



AVEVA Instrumentation
Instrument Designer
User Guide

AVEVA Solutions Limited

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Instrumentation Designer User Guide

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Instrumentation Designer User Guide

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1 Introduction

The Instrument Designer User Guide is designed to help users learn how to use the Instrument Designer module of AVEVA Instrumentation. The User Guide describes how to create automated Loop and Termination diagrams from cable and wiring data.

Instrument Designer manages all tasks typically handled by an Instrument Designer during a project life cycle including CAD drawing generation, drawing list management, updating of revisions and printing of CAD files for loop diagrams, termination diagrams, Hookups etc. Instrument Designer can be used to:

- Manage all project drawings and drawing revisions (including batch update, batch revision changes and plotting) from a Graphical User Interface.
- Generate loop drawings from templates with updated attributes from the AVEVA Instrumentation database including:
 - Data from Instrument Engineer (Manufacturer, model number., range, P&ID drawing numbers., I/O etc).
 - Data from AVEVA Instrumentation Wiring Manager (Cables, terminations, wire numbers etc).
 - Data from the Instrument Designer drawing register (e.g Drawing No, Title, Drawn By, Date etc) and revision history is automatically updated on all drawings.
- Generate Termination drawings parametrically from the AVEVA Instrumentation database including:
 - Data from AVEVA Instrumentation Wiring Manager (terminal strips & devices, cables and core markings/wire numbers etc).
 - Data from the Designer drawing register (e.g Drawing No, Title, Drawn By, Date etc) and revision history is automatically updated on all drawings.
- Generate Hookup drawings with Bill of Materials and create bulk Bill of Materials reports for an entire project.
- Access Engineering Data created with other AVEVA Instrumentation applications including:
 - Instrument and Loop data created with the Instrument Engineer application.
 - Auto generate field device wiring including Junction Box termination via AVEVA Instrumentation [Using Wiring Rules to Create Data](#).
 - Access Termination data created with the AVEVA Instrumentation Wiring Manager application.
- Produce reports:
 - Drawing List.
 - Changes to Drawings.

AVEVA Instrumentation Designer utilises Autodesk's AutoCAD application to allow:

- Industry standard drawing/document exchange (data is never lost in a proprietary database).

- AutoCAD is used to define loop diagram layout. Users have total control over drawing standards, symbology and drawing format.
- AutoCAD attributes are “linked” to the database for data transfer to each drawing. That is any information that is changed in the AVEVA Instrumentation database (e.g. a Tag Number, Cable No, wire marking etc) is automatically updated in the appropriate drawing (the next time it is updated - updating can be done in batch mode).
- Print/update any number of selected drawings via the Drawing List (Drawing Register).

Loop data entry forms in Instrument Engineer and Wiring Termination forms in Wiring Manager can be accessed directly from within Instrument Designer. Licenses for AVEVA Instrumentation Engineer/Wiring Manager are required to access these forms.

Important: Instrument Designer uses data created by Instrument Engineer and AVEVA Instrumentation Wiring Manager to generate CAD drawing files automatically from the AVEVA Instrumentation project database. Normally this is the last AVEVA Instrumentation module used on a project as Instrument Engineer is used to create instruments tags and assign tags into 'loops'. AVEVA Instrumentation Wiring Manager is used to create equipment, cables and wiring including terminations. Without this data Instrument Designer cannot create completed drawing files.

For more information refer to [Feature Overview](#).

1.1 Feature Overview

Instrument Designer handles automated generation of CAD drawings from multi-user project/plant databases. It manages the process of CAD drawing creation, drawing revision update, transferring of data to drawings, parametric creation of termination (wiring) drawings and printing CAD files.

Drawing List Management

- Add/Edit/Update/Delete/Open drawings from the Drawing List (register) manually.
- Add loop drawings automatically from Instrument Engineer's Loop List.
- Add termination drawings automatically from Wiring Manager's Equipment List.
- Manage drawing revisions (update all selected in “batch” mode).
- Create new revisions using next revision number or Update current revisions with new information.
- Updates all drawing data:
 - Drawing title block from Drawing List (titles, drawing no, plant area etc).
 - Revisions from Revisions history.
 - Engineering Data from any Instrumentation database field.
- Link drawing text fields to any user defined database field using AVEVA Instrumentation Datalinks or SQL queries.
- Create/update and print selected drawings in batch mode.
- Print selected drawings in batch mode.

Loop Drawing Generation

- Create multiple drawings based on user templates (fully user definable).
- Edit drawings and update existing drawings without templates.

- Updates cable/termination data from Wiring Manager (e.g. Cable, Terminal and Wire Numbers etc.).
- Updates Instrument data from Instrument Engineer (e.g. P&ID No, Manufacturer, Model No., Range, DCS/PLC I/O information etc.).
- Updates title block information (titles, revisions etc) and stacks revision history.

Termination Drawing Generation

- Creates drawings based on:
 - Templates (typically termination schedules).
 - Parametrics/Automated drawing (typically termination diagrams) - user defined parameters - fully automated drawing creation.
- Updates cable/termination data from Wiring Manager (e.g. Cable, Terminal and Wires No.'s).
- Supports cross-patch wiring and links between terminals.
- Supports automatic continuation over multiple drawings (e.g. Marshalling Racks etc).
- Supports automatic reference drawing numbers to loop diagrams for field cables & To/From equipment & drawing numbers for termination drawings.
- Updates title block information (titles, revisions etc) and stacks revision history.

Hookup/Installation Drawings

- Assign tags to Hookup Type (Hookup drawings are user definable using AutoCAD).
- Assign Hookup Items from user definable catalogue (AVEVA Instrumentation currently has over 3000 catalogue items already entered).
- Auto create Drawings with Bill of Materials and Tag List.
- Project Bill Of Materials (BOM) reports (by Plant Area and Total Project BOM).

Change Management

- Report all drawings added, deleted and renamed.
- Report detail changes in each field (e.g. Drawing No. now ABCD was XYZ).
- Log changes for future reporting (e.g. 8/7/99 Drawing No. XYZ: Cable No. 1234 was 4567 etc).
- [Audit Manager](#) enables users to view changes by object type.

Integration

The Designer is integrated with other AVEVA Instrumentation applications.

- Loop Drawings automatically added to Drawing List from Engineer.
- Tag Numbers, service, range, manufacturer, model no. etc updated from Engineer.
- Equipment, cables, terminations, wire numbers. etc automatically updated from Wiring Manager.
- Loop Drawing No. is passed to Instrument Engineer's Instrument List (Index).
- Hookup Drawing number is passed to Instrument Engineer's Instrument List (Index).

Designer can be used on any existing AutoCAD drawings and allows drawings to be updated from the Instrumentation databases (Instrument Engineer, Wiring Manager or user defined) without requiring use of templates. For example, several loop drawings could be initially generated from a standard loop definition (template), then any number can be edited and made non-standard, but the information can still be updated automatically from the original databases.

Reports and associated data can be exported to AVEVA NET.

User Security Rights

An AVEVA Instrumentation administrator can set security rights for users to enable/disable access to AVEVA Instrumentation functionality including:

- Access to AVEVA Instrumentation application modules - users can be restricted from using any module (license).
- Access to AVEVA Instrumentation objects can be restricted to read-only (e.g. a user cannot add/edit a drawings) or no access (i.e. the user cannot view an instrument etc.).

AVEVA Instrumentation objects include project entities such as cables, instruments, drawings, reports etc and catalogues, the importing of data etc.

By default all new projects have the Security Rights features disabled for backward compatibility with earlier versions of AVEVA Instrumentation. If security is required it must be turned on using the Security Manager. Users must then be allocated to 'Security Groups' such as Engineers and Designers, Read-Only Users etc. Refer to the Security Manager documentation for more information.

1.2 System Requirements

For the minimum system requirements needed to run AVEVA Instrumentation, refer to the [Installation User Guide](#).

1.3 AVEVA Instrumentation

For an overview of AVEVA Instrumentation, its features and benefits, refer to the [Common Functionality User Guide](#).

1.4 Guide Structure

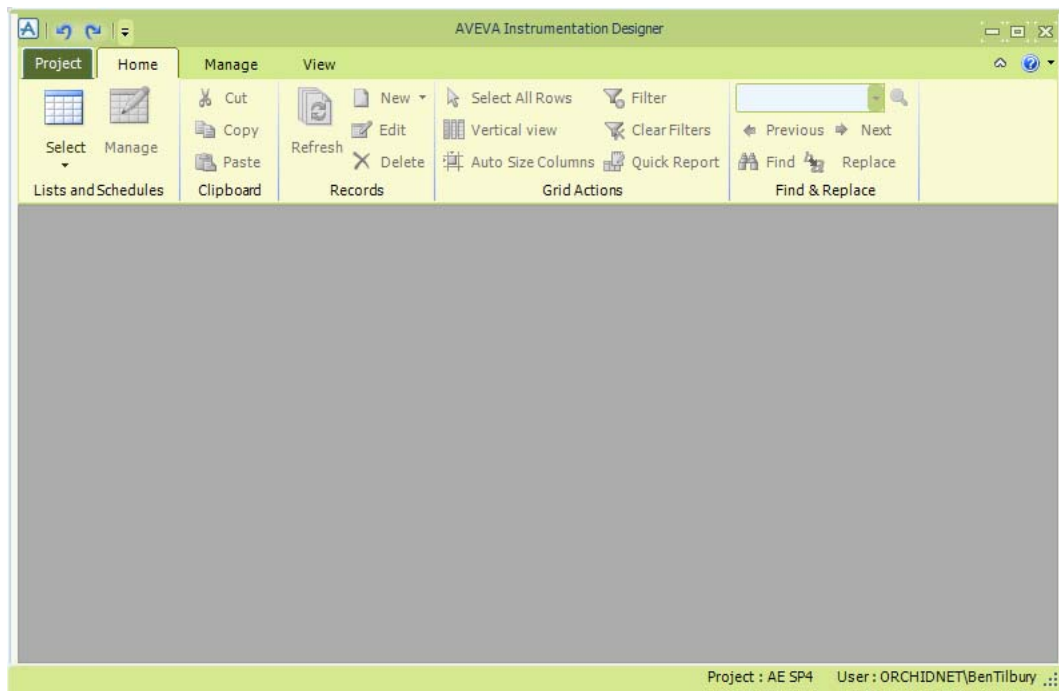
Introduction	a brief description of Instrument Designer.
User Interface	begins by displaying the View tab of Instrument Designer.
Options	describes how to set various Designer options and preferences
Areas	all objects are based on Plant Areas, once the project is setup the first task is to add the various plant areas to the project database.
Drawing List	is the main Designer window for adding/editing and accessing drawings.
Drawing Generation	how Designer generates CAD drawings from the Drawing List.
Hookups	drawings are created by assigning a pre-defined Hookup Template to each project hookup drawing.
Engineering Data	allows access to the Instrument Engineering data normally created by the Engineer application.

<i>Using Wiring Rules to Create Data</i>	to auto generate typical field instrument wiring/cabling.
<i>Exports</i>	includes facilities to export files of item data and report PDF files for import into AVEVA NET.
<i>Work Packs</i>	can be created with selected equipment and time scales for a particular project.
<i>Change Reports</i>	has an in-built Audit Manager that enables users to view database changes made during the project in the database audit log.
<i>Reports</i>	that enables users to create and modify reports.
<i>AVEVA NET Export Configurations Files</i>	explains the configuration required for AVEVA NET Export.

2 User Interface

Important: Instrument Designer uses data created by Instrument Engineer and Instrument Wiring Manager to generate CAD drawing files automatically from the AVEVA Instrumentation project database. Normally this is the last AVEVA Instrumentation module used on a project, as Instrument Engineer is used to create instruments tags and assign tags into 'loops' and Instrument Wiring Manager is used to create equipment, cables and wiring including terminations. Without this data Instrument Designer cannot create completed drawing files.

When Instrument Designer starts up the AVEVA Instrumentation Designer window is displayed showing the **Home** tab.



The **Select an AVEVA Instrumentation Project** window is also displayed.

Continue at:

- [Open an AVEVA Instrumentation Project](#)
- [Instrument Designer Tabs](#)
- [Select a Language](#)

- [Select a Colour Scheme](#)
- [Working with the Data Grid](#)
- [Finding and Replacing Text in a Grid](#)
- [Advanced Grid Filters](#)
- [Grid Manager](#)
- [Using PickLists](#)
- [Claims](#)

2.1 Open an AVEVA Instrumentation Project

When an AVEVA Instrumentation module is started, the **Select an AVEVA Electrical Project** window is displayed, from which the required project can be selected. refer to the [Common Functionality User Guide](#) for details.

2.2 Instrument Designer Tabs

On opening, the Designer module displays four tabs: Project, Home, Manage and View. Once a grid is opened, an additional "List Tools" tab, named after that grid and containing commands specific to that grid, is displayed (if there are any).

The rest of this section describes those tab options specific to Designer.

For details of options common to all Instrumentation modules, refer to the [Common Functionality User Guide](#).

2.2.1 Project Tab

The **Project** tab includes the following Designer-specific options:

Setup Sub Menu:

Loop Titles (Import format)	Displays the Loop Import Drawing Titles Settings window. Refer to Drawing Title Setup Preferences .
Termination Titles (Import format)	Displays the Termination Import Drawing Titles Settings window. Refer to Drawing Title Setup Preferences .
Enhanced Cable Block Diagrams Titles (Import Format)	Displays the Enhanced Cable Block Diagrams Import Drawing Titles Settings window. Refer to Drawing Title Setup Preferences .
Set Export File Name/ Folders	Displays the File Export Settings window. Refer to Export Drawings to Pre-Defined Folders with File Names in a Pre-Defined Format
Drawings Export to External System Configuration	Displays the Export to External System Configuration window. Refer to Drawing Publishing .

2.2.2 Home Tab

The following Designer-specific options are accessed from the **Select** option in the **Lists and Schedules** section:

Under the **List** heading:

Drawing List	Displays the Drawing List grid view.
Template List	Displays the Template window showing all project Template files, which may then be opened in AutoCAD. Refer to Open a Template Drawing with AutoCAD .
Hookup Drawing List	Displays the Hookup Drawings List grid view showing only hookup drawings and hookup specific commands. Refer to Hookups .
Seeds	Displays the Seeds grid view. Refer to Seeds List .
CBD Seeds	Displays the CBD Seeds grid view. Refer to Enhanced Cable Block Diagram Seeds List .
Reports	Display the Reports grid, showing Designer-specific reports. Refer to Reports .

Under the **Catalogue** heading:

Hookup Catalogue	Displays the Hookup Catalogue grid view. Refer to Hookups Template Catalogue .
Hookup Items Catalogue	Displays the Hookup Items Catalogue grid view.

2.2.3 Manage Tab

The **Manage** tab includes the following Designer-specific options:

In the **Integration** section:

Publish to AVEVA NET	Used to export data to AVEVA NET. Refer to Export to AVEVA NET .
-----------------------------	--

In the **Import** section:

From Other Project	Used to import Hookup drawing templates and Hookup catalogue items from another Instrumentation project. Refer to Import Hookup Catalogue
---------------------------	---

2.2.4 View Tab

All options on the **View** tab are common to all AVEVA Instrumentation modules.

2.2.5 List Tools Tab

The **List Tools** tab contains options specific to the grid which is currently being viewed. If no grid is open, or if the current grid has no grid-specific options, the tab will not be displayed.

The name of the tab will be the name of the current grid.

For details of the options on this tab, refer to the appropriate grid topic.

2.3 Select a Language

If required, a different language can be selected. For a description of this functionality, refer to the [Common Functionality User Guide](#).

2.4 Select a Colour Scheme

If required, a different colour scheme can be selected. For a description of this functionality, refer to the [Common Functionality User Guide](#).

2.5 Working with the Data Grid

For a description of the generic functionality of the Data Grid used in all AVEVA Instrumentation applications, refer to the [Common Functionality User Guide](#).

2.6 Finding and Replacing Text in a Grid

Any text string within a grid can be found, highlighted and optionally replaced. For a description of this functionality, refer to the [Common Functionality User Guide](#).

2.7 Advanced Grid Filters

Advanced (complex) filters can be applied to a grid. For a description of this functionality, refer to the [Common Functionality User Guide](#).

2.8 Grid Manager

The Grid Manager allows users to define their own sets of data fields (columns), default column orders, default sorting and predefined data filters for most grids. For a description of this functionality, refer to the [Common Functionality User Guide](#).

2.9 Using PickLists

Many grid cells and window fields can be, or must be, completed by selecting from lists of values. These “Pick Lists” can be edited if required. For a description of this functionality, refer to the [Common Functionality User Guide](#).

2.10 Claims

If a user attempts to edit an item which is currently being edited by another item, a message is displayed to inform the user that the item is locked. For details of how to unlock claims, refer to the [Common Functionality User Guide](#).

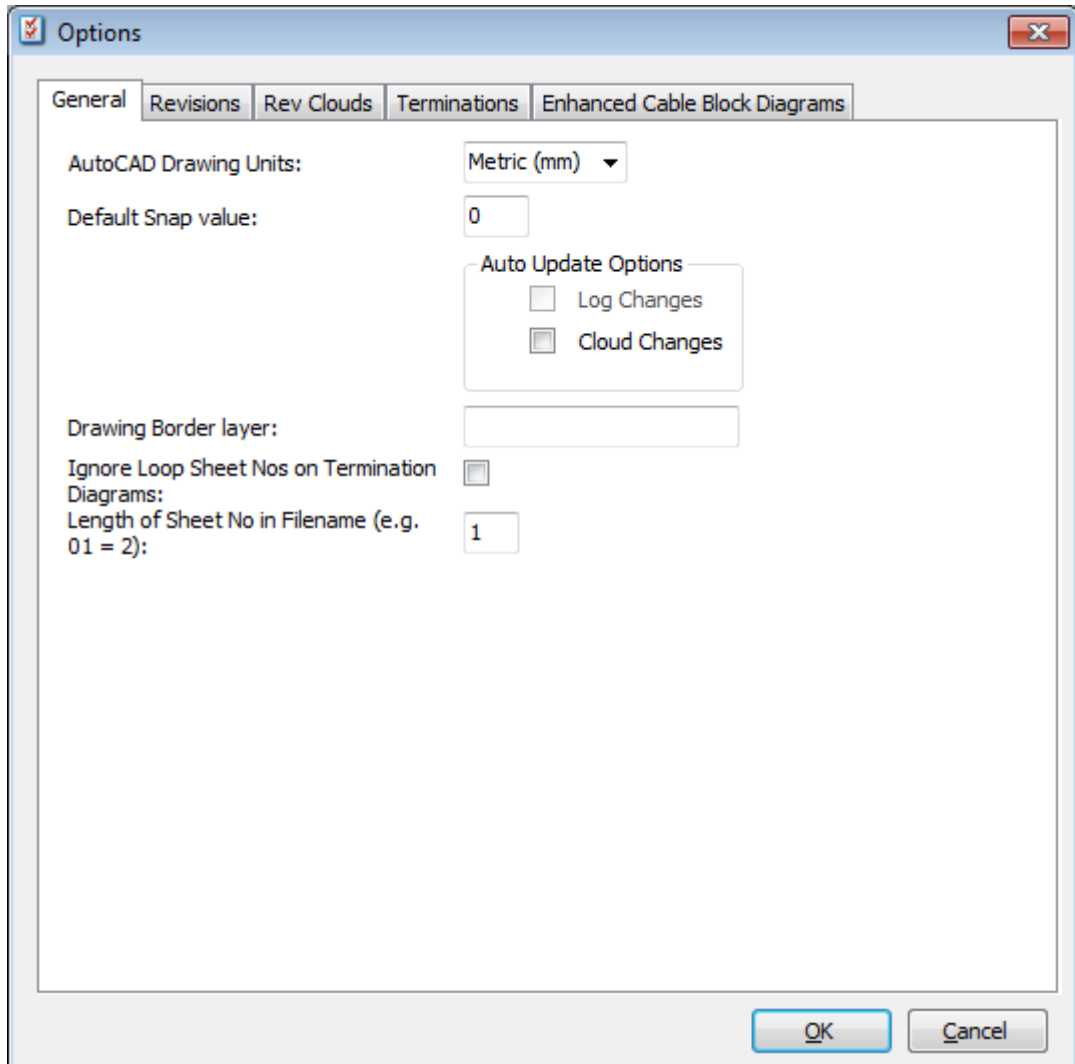
3 Options

The **Options** window is used to view and edit preferences for drawings generated by Designer. To open the **Options** window, select **Options** from the **Project** tab.

The window includes five tabs. Continue at:

- [General Tab](#)
- [Revisions Tab](#)
- [Rev Clouds Tab](#)
- [Terminations Tab](#)
- [Enhanced Cable Block Diagrams Tab](#)

3.1 General Tab



From the **AutoCAD Drawing Units** list, select Metric (mm) or Imperial (inch).

Enter the default snap value in the **Default Snap value** field.

Note: The **Log Changes** checkbox is not currently used.

In changes to drawings are to be automatically highlighted by clouds, check **Cloud Changes**. The appearance and other preferences for clouds are specified on the Rev Clouds tab (see below).

Enter the drawing layer to be used for drawing borders in the **Drawing Border layer** field.

If loop sheet numbers are to be ignored on termination diagrams, check **Ignore Loop Sheet Nos on Termination Diagrams**.

Enter the number of characters to be used for sheet numbers in file names in the **Length of Sheet No in Filename** field.

3.2 Revisions Tab

The screenshot shows the 'Revisions' tab in a software options dialog. It contains several settings for maximum revision counts and a 'Name Captions' section.

Setting	Value
Maximum Number of Loop Revisions:	6
Maximum Number of Term Revisions:	6
Maximum Number of Hookup Revisions:	6
Maximum Number of Schematic Revisions:	6
Maximum Number of Designer Revisions:	6
Maximum Number of KOL/SLD Diagram Revisions:	6
Maximum Number of Enhanced Cable Block Diagram Revisions:	6

Name Captions

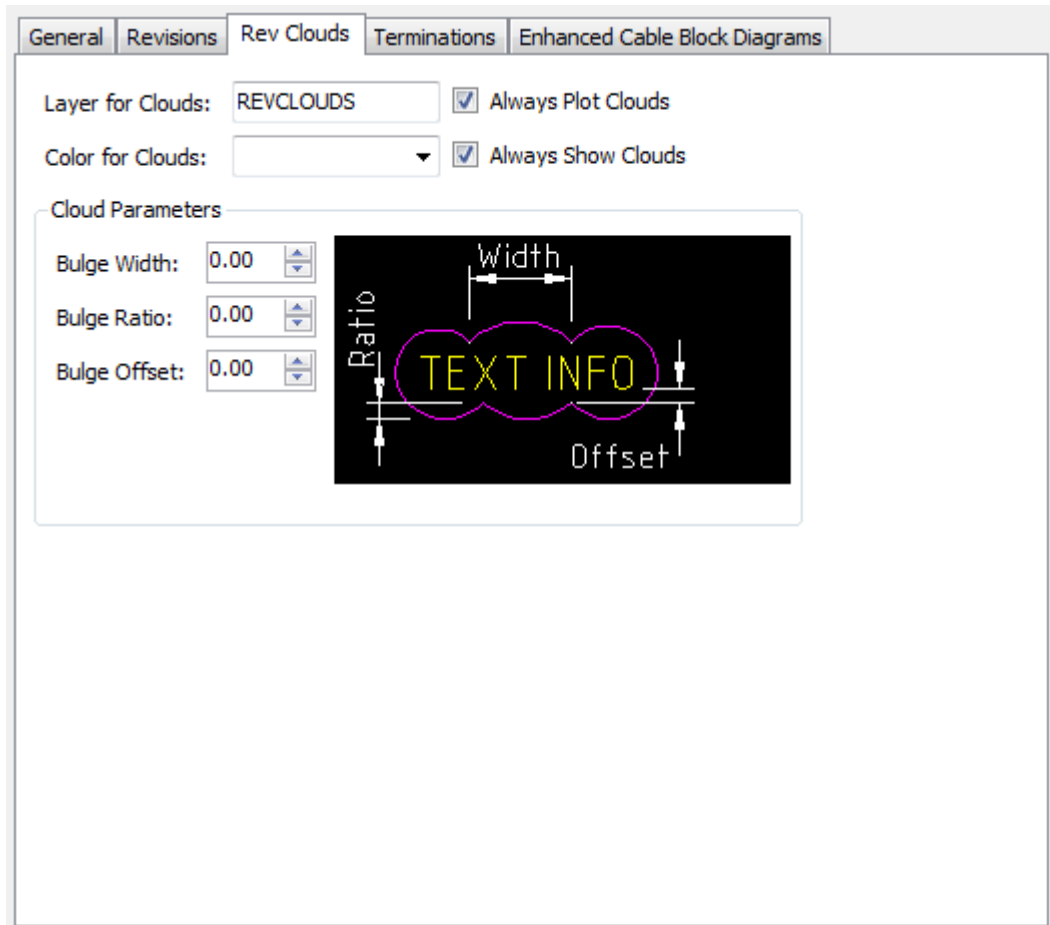
Use:	Field Name:	Caption:
<input checked="" type="checkbox"/>	By	
<input checked="" type="checkbox"/>	Checked	
<input checked="" type="checkbox"/>	Approved	
<input type="checkbox"/>	Other Info 1	
<input type="checkbox"/>	Other Info 2	
<input type="checkbox"/>	Other Info 3	

Enter the maximum numbers of loop, termination and hookup revisions that are to be listed on drawings in the fields provided.

In the **Name Captions** section of the tab, specify which details are to be displayed for each drawing revision (e.g. By, Checked, Approved etc) by checking the appropriate checkbox.

If the caption for a revision detail is to be other than the default caption, enter the required caption in the field provided. For example, if "Reviewed" is to be used instead of "Checked", enter "Reviewed" in the **Caption** field for the Checked caption.

3.3 Rev Clouds Tab



Changes to drawings are automatically highlighted using revision clouds if the **Cloud Changes** checkbox on the General tab (see above) is checked.

Enter the drawing layer to be used for revision clouds in the **Drawing Border layer** field.

Select the colour of clouds from the **Color for Clouds** list.

If clouds are always to be plotted, check **Always Plot Clouds**.

If clouds are always to be shown, check **Always Show Clouds**.

Enter the width, ratio and offset of the cloud bulges in the **Cloud Parameter** fields.

3.4 Terminations Tab

General	Revisions	Rev Clouds	Terminations	Enhanced Cable Block Diagrams
Term Strip Marking Text Height:	<input type="text" value="5"/>	Cable Length:	<input type="text" value="55"/>	
Terminal Strip Width:	<input type="text" value="25"/>	Cable No Width:	<input type="text" value="30"/>	
Terminal Marking Text Height:	<input type="text" value="2.5"/>	Cable No. Offset:	<input type="text" value="0"/>	
Terminal Height:	<input type="text" value="5"/>	Cable Spacing:	<input type="text" value="17.5"/>	
Device Width:	<input type="text" value="40"/>	OAS Screen Width:	<input type="text" value="2.5"/>	
Device Terminal Width:	<input type="text" value="10"/>	Group Screen Width:	<input type="text" value="3"/>	
I/O Module Width:	<input type="text" value="40"/>	Core Length (min):	<input type="text" value="35"/>	
I/O Module Terminal Width:	<input type="text" value="7.5"/>	Wire Length (min):	<input type="text" value="35"/>	
Draw Ferrule Nos 'Inside' Wire	<input checked="" type="checkbox"/>	Core/Wire No Text Height:	<input type="text" value="2.5"/>	
Draw Core Marking on 'Outside'	<input type="checkbox"/>	Caption for 'TO':	<input type="text" value="TO"/>	
Show Ferrule Numbers on Termination Diagrams	<input checked="" type="checkbox"/>	Show Intermediate Junction Box Connections on Termination Diagrams:	<input type="checkbox"/>	
Draw Looping Wire with Bend:	<input checked="" type="checkbox"/>	Cable Connector Gap (prevent overlap):	<input type="text" value="3"/>	
Show Core Group No's. on Termination Diagram	<input type="checkbox"/>	Show Loop Diagram No:	<input type="checkbox"/>	
Wire Destination References Use DwgNo. References for Wires <input type="checkbox"/> Use Sheet References for Wires <input type="checkbox"/> Format: <input type="text" value="Prefix"/> + <input type="text" value="Drawing No."/> + <input type="text" value="Sheet No. Prefix"/> + <input type="text" value="Sheet No."/> + <input type="text" value="Suffix"/> <input type="text" value("(""=""/> <input type="text" value="Sheet"/> <input type="text" value=")"/>				

In the fields provided, enter:

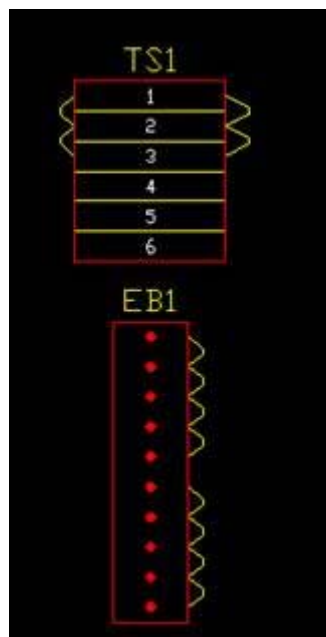
- The heights of terminal strip marking text, terminal marking text and core/wire number text.
- The widths of devices, device terminals, I/O modules, I/O module terminals, cable numbers, OAS screens and group screens.
- The lengths of cables and the minimum lengths of cores and wires.

