Flexible | No |
| Loop | Loop | Yes |
| Loop | ISA | Yes |
| Loop | Free | Yes |
| Loop | Flexible | No |
| Free | Free | Yes |
| Free | ISA | No |
| Free | Loop | No |
| Free | Flexible | No |
| Flexible | ISA | Yes |
| Flexible | Loop | Yes |
| Flexible | Free | Yes |
| Flexible | Flexible | Yes |