Note: The **Cable No Width** value is to break the cable line. It does not define the actual block width. To change the Cable No block width the block, the **Cable No Offset** must be redefined (see below).

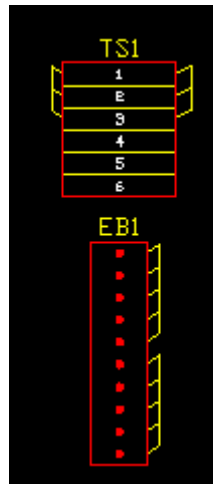
Other Parameters

- In the **Cable Spacing** field enter the horizontal distance between cables when more than one cable is drawn to the same terminal strip when cables are being drawn vertically

- In the **Cable No Offset** field, enter the vertical distance from the centre of the Cable No block to the cable. The default zero (0) places the Cable No within the cable.
- In the **Caption for 'TO'** field enter the text to be used as the caption before other “off-sheet” drawing numbers referred to on Termination diagrams, e.g. 'TO' (the default), or 'REFER'.
- If ferrule numbers are to be included by default on Termination diagrams instead of signal numbers, ensure that the **Show Ferrule Numbers on Termination Diagrams** checkbox is checked (it is checked by default). Note that whether or not ferrule numbers are shown can be overridden for individual diagrams.
- If ferrule numbers are to be shown (see the above settings), and are to be placed “inside” wires, check **Draw Ferrule Nos 'Inside' Wire**. If this is not checked then ferrule numbers are drawn above the wires.
- If core markings are to be placed outside of wire numbers, check **Draw Core Marking on 'Outside'**. If checked, core markings are drawn to the right side of wire numbers for wires drawn from the right side of a terminal, and to the left for wires drawn from the left side.
- If intermediate junction box connections are to be included on Termination diagrams, ensure that the **Show Intermediate Junction Box Connections on Termination Diagrams** checkbox is checked (two levels of marshalling on the left hand side of the primary junction box terminal strips may be displayed on Termination diagrams and Enhanced Termination Reports). Note that whether or not intermediate junction box connections are shown can be overridden for individual diagrams.
- The **Draw Looping Wire with Bend** checkbox controls how looping wires are drawn on Termination diagrams. If the checkbox is checked, looping wires will be drawn like this, with an extra bend:

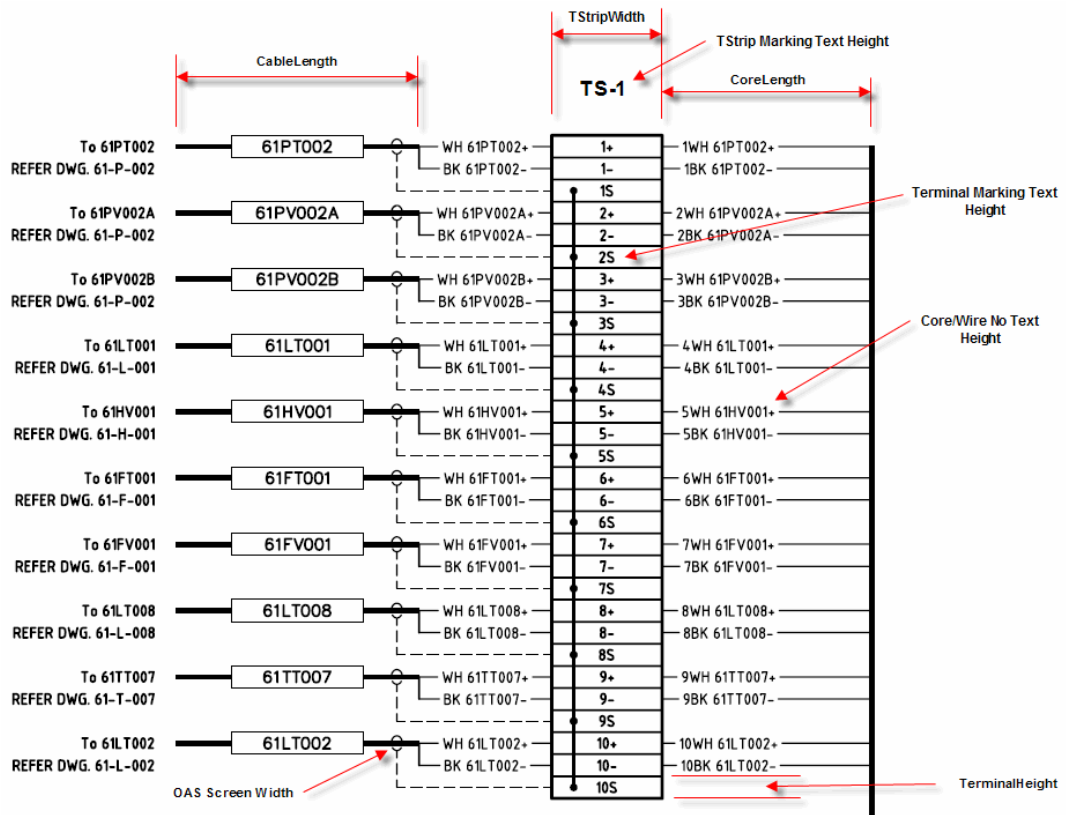


If the checkbox is unchecked, they will be drawn with the extra bend:



- In the **Cable Connector Gap (prevent overlap)** field, enter the horizontal distance between parallel cables that are drawn vertically on Termination diagrams. The default value is 3.
- If the markings of cable cores do not include group numbers (only their colours), they may instead be identified on Termination diagrams using their core group numbers. Ensure that the **Show Core Group No's on Termination Diagrams** checkbox is checked if this is required. Note that whether or not core group numbers are shown can be overridden for individual diagrams.
Group numbers will be displayed with a prefix that depends on the group type: Pr for Pairs, Tr for Triads and Qd for Quads. For the Cores (single wire) group type there will be no prefix.
- If a cable is connected to an instrument that has a Loop diagram generated for it, the Loop diagram numbers may be displayed on Termination diagrams. If this is required, ensure the **Show Loop Diagram Number** checkbox (the default setting) is checked.

The following example illustrates how the basic parameters are applied to a termination drawings:



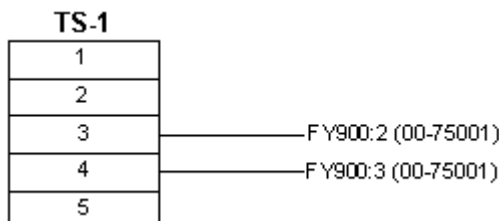
Wire Destination References

Checking either the **Use DwgNo. References for Wires** or the **Use Sheet References for Wires** checkboxes activates the **Prefix** and **Suffix** list which enables the user to enter their own prefix or suffix.

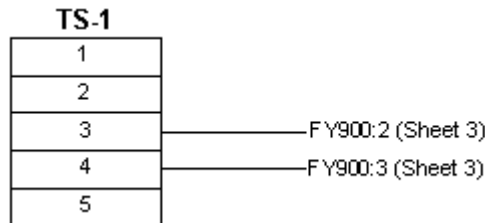
Checking the **Use DwgNo. References for Wires** checkbox also activates the Drawing No. list. The drop-down list has the following options:

Use Dwg No. Default option which uses the drawing number shown in the **DwgNo** column on the Drawing List grid view.

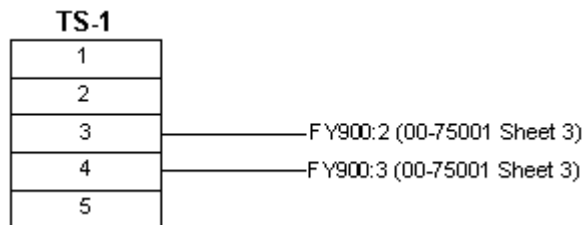
Use Client Dwg No Users that want to use their own drawing number instead of the AVEVA Instrumentation number can select this option which uses the drawing number shown in the **ClientDwgNo** column on the Drawing List grid view.



Checking the **Use Sheet References for Wires** checkbox activates the **Sheet No. Prefix** list, enabling users to change the word used to prefix the Sheet No., for example Sheet, SHEET or SHT.



The user can check both the **Use DwgNo. References for Wires** and the **Use Sheet References for Wires** checkboxes enabling the user to add a **Drawing No.** and a **Sheet No. Prefix**.



Text Styles/Fonts Definition

AVEVA Instrumentation draws all Wire/Ferrule Nos and reference text in the Seed File Drawing's current text style. By setting the current text style in the Seed Drawing File(s) the final text style (font) can be user defined.

Line Weights/Line Colours Definition

AVEVA Instrumentation uses three predefined layers to draw the graphics. Layer colours to and line weights may be changed to client standards if required in the Seed Drawing File(s) used to generate termination diagrams.

Layers used are:

- L2 Default colour is White. This is the Layer associated with a 0.25mm pen width and 2.5mm text height.
- L3 Default colour is Yellow. This is the Layer associated with a 0.35mm pen width and 3.5mm text height.
- L5 Default colour is Red. This is the Layer associated with a 0.5mm pen width and 5mm text height.

Cable Number Block Definition

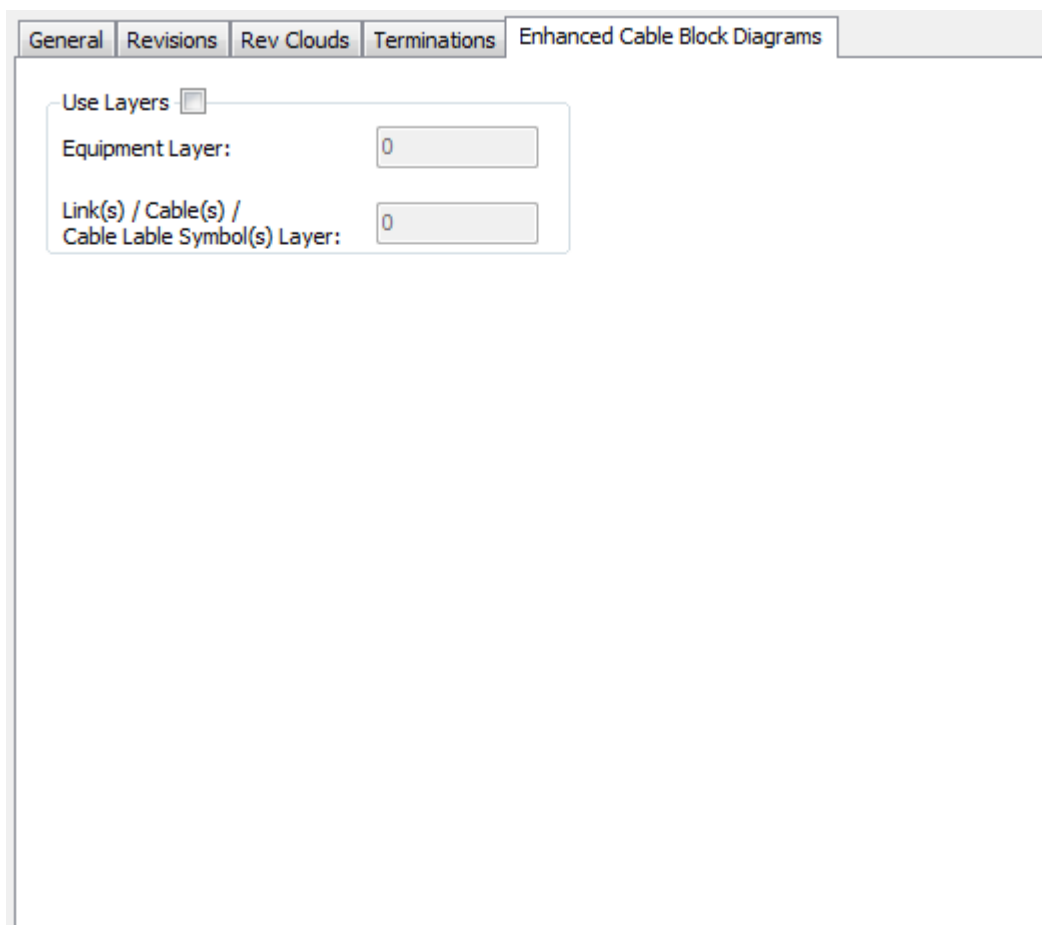
AVEVA Instrumentation uses a Cable Number block named 'CableNo' which is inserted into the drawing for each cable number. The Cable Number block can be redefined to change its appearance (for example, change text height, use rounded ends or make longer etc.). The block should be defined with a single attribute and redefined within each Seed Drawing File used by AVEVA Instrumentation for the project.

If AVEVA Instrumentation does not find a block named 'CableNo', it is inserted from a file named AVEVA InstrumentationTermDefaults (or AVEVA InstrumentationTermDefaultsImperial if using non-metric settings) located in the 'DwgExamples\Seeds' folder in the AVEVA Instrumentation program files folder. Opening AVEVA InstrumentationTermDefaults (or AVEVA InstrumentationTermDefaultsImperial) and redefining the Block 'CableNo' will affect all termination drawings where the Seed file does not contain any 'CableNo' block reference.

Device and I/O Module Description Text

In the Device and I/O Module Catalogues in Wiring Manager, the **Description on Drawing** field can be used to change the default drawing description to the value entered in that field. Using the <Enter> key will add a line-break in the drawing to create multiple lines of text. Up to three lines will be created for the description in both AutoCAD termination diagrams created in Designer and Termination PDF reports created in Wiring Manager. If the Catalogue **Definition Description on Drawing** field is left empty the default description will be used which is a concatenation of the Manufacturer and Model No., separated by a space.

3.5 Enhanced Cable Block Diagrams Tab



If layers are to be utilised in distribution diagrams, check the **Use Layers** checkbox. In the fields below the checkbox, specify which layers are to be used for equipment, and for links and cables.

Note: Ensure that the entered layers correspond to the appropriate layers in the seed files, as set up using the [Seeds List](#).

Click **Save** to exit the **Options** window and save changes made to preferences.

Click **Cancel** to exit the window without saving changes.

4 Areas

All engineering items in AVEVA Instrumentation must be assigned to a Plant Area. The first task once the project is setup (refer to the *Installation User Guide* for further information on project setup), is to add areas to the project database.

For a description of this functionality, refer to the *Common Functionality User Guide*.

5 Drawing List

The Drawing List is the Instrument Designer window for adding/editing and accessing drawings. By default all drawings for the project are shown in the grid, however the user can filter the data by using the column 'on-the-fly' filters, the advanced filter window or by creating new grid views containing user-defined sets of columns using the [Grid Manager](#).

Note: Hookup drawings are created using a separate facility. See [Hookups](#).

To open the Drawing List, click **Select** in the **Grids and Schedules** section of the **Home** tab.

Select **Drawings** from the list of grids that is then displayed. The Drawing List grid is then displayed:

Drawings									
Drag a column header here to group by that column.									
Area	Area Path	DWGNO	Shee	DrawingType	LOOPNO	EquipmentNo	Show Ferrule Num	Show IJB Connections	Segment N
<input checked="" type="checkbox"/>	<input type="text"/>	<input type="text"/>	=	<input type="text"/>	<input type="text"/>	<input type="text"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="text"/>
▶ 25		00-75001	1	Termination Diagra		MR-001	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
25		00-75001	2	Termination Diagra		MR-001	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
25		00-75001	3	Termination Diagra		MR-001	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
▶ 00		00-75002	1	Termination Diagra		MCC-01	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
▶ 01		01-00001	1	General Hookup			<input type="checkbox"/>	<input type="checkbox"/>	
▶ 01		01-70001	1	Termination Diagra		01-JB-001	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	
▶ 01		01-80001	1	Loop Diagram	01-F-510		<input type="checkbox"/>	<input type="checkbox"/>	
▶ 01		01-80002	1	Loop Diagram	01-L-525		<input type="checkbox"/>	<input type="checkbox"/>	
▶ 01		01-80003	1	Loop Diagram	01-P-500		<input type="checkbox"/>	<input type="checkbox"/>	

Note: Refer to [Working with the Data Grid](#) for information on the grid control including how to select a record (a Drawing).

The grid provides details on each project drawing, including Drawing Number, Loop No (if a Loop Diagram), Title, Current Revision, Equipment No (if a Termination Diagram) and dates/times for Last Updated, Last Printed etc.

Mandatory Data

To produce a drawing, a drawing number and sheet number must be entered. Designer uses these to create a file name. For example: Drawing No: 123456 and Sheet No: 1 are combined to create a file name: 123456-1.dwg.

Special Grid Features

Some cells within the grid will display a small button in the right side of the cell when the mouse cursor is hovered over it. Additional information related to the cell's instrument and cell name can be accessed from these button. These cells are:

- **Loop No:** Selecting the **Loop No** cell button displays the **Options** window, used to view/edit Loop data, as described in [Loop Data](#).

- **Equipment No:** Selecting the **Equipment No** cell button enables users to view/edit the associated Equipment and terminations, using Wiring Manager facilities. See [Equipment Data](#).
- **Segment Name:** Selecting the **Segment Name** cell button displays the **Fieldbus Segments Diagrams** window, in which details of the associated segment (if there is one), can be viewed and edited. Refer to the [Wiring Manager User Guide](#) for details.

Auto Generation of Drawings

AVEVA Instrumentation uses special 'DataLinks' to map database data to AutoCAD drawing attributes. DataLinks are automatically updated by Designer when a drawing is opened or updated from the Drawing List. For information on using Designer's DataLinks to update: Drawing Title Block (Drawing Border) - including revisions history, Loop Diagram technical data (tag, cable, wire numbers, terminal markings etc) or to generate Termination Diagrams refer to [Drawing Generation](#).

Drawing List - List Tools Options

The following options are located on the List Tools - Drawings tab:

Records Section

Refresh

- New** These common options are also located on the **Home** tab.
- Edit** Refer to the [Common Functionality User Guide](#) for details.

Delete

Actions Section

- Open** Opens the selected drawing for reviewing/printing etc in AutoCAD (editing title block and revision information should be done from the **Edit** button on the **Home** tab) (refer to [Issues when Opening AutoCAD Drawings](#)).

- Update** Creates or updates selected drawing(s) in AutoCAD - DataLinks in each CAD drawing are updated with current project data from the AVEVA Instrumentation database. Refer to [Create or Update Drawings](#) for details.

Note: If the drawing file does not exist, the file is created by copying a) the template file (if drawing uses a template drawing) or b) the seed file (if drawing uses a seed drawing). Refer to the [Drawing Generation](#) for more information.

- Issue** Issues and updates selected drawing(s). Refer to [Drawing Issues](#).
- Open Issues For Selected** Displays the **Issues** window listing all the current issues for the selected drawing. Refer to [View Previous Issues](#) for further information.
- Open Issues For All** Displays the **Issues** window. Refer to [View Previous Issues](#) for further information.
- Revisions** Displays a list of all drawings with revisions (and their revisions). Refer to [Viewing and Editing Multiple Document Revisions](#).

Add Revisions	Used to create a new revision. Refer to Create a Revision .
Edit Revisions	Used to edit the current revision. Refer to Edit a Revision .
Check for New Loops	Checks for new Loop drawings created in the Engineer module and imports them into the Drawing List. Refer to Import Drawings into the Drawing List .
Check for new CBD	Checks for new Enhanced Cable Block diagrams created in the Wiring Manager module and adds them to the Drawing List. Refer to Import Drawings into the Drawing List .
Check for New Terminations	Checks for new Termination drawings created in the Wiring Manager module and imports them into the Drawing List. Refer to Import Drawings into the Drawing List .
External Ref Drawing Nos.	Used to view, add and edit list of non-AVEVA Instrumentation Termination Drawing numbers for equipment. Refer to Non-AI Termination Drawing References .
Highlight Documents for Reissue	Used to highlight which issued drawings include data that has been changed in the database and therefore should be updated and reissued. Refer to Highlight Drawings for Reissue .
Tools Section	
Show Datalinks	Used to view the list of DataLinks for a selected drawing. Refer to DataLinks Window .
Rename	Used to rename batches of selected drawings. Refer to Rename Selected Drawings .
Printing Section	
Print	Prints selected drawing(s).
Export Section	
To External System	Publishes selected drawings to a folder. Refer to Drawing Publishing .
Selected Drawings	Used to export selected drawings files in the following ways:
Copy/Archive to Folder	Used to export drawing files to a folder defined during the export process. Refer to Export Drawings to a Specified Folder .
Copy to User Defined Names	Used to export drawing files to a pre-defined folder or folders with file names in a pre-defined, user-defined format. Refer to Export Drawings to Pre-Defined Folders with File Names in a Pre-Defined Format .

5.1 Add a New Drawing

This topic describes how to manually add drawings to the Instrument Designer's Drawing List.

Important: Drawings can also be added to the drawing list by checking Engineer and Wiring Manager for any new diagrams that may be required.
 Any new loops that have been marked as 'Drawing Required' can be imported in Engineer into the Drawing List as a Loop Diagram.
 Any equipment added that has been marked as 'Termination Dwg Required' in Engineer can be imported into the Drawing List as a Termination Diagram.
 Any new Enhanced Cable Block Diagrams in Wiring Manager can be imported into the Drawing List.
 Refer to [Import Drawings into the Drawing List](#).

Note: These methods are the preferred way to populate the Drawing List as they automatically create the new Drawing List entry, assign the Drawing Type and populate the drawing titles based on the engineering data. The drawing title formats used can be user-defined in the drawing title setup preferences windows (refer to [Drawing Title Setup Preferences](#)).

Note: Loop diagrams can also be added to the drawing list using facilities available from the Loop Check Report feature in Engineer.
 Termination diagrams can also be added to the drawing list using facilities available from the Enhanced Termination Report feature in Wiring Manager.

With the Drawing List open, click **New** on the **Home** tab to display the **Drawing Information** window:

The screenshot shows the 'Drawing Information' dialog box with the following fields and options:

- Plant Area:** A dropdown menu.
- Drawing Type:** A dropdown menu.
- Drawing No.:** A text input field.
- Sheet No.:** A text input field followed by 'of 1'.
- Index Sheet Order:** A text input field with the value '0'.
- Template:** A dropdown menu with a right-pointing arrow icon.
- Seed:** A dropdown menu.
- Equipment No.:** A text input field with a yellow background.
- Last Updated:** A section with tabs for 'Author(s)', 'Title', 'Revisions', 'Notes', 'Reference Dwgs', and 'User Fields'.
- Authors/Approvals:** A sub-section containing:
 - Drawn By:** Text input field and **Date Drawn:** dropdown menu (20/11/2015).
 - Designed By:** Text input field and **Date Designed:** dropdown menu (20/11/2015).
 - Checked By:** Text input field and **Date Checked:** dropdown menu (20/11/2015).
 - Approved By:** Text input field and **Date Approved:** dropdown menu (20/11/2015).
- Design Status:** A dropdown menu with a left-pointing arrow icon.
- Alternate Document No.:** A text input field.
- Buttons:** OK, Cancel, and Apply buttons at the bottom right.

Note: Existing drawing entries can be copied to create a new drawing record in the Drawing List by selecting an existing record, then using the **Copy Selected** command in the drop-down menu next to **New** on the **Home** tab.

Note: All of the data entry fields in this **Drawing Information** window can automatically update each drawing by using DataLinks to link the database data to drawing attributes.

Continue at:

- [Drawing Information Overview](#)
- [Drawing Information Tabs](#)

5.1.1 Drawing Information Overview

The **Drawing No** and **Sheet No** fields are used to create the drawing filename and must be completed with a unique combination of drawing number and sheet number. The filename is always DrawingNo + '-' + SheetNo (e.g XXXXX-1). Every drawing should also have either a Template or a Seed file associated with it.

Enter a number in the **Index Sheet Order** field to specify the order in which the drawing will be listed on Index Sheet type drawings (from lowest to highest). The number must be unique for the drawing number.

Note: If there is a value of -1 in an **Index Sheet Order** field, this indicates that the drawing was upgraded as part of an older project without the Index Sheet drawing functionality. Such drawings will be ignored by Index Sheets. The user may replace any -1 values with positive Index Sheet numbers as required.

Select a Plant Area from the **Plant Area** field.

Select the drawing type from the list provided: Cover Sheet, Index Sheet, Notes Sheet, Reference Drawing Sheet, Loop Diagram, Segment Check Report, Loop Check Report, Enhanced Termination Report, Termination Diagram, Enhanced Cable Block Diagram, and Other.

Note: For Cover Sheet, Index Sheet, Notes Sheet and Reference Drawing Sheet drawing types, the sheet number can be either a letter, or a number, or a combination. For other drawing types, it must be a number.

Refer to [Cover, Index, Notes and Reference Drawing Sheet Drawing Types](#) for details of these drawing types.

- For all drawing types except the Enhanced Cable Block Diagram drawing type, the **Template** drop-down list shows a list of all templates drawings created for the current project (all drawings in the Project Template directory). Select the required template.
- For all drawing types except the Enhanced Cable Block Diagram drawing type, the **Seed** drop-down list shows a list of all Seed drawings created for the current project (all drawings in the Project Seed directory). Select the required seed drawing (refer to [Seeds List](#) for details of seeds).

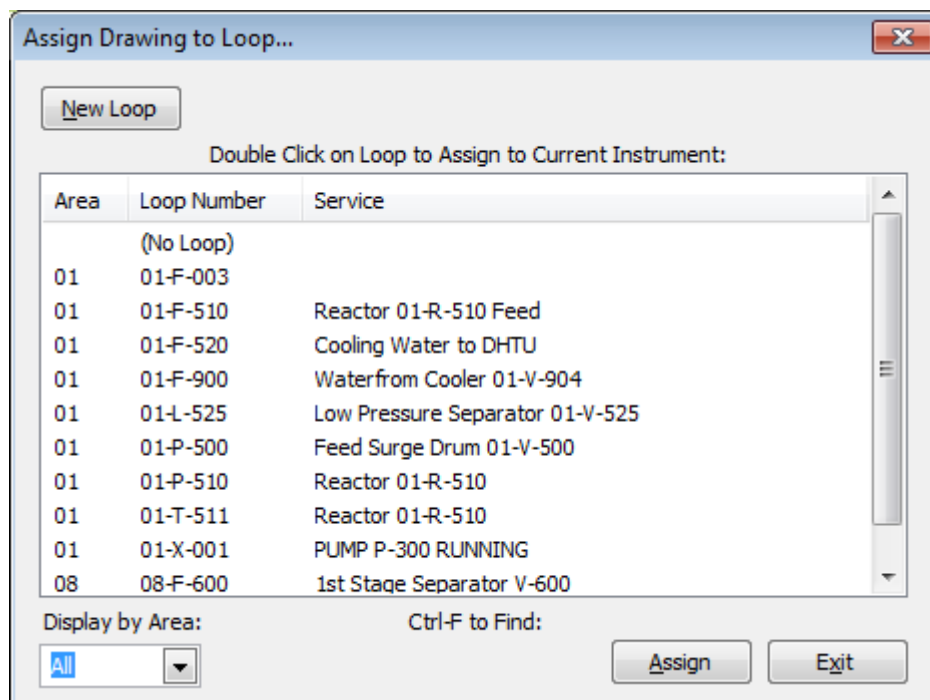
In the case of Enhanced Cable Block Diagrams, the **Seed** drop-down list shows a different list of ECBD-specific seeds (refer to [Enhanced Cable Block Diagram Seeds List](#) for details).

- If the Loop Diagram or Loop Check Report types are selected, the **Loop No.** drop-down list becomes active. Select the loop that the drawing is associated with. See below for details.

- If the Segment Check Report type is selected, the **Segment Name** drop-down list becomes active. Select the name of the associated segment in Wiring Manager. See below for details.
- If the Termination Diagram or Enhanced Termination Report types are selected, the **Equipment No.** drop-down list becomes active. Select the equipment that the drawing is associated with. See below for details.
- If the Termination Diagram drawing type is selected, the **Show Ferrule Numbers** checkbox is displayed. If ferrule numbers are to be displayed on the diagram instead of signal numbers, ensure that this checkbox is checked. The default setting for this checkbox is set on the *Terminations Tab* of the *Options* window.
- If the Termination Diagram drawing type is selected, the **Show Intermediate Junction Box Connections** checkbox is displayed. If intermediate junction box connections are to be included on the diagram, ensure this checkbox is checked (two levels of marshalling on the left hand side of the primary junction box terminal strips may be displayed on Termination diagrams). The default setting for this checkbox is set on the *Terminations Tab* of the *Options* window.
- If the Termination Diagram drawing type is selected, the **Show Cable Core Group No's** checkbox is displayed. If cable core group numbers are to be displayed on the diagram, ensure that this checkbox is checked. The default setting for this checkbox is set on the *Terminations Tab* of the *Options* window.
- If the Enhanced Cable Block Diagram drawing type is selected, the **CBD Name** drop-down list becomes active. The list consist of the Enhanced Cable Block Diagram drawings in Wiring Manager. Select the ECBD that the new drawing is to be linked to in Designer.

Select a Loop

To select a loop number, click the button in the **Loop No** field to display the **Assign Drawing to Loop** window:



Select the required loop from the list and click **Assign**, or double-click on it.

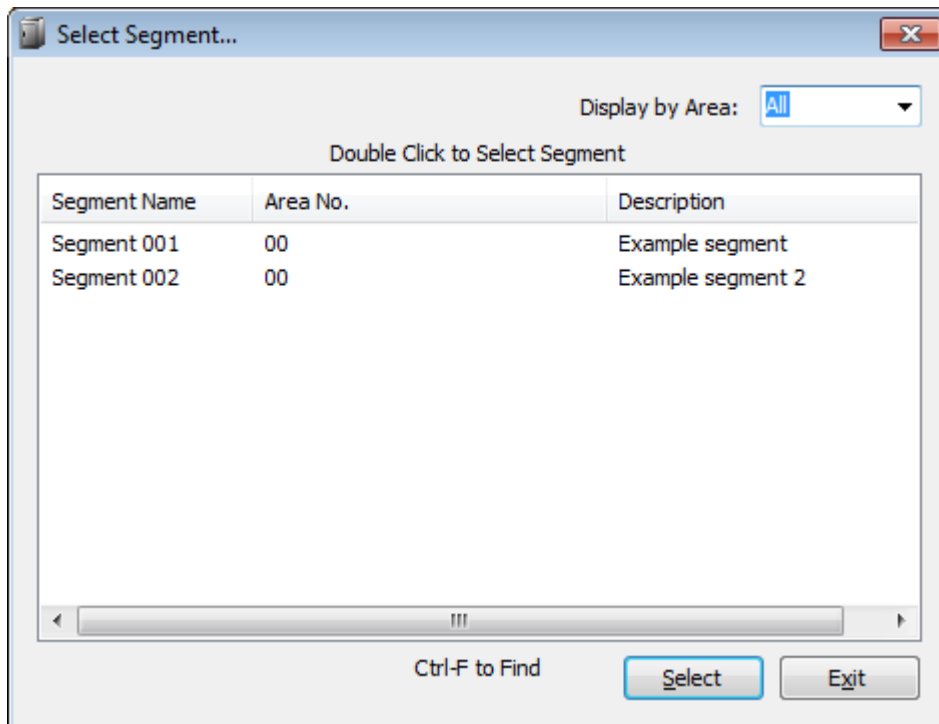
Refer to Engineer documentation for more details of the **Select Equipment** window.

Note: It is possible to create a multiple drawing sheet loop diagram by creating multiple records in the Drawing List (each with a different sheet number). Users can assign a different Template to each drawing if required.

Select a Segment

A segment must be selected when a Segment Check Report is created.

To select a segment name, click the button in the **Segment Name** field to display the **Select Segment** window:

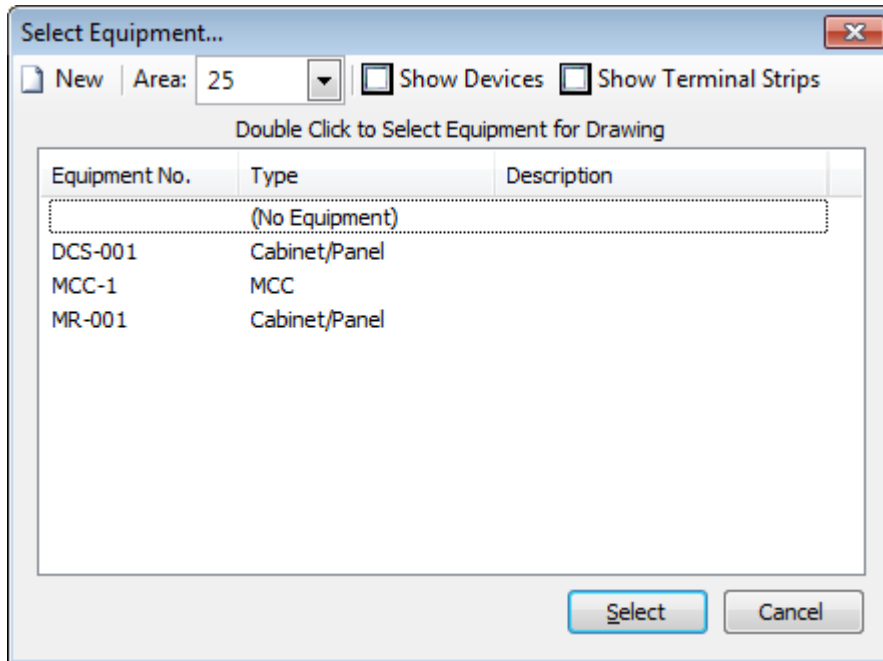


Select the required segment from the list and click **Select**, or double-click on it.

Refer to Wiring Manager documentation for more details of the **Select Equipment** window.

Select Equipment

To select an equipment number, click the button in the **Equipment No** field to display the **Select Equipment** window:



Select the required equipment from the list and click **Select**, or double-click on it.

Different items of equipment can be selected for drawings with the same drawing number. There is no requirement that all drawings with the same drawing number are associated with the same equipment.

Note: If the selected equipment has more terminations than can fit on a single drawing sheet, additional drawings sheets will be created automatically as required when the drawing is generated using the Update command. Refer to [Create or Update Drawings](#) for further details.

Refer to Wiring Manager documentation for more details of the **Select Equipment** window.

5.1.2 Drawing Information Tabs

Drawing Author Information

The Author(s) tab is used to record the identities of the drawing author, designer, checker and approver, and when these activities were completed.

Author(s)	Title	Revisions	Notes	Reference Dwgs	User Fields
<p>Authors/Approvals</p> <p>Drawn By: <input type="text"/> Date Drawn: 12/02/2013 ▼</p> <p>Designed By: <input type="text"/> Date Designed: 12/02/2013 ▼</p> <p>Checked By: <input type="text"/> Date Checked: 12/02/2013 ▼</p> <p>Approved By: <input type="text"/> Date Approved: 12/02/2013 ▼</p> <p>Design Status: <input type="text"/> ↩</p> <p>Alternate Document No: <input type="text"/></p>					

The tab is also used to specify the design status and enter an alternate document number and work pack number if required.

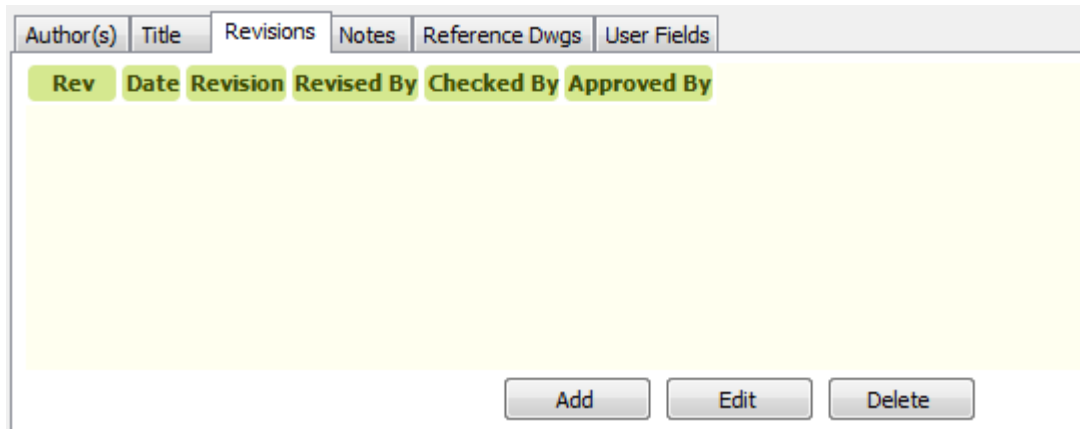
Drawing Title

The Title tab is used to enter the drawing title, as it will appear on the drawing itself, plus remarks on the drawing.

Author(s)	Title	Revisions	Notes	Reference Dwgs	User Fields
<p>Title 1: <input type="text"/></p> <p>Title 2: <input type="text"/></p> <p>Title 3: <input type="text"/></p> <p>Remarks: <input type="text"/></p>					

Revision History

The Revision History list (in the Revisions tab) shows all revisions for the current drawing:



Revisions Tab Buttons

Add Used to add a new revision to the current drawing using the **Revision Entry** window. Refer to [Drawing Revisions](#) for more information.

Note: Adding a new Revision changes the Current Revision of the drawing in the Drawing List to the new Revision Number.

Note: Revisions may also be added to multiple drawings in one command. For information on this feature refer to [Viewing and Editing Multiple Document Revisions](#).

Edit Used to edit a selected drawing revision using the **Revision Entry** window. Refer to [Drawing Revisions](#) for more information.

Note: Double-clicking on any existing Revision will also bring up the **Revision Entry** window.

Delete Enables the deletion of the currently selected revision.

Note: Pressing the **Delete** button will also delete the currently selected revision.

Drawing Notes

The user can add notes to the drawing in the Notes tab.

Author(s)	Title	Revisions	Notes	Reference Dwgs	User Fields
Note 1:	<input type="text"/>				
Note 2:	<input type="text"/>				
Note 3:	<input type="text"/>				
Note 4:	<input type="text"/>				
Note 5:	<input type="text"/>				
Note 6:	<input type="text"/>				

Reference Drawings

The Reference Dwgs tab enables a user to add manual drawing references for the current drawing:

Author(s)	Title	Revisions	Notes	Reference Dwgs	User Fields
Drawing No:		Description:			
1:	<input type="text"/>	<input type="text"/>			
2:	<input type="text"/>	<input type="text"/>			
3:	<input type="text"/>	<input type="text"/>			
4:	<input type="text"/>	<input type="text"/>			

User Fields

The User Fields tab is used to enter any additional project or user-specific information on the drawing in the six fields provided.

Author(s)	Title	Revisions	Notes	Reference Dwgs	User Fields
UserField1:	<input type="text"/>				
UserField2:	<input type="text"/>				
UserField3:	<input type="text"/>				
UserField4:	<input type="text"/>				
UserField5:	<input type="text"/>				
UserField6:	<input type="text"/>				

5.2 Cover, Index, Notes and Reference Drawing Sheet Drawing Types

These drawing types are used to present information about multiple drawings, i.e. “bundle” all with the same drawing number.

For example, an item may possess many terminations to be displayed on a single Termination Diagram. Multiple Termination Diagrams must therefore be used to display them. Each of these drawings will have the same drawing number, and a unique sheet number. Alternately, a “bundle” of drawings with the same drawing number may be created for associated equipment items.

Cover, Index, Notes and Reference Drawing Sheet drawings can be generated to accompany these drawings, so as to provide:

- A Cover Sheet, displaying general information regarding the drawings. The Cover Sheet, when created, will display the data entered in its Author(s), Title and Revisions tabs (see [Drawing Information Tabs](#)), and general drawing and project information (area, project number etc.).
- An Index Sheet, display the content of the drawing “bundle”, i.e. a list of the drawings in it. An Index Sheet will display all drawings with the same drawing numbers as it. The order they are listed in is controlled by their Index Sheet Order number, as entered into the field of the same name (see [Drawing Information Overview](#)).
- A Notes Sheet, displaying any general additional information regarding the drawings. This will display the information entered in its Notes tab (see [Drawing Information Tabs](#)).
- A Reference Drawings sheet, listing associated drawings and documentation. This will display the information entered in its Reference Dwgs tab (see [Drawing Information Tabs](#)).

Cover, Notes and Reference Drawing Sheet drawings can be used for drawing bundles consisting of drawings with different drawing numbers, and may themselves have different drawing numbers. If they have the same drawing number, they must have a unique sheet number. As described above, Index Sheet drawings must have the same drawing number as the drawings they list.

For Cover Sheet, Index Sheet, Notes Sheet and Reference Drawing Sheet drawing types, the sheet number can be either a letter, or a number, or a combination. For other drawing types, it must be a number.

Note: In order for these drawing types to display sheet numbers with letters, on their templates the sheet number attribute must be mapped to the {Sheet} datalink (and not {SHT} as in most templates). Refer to [Assign DataLinks in AutoCAD](#) for details.

Example information on Index Sheet drawing:

Drawing No.	Sheet No.	Title Line 1	Title Line 2	Title Line 3	Template/Seed
00-75001	A	Cover Sheet for Demo			CoverSheet
00-75001	B	Index Sheet for 00-75001			IndexSheet
00-75001	1	AREA 25	CABINET/PANEL MR-001	TERMINATION DIAGRAM	TerminationA32T
00-75001	2	AREA 25	CABINET/PANEL MR-001	TERMINATION DIAGRAM	- child -
00-75001	3	AREA 25	CABINET/PANEL MR-001	TERMINATION DIAGRAM	- child -

Note: The index sheet order number is allocated to the index sheet order datalink values of drawings of the Index Sheet drawing type. Changing one will change the other.

5.3 View and Edit Drawing Information

To view and edit existing drawing information, select the drawing in the Drawing List and click **Edit** on the **Home** tab, or double-click on the drawing record in the Drawing List. The **Drawing Information** window is then displayed.

The screenshot shows the 'Drawing Information' dialog box with the following details:

- Plant Area: 25
- Drawing Type: Termination Diagram
- Drawing No.: 00-75001
- Sheet No.: 1 of 3
- Index Sheet Order: 1
- Last Updated: 06/06/2008 16:40:13
- Template: (empty)
- Seed: TerminationA32T
- Equipment No.: MR-001
- Show Ferrule Numbers:
- Show Intermediate Junction Box Connections:
- Show Cable Core Group No's:
- Author(s) tabs: Title, Revisions, Notes, Reference Dwgs, User Fields
- Authors/Approvals section:
 - Drawn By: (empty)
 - Designed By: (empty)
 - Checked By: (empty)
 - Approved By: (empty)
 - Date Drawn: 23/10/2005
 - Date Designed: 23/10/2005
 - Date Checked: (empty)
 - Date Approved: (empty)
- Design Status: (empty)
- Alternate Document No: (empty)
- Last Edit: 20/11/2015 15:11

Note: All of the data entry fields in the **Drawing Information** window can be automatically updated for each drawing by using DataLinks to link the database data to drawing attributes.

Note: The **Last Edit** field displays the date and time when the drawing data was last edited. The user name of the individual that performed the edit is displayed in a tooltip when the mouse cursor is hovered over the field. Click the button in the field to display the [Audit Manager](#), which will display a list of all the changes to the drawing data.

Refer to [Add a New Drawing](#) for further details of this window.

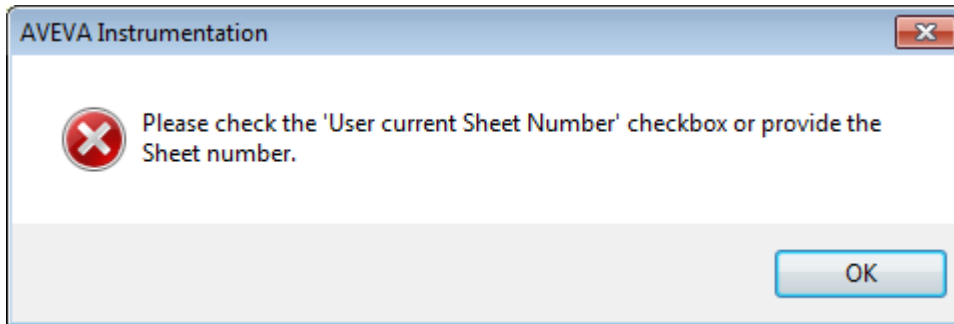
5.4 Rename Selected Drawings

This facility enables the user to rename drawings in batches.

Select the items to be renamed in the Drawing List grid view and then click **Rename** on the **List Tools - Drawings** tab to display the **Batch Drawing Rename** window.

The user must enter a value into the **Number** field. The value can be numbers, letters or a combination of the two. If the user enters any letters the **Increment** checkbox next to the **Number** field cannot be used. If only numbers are entered, the user may check the **Increment** box. This causes the Drawing Numbers of the selected items to be incremented by one.

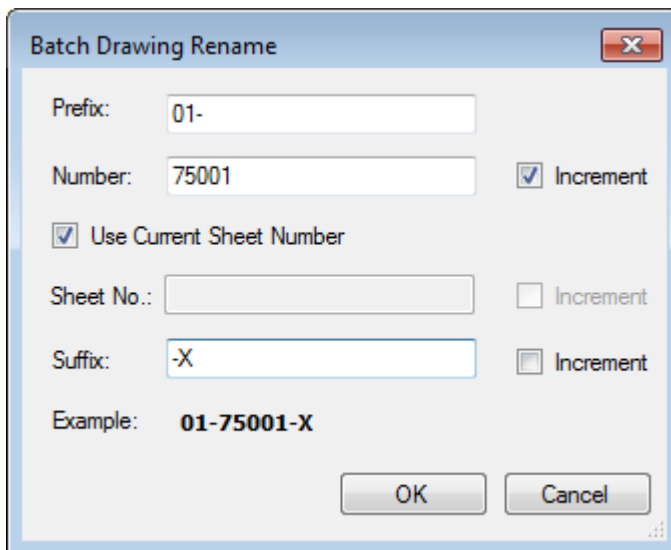
The user must choose between using the existing sheet numbers by checking **Use Current Sheet Number** box or to enter a new value in the **Sheet No** field. Using the **Sheet No** field enables the user to check the **Increment** checkbox to increment the sheet numbers by one. If neither option is used, a message is displayed requesting the user make a choice.



The **Prefix** and **Suffix** fields can optionally be used to add prefixes and suffixes to drawing numbers. They can be numbers, letters or a combination of the two. If the user enters any letters in the **Suffix** field the **Increment** checkbox cannot be used.

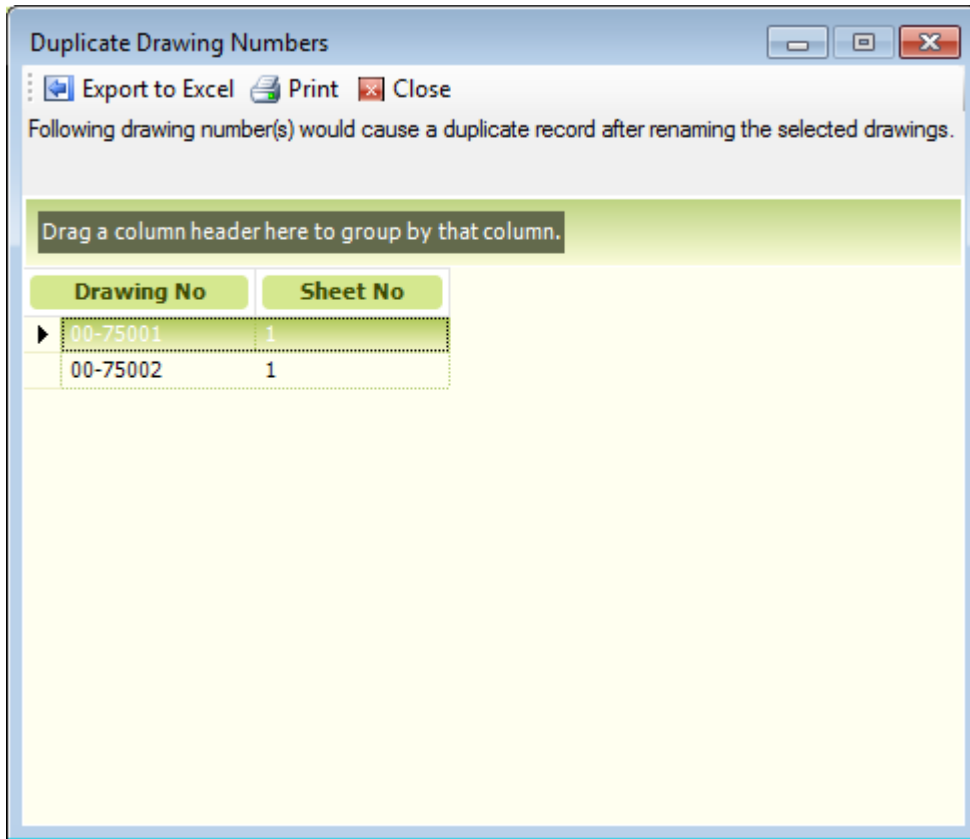
This checkbox can be used to set the suffix to be incremented instead of the drawing number. If the drawing number is set to be incremented, the suffix cannot be set to be incremented, and vice versa.

When values are entered, a preview of the new drawing number is displayed under the **Suffix** field.



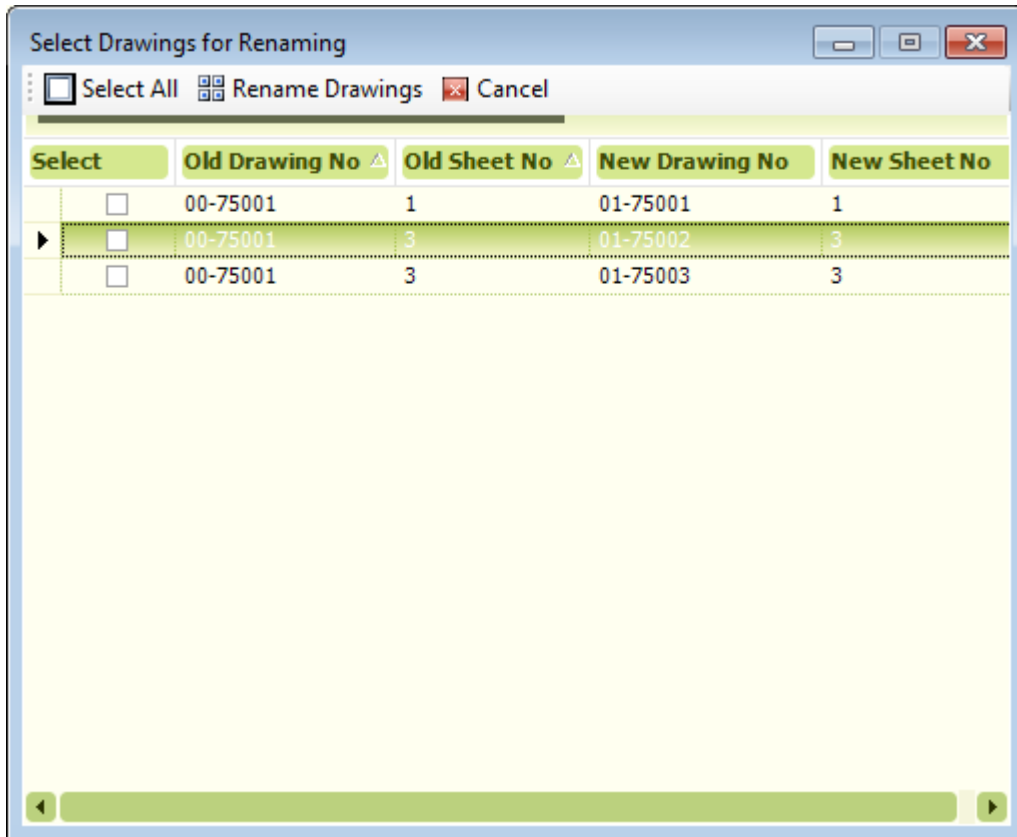
When the required fields have been completed the user must click **OK** to accept the values and display the **Select Drawings for Renaming** window or click **Cancel** to close the **Batch Drawing Rename** window and return to the grid view.

If the new number already exists the **Duplicate Drawing Numbers** window is displayed warning the user that the number cannot be used.



Click **Close** to close the **Duplicate Drawing Numbers** window and return to the grid view without renaming the file(s).

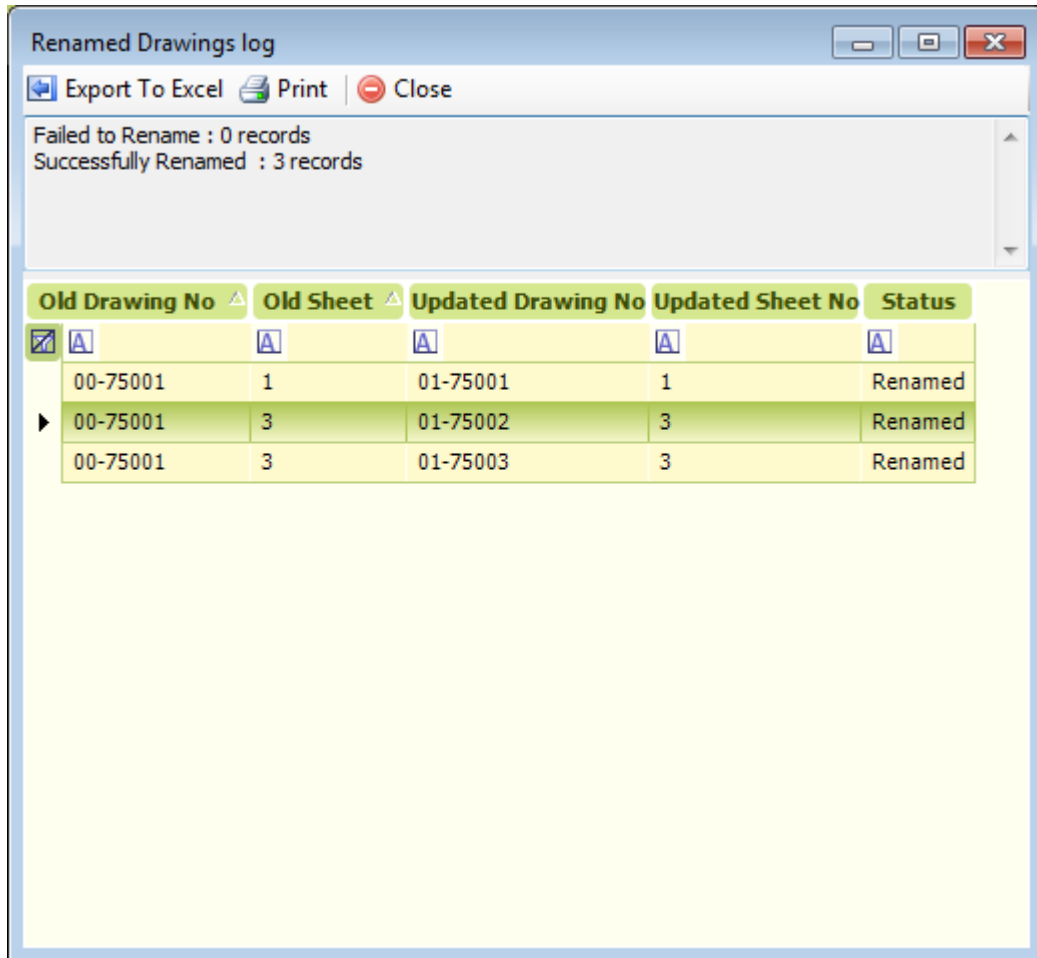
If there are no duplicate drawing numbers, the **Select Drawings for Renaming** window is then displayed. This lists all the drawings selected in the grid view and displays the **Old Drawing No**, **Old Sheet No**, **New Drawing No** and the **New Sheet No**.



The user can select individual drawings to be renamed by clicking the appropriate checkboxes. To select all the drawings the user can click **Select All** to check all the boxes.

Clicking **Cancel** closes the **Select Drawings for Renaming** window and returns the user back to the **Batch Drawing Rename** window.

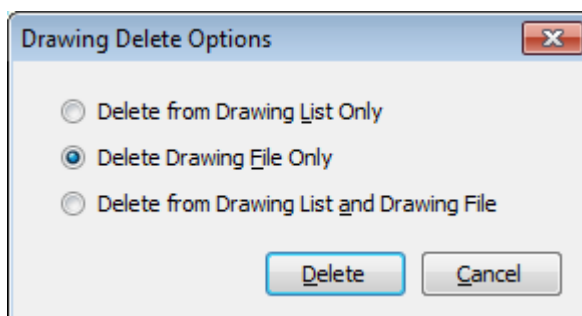
After selecting the required drawings, clicking **Rename Drawings** displays the **Renamed Drawing Log** window which displays the status of the renamed drawings.



Click **Close** to close the **Renamed Drawings Log** window and return to the grid view which refreshes to display the new drawing names.

5.5 Delete Drawings

To delete a drawing, select it from the list and click **Delete** on the **Home** tab. The Drawing **Delete Options** window is then displayed:



- Click **Delete from Drawing List** if the drawing is to be deleted from the list, but the drawing file is not to be deleted.

- Click **Delete Drawing File Only** if the drawing file is to be deleted, but not the record in the drawing list.
- Click **Delete from Drawing List and Drawing File** if both the drawing record in the list and the associated drawing file are to be deleted.

After selecting from the above options, click **Delete** to complete the deletion.

Note: The drawing sheet and index sheet order numbers of subsequent drawing sheets with the same drawing number as the deleted sheet will be automatically updated (i.e. decremented) when the drawing is updated (refer to [Create or Update Drawings](#) for details).

Note: For termination diagram drawings, if the equipment has more terminations than can fit on a single drawing sheet, additional drawings sheets will be created automatically as required when the drawing is updated. If such a sheet is deleted, it will automatically be created again when the drawing is updated, unless the underlying termination data is amended so that this sheet is no longer required.

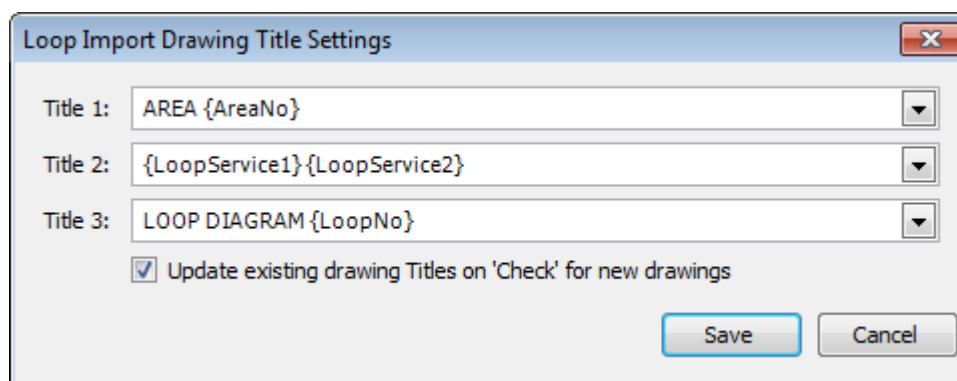
5.6 Drawing Title Setup Preferences

Designer provides facilities for the importing of loop diagram, termination diagram and enhanced cable block diagram drawing records from other AVEVA Instrumentation applications as described in [Import Drawings into the Drawing List](#).

AVEVA Instrumentation enables users to define how the drawing titles will be created based on values assigned to the loop or equipment engineering data.

To Define Imported Diagram Drawing Titles

From the **Project** tab, click **Setup**, then click either **Loop Titles (Import format)**, **Termination Titles (Import format)** or **Enhanced Cable Block Diagrams Titles (Import format)** as required. The appropriate **Import Drawing Title Settings** window is then displayed (for example):



The window contains three fields that defines each of the Drawing List's title data fields. Each title can contain a mixture of text and DataLinks. On importing a new loop diagram from Engineer's Loop List, AVEVA Instrumentation will replace the DataLinks with the value for the database field within the DataLink. For example: Title 1 above is defined as: AREA {AreaNo}. When checking for new loops, if AVEVA Instrumentation found a new loop in area 21 then Title 1 would be: AREA 21.

To edit each import title, open the field on the right of **Title** field for the desired title field.

To select a DataLink, check the appropriate checkbox in the field for the DataLink(s) required.

AVEVA Instrumentation will add the selected DataLink to the **Title** field.

The **Title** field can be edited manually, text added or deleted as required.

Use **Save** to save the title format.

5.7 Import Drawings into the Drawing List

Loop diagram, enhanced cable block diagram and termination diagram drawing records may be imported from other AVEVA Instrumentation applications and from Excel:

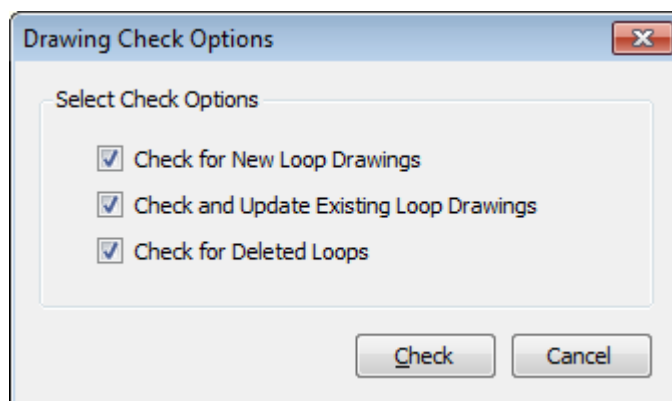
Drawing Type	Application	From
Loop Diagrams	Engineer	When the Drawing Required option is selected in the Loop List (or Loop Detail window)
Termination Diagrams	Wiring Manager	When the Dwg Required option is selected in the Equipment List (or Equipment Detail window)
Enhanced Cable Block Diagrams	Wiring Manager	The Cable Block Diagrams list.

To check Wiring Manager and Engineer for drawings:

As required, click **Check for New Loops**, **Check for New CBDs**, or **Check for New Terminations** on the **List Tools - Drawings** tab.

Note: If drawing numbers contain special characters such as <, >, ?, * etc. they will not be imported. A message is displayed to inform the user of this when any of the above options is selected.

The **Drawing Check Options** window is then displayed (for example):



Select the required option or options:

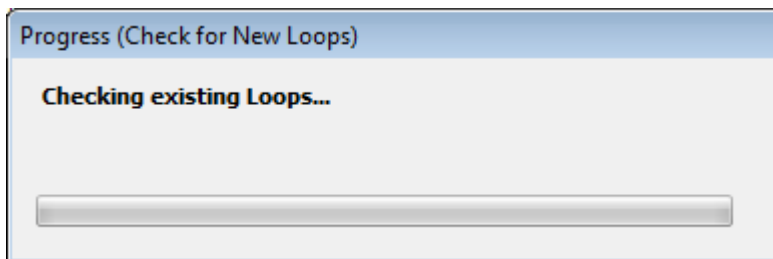
- If the **Check For New** option is selected, new diagrams of the appropriate type will be added to the Drawing List for each new equipment, loop or enhanced cable block diagram found in Wiring Manager or Engineer.

- If the **Check and Update Existing** option is selected, details of equipment, loops or diagrams that already have drawings in the Drawing List are checked, and the details in the Drawing List are updated if changes are detected.
- If the **Check for Deleted** option is checked, diagrams for any equipment, loops or diagrams that has been deleted from Wiring Manager or Engineer will be removed from the Drawing List.

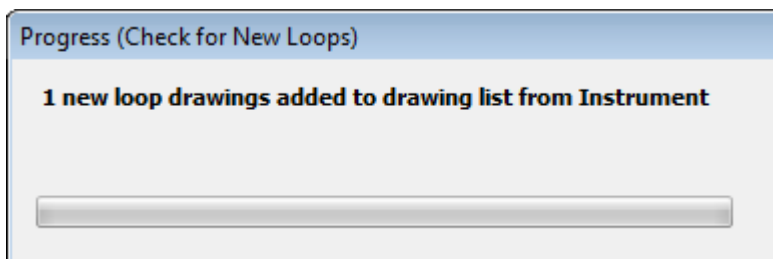
Click **Check**.

The appropriate list is then checked for new, updated and/or deleted equipment, loops or enhanced cable block diagrams depending on the option(s) specified.

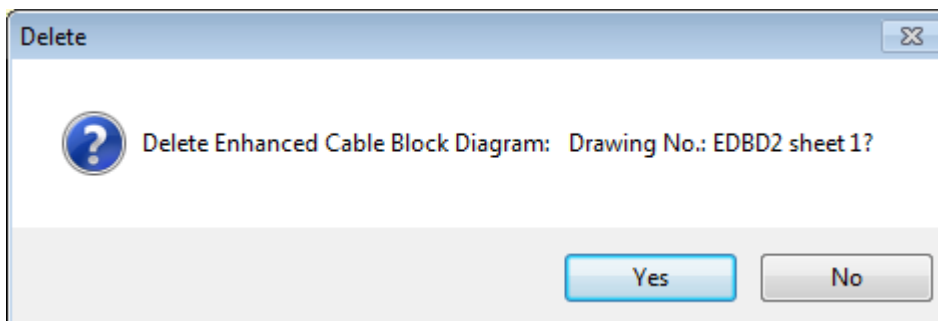
A **Progress** window displays the progress of the check (for example):



When the procedure is completed, the number of added, changed and/or deleted drawings is displayed (for example):



If deleted equipment, loops or diagrams are detected, the user will be asked to confirm the deletion of the relevant drawing from the Drawing List. For example:



Titles of new drawings in the Drawing List will be created based on values assigned to the equipment engineering data, according to configuration rules defined by users. Refer to [Drawing Title Setup Preferences](#) for details.

5.7.1 Importing from Excel

Drawings can also be imported from an Excel spreadsheet.

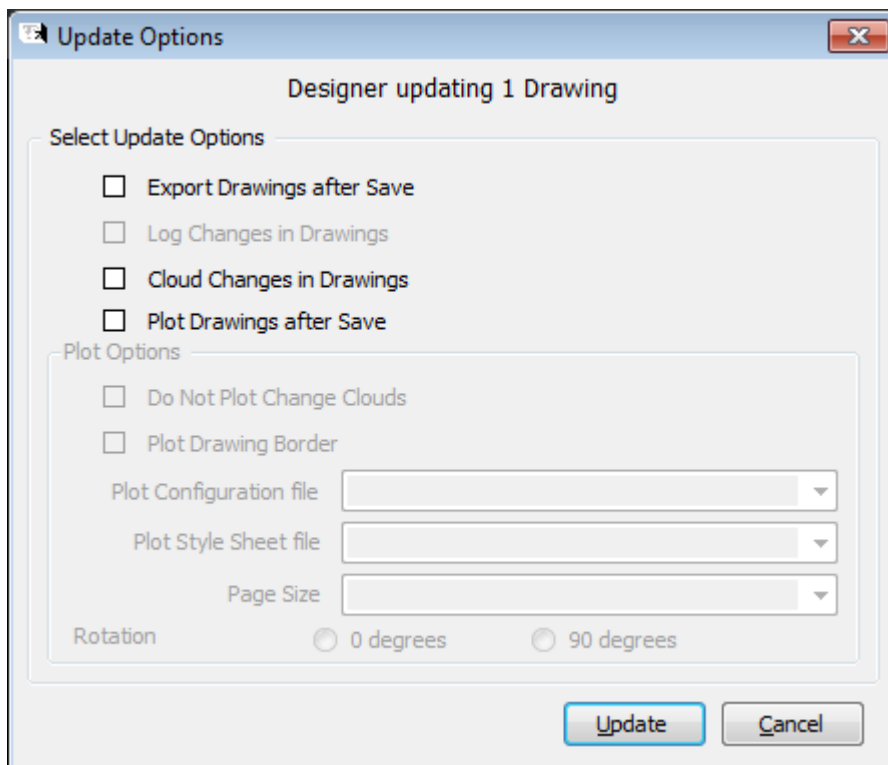
For a description of this functionality, refer to the [Common Functionality User Guide](#).

5.8 Create or Update Drawings

To create or update selected drawings and trigger DataLinks in each CAD drawing to be updated with current project data from the AVEVA Instrumentation database, select the drawing(s) in the Drawing List and click **Update** on the **List Tools - Drawings** tab.

Note: In the case of termination diagrams, if the selected equipment has more terminations than can fit on a single drawing sheet, additional drawing sheets will be created automatically as required when the drawing is created or updated during this procedure. See [Termination Diagrams](#) for further details.

Each selected drawing is then opened in AutoCAD (refer to [Issues when Opening AutoCAD Drawings](#)). The **Update Options** window is displayed:



The window is used to specify whether or not the drawings are to be exported when they are saved, whether or not changes in the drawing are to be highlighted with revision clouds, and whether or not the drawings are to be plotted when they are saved.

If the export option is selected, the drawings are exported to a pre-defined folder or folders with file names in a pre-defined, user-defined format. The folder(s) and the file name format are specified using facilities accessed from the **Setup** menu on the **Project** tab. Refer to [Export Drawings to Pre-Defined Folders with File Names in a Pre-Defined Format](#) for details.

Issues when Opening AutoCAD Drawings

When attempting to open an AutoCAD template, from within AVEVA Instrumentation the following message may be received:

Error Decrypting Data

This is caused by the fact that the original drawing was created by an application that is not trusted by AutoCAD. To bypass this problem the following action should be completed:

1. Open the drawing in native AutoCAD.
2. At the command line enter: Dwgcheck.
3. Enter a new value = 0.
4. Save the drawing.

This will prevent this error occurring.

5.9 Drawing Revisions

Revisions can be assigned to drawings. Each revision has a unique identifier, and is assigned a date. Other details such as a description and details of the individuals that created, checked and approved the revision may also be specified.

Continue at:

- [Create a Revision](#)
- [Edit a Revision](#)
- [Viewing and Editing Multiple Document Revisions](#)

5.9.1 Create a Revision

To create a revision for a drawing or drawings, select the drawing(s) in the Drawing List, then click **Add Revision** on the **List Tools - Drawings** tab. The **Revision Entry** window is then displayed:

If a single drawing was selected, enter the new revision number in the **Revision No** field.

If multiple drawings were selected, a different version of the window is displayed:

Either enter a revision number in the **Revision No** field to be applied to all the selected drawings, or click the **Auto Increment** checkbox (this is not available when editing multiple revisions, only when creating). The **Revision No** field is then disabled. When **Save** is clicked, all the revision numbers of the selected drawings are incremented by one, e.g. if the current revision is “A”, then the next is “B” or if current revision is “2”, then the next is “3” etc.

Double-click on the **Date** field to open a date selection form (or press the Enter key when the **Date** field is selected).

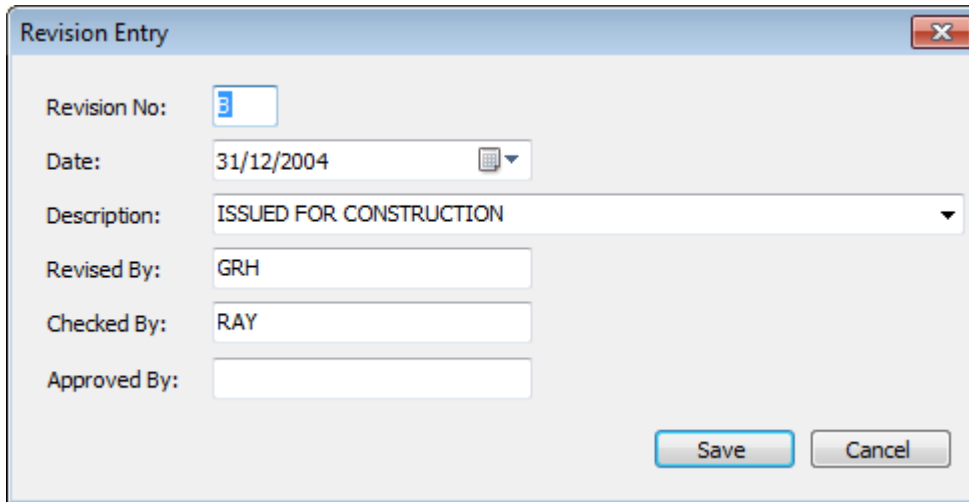
The **Description** field contains a list of all previously created revision descriptions. Add a new description by entering it in the field. Any new descriptions will be available for future revisions.

Note: Which fields appear on this window (apart from the **Revision No**, **Date** and **Description** fields) and their names is specified on the Revision tab of the **Options** window. See [Revisions Tab](#).

5.9.2 Edit a Revision

To edit the current revision of a drawing or drawings, select the drawing(s) and click **Edit Revision** on the **List Tools - Drawings** tab.

If a single drawing was selected, the **Revision Entry** window is then displayed with the details of the current revision displayed for editing.



Revision Entry dialog box with the following fields:

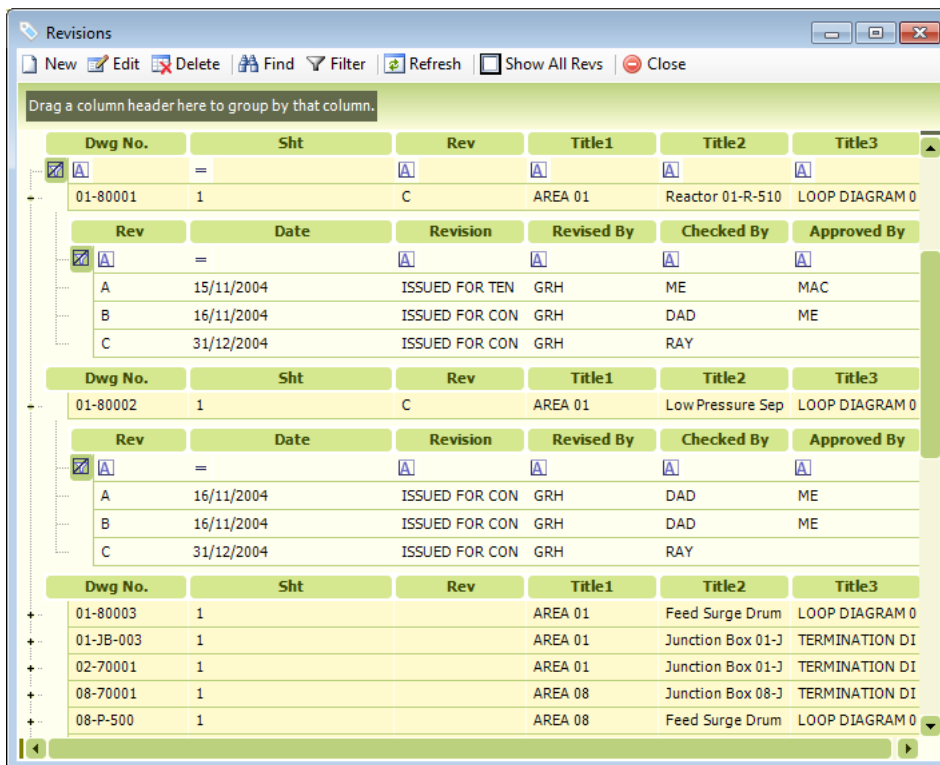
- Revision No: 3
- Date: 31/12/2004
- Description: ISSUED FOR CONSTRUCTION
- Revised By: GRH
- Checked By: RAY
- Approved By: (empty)

Buttons: Save, Cancel

If multiple drawings were selected, the window will be blank except for the **Date** field. Refer to [Create a Revision](#) for details.

5.9.3 Viewing and Editing Multiple Document Revisions

To view a list of all revisions of all drawings, click **Revisions** on the **List Tools - Drawings** tab. The **Revisions** window is displayed:



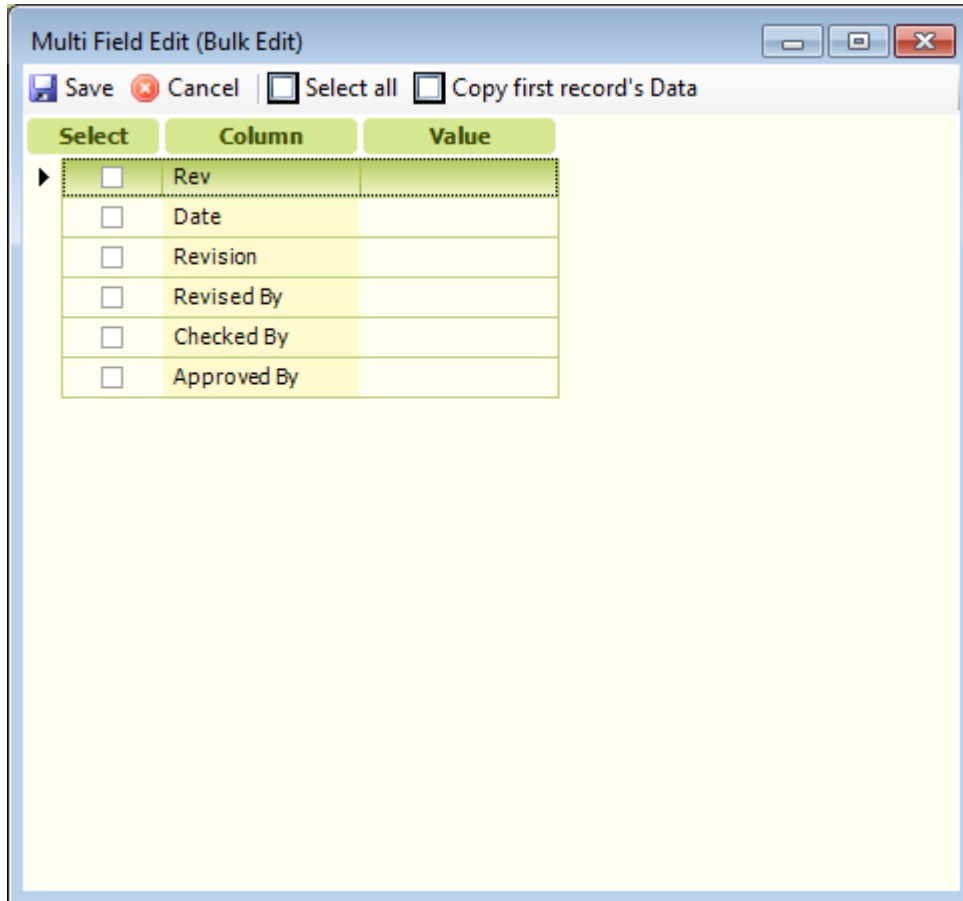
Revisions window showing a list of revisions for multiple drawings. The window includes a toolbar with New, Edit, Delete, Find, Filter, Refresh, Show All Revs, and Close. A message says "Drag a column header here to group by that column." The table below shows the data:

Dwg No.	Sht	Rev	Title1	Title2	Title3																								
01-80001	1	C	AREA 01	Reactor 01-R-510	LOOP DIAGRAM 0																								
<table border="1"> <thead> <tr> <th>Rev</th> <th>Date</th> <th>Revision</th> <th>Revised By</th> <th>Checked By</th> <th>Approved By</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>15/11/2004</td> <td>ISSUED FOR TEN</td> <td>GRH</td> <td>ME</td> <td>MAC</td> </tr> <tr> <td>B</td> <td>16/11/2004</td> <td>ISSUED FOR CON</td> <td>GRH</td> <td>DAD</td> <td>ME</td> </tr> <tr> <td>C</td> <td>31/12/2004</td> <td>ISSUED FOR CON</td> <td>GRH</td> <td>RAY</td> <td></td> </tr> </tbody> </table>						Rev	Date	Revision	Revised By	Checked By	Approved By	A	15/11/2004	ISSUED FOR TEN	GRH	ME	MAC	B	16/11/2004	ISSUED FOR CON	GRH	DAD	ME	C	31/12/2004	ISSUED FOR CON	GRH	RAY	
Rev	Date	Revision	Revised By	Checked By	Approved By																								
A	15/11/2004	ISSUED FOR TEN	GRH	ME	MAC																								
B	16/11/2004	ISSUED FOR CON	GRH	DAD	ME																								
C	31/12/2004	ISSUED FOR CON	GRH	RAY																									
01-80002	1	C	AREA 01	Low Pressure Sep	LOOP DIAGRAM 0																								
<table border="1"> <thead> <tr> <th>Rev</th> <th>Date</th> <th>Revision</th> <th>Revised By</th> <th>Checked By</th> <th>Approved By</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>16/11/2004</td> <td>ISSUED FOR CON</td> <td>GRH</td> <td>DAD</td> <td>ME</td> </tr> <tr> <td>B</td> <td>16/11/2004</td> <td>ISSUED FOR CON</td> <td>GRH</td> <td>DAD</td> <td>ME</td> </tr> <tr> <td>C</td> <td>31/12/2004</td> <td>ISSUED FOR CON</td> <td>GRH</td> <td>RAY</td> <td></td> </tr> </tbody> </table>						Rev	Date	Revision	Revised By	Checked By	Approved By	A	16/11/2004	ISSUED FOR CON	GRH	DAD	ME	B	16/11/2004	ISSUED FOR CON	GRH	DAD	ME	C	31/12/2004	ISSUED FOR CON	GRH	RAY	
Rev	Date	Revision	Revised By	Checked By	Approved By																								
A	16/11/2004	ISSUED FOR CON	GRH	DAD	ME																								
B	16/11/2004	ISSUED FOR CON	GRH	DAD	ME																								
C	31/12/2004	ISSUED FOR CON	GRH	RAY																									
01-80003	1		AREA 01	Feed Surge Drum	LOOP DIAGRAM 0																								
01-JB-003	1		AREA 01	Junction Box 01-J	TERMINATION DI																								
02-70001	1		AREA 01	Junction Box 01-J	TERMINATION DI																								
08-70001	1		AREA 08	Junction Box 08-J	TERMINATION DI																								
08-P-500	1		AREA 08	Feed Surge Drum	LOOP DIAGRAM 0																								

To view the revisions for a single drawing click on the + icon next to its listing.

To view revisions for all drawings, click **Show All Revs.**

To edit an existing revision click **Edit**. The **Multi-Field Edit (Bulk Edit)** window is displayed.



- To edit a revision field, check the appropriate checkbox and enter the new value.
- Click **Select all** to select all fields for editing.
- Click **Copy first record's data** to copy the values for the revision first selected in the Revision window into the fields.
- Once the required changes have been entered, click **Save**.

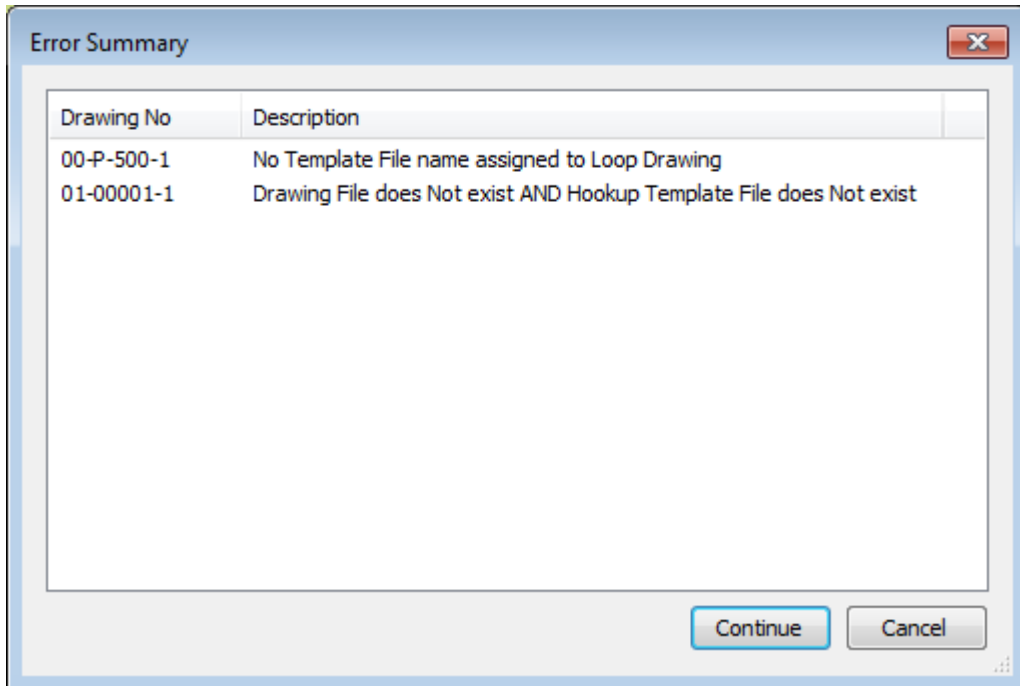
To add a new revision, click **New**. The **Revision Entry** window (described above) is then displayed. Enter the required details and click **Save**.

To delete a revision, select the revision and click **Delete**. A message will then be displayed requesting that the deletion be confirmed. Click **Yes** to confirm the deletion or **No** to cancel.

5.10 Drawing Issues

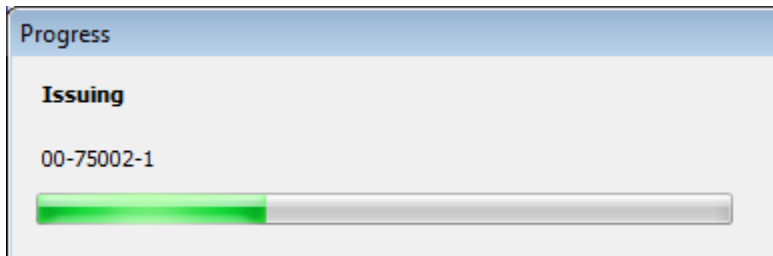
To issue a drawing or drawings, select them in the Drawing List grid and click **Issue** on the **List Tools - Drawings** tab.

If there are reasons why selected drawings cannot be issued, they are listed in the **Error Summary** window.

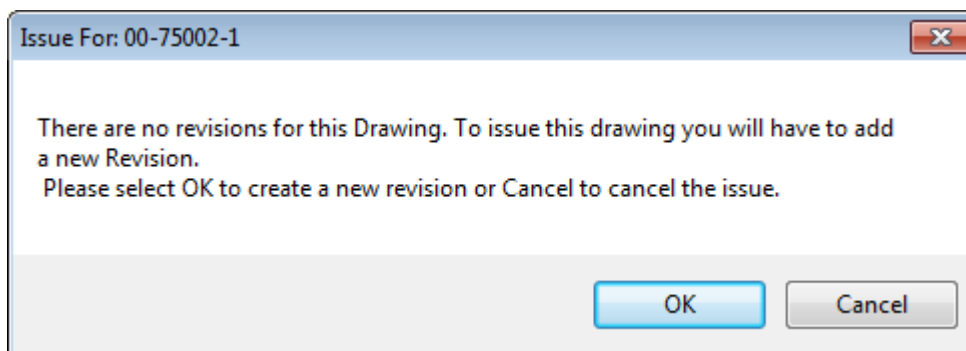
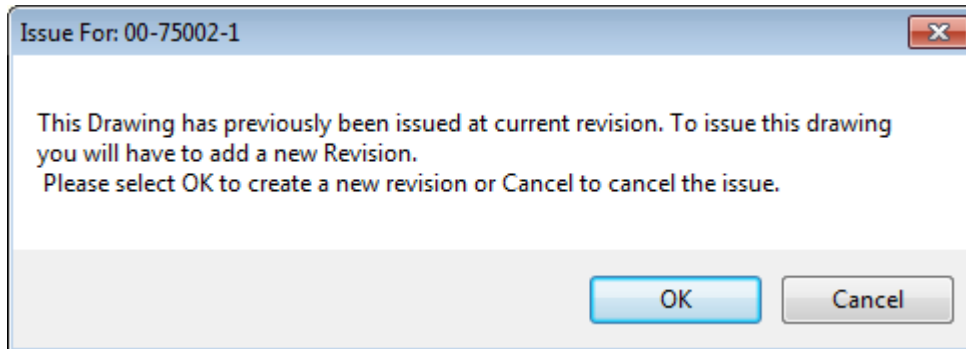


Click **Cancel** to stop the procedure. Click **Continue** to continue with the issue of any other selected drawings. The first of the selected drawings for which errors were not detected is then issued as described next.

A **Progress** window for the issue is displayed:



If the drawing has already been issued at the current revision, or has had no revisions created for it, a message window is displayed to inform that the user that a new revision must be created before issuing.



Click **Cancel** to cancel the issue or **OK** to create a new revision. Refer to [Drawing Revisions](#) for further information on creating a new revision. Once the revision has been created, the issue procedure automatically resumes.

The issued drawing is then opened in AutoCAD (refer to [Issues when Opening AutoCAD Drawings](#)), and the **Update Options** window is displayed. Refer to [Create or Update Drawings](#) for details. Once the update is completed, the drawing is automatically closed.

If multiple drawings have been selected for issue, each is issued one at a time, as described above.

5.10.1 Highlight Drawings for Reissue

To highlight issued drawings which show data that has been changed in the database, and therefore require updating and reissuing, select the drawings to be checked from the [Drawing List](#) and then click **Highlight Documents for Reissue** on the **List Tools - Drawings** tab.

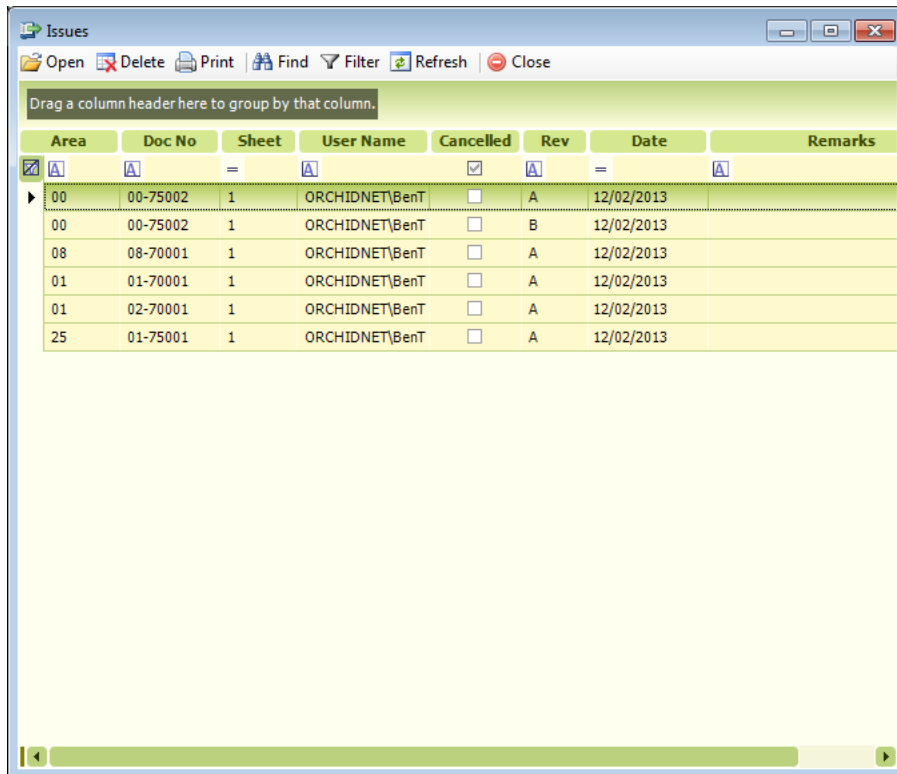
The drawings are then checked for changed data, and those that include changed data are highlighted to the user by displaying an asterisk * in the **Rev** field after the revision number.

The highlighting drawings should then be updated (refer to [Create or Update Drawings](#)), and issued again (refer to [Drawing Issues](#)).

5.10.2 View Previous Issues

To see previous issues click either **Open Issues For Selected** or **Open Issues For All** on the **List Tools - Drawings** tab.

The **Issues** window is then displayed.



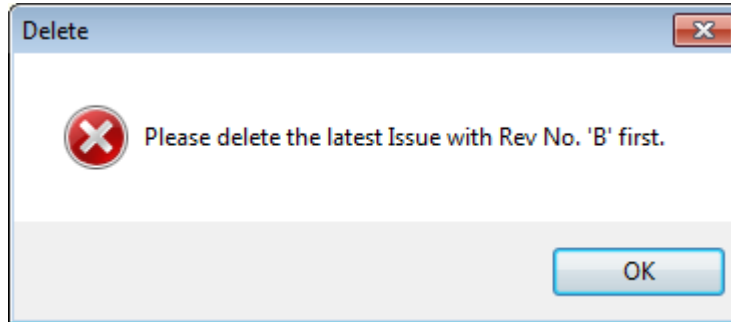
If **Open Issues For Selected** was clicked the window lists all the issues for the drawing currently selected in the grid. If **Open Issues For All** was clicked the window lists all the issues for all the drawings in the grid.

Note: If the revision associated with an issue has been deleted, the **Cancelled** check box for the issue will be checked. The issue itself however will not be deleted, and the issued drawing may still be opened and viewed.

Command Buttons:

- Open** Opens the selected issues in AutoCAD (refer to [Issues when Opening AutoCAD Drawings](#)).
- Delete** Deletes the selected issues. A confirmation message is displayed before the deletion takes place.

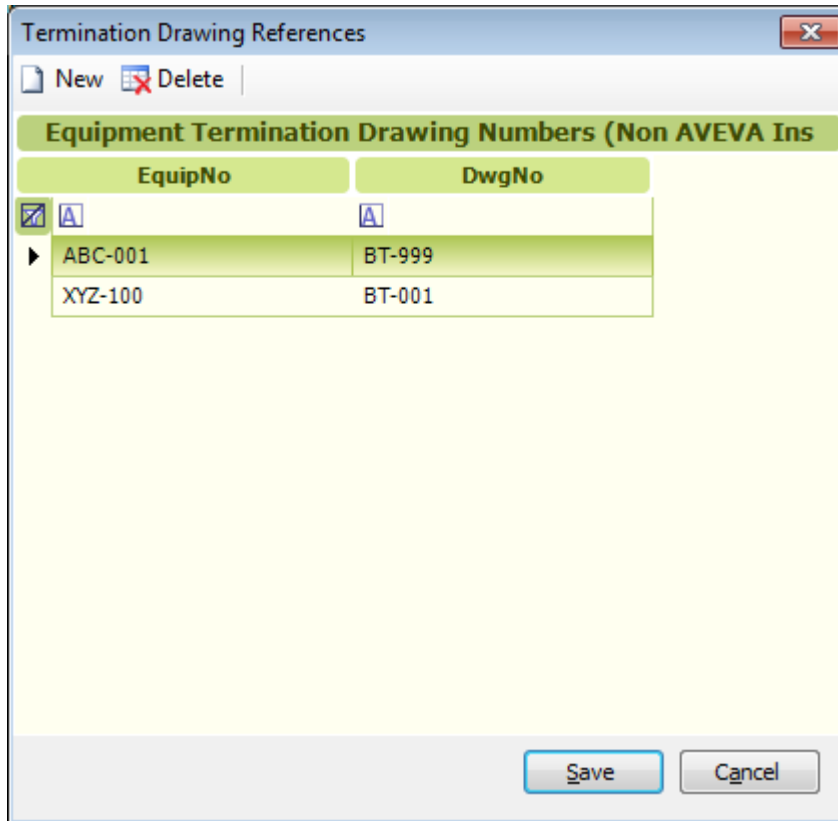
Note: Before an issue of a drawing can be deleted, all later issues of that drawing must first be deleted. A message is displayed if a user attempts to delete an issue of a drawing for which later issues exist. For example:



- Print** Prints the selected issues.
- Find** Displays the **Find** window, used to search by any text string located anywhere within the grid.
- Filter** Opens the *Advanced Grid Filters* window used to define the current grid view filter criteria.
- Refresh** Updates entire grid with latest database information (useful in multi-user project environments).
- Close** Closes the window.

5.11 Non-AI Termination Drawing References

To view, add and edit list of non-AVEVA Instrumentation Termination Drawing numbers for equipment, click **External Ref Drawing Nos** on the **List Tools - Drawings** tab. The **Termination Drawing References** window is then displayed:



To add a new drawing reference, click **New**. A new row is then added to the window. Enter the equipment number and the drawing number in the fields provided.

To edit a drawing reference, type new values into the references fields as required.

To delete a drawing reference, click on it, then click **Delete**. A message is then displayed requesting that the deletion be confirmed. Click **Yes** to proceed with the deletion.

Only one drawing reference can be deleted at a time.

To save changes made to the list of drawing references and to exit the window, click **Save**.

To exit the window without saving, click **Cancel**.

5.12 Drawing Publishing

Drawings in the Drawing List (and also the Hookup Drawing List) can be published, i.e. their AutoCAD files saved to a pre-defined location.

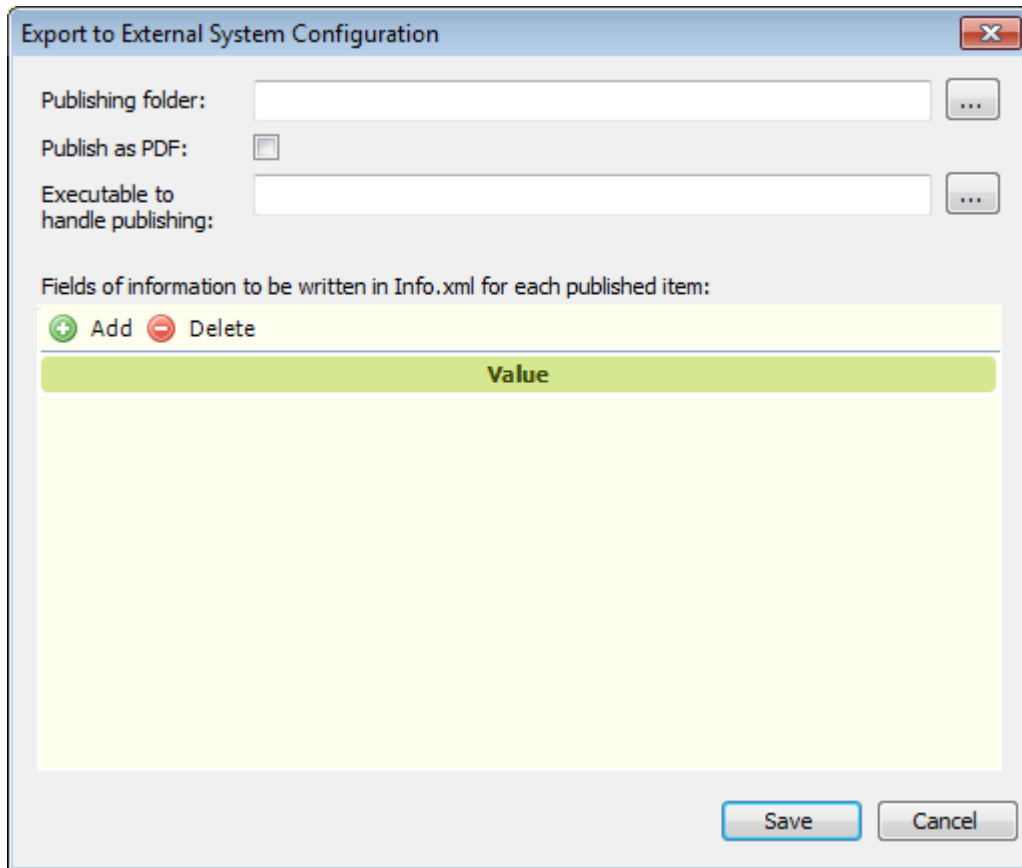
PDF versions of the published drawings may also be produced.

The folder that drawings are published to, whether or not PDF versions of the published files are to be produced, and other options are specified using the **Publishing Configuration** window.

5.12.1 Publishing Configuration

Before drawings can be published, a number of configuration options must be specified.

Select **Drawings Publishing Configuration** from the **Setup** menu on the **Project** tab. The **Export to External System Configuration** window is then displayed:



In the **Publishing folder** field, enter the folder into which drawings are to be published, or click ... and browse for it.

If PDF versions of published files are to be generated using AutoCAD, in addition to the published DWG files, check **Publish as PDF**.

If PDF versions of published files are to be generated using a PDF generator other than AutoCAD, in the **Executable to handle publishing** field, enter the name and location of the executable file that will handle the publishing, or click ... and browse for it. If **Publish as PDF** is checked, this setting will be ignored.

For each published drawing, an XML file containing selected drawing data is also produced in the publishing folder. To select the drawing data that the XML file will include, click **Add**. A blank row is added to the area below this button. From the drop down list in this row, select the required drawing data. Repeat for each type of drawing data required.

To delete a row, select it and click **Delete**. A message will be displayed requesting that the deletion be confirmed. Click **Yes**.

If no fields are selected, the XML files are not generated.

To save configuration changes and exit the window, click **Save**.

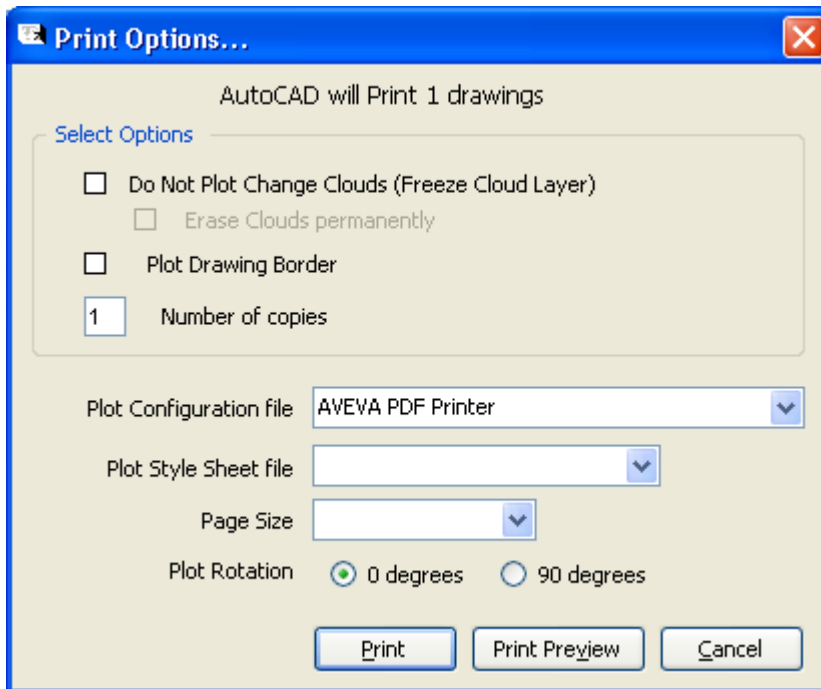
To exit the window without saving any changes, click **Cancel**.

5.12.2 Publishing Drawings

To publish drawings, select them in the grid and click **To External System** on the **List Tools - Drawings** tab. Multiple drawings can be selected and published.

The drawings will then be published to the publishing folder along with (optionally) the PDF and XML data files.

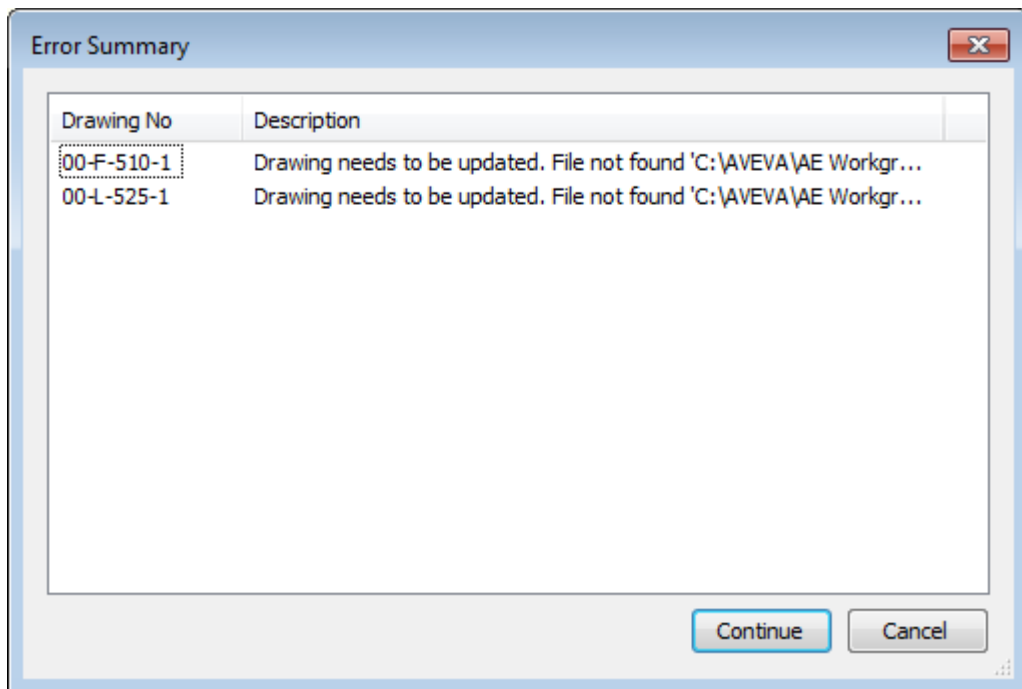
The **Print Options** window is then displayed.



Specify the required print options and click **Print**. The PDF files are then generated.

If PDF versions of the drawings are to be generated using another PDF generator, this is used to generate the PDFs instead.

Any errors that occur during the publishing process are reported in the **Error Summary** window.



Click **Continue** to carry on with the procedure or **Cancel** to stop it.

6 Drawing Generation

This section describes how Designer generates CAD drawings from the Drawing List. However, before any CAD drawing can be created, a drawing record must exist in the Drawing List for each drawing to be created as a CAD file. This topic assumes drawing records already exist.

Note: To add a drawing record to the Drawing List use either the [Add a New Drawing](#) procedure or import drawings from the Engineer's instrument list (loop diagrams) or Wiring Manager's equipment list (termination diagrams) using the [Import Drawings into the Drawing List](#) commands.

Updating CAD Text/Attributes

Designer uses DataLinks to establish a link between a value in the AVEVA Instrumentation project database and a drawing block attribute, so that when a drawing is generated by Designer the CAD attribute is automatically updated with the data from the database. DataLinks can be linked to data such as project name or number or client name from Project Data, or drawing number or title from the Drawing List, Loop No, Tag No, Cable No or other engineering data from Engineer or Wiring Manager data. Once the DataLinks are added to a drawing they ensure that the engineering data in drawings is the same as that currently in the project database. Refer to the [DataLinks](#) for more information.

6.1 Loop Diagrams and Hookup Drawings

Template files are used as templates for both loop diagrams and hookup (installation) drawings. Templates are copied to create the drawing file and are not modified graphically, except for text values (AutoCAD attribute values) that have DataLinks assigned. When a drawing based on a Template is updated, every DataLink is evaluated and translated into a value based on the current drawing's data and is placed into its corresponding drawing attribute. DataLinks are easily placed into templates file blocks: refer to [Assign DataLinks in AutoCAD](#).

If a loop diagram is to be created the **Loop No** field for the drawing must contain a valid project loop number from the Engineer Loop List. If a hookup drawing is to be created the drawing must be assigned to a hookup template via the [Add a New Hookup Drawing](#) window.

Loop and Hookup Drawing Creation

There are two Drawing List commands that can create a Loop or Hookup CAD drawing: **Open** and **Update** on the **List Tools - Drawing** tab.

Command	Functionality	Remarks
Open	Opens drawing file, no data is updated	Only applicable to one drawing at a time
Update	Opens drawing file and updates data via AVEVA Instrumentation DataLinks	Can be used on any number of selected drawings

These commands are used as follows:

- **Open** - used to view the current drawing in CAD (refer to [Issues when Opening AutoCAD Drawings](#)).
- **Update** - used to update the drawing with database information (DataLinks, if any), then view the updated drawing in CAD.

When either of these commands is used, Designer performs the following actions:

If Drawing file Exists

Opens the drawing file in CAD.

If updating, then [DataLinks](#) are updated (design data is copied from the database)

If Drawing file does NOT Exist

If drawing has a Template then the Template file is copied to create the Drawing file.

Opens the drawing file in CAD.

If updating, then [DataLinks](#) are updated (design data is copied from the database into the drawing block attributes).

Important: The template is only copied if the drawing file does not exist. Therefore, any changes made in a drawing once created from a template will remain in the drawing and those changes will not be overwritten. This gives the flexibility to start a drawing based on a template, then modify that drawing as required, in affect making the drawing a template for itself.

6.2 Termination Diagrams

Seed Files are used as a base to start automated drawing activity and are used to create termination drawings. Typically a Seed File contains the drawing title block, (and company logos) revision blocks etc with attributes and DataLinks attached). When a drawing based on a Seed File is updated, every DataLink is evaluated and any change is placed into its associated drawing attribute (e.g. Title Block and revision data is updated in the drawing).

If the drawing being updated is a Termination Diagram (actually, if it has an Equipment No value), then the existing drawing file (if any) is deleted and created again by copying the seed file, then terminations are parametrically (automatically) drawn based on the Wiring Manager's termination data for that equipment number and the Seed drawing's parameter data.

Seed File parameters include drawing sheet size (physical dimensions), the maximum number of terminal strips per drawing, maximum number of terminals per terminal strip/Din Rail, spacing between terminal strips etc. Refer to [Seeds List](#) for more information.

In addition to the Seed File parameters, which are defined per Seed File, AVEVA Instrumentation provides user project definable preference settings that control drawing parameters such as terminal height/width, cable core/wire length, text heights etc. These project preferences are set in Designer's [Auto Insert Blocks](#) window.

To create a termination diagram, the **Equipment No** field must contain a valid project equipment number from the Wiring Manager's Equipment List and there must be internal terminals/devices with cable/wire connections.

Multiple Equipment Items and Drawing Sheets

If the selected equipment has more terminations than can fit on a single drawing sheet, additional drawing sheets will be created automatically as required when the drawing is created or updated during this procedure.

These additional sheets will be added to the Drawing List and assigned automatically generated (incremented) sheet numbers and index sheet order numbers.

If a termination diagram drawing number is associated with more than one item of equipment, only the sheet or sheets for the item selected when the **Update** option was clicked are created/updated.

If an update results in the number of drawing sheets increasing or decreasing, the sheet numbers and index sheet order numbers for all subsequent drawing sheets are automatically increased or decreased as appropriate to reflect this.

Only drawing sheet numbers in the same sequence as the updated drawing are affected. So, if sheets of the [Cover, Index, Notes and Reference Drawing Sheet Drawing Types](#) are identified using a separate sequence from the termination diagram drawing sheets with the same drawing number (e.g. by using letters), these sheet numbers will not be changed.

Termination Drawing Creation

There are two Drawing List commands that can create a Termination CAD drawing: **Open** and **Update** on the **List Tools - Drawing** tab.

Command	Functionality	Remarks
Open	Opens drawing file, no data is updated	Only applicable to one drawing at a time
Update	Recreates drawing file and updates data via AVEVA Instrumentation DataLinks	Can be used on any number of selected drawings

These commands are used as follows:

- **Open** - used to view the current drawing in CAD (refer to [Issues when Opening AutoCAD Drawings](#)).
- **Update** - used to recreate the drawing with database information (if any), then view the updated drawing in CAD.

When update is used, the Seed file is copied to create the Drawing file (whether the drawing file exists or not).

The drawing file is opened in CAD and the [DataLinks](#) are updated (design data is copied from the database into the drawing block attributes).

Terminations are parametrically (automatically) drawn based on the equipment layout/terminations designed in the project database.

6.3 Enhanced Cable Block Diagrams

Like Termination diagrams, enhanced block cable diagrams are based on seed files which contain the drawing borders, title blocks etc. Seed File parameters include drawing sheet size and extents.

Enhanced block cable diagrams use a specific sub-set of seed files. Refer to [Enhanced Cable Block Diagram Seeds List](#) for further information.

Distribution Drawing Creation

There are two Drawing List commands that can create an enhanced block cable diagram CAD drawing: **Open** and **Update** on the **List Tools - Drawing** tab.

Command	Functionality	Remarks
Open	Opens drawing file, no data is updated	Only applicable to one drawing at a time
Update	Recreates drawing file and updates data via AVEVA Instrumentation DataLinks	Can be used on any number of selected drawings

Think of these commands as:

- **Open** - used to view the current drawing in CAD (refer to [Issues when Opening AutoCAD Drawings](#)).
- **Update** - Used to recreate the drawing with database information (if any), then view the updated drawing in CAD.

When update is used, the Seed file is copied to create the Drawing file (whether the drawing file exists or not).

6.4 Open a Template Drawing with AutoCAD

To open a template file in AutoCAD, start AutoCAD and then use the file open command and navigate to the project template folder. Use the **Project** tab > **Edit Project** menu option to view the template folder name (refer to [Issues when Opening AutoCAD Drawings](#)).

Alternatively, open them in AutoCAD from within Designer from the list of project templates, as described below.

To open the list of templates, click **Select** in the **Grids and Schedules** section of the **Home** tab. Select **Templates** from the list of grids that is then displayed. The Templates grid is then displayed:

Templates	
Drag a column header here to group by that column.	
File Name	Times Used
DCS-AI-Transmitter	1
DCSAI-Transmitter	0
DCSAIandDCSAO	2

This window lists all the drawing files in the project template folder. **Times Used** shows the number of drawings in the Drawing list that use each template.

Note: If templates have been created in a folder other than the project's Template folder, copy them to the project Template folder. They will appear in this list the next time the Templates list is opened.

To find out what the project template folder is use the **Project** tab's **Edit Project** option. This displays a window that contains all the project settings, including the names of folders being used by the project.

To open a template in AutoCAD, select the template file name and click **Open** from the **List Tools - Templates** tab. AutoCAD then starts (if not already running) and the file is opened.

Note: This grid to open can only be used to open templates drawings. To create a new Template, users should copy the templates they create into the project's Template folder or use AutoCAD's **Save As** command to save to that folder.

Templates Used Report

A report listing the templates used in the project and how often each of them has been used can be accessed by selecting **Templates Used** from the [Reports](#) grid.

TEMPLATE	NumberOf
DCSAIandDCSAO	2
DCS-AI-Transmitter	1

For descriptions of the toolbar buttons of the report window, refer to [Reports](#).

6.5 Assign DataLinks in AutoCAD

To assign or modify DataLinks to an AutoCAD template or seed drawing file, the file first needs to be opened using AutoCAD (refer to [Issues when Opening AutoCAD Drawings](#)).

Refer to [Open a Template Drawing with AutoCAD](#) for how to open a Template drawing file.

Refer to [Seeds List](#) for how to open a Seed drawing file.

Use of the Designer AutoCAD Menu

When assigning new DataLinks (or modify DataLinks already assigned) first ensure the AVEVA Instrumentation AutoCAD menu is loaded into AutoCAD. This toolbar menu should be automatically loaded when an AutoCAD drawing is opened from Designer.

Note: If the 'AVEVA Instrumentation' menu is not auto loaded the Designer.mns menu will need to be loaded manually (using the AutoCAD 'menu' command).

The menu files are located in the AVEVA Instrumentation program installation folder.

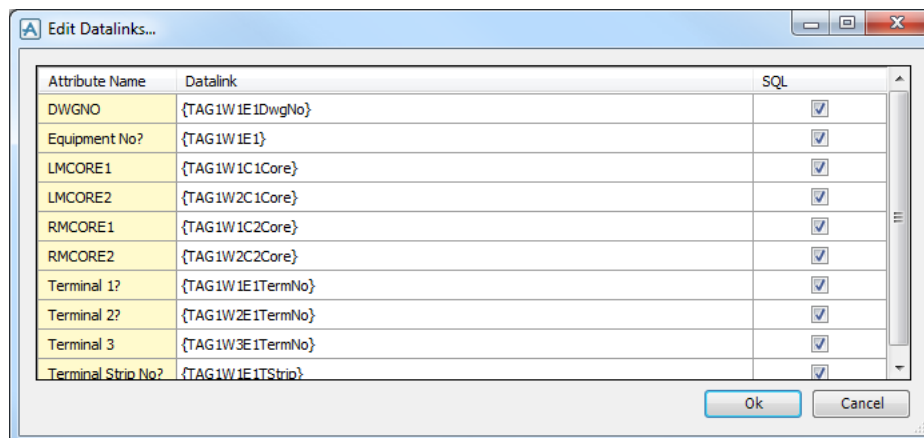
To Assign/Edit DataLinks

Once the AutoCAD AVEVA Instrumentation menu is loaded, select **AVEVA Instrumentation** from the pull-down menus, then **Edit DataLinks**.

This displays a window showing all attributes in the selected AutoCAD block.

AutoCAD will prompt users to select objects.

Select a block with attributes, and then press enter. AutoCAD will display the **Edit DataLinks** window:



This window shows all attributes and datalinks defined in the block selected.

Note: To view available Keyword DataLinks for any drawing in the Designer's Drawing List open the [DataLinks Window](#). This window includes 'copy and paste facilities' of DataLinks from the report window into the AutoCAD **DataLinks Edit** window.

To assign a DataLink, either type in a valid DataLink or copy it from the [DataLinks Window](#) (using Windows copy and paste - Ctrl-C / Ctrl-V etc) or by dragging and dropping from that window (hold the Ctrl key and drag the report DataLink to a field above).

Refer to [DataLinks](#) for more information on DataLinks.

Copying Blocks with DataLinks in AutoCAD

Since DataLinks are defined as Extended Entity Data within AutoCAD, their behaviour is same as Xdata. That is, if a block is copied with DataLinks attached, the DataLinks are copied too. This can drastically reduce data entry when setting up DataLinks.

For example, required DataLinks can be attached to a block that may represent a Field Device. That block can be copied to as many drawings as required, saving the effort of re-entering the DataLinks each time. Another example is the Title block used in all drawings. Set-up the first drawing with all DataLinks, and once it has been tested, copy that Title Block (which may contain multiple AutoCAD blocks) to the other drawings.

Auto-Erasing Blocks with DataLinks in AutoCAD

Designer provides an 'Auto-Erase' (or auto-delete) function where a block will be automatically erased from a drawing if a specific DataLink returns nothing. If a DataLink attribute is prefixed with and AVEVA Instrumentation detects that the following DataLink has no value, then Designer will erase the block containing the Datalink.

For example, it is required to erase a block if there is no tag number for {TAG10}. Entering: {TAG10} in for an attribute in a block will tell AVEVA Instrumentation to erase the block if {TAG10} evaluates to nothing (i.e. there is no TAG10 for this drawing).

6.6 DataLinks Window

To view DataLinks for any drawing in a project:

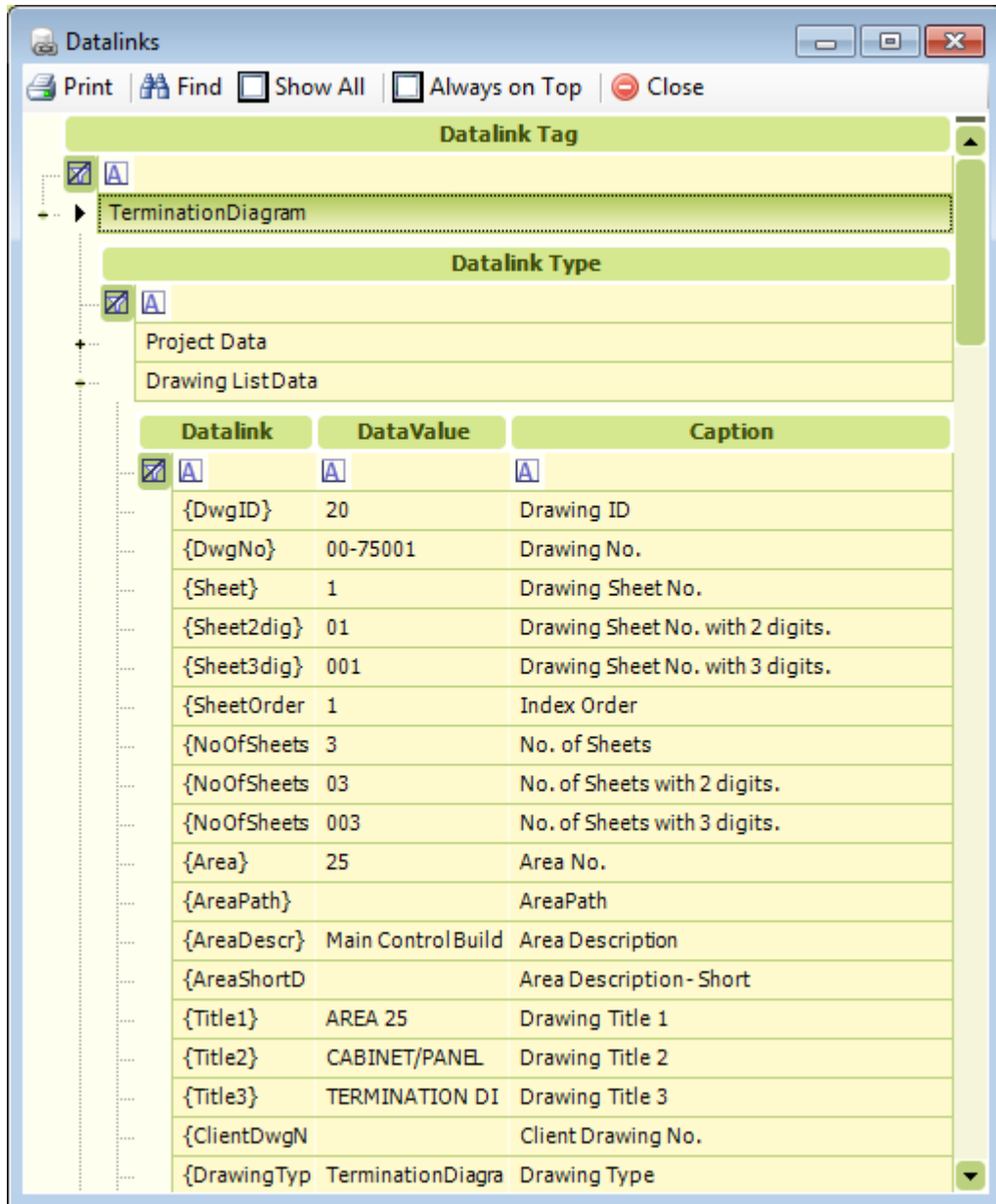
- Select a drawing from the Drawing List, then click **Show Datalinks** on the **List Tools - Drawing** tab
- Or right-click on a drawing in the Drawing List and click **Show Datalinks** on the menu that is then displayed.

The **DataLinks** window is then opened which shows all DataLinks generated for the selected drawing. DataLinks are grouped into logical groups.

Note: DataLinks are created based on the current drawing type (i.e Loop, Termination or Hook-up Diagram) and the current engineering data assigned to the AVEVA Instrumentation object type (i.e Loop, Equipment or Hookup Type). A complete set of DataLinks is not available to each drawing until the engineering data is complete (i.e. the loop wiring, equipment terminations or hookup template is finished).

The project-specific properties that may be setup in the Engineer and Process Engineer modules are available as DataLinks.

To view DataLinks for a group select the '+' box at the left of the group name:



The example above shows DataLinks for the **Drawing List Data** group. If the DataLink {DWGNO} is placed in the AutoCAD drawing file then it will be updated during auto generation with the value "00-75002". For more technical information about DataLinks refer to [DataLinks](#). The DataLinks are grouped by Type (e.g. Project Data, Drawing List, Loop List, Instrument List, DCS I/O, Wiring etc). This grid can be printed for reference or users can copy and paste into AutoCAD Templates etc via Designer.

DataLinks can be copied from this **DataLinks** window directly into the AutoCAD symbols (blocks) used as templates for loop diagrams and/or title blocks used as Seeds. To copy a DataLink select it (click on the DataLink) and use the Ctrl + C keys to copy to the Windows clipboard. Then select the AutoCAD DataLink field and paste the DataLink value. Refer to [Assign DataLinks in AutoCAD](#).

DataLinks can also be copied by 'drag and drop' selecting one (click in the white space immediately to the left of the DataLink field) and dragging the DataLink into an AutoCAD DataLink field and dropping it (release the mouse button).

When copied to an AutoCAD attribute, the DataLink is stored within the Block inside AutoCAD. Blocks (including DataLinks) may be copied within an AutoCAD drawing file or between drawing files using standard AutoCAD commands (copy, insert etc), any DataLinks will remain within the copied blocks and drawings. This means DataLinks can be setup for typical blocks which can then be copied to create new templates without having to assign Datalinks to those blocks again.

Refer to [Assign DataLinks in AutoCAD](#).

The following table shows typical DataLinks shown for each group:

Group Name	DataLink	Example Value
Project Data:		
	{ProjectNo}	25400
	{ProjectName}	FuelX Modernisation
	{ProjectDesc}	Refinery Clean Fuels
	{PlantName}	FuelX
Drawing Data:		
	{DwgNo}	340-07-1045
	{Sheet}	1
	{NoOfSheets}	1
	{Title1}	Area 340
Drawing Revisions:		
	{RevNo1}	A
	{Date1}	7/7/2003
	{Revision1}	ISSUED FOR REVIEW
	{By1}	GRH
Instrument Tag Data:		
	{TAG1}	34-FT-1005
	{TAG1Manufact}	Honeywell
	{TAG1Model}	
Tag Wiring Data:		
	{TAG1T1}	+
	{TAG1W1C1CableNo}	C34FT1005
	{TAG1W1C1CableType}	1Pr

{TAG1W1C1Core}	WH
{TAG1W1E1}	34-JB-114

DataLinks for Project Data, Drawing Data and Drawing Revisions are always the same regardless of drawing type being generated (whether the drawing is based on a Template or Seed or whether it is a Loop Diagram, Termination Diagram, Hookup or any other type). However, the Revision DataLinks always end in a number corresponding to Revision history sequence (example: {RevNo1} is always earliest Revision, {RevNo2} is the second earliest etc).

DataLinks for Instrument Tag Data always end in a number corresponding to the 'Loop Dwg Code' set for each instrument in the Instrument List. This number must be unique for each instrument in a loop and is used to identify each instrument in the loop drawing. This 'Loop Dwg Code' can be modified from Instrument Engineer or Designer from the [View and Edit Drawing Information](#) window or the 'LoopDwgCode' field can be added to a GridView in Engineer's Instrument List for bulk editing.

Note: Setting 'Loop Dwg Code' by instrument type should be considered. For example Transmitters = 11, Solenoid Valves = 51, Control Valves = 61 etc. This may reduce editing associated with each DataLink in the AutoCAD templates. A set of blocks may easily be setup to represent a Transmitter and all its associated wiring, junction boxes, marshalling cabinet all using DataLinks like {TAG11. Once this is done, this set of symbols may be copied to make up more complex loops containing transmitter, I/P, Limit switches etc.

6.7 Seeds List

Seed drawings are used by Designer to create termination drawings. Seed drawings are normally just an empty drawing file containing a drawing title block (drawing frame with attributes). The title block will have attributes linked to the project database using [DataLinks](#). In addition to the title block, AVEVA Instrumentation requires specific parameters to enable termination diagrams to be automatically drawn. These parameters are set in the **Seed File Parameters** window.

Note: To use a Seed file to auto-generate drawings, all the Seed parameters below must be entered for the Seed file and the Seed file must be located in the AVEVA Instrumentation project 'Seed' folder.

To open the Seed Drawing List window which lists of all Seed files for the project, click **Select** in the **Grids and Schedules** section of the **Home** tab.

Select **Seeds** from the list of grids that is then displayed. The Seeds grid is then displayed:

Seeds						
Drag a column header here to group by that column.						
Seed File	Description	Size	Max. No. of TStrips	Max. No. of Terminal	Default Spacing	TStripStartX
<input checked="" type="checkbox"/> TerminationA1	Termination Diagram	A1	3	80	250	180
<input checked="" type="checkbox"/> TerminationA3	Termination Diagram	A3	1	50	170	270
<input checked="" type="checkbox"/> TerminationA32T	Termination Diagram	A3	2	50	170	190

This window contains a list of all Seed drawing files added to the project database through this window.

Note: Ensure that a Seed file is copied (or saved in AutoCAD) to the project seed folder with the same file name as the 'Seed File' name entered in the Seed List, otherwise Designer cannot use the seed drawing to generate termination drawings.

This Seed Drawing List contains important information used by Designer when termination drawings are parametrically created. The following parameters are required to be entered for all Seed drawings:

Parameter	Description
Seed File	A unique name that matches the Seed File name (the AutoCAD drawing file name).
Description	User defined description (optional).
Size	User defined size - used to help a user select the appropriate seed drawing size (optional).
TStrip Start X	X coordinate where the first terminal strip will be started (the top left of the strip).
TStrip Start Y	Y coordinate where the first terminal strip will be started (the top left of the strip).
TStrip Spacing	Horizontal spacing ('X') between terminal strips.
Max No. of Terminals	Maximum number of Terminals to draw in a single vertical set of terminals before start at top again.
Max No. of TStrips	Maximum number of Terminal Strips to be placed on the drawing (see Note 1 below).
Extents Min/Max X/ Y	Minimum and maximum X and Y coordinates in which AutoCAD can draw within the title block (ExtentsMinY affects bottom of vertically drawn cables).
AllCablesVertical	Defines whether all cables will be drawn to the bottom of the drawing sheet (to the ExtentsMinY above) - see the Exceptions setting below.

Notes:

1. If the Equipment being drawn has multiple terminal strips or the number of terminals in a single terminal strip exceeds the **MaxNoOfTerminals** parameter, then Designer will start a new strip of terminals. If the **MaxNoOfTStrips** is exceeded for the current equipment, then AVEVA Instrumentation will automatically create a new drawing sheet and continue to draw terminals/terminal strips until there are no more terminals/terminal strips for the Equipment. AVEVA Instrumentation will continue to create new sheets if required.
2. If the Equipment being drawn has terminal strips containing more terminals in a single terminal than the **MaxNoOfTerminals** parameter then Designer will start a new Terminal Strip to continue until all terminals are drawn. If the **MaxNoOfTStrips** is not exceeded, the continuation Terminal Strip is drawn on the same drawing sheet. If the **MaxNoOfTStrips** is exceeded for the current equipment, then AVEVA Instrumentation will automatically create a new drawing sheet and continue to draw terminals/terminal strips until there are no more terminals.
3. **ExtentsMinY** controls the positioning of cables drawn to the bottom of the drawing. AVEVA Instrumentation will not draw below the **ExtentsMinY**.

- The coordinates at which an intermediate Junction Box terminal strip (if present) will be located (its top left corner) are specified by the following formula:

$$\text{TStrip Start X} = (\text{Cable Length} + (2 \times \text{Core Length}) + \text{Terminal Strip Width})$$

TStrip Start X is set in the seed file parameters (see below).

Cable Length, **Core Length** and **Terminal Strip Width** are set on the *Terminations Tab* of the *Options* window.

To Open a Seed in AutoCAD

Select the Seed file name, click **Open** on the **List Tools - Seeds** tab. AutoCAD then starts (if not already running) and the file is opened (refer to *Issues when Opening AutoCAD Drawings*).

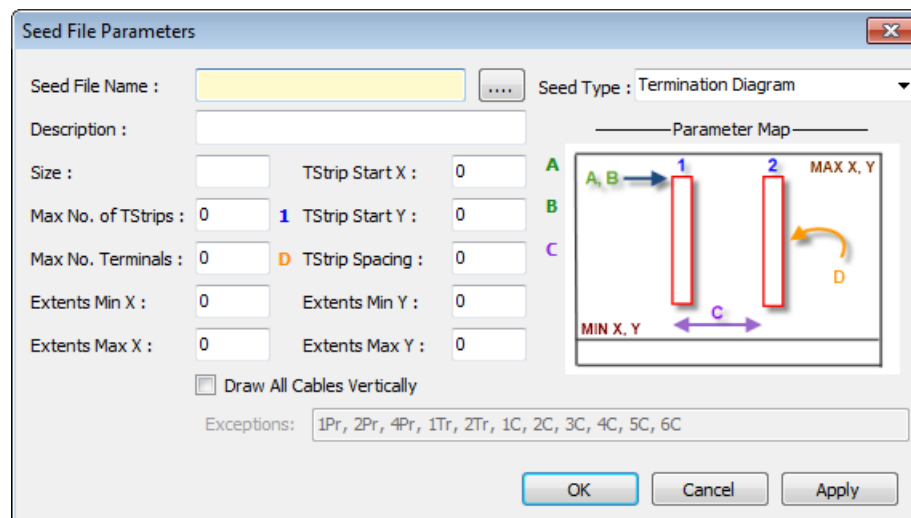
Note: In order for dashed lines to be displayed correctly in drawings that use a seed file:

- The LWDISPLAY command must be set to ON.
- The LTSCALE may need to be adjusted.

To Add a New Seed File

To add a new Seed file, click **New** on the **Home** tab (existing seed records can be copied by using the **Copy** command, accessed by click the arrow next to the **New** option).

AVEVA Instrumentation then displays the **Seed File Parameters** window (the following example shows the window after typical parameters have been entered for a metric drawing):



Complete all parameters as described, in the drawing units required in the AutoCAD drawing files (i.e. mm or inches)

Parameter	Description
Seed File Name	A unique name that matches the Seed File name (the AutoCAD drawing file name).
Description	User defined description (optional).

Size	User defined size - used to help a user select the appropriate seed drawing size (optional).
TStrip Start X	X coordinate where the first terminal strip will be started (the top left of the strip).
TStrip Start Y	Y coordinate where the first terminal strip will be started (the top left of the strip).
TStrip Spacing	Horizontal spacing ('X') between terminal strips.
Max No. of Terminals	Maximum number of Terminals to draw in a single vertical set of terminals before start at top again.
Max No. of TStrips	Maximum number of Terminal Strips to be placed on the drawing (see Note 1 above).
Extents Min/Max X/Y	Minimum and maximum X and Y coordinates in which AutoCAD can draw within the title block (ExtentsMinY affects bottom of vertically drawn cables).
Draw All Cables Vertically	Defines whether all cables will be drawn to the bottom of the drawing sheet (to the Extents Min Y above).
Exceptions	If Draw All Cables Vertically is selected then the user may add a list of exceptions. Exceptions are cable types that will always be drawn horizontally and are entered with a comma delimiter. In the above example all cables will be drawn vertically except cables that are 1Pr, 2Pr, 4Pr, 1Tr, 2Tr, 1C, 2C etc as shown the Exceptions field.

Note: Remember that to use a new Seed file an AutoCAD drawing file with the same name as the seed entry must exist in the AVEVA Instrumentation project 'Seed Folder'.

6.8 Enhanced Cable Block Diagram Seeds List

Seed drawings are used by Designer to create enhanced cable block diagram drawings. Seed drawings are normally just an empty drawing file containing a drawing title block (drawing frame with attributes). The title block will have attributes linked to the project database using [DataLinks](#). In addition to the title block, AVEVA Instrumentation requires specific parameters to enable distribution diagrams to be auto-drawn. These parameters are set in the **CBD Seeds File Parameters** window.

Note: To use a CBD Seed file to auto-generate drawings all the Seed parameters below must be entered for the Seed file and the Seed file must be located in the AVEVA Instrumentation project 'Seed' folder.

Note: A different type of Seed file is used to generate Termination drawings. Refer to [Seeds List](#).

To open the CBD Seeds list window which contains a list of all CBD Seed files for the project, click **Select** in the **Grids and Schedules** section of the **Home** tab.

Select **CBD Seeds** from the list of grids that is then displayed. The CBD Seeds grid is then displayed:

CBD Seeds							
Drag a column header here to group by that column.							
Seed File	Description	Size	Extents Min. X	Extents Min. Y	Extents Max. X	Extents Max. Y	Seed Type
<input checked="" type="checkbox"/> A	A	A	=	=	=	=	A
▶ CBDSeed1	CDB Seed 1	A0	50	50	500	300	Enhanced CableBlock
▶ CBDSeed2	CDB Seed 2	A0	50	50	500	300	Enhanced CableBlock
▶ CBDSeed3	CDB Seed 3	A0	25	25	500	300	Enhanced CableBlock

Note: Refer to *Working with the Data Grid* for information on the grid control including how to select a record.

This window contains a list of all Enhanced CBD Seed drawing files added to the project database through this window.

Note: Ensure that a Seed file is copied (or saved in AutoCAD) to the project seed folder with the same file name as the 'Seed File' name entered in the Seed List otherwise Designer cannot use the seed drawing to generate distribution drawings.

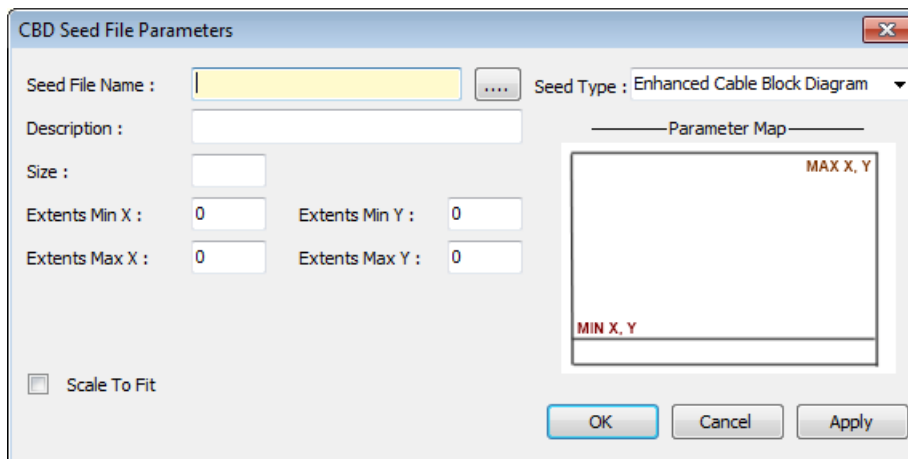
To Open a CBD Seed in AutoCAD

Select the CBD Seed file name, click **Open** on the **List Tools - Seeds** tab. AutoCAD then starts (if not already running) and the file is opened.

To Add a New CBD Seed File

To add a new CBD Seed file, click **New** on the **Home** tab (existing seed records can be copied by using the 'copy' drop down toolbar command next to the **New** option).

The **CBD Seed File Parameters** window is then displayed:



Complete all parameters as described in the drawing units required in the AutoCAD drawing files (i.e. mm or inches):

Parameter	Description
Seed File Name	The AutoCAD drawing file. Click the ... button to open a file browser to be used in selecting the required file.

Seed Type	The type of drawing that the Seed file is for, in this case always Enhanced Cable Block Diagrams.
Description	User defined description (optional).
Extents Min X and Y	Minimum coordinates from which AutoCAD can draw the seed drawing border, i.e. its starting point.
Extents Max X and Y	Maximum coordinates to which AutoCAD can draw the seed drawing border.
Scale to Fit	Check this checkbox if the diagram contents (as defined in Wiring Manager) are to be scaled to fit within the extents of the seed drawing border.

Note: Remember that to use a new Seed file, an AutoCAD drawing file with the same name as the seed entry must exist in the AVEVA Instrumentation project 'Seed Folder'.

6.9 Auto Insert Blocks

Designer enables the auto-insertion of user-defined blocks into any AVEVA Instrumentation generated drawing by adding block names to the Drawing List for any or all drawings. The inserted blocks can contain DataLinks that will be updated by AVEVA Instrumentation with project data. AVEVA Instrumentation supports up to 6 blocks per drawing. Blocks are always inserted at drawing coordinates 0,0.

This feature was added to AVEVA Instrumentation to enable users to reduce the number of seed and template drawings as often the only difference between drawings is a different set of drawing notes etc.

It can also be used in a situation where it is required to show detailed process data, such as a detailed 'P&ID' type bubble diagram on Loop Diagrams. In this case, although the wiring is standardised and a simple template could be used on, for example 50 loops (e.g. 2 Wire Analog Input to DCS), the process connections may be quite different. The Auto Inserting Blocks facility can be used here as only one template (wiring) is required, but maybe 3 or 4 different 'P&ID' Blocks can be used depending on whether the transmitter is a D/P Flow connected to a orifice plate, a D/P Level transmitter connected to a vessel etc.

Add an Auto-Inserting Block

To enable Designer to locate the user-defined blocks, each block must reside in the current projects 'CAD Block/Circuit' folder as defined in the Project Setup window (**Project** tab > **Edit Project** option).

To assign blocks to a specific AVEVA Instrumentation Drawing add the block name to one of the Drawing List's six block fields (Block1, Block2, etc.). The easiest way to do this is to add the Block fields to a GridView using the AVEVA Instrumentation Grid Manager, accessed from the **Manage** option on the **Home** tab (refer to the [Common Functionality User Guide](#) for details).

Once the Block fields are in the Drawing List data grid, select the required value from the pull down list that appears in each 'Block' cell of the grid when the mouse is hovered over that cell.

When generating the drawing AVEVA Instrumentation inserts any defined Blocks just prior to updating DataLink data so DataLinks can be embedded in the Auto Inserting Blocks successfully.

Note: AVEVA Instrumentation only inserts these Blocks if the drawing is being created (i.e. the drawing file does not currently exist). To add Blocks to an existing drawing, delete the drawing file prior to Update for the blocks to be auto-inserted.

6.10 DataLinks

Designer enables any attribute within any AutoCAD drawing to be updated from the AVEVA Instrumentation Project Database. A DataLink is attached to each block's attributes in a Template file or Seed file as Extended Entity Data (Xdata). Extended Entity data is invisible in AutoCAD, so the DataLinks will not effect the CAD file visually.

Note: DataLink definitions are invisible within the drawing file and can only be accessed by an applications program such as Designer (or AutoLisp/Visual Basic etc).

An AVEVA Instrumentation DataLink represents a data value that is replaced by the actual project data when updated by Designer. When a drawing is updated by Designer, all AutoCAD attributes that contain a DataLink are automatically updated with the current data from the AVEVA Instrumentation project database. This data could include title block and revision information as well as engineering, wiring or other project data.

Types of DataLinks

Designer uses two types of DataLinks:

- **Keywords.** These are always enclosed in curly brackets {}

Examples:

{DwgNo}	returns the value of the Drawing Number field for the current drawing.
{Title1}	returns the value of the Title1 field of the Drawing List for the current drawing.
{Tag1}	returns the Tag No of the first instrument in current loop (if the current drawing is a Loop Diagram).

Note: Refer to DataLink Keyword Samples for a comprehensive list of Keyword DataLink definitions used within Designer.

- **SQL Statements.** These are always enclosed in curved brackets () and are written in the form of a standard SQL (Structured Query Language) query definition for database access:

```
(SELECT Field1 FROM TableName WHERE Field2 = Value)
```

For example:

```
(SELECT ModelNo FROM InstrumentList where TagNo ='FT-600')
```

...returns the **ModelNo** field value from the InstrumentList table where the **TagNo** field is equal to FT-600).

Keyword DataLinks are predefined within the Designer and cannot be user defined.

SQL Statements are user-definable and are included to enable advanced users to access data that has not been defined as a Keyword DataLink.

Note: To view available Keyword DataLinks for any drawing in the Designer's Drawing List bring up the [DataLinks Window](#).

Multiple DataLinks

Designer supports multiple DataLinks for each Block Attribute. They can be used to update multiple values within a single attribute.

For example:

Attribute with DataLinks: {DWGNo} {Rev1} would fetch the current drawings 'Drawing No' and 'Rev1' fields and append them together with a space in between (such as D1234 A - if 'Drawing No' was: 'D1234' and Revision 1 was 'A').

Character or numerical values may also be concatenated within the DataLink definition.

For example:

Attribute with DataLinks: Dwg No.{DWGNo}-{Rev1} would return the current drawings **Drawing No** field and append it after the characters 'Dwg No. ' followed by a '-' (dash) followed by the current drawings value of the **Rev1** field.

Nested DataLinks

Designer supports Nested DataLinks for each Block Attribute. They can be used to update multiple values within a single attribute or used as a lookup value in a SQL type DataLink.

For example:

Attribute with DataLink: (SELECT DrawnBy FROM Drawings WHERE DwgID = {DwgID})

Here the Keyword DataLink {DwgID} is being used as the value to search for in the DwgID field of the Drawings table.

Another example: how to get access to any data from the InstrumentList:

In the following DataLink the Keyword DataLink {TAG1Key} is unique name of instrument 1 in the loop currently being created/updated. We use that value to lookup a field in the AVEVA Instrumentation InstrumentList table. Here we are returning the value of 'UserField1'.

```
(SELECT UserField1 FROM InstrumentList WHERE InstKey={TAG1Key})
```

Attaching DataLinks to Attributes in AutoCAD

Open the Template, Seed or Drawing File using Designer's **Open** options (on the **List Tools** tabs) as this ensures the AutoCAD VBA (Visual Basic for Applications) program is loaded into AutoCAD. If the 'AVEVA Instrumentation' tools menu is not visible the menu has not yet been changed, so select the appropriate AutoCAD menu from wherever AVEVA Instrumentation was installed. Refer to the [Assign DataLinks in AutoCAD](#) for more information.

Editing DataLinks in AutoCAD

Refer to the [Assign DataLinks in AutoCAD](#) for more information.

Auto-Erase Block in AutoCAD using DataLinks

Designer provides an 'Auto-Erase' (or auto-delete) function where a block will be automatically erased from a drawing if a specific DataLink returns nothing. If a DataLink attribute is prefixed with and AVEVA Instrumentation evaluates the following DataLink with nothing (no value) then Designer will erase the block containing the Datalink.

For example, it is required to erase a block if there is no tag number for {TAG10}. Entering: {TAG10} in for an attribute in a block will tell AVEVA Instrumentation to erase the block if {TAG10} evaluates to nothing (i.e. there is no TAG10 for this drawing).

Forcing Uppercase Text in AutoCAD

Designer provides a method to change any DataLink values retrieved from the AVEVA Instrumentation Database to uppercase. For example, the database value for {Client} may be 'Xyz Oil Company'. To force this to become 'XYZ OIL COMPANY' prefix the DataLink attribute with <UCASE> and AVEVA Instrumentation will update to uppercase. If both the operator (see above) and the <UCASE> operator are required, then must be the first within the attribute (e.g. <UCASE>{TAG1Manufacturer}).

Copying Blocks with DataLinks in AutoCAD

Since DataLinks are defined as Extended Entity Data within AutoCAD, their behaviour is same as Xdata. That is, if a block is copied with DataLinks attached, the DataLinks are copied too. This can drastically reduce data entry when setting up DataLinks.

For example, required DataLinks can be attached to a block that may represent a Field Device. That block can be copied to as many drawings as required, saving the effort of re-entering the DataLinks each time. Another example is the Title block used in all drawings. Set-up the first drawing with all DataLinks, and once it has been tested, copy that Title Block (which may contain multiple AutoCAD blocks) to the other drawings.

Summary

- DataLinks are used to define where data comes from in the database and are attached to Attributes as Extended Entity Data.
- There are two types of DataLinks: **Keywords** (predefined) and **SQL statements** (which are user definable)
- DataLinks can be used to fill in values to a single attribute and they may be nested within each other and/or concatenated within character strings
- DataLinks are attached and edited from within AutoCAD by selecting the desired block containing attributes with the menu **AVEVA Instrumentation > Edit DataLinks** command.
- Blocks may be copied with DataLinks within AutoCAD to reduce setup time (and to copy entire drawings)
- A list of predefined keywords within the Designer Drawing List for any selected drawing can be viewed by using the **Show Datalinks** option on the **List Tools - Drawings** tab (after selecting a drawing in the Drawing List), which opens the [DataLinks Window](#).

7 Hookups

Hookup drawings are created by assigning a pre-defined Hookup Template to each project hookup drawing. A Hookup Template is made up of two parts:

- an AutoCAD drawing that contains the graphical representation of the installation detail.
- a Bill of Materials or Parts List that is assigned from the Designer Hookup parts catalogue.

Hookup drawings can be one of the following types: General, Process, Pneumatic or Mounting.

When the project Hookup drawing is created, AVEVA Instrumentation updates the Hookup Template drawing with all parts and all tags assigned to the drawing.

Continue at:

- [Hookup Drawing List](#)
- [Add a New Hookup Drawing](#)
- [Assign a Hookup Template](#)
- [Assign Tags to a Hookup](#)
- [View and Edit Hookup Drawing Information](#)
- [Hookups Template Catalogue](#)
- [Hookup Items Catalogue](#)
- [Hookup Reports](#)

7.1 Hookup Drawing List

The Hookup Drawing List is the main Designer module window for adding/editing and accessing Hookup drawings.

To open the Hookup Drawing List, click **Select** in the **Grids and Schedules** section of the **Home** tab.

Select **Hookup Drawings** from the list of grids that is then displayed. The Hookup Drawing List grid is then opened:

Hookup Drawings							
Drag a column header here to group by that column.							
AREA	DWGNO	Sheet	Drawing	Title1	Title2	Title3	Hookup Type
01	01-00001	1	General	AREA 01	HOOKUP DIAGRAM	ORIFICE & D/P TRANSMITT	Orifice & D/P Transmitter - Short
01	01-00002	1	General	AREA 01	HOOKUP DIAGRAM	ORIFICE & D/P TRANSMITTER	Orifice & D/P Transmitter - Long Mount
01	01-00003	1	General	AREA 01	HOOKUP DIAGRAM	ORIFICE & D/P TRANSMITTER	Level Radar
01	01-00004	1	General	AREA 01	HOOKUP DIAGRAM	ORIFICE & D/P TRANSMITTER	Temperature Gauge
01	01-00005	1	General	AREA 01	HOOKUP DIAGRAM	ORIFICE & D/P TRANSMITTER	Diff Pressure Gauge - Liquid Service

Note: Refer to [Working with the Data Grid](#) for information on the grid controls, including how to select a record (a Drawing).

The grid provides details on each project Hookup drawing, including Drawing Number, Hookup Type, Title, Current Revision etc.

The grid is very similar to the Designer [Drawing List](#), except that it is filtered to show only Hookup Drawings.

Mandatory Data

To produce a drawing, a drawing number and sheet number must be entered. Designer uses these to create a file name. For example: Drawing No: 123456 and Sheet No: 1 are combined to create a file name: 123456-1.dwg.

To produce project Hookup Drawings a pre-defined Hookup Template must be assigned to each of the drawings in this Hookup Drawing List.

Auto Generation of Drawings

AVEVA Instrumentation uses 'DataLinks' to map database data to AutoCAD drawing attributes. DataLinks are automatically updated by Designer when a drawing is opened or updated from the Drawing List. For information on using Designer's DataLinks to update: Drawing Title Block (Drawing Border) - including revisions history, Tags numbers assigned to the hookup and the Bill of Materials (or Parts List) refer to [Drawing Generation](#).

Hookup Drawing List - List Tools Options

The following options are located on the **List Tools - Drawings** tab.

These facilities are the same as those for the Drawing List, except where noted.

Records Section

Refresh

New These common options are also located on the **Home** tab.

Edit Refer to the [Common Functionality User Guide](#) for details.

Delete

Actions Tab

Open Opens the selected drawing for reviewing/printing etc in AutoCAD (editing title block and revision information should be done from the **Edit** button on the **Home** tab) (refer to [Issues when Opening AutoCAD Drawings](#)).

Update Updates selected drawing(s) - DataLinks in each CAD drawing are updated with current project data from the AVEVA Instrumentation database. Refer to [Create or Update Drawings](#) for details.

Note: If the drawing file does not exist, the file is created by copying a) the template file (if drawing uses a template drawing) or b) the seed file (if drawing uses a seed drawing). Refer to the [Drawing Generation](#) for more information.

Issue Issues and updates selected drawing(s). Refer to [Drawing Issues](#).

Open Issues For Selected	Displays the Issues window listing all the current issues for the selected drawing. Refer to View Previous Issues for further information.
Open Issues For All	Displays the Issues window. Refer to View Previous Issues for further information.
Revisions	Displays a list of all drawings with revisions (and their revisions). Refer to Viewing and Editing Multiple Document Revisions .
Add Revisions	Used to create a new revision. Refer to Create a Revision .
Edit Revisions	Used to edit the current revision. Refer to Edit a Revision .
Check for New Loops	Checks for new Loop drawings created in the Engineer module and imports them into the Drawing List. Not relevant to the Hookup Drawing List.
Check for New Terminations	Checks for new Termination drawings created in the Wiring Manager module and imports them into the Drawing List. Not relevant to the Hookup Drawing List.
External Ref Drawing Nos.	Used to view, add and edit list of non-AVEVA Instrumentation Termination Drawing numbers for equipment. Refer to Non-AI Termination Drawing References .
Highlight Documents for Reissue	Used to highlight which issued drawings include data that has been changed in the database and therefore should be updated and reissued. Refer to Highlight Drawings for Reissue .
Tools Tab	
Show Datalinks	Used to view the list of DataLinks for a selected drawing. Refer to DataLinks Window .
Rename	Used to rename batches of selected drawings. Refer to Rename Selected Drawings .
Printing Tab	
Print	Prints selected drawing(s) - if the drawing files exists.
Export Tab	
To External System	Publishes selected drawings to a folder. Refer to Drawing Publishing .
Selected Drawings	Used to export selected drawings files in the following ways:
Copy/Archive to Folder	Used to export drawing files to a folder defined during the export process. Refer to Export Drawings to a Specified Folder .
Copy to User Defined Names	Used to export drawing files to a pre-defined folder or folders with file names in a pre-defined, user-defined format. Refer to Export Drawings to Pre-Defined Folders with File Names in a Pre-Defined Format .

7.2 Add a New Hookup Drawing

With the Hookup Drawing List open, click **New** on the **Home** tab to display the **Hookup Drawing Information** window:

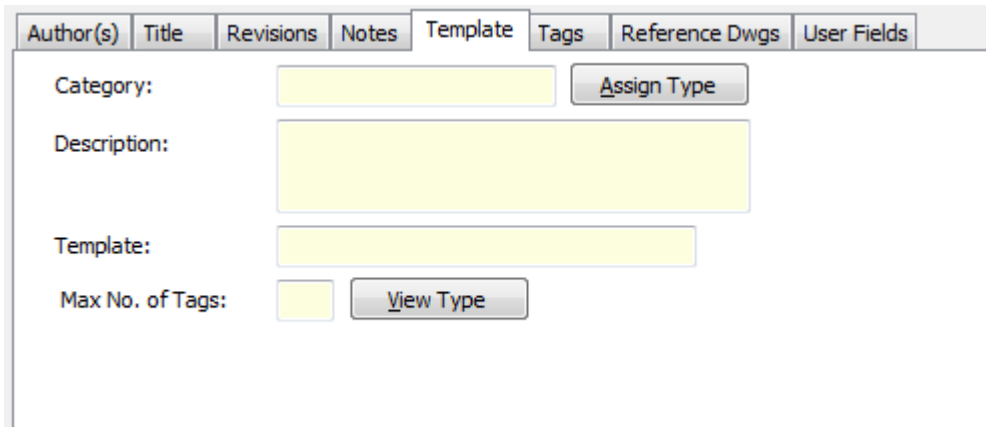
This window is identical to the standard **Drawing Information** window (see [Add a New Drawing](#)) except that it has two additional tabs:

Template Used to select the Hookup Template to be used when creating the Hookup Drawing. See [Assign a Hookup Template](#).

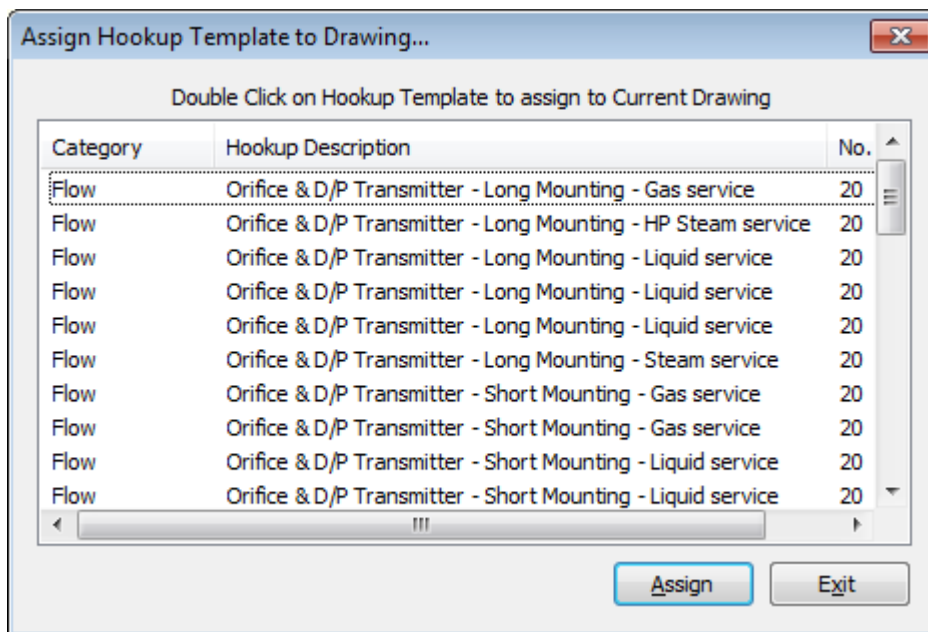
Tags Used to assign tags to the current Hookup Drawing. See [Assign Tags to a Hookup](#).

7.3 Assign a Hookup Template

In the **Hookup Drawing Information** window click **Assign Type** on the **Template** tab.



This displays the **Assign Hookup Template to Drawing** window, listing the current Hookup Drawing Catalogue template drawings:

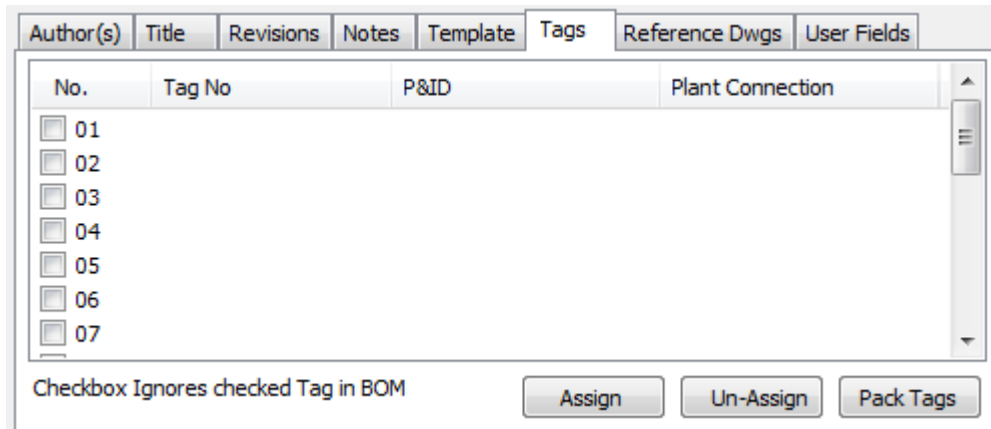


To assign a template either double-click on the Hookup Template record, or click on the Hookup Template record and then click **Assign**.

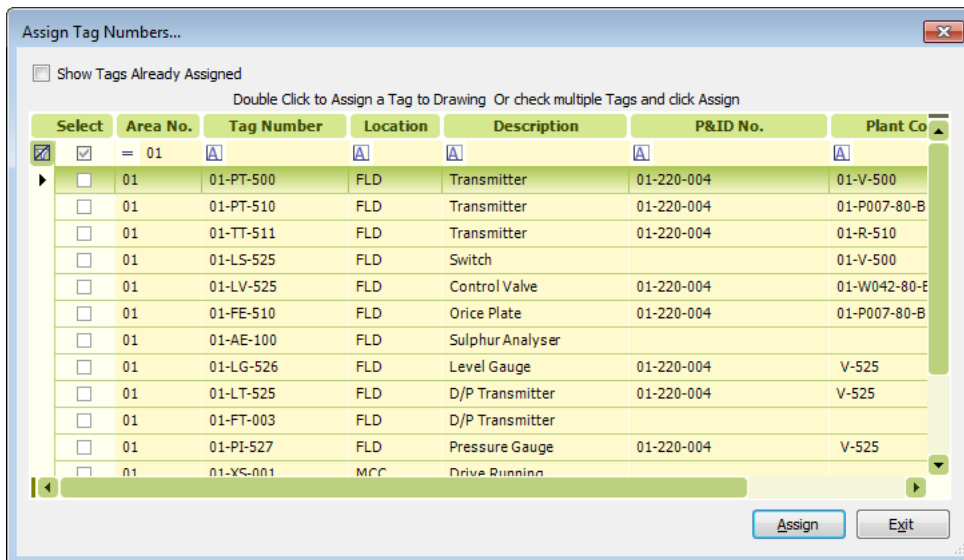
To add new template drawings to the project refer to [Hookup Items Catalogue](#).

7.4 Assign Tags to a Hookup

To assign an instrument tag to a specific Hookup Drawing, in the **Hookup Drawing Information** window double-click on an empty tag number record on the Tags tab.



The **Assign Tag Numbers** window is then displayed:



By default, this list shows all tags not yet assigned to a Hookup Drawing. Check **Show Tags Already Assigned** if all tags are to be listed.

To assign a tag to the current Hookup Drawing, double-click on its tag number.

Repeat the double-click selection as required to assign more than one tag (if the current drawing has multiple tags that are yet to be assigned).

Click **Exit** when the required tags have been assigned.

Alternatively check the **Select** checkboxes for the tags to be assigned, then click **Assign** to assign all selected tags to the hookup drawing.

Note: The selected tag(s) are allocated to the next available spare tag position on the hookup. If required, tags can subsequently be dragged into different positions. They can also be deleted and "packed". See [View and Edit Hookup Drawing Information](#).

7.5 View and Edit Hookup Drawing Information

To view and edit existing Hookup Drawing information, select the drawing in the Hookup Drawing List and click **Edit** on the **Home** tab, or double-click on the drawing record in the Hookup Drawing List. The **Hookup Drawing Information** window is then displayed.

Note: The **Last Edit** field displays the date and time when the hookup drawing data was last edited. The user name of the individual that performed the edit is displayed in a tool-tip when the mouse cursor is hovered over the field. Click the button in the field to display the *Audit Manager*, which will display a list of all the changes to the hookup drawing data.

This window is identical to the normal **Drawing Information** window (see [Add a New Drawing](#)) except it has two additional tabs:

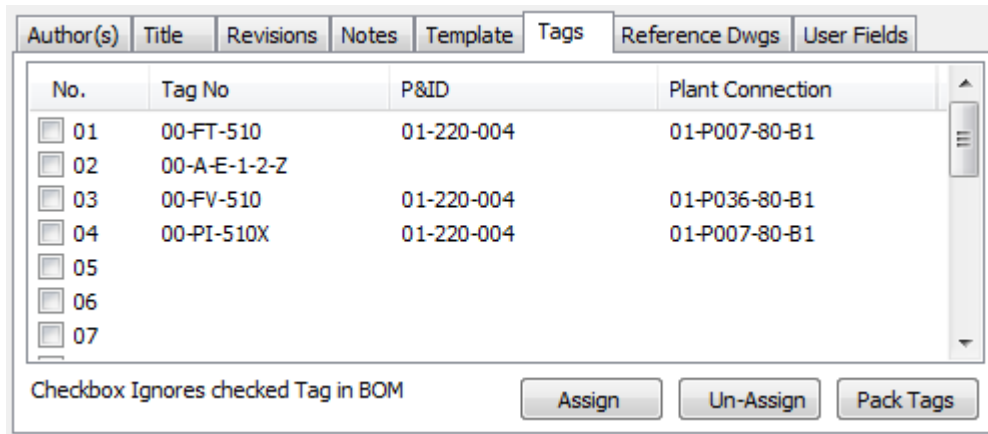
Template Used to select the Hookup Template to be used when creating the Hookup Drawing. See [Assign a Hookup Template](#)

Tags Used to assign tags to the current Hookup Drawing. See [Assign Tags to a Hookup](#).

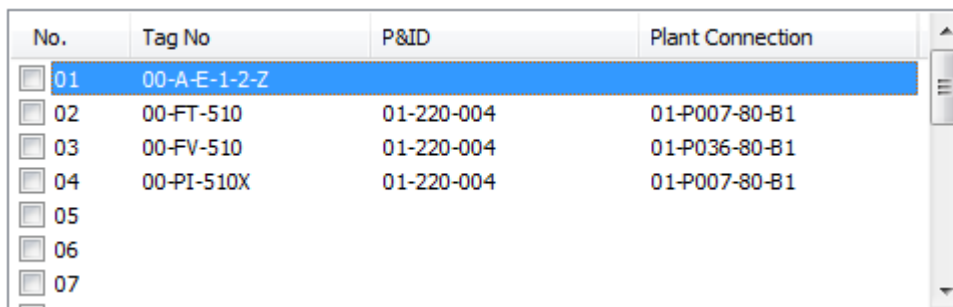
Reassign a Tag Position in a Hookup Drawing

Select a tag and drag it into a new position.

The example below shows four tags.



Drag the second tag and "drop" it onto the first position to move the selected tag to that position.



This will automatically move all tag data on the corresponding hookup drawing to the new positions next time the drawing is updated.

Remove a Tag from a Hookup Drawing

Select a tag and click **Un-Assign**.

Note: Removing a tag does not delete its data. It only unassigns the tag from the drawing.

Pack Tags

If tags are removed and gaps appear in the list of assigned tags, the tags can be "packed" using the **Pack Tags** button. This removes the gaps: tags are moved up the list to remove them. Packing tags also re-sorts the order based on the tag number.

7.6 Hookups Template Catalogue

The Hookup template catalogue contains definitions of all the template drawings that can be used to create project hookup drawings. A Hookup template drawing contains the graphic

representation of the installation/hookup. It also includes place-holders so that the component items/parts list can be created, and the instrument tags assigned to each drawing listed.

The place-holders are AutoCAD blocks with attributes. AVEVA Instrumentation uses Datalinks to map each attribute to a database field so that when a template is used to generate a project CAD drawing, all the component items and all tags are automatically updated by AVEVA Instrumentation.

To open the Hookup template catalogue, click **Select** in the **Grids and Schedules** section of the **Home** tab.

Select **Hookup** from the list of grids that is then displayed. The Hookup Catalogue grid is then displayed:

Hookup Catalogue					
Drag a column header here to group by that column.					
Category	Description	Template FileName	NoOfTags	Remarks	
Flow	Orifice &D/P Transmitter - Long Mounting - Gas service	F121	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Long Mounting - HP Steam service	F202	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Long Mounting - Liquid service	F022	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Long Mounting - Liquid service	F021	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Long Mounting - Liquid service	F122	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Long Mounting - Steam service	F201	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Short Mounting - Gas service	F111	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Short Mounting - Gas service	F112	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Short Mounting - Liquid service	F011	20	Typical HookUp	
Flow	Orifice &D/P Transmitter - Short Mounting - Liquid service	F012	20	Typical HookUp	
Level	Level Displacer	L051	20	Typical HookUp	
Level	Level Radar	L052	20	Typical HookUp	
Level	Level Switch : Turning Fork	L053	20	Typical HookUp	

7.6.1 Add a New Hookup Template

With the Hookup catalogue template grid open, click **New** on the **Home** tab to display the **Hookup Template Details** window:

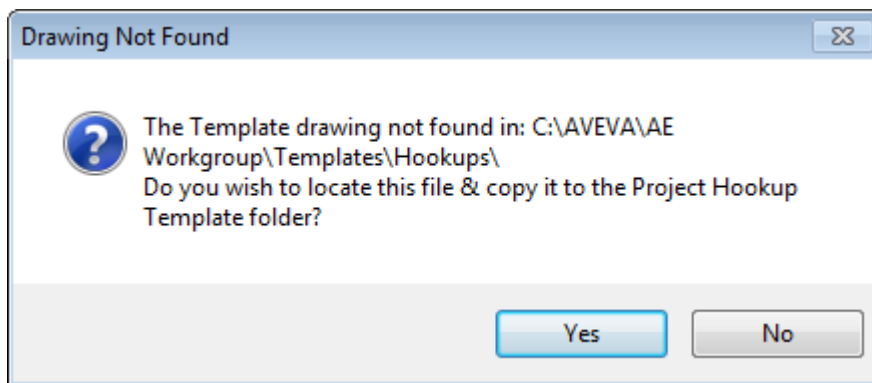
Enter a category, description, template name and the maximum number of tags that can be assigned to Hookup drawings that use this template.

Open the Template in AutoCAD / Select an existing AutoCAD drawing to be used as the Hookup Template

Click **Open Drawing**.

If a drawing with the same name as that entered in the **Template** field is found in the Hookup templates folder for the project, this drawing is automatically selected and opened in AutoCAD.

If there is no such drawing in that folder, a message is displayed asking whether or not the required file is to be browsed for and copied to the Hookup templates folder:



Click **Yes** to proceed. A window is then displayed which is used to browse for the required file. Once the required file is selected, click **Open** to open the drawing in AutoCAD and copy it to the Hookup template folder.

Once the drawing is opened in AutoCAD appropriate DataLinks must be assigned to each block attribute so AVEVA Instrumentation can update the attribute values with hookup item bill of materials, tags assigned and title block information. Refer to [Assign Hookup DataLinks in AutoCAD](#).

Apply the appropriate DataLinks to each of the template drawings attributes to map fields to update:

- Title Block information
- Drawing Revision history
- Tags Assigned
- Bill of Materials

Note: Once the AVEVA Instrumentation DataLinks have been assigned to the Template drawing, **Open Drawing** will automatically update the DataLinks with the current Bill of Materials saved to the database.

Assign a new Bill of Materials Catalogue Item to the Hookup Template

Click **New Item** to display the **Find a Component** window, used to assign items to the template. Refer to [Assign Hookup Items to Templates](#).

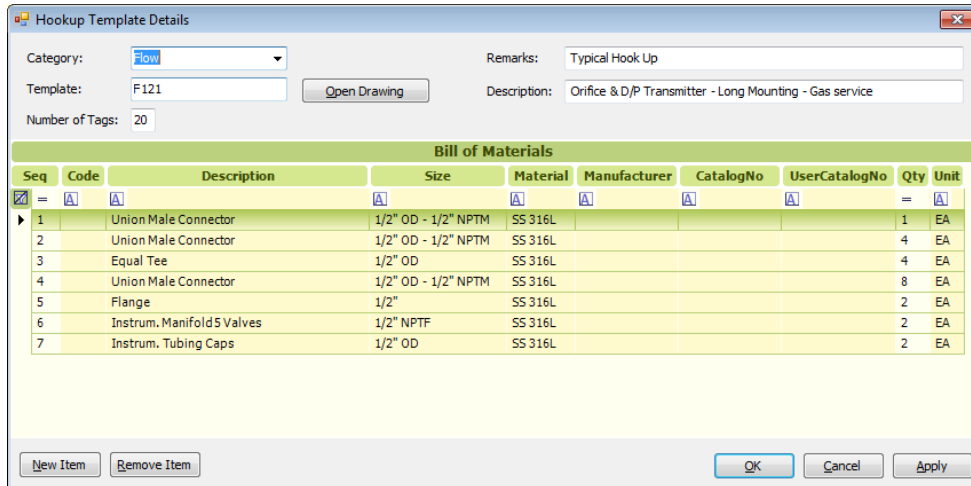
To change the quantity of any items assigned, click in the **Qty** grid column and edit the value.

Remove an Item from the Bill of Materials

Select the item record and click **Remove Item**.

7.6.2 View and Edit Template Data

To view and edit existing Hookup template information, select the template in the Hookup catalogue template grid and click **Edit** on the **Home** tab, or double-click on the template record in the Hookup catalogue template grid. The **Hookup Template Details** window is then displayed:



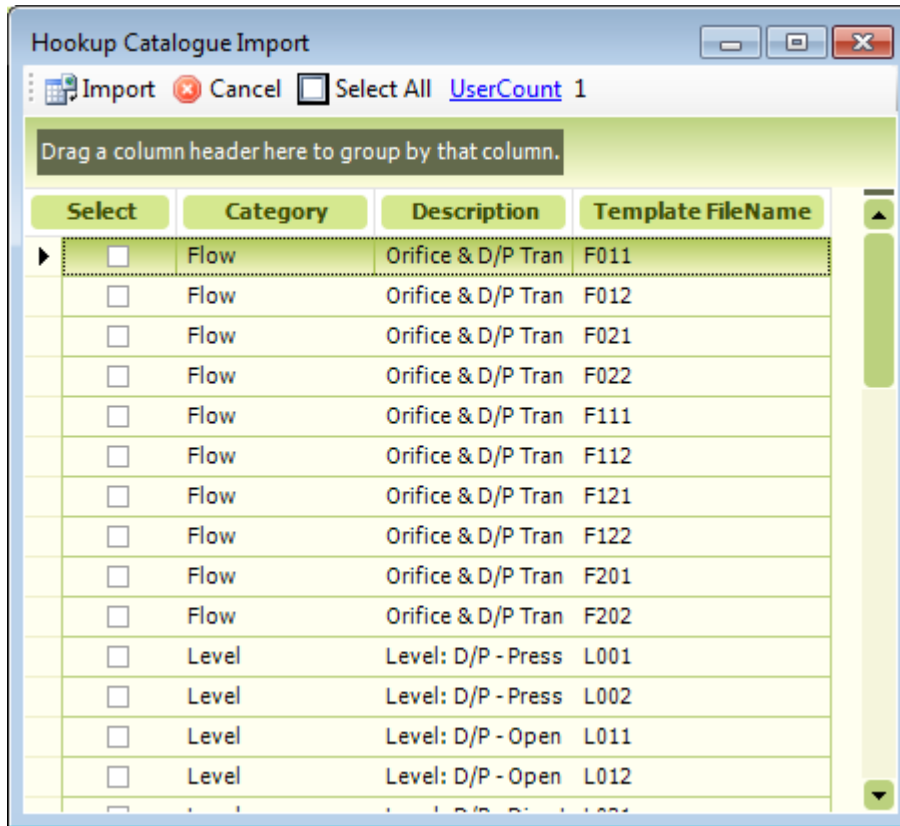
Refer to [Add a New Hookup Template](#) for details.

7.6.3 Import Hookup Catalogue

The user may import Hookup catalogues from other AVEVA Instrumentation projects.

With the Hookup catalogue template grid open, select **From Other Project** from the **Import** section of the **Manage** tab to display the **Select an AVEVA Instrumentation Project** window.

Select a project from the list of projects and click **Select**. The **Hookup Catalogue Import** window is then displayed:

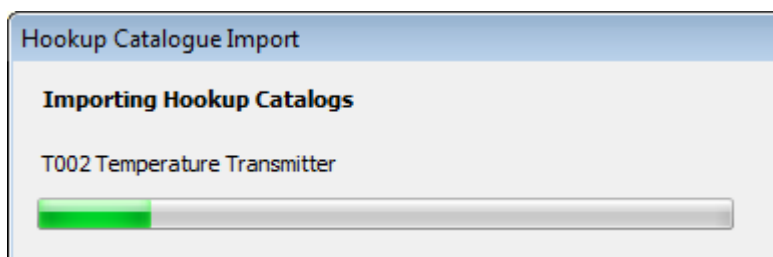


Note: To minimise the possibility that data currently being worked on by another user may be affected by an import, a list of the users working on the current project is available from the **UserCount** link. The number of current users is displayed next to the link. This total includes the user performing the import.

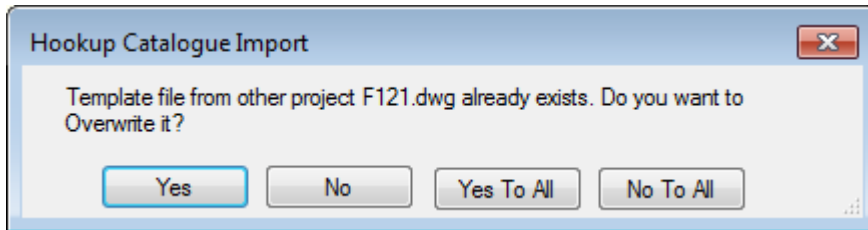
The user can select individual templates to be imported by clicking the **Select** checkboxes of the required templates. To select all the templates, click **Select All** to check all the **Select** checkboxes.

Clicking **Cancel** closes the **Hookup Catalogue Import** window.

After selecting the required templates, click **Import** to proceed with the import. A progress window is then displayed.



The import process checks to see if the selected templates already exist in the project. If any existing templates are found a message is displayed. For example:



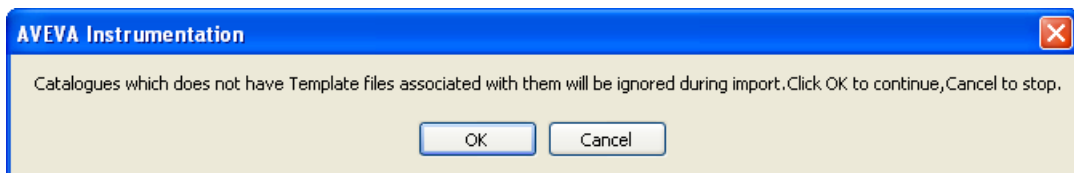
Click **Yes** to overwrite the existing template. The message will re-appear each time the import process finds an existing template.

Click **No** to prevent the import process overwriting the existing template. The message will re-appear each time the import process finds an existing template.

Click **Yes To All** to overwrite all the existing templates. The message will not re-appear each time the import process finds an existing template.

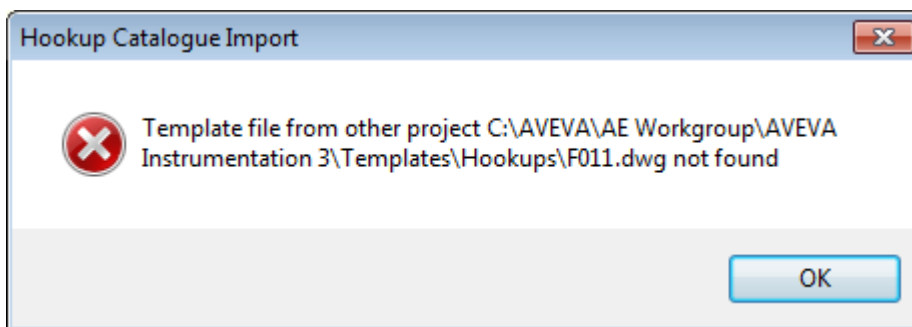
Click **No To All** to prevent the import process overwriting the existing templates. The message will not re-appear each time the import process finds an existing template.

If during the import process files are found that do not have a Template Filename, a message is displayed informing the user that these files will be ignored and not imported.



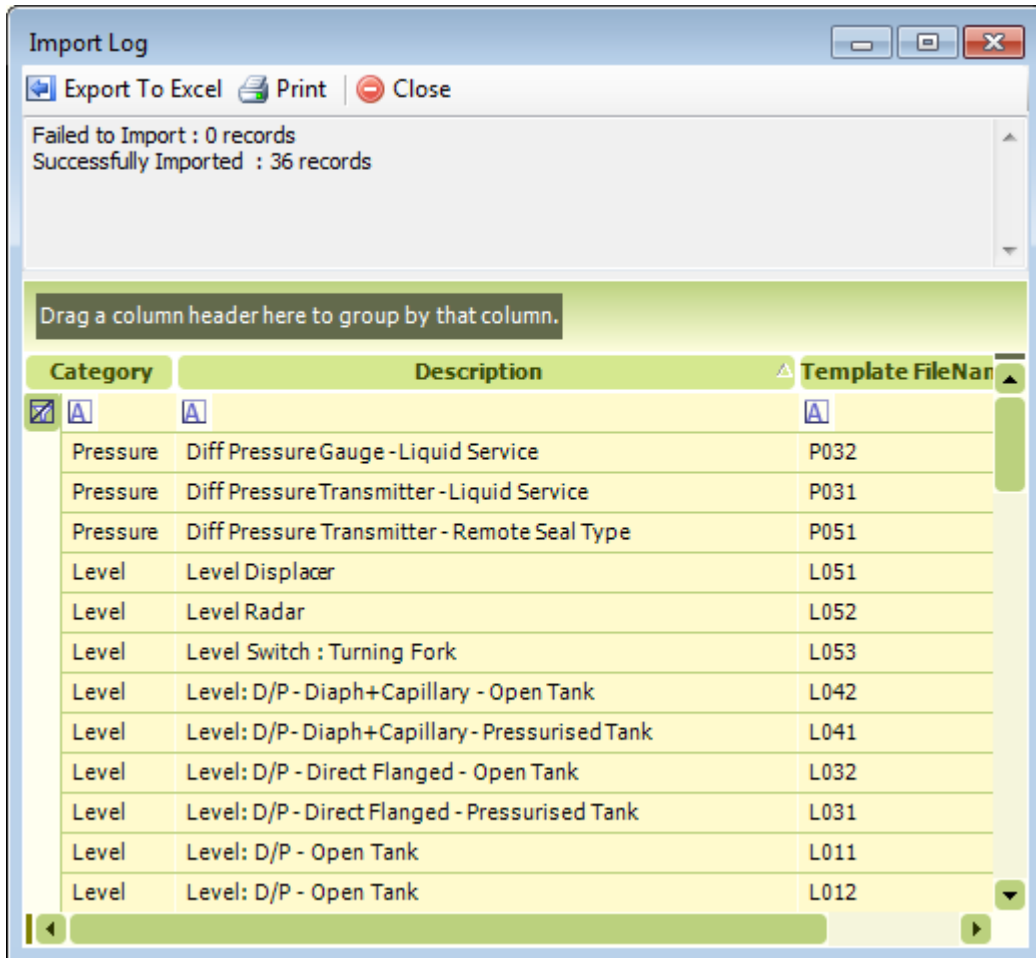
Click **Yes** to continue and **Cancel** to stop the import.

Files with a Template Filename will be imported, but if the import process cannot find the template files themselves, a message is displayed informing the user that the template files are not found.



Click **OK** to continue. The message will re-appear each time the import process cannot find a template file.

After the import process is complete the **Import Log** window is displayed.



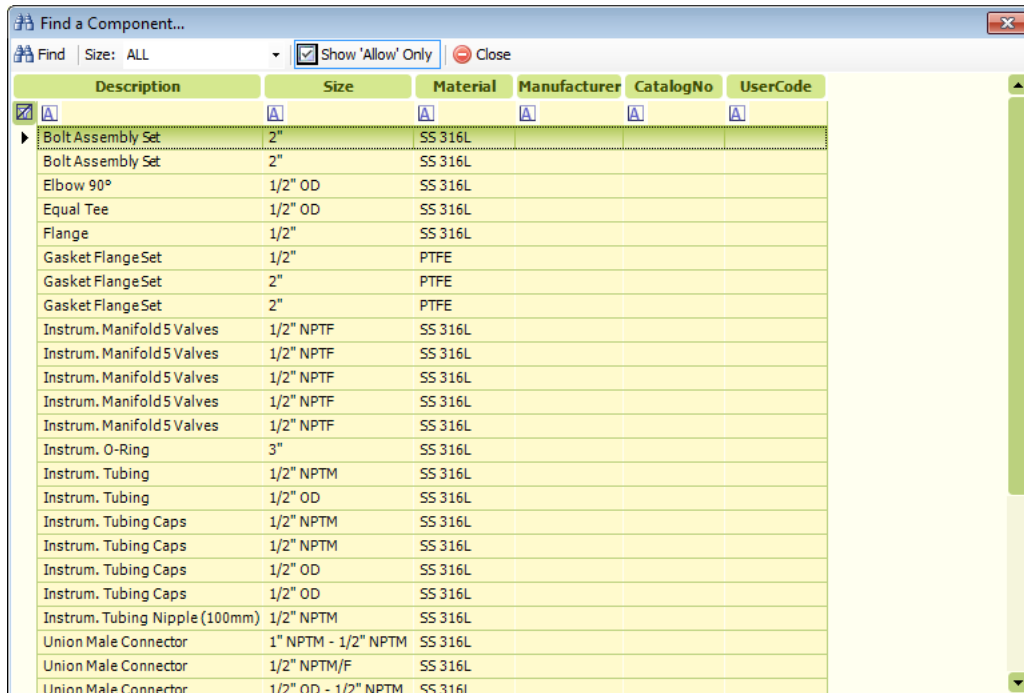
The window shows the user the import status and displays the successfully imported files in the grid view.

7.6.4 Assign Hookup Items to Templates

In order for components/items to be assigned to a Hookup Drawing, the items must be assigned to the template that the drawing uses.

To assign items to a Hookup template, in the **Hookup Template Details** window (see [View and Edit Template Data](#)), click **New Item**.

This displays the **Find a Component** window:



Note: Only those Hookup items in the Hookup Items Catalogue that have been set to 'Allow' are shown by default in this selection list. See the [Hookup Items Catalogue](#) for more information.

Uncheck the **Show Allow Only** checkbox to list items not marked set to 'Allow'.

Select Items or Components

Double-click on as many items as required.

Use the **Find** toolbar command to search for any specific text in the grid.

To exit the window, click **Close**.

Note: Each time an item is selected, the item is added to the list of items in the **Hookup Template Details** window. If the same item is selected more than once, the quantity of that item is incremented each time. The quantity may also be manually changed by editing the quantity value in the **Hookup Template Details** window.

Filter the Catalogue Items List

Filter the items catalogue by selecting a size from the **Size** list. The "All" option resets the filter so that all items are shown.

Note: When selecting a size, AVEVA Instrumentation finds any component matching the size anywhere within the catalogue size field. A size may also be typed in (e.g 1/4" OD and the <Enter> key pressed to filter the items by that size.

7.6.5 Assign Hookup DataLinks in AutoCAD

To assign or modify DataLinks to an AutoCAD Hookup template the file first must be opened using AutoCAD (refer to [Issues when Opening AutoCAD Drawings](#)).

The Hookup Template can be opened in AutoCAD by using the **Open Drawing** button on the **Hookup Template Details** window (refer to [Open the Template in AutoCAD / Select an existing AutoCAD drawing to be used as the Hookup Template](#)).

Use the AVEVA Instrumentation Designer AutoCAD Menu

When assigning new DataLinks (or modifying DataLinks already assigned) first ensure the Designer AutoCAD menu is loaded into AutoCAD. This toolbar menu should be automatically loaded when an AutoCAD drawing is opened from Designer.

Note: If the 'iDesigner' menu is not auto loaded the Designer.mns menu will need to be loaded manually (using the AutoCAD 'menu' command).

The menu files are located in the AVEVA Instrumentation program installation folder.

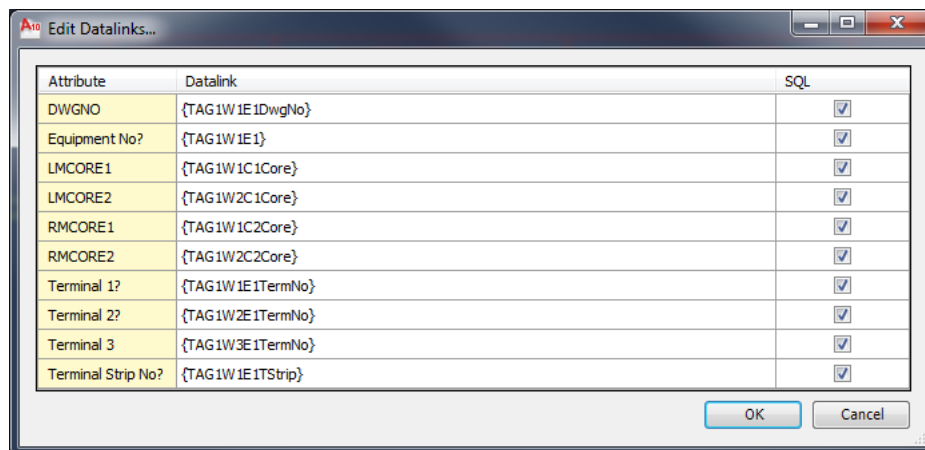
Assign/Edit DataLinks

Once the AutoCAD iDesigner menu is loaded, select **iDesigner** from the pull-down menus, then **Edit DataLinks**.

This displays a window showing all attributes in the selected AutoCAD block.

AutoCAD will prompt users to select objects.

Select a block with attributes, and then press enter. AutoCAD will display the **Edit DataLinks** window:



This window shows all attributes and DataLinks defined in the block selected.

Note: To view available Keyword DataLinks for any drawing in the Designer's Drawing List open the [DataLinks Window](#). This window includes 'copy and paste facilities' of DataLinks from the report window into the AutoCAD **Edit DataLinks** window.

In the example above, the Description attribute has three Datalinks assigned. This will update the attribute value with item Description, Size and Material for the first item assigned to the hookup (e.g. Description1, Size1 and Material1 return the values for Item 1).

To assign a DataLink, either type in a valid DataLink or copy it from the [DataLinks Window](#) (using Windows copy and paste - Ctrl-C / Ctrl-V etc) or by dragging and dropping from that window (hold the Ctrl key and drag the report DataLink to a field above).

Refer to [DataLinks](#) for more information on DataLinks.

Copying Blocks with DataLinks in AutoCAD

Since DataLinks are defined as Extended Entity Data within AutoCAD, their behaviour is same as Xdata. That is, if a block is copied with DataLinks attached, the DataLinks are copied too. This can drastically reduce data entry when setting up DataLinks.

For example, required DataLinks can be attached to a block that may represent a Field Device. That block can be copied to as many drawings as required, saving the effort of re-entering the DataLinks each time. Another example is the Title block used in all drawings. Set-up the first drawing with all DataLinks, and once it has been tested, copy that Title Block (which may contain multiple AutoCAD blocks) to the other drawings.

Auto-Erasing Blocks with DataLinks in AutoCAD

Designer provides an 'Auto-Erase' (or auto-delete) function where a block will be automatically erased from a drawing if a specific DataLink returns nothing. If a DataLink attribute is prefixed with and AVEVA Instrumentation detects that the following DataLink has no value, then Designer will erase the block containing the Datalink.

For example, it is required to erase a block if there is no tag number for {TAG10}. Entering: {TAG10} in for an attribute in a block will tell AVEVA Instrumentation to erase the block if {TAG10} evaluates to nothing (i.e. there is no TAG10 for this drawing).

7.7 Hookup Items Catalogue

The Hookup Items catalogue is used to add and edit the Hookup items for the project.

To open the Hookup Items catalogue, click **Select** in the **Grids and Schedules** section of the **Home** tab.

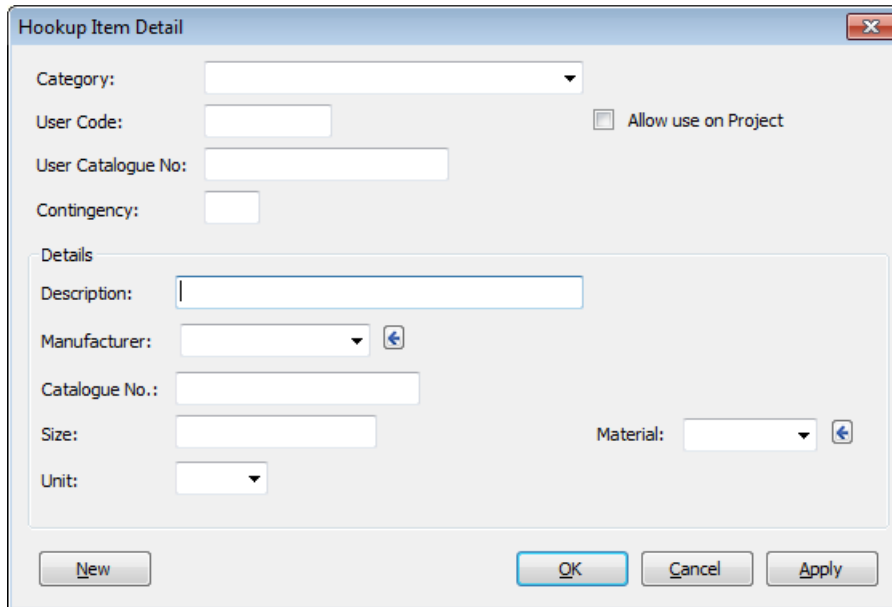
Select **Hookup Items** from the list of grids that is then displayed. The Hookup Items Catalogue grid is then displayed:

Hookup Item Catalogue										
Drag a column header here to group by that column.										
Category	Description	Size	Material	Unit	Manufacturer	Catalogue No.	Allow Use	UserCode	Contingency	
2 VALVE MANIFOL	2 VALVE MANIFOL	1/2" NPTF x FLAN	SS	EA	SWAGelok	SS-V2BF8-FL	<input type="checkbox"/>			
2 VALVE MANIFOL	2 VALVE MANIFOL	1/2" NPTF x 1/2"	SS	EA	SWAGelok	SS-V2BF8	<input type="checkbox"/>			
2 VALVE MANIFOL	2 VALVE MANIFOL	1/2" NPTF x 1/2"	SS	EA	SWAGelok	SS-V2BF8-G	<input type="checkbox"/>			
3 VALVE MANIFOL	3 VALVE MANIFOL	1/2" NPTF x FLAN	SS	EA	SWAGelok	SS-V3NBF8-FL	<input type="checkbox"/>			
3 VALVE MANIFOL	3 VALVE MANIFOL	1/2" NPTF x 1/2"	SS	EA	SWAGelok	SS-V3NBF8	<input type="checkbox"/>			
5 VALVE MANIFOL	5 VALVE MANIFOL	1/2" NPTF x FLAN	SS	EA	SWAGelok	SS-V5NBF8-FL	<input type="checkbox"/>			
5 VALVE MANIFOL	5 VALVE MANIFOL	1/2" NPTF x 1/2"	SS	EA	SWAGelok	SS-V5NBF8	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" ISOF x 1" ISOF	SS	EA	WHITEY	SS-65TF16RT	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	SS	EA	WHITEY	SS-65XTF16	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	SS	EA	WHITEY	SS-65TF16	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	SS	EA	WHITEY	SS-65TF16-35C	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	SS	EA	WHITEY	SS-65TF16-JL	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	SS	EA	WHITEY	SS-65TF16-NH	<input type="checkbox"/>		3%	
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	Brass	EA	WHITEY	B-65TF16	<input type="checkbox"/>			
BALL VALVE	BALL VALVE (60 S	1" NPTF x 1" NPT	Steel	EA	WHITEY	S-65TF16	<input type="checkbox"/>			

7.7.1 Adding a New Catalogue Item

To add a new Hookup Item to the catalogue, with the Hookup Item Catalogue grid open, click **New** on the **Home** tab.

The **Hookup Item Detail** window is then displayed:



Field Information

Category can be any text value, for example 'Ball Valve' or 'Male Elbow' etc. The category field is automatically filled with all the unique categories already defined in the catalog. Additional categories may be created by entering them. They will then be added to this list.

User Code is the code that will appear on the Hookup Drawing. This is a simplified code that for example could be a three digit number, so that all 1/2" Unions would be a 101 etc.

User Catalogue No is an optional field used to enable materials management systems to track the component. For example a SAP code. MESC number etc.

Contingency allows the project Bill of Materials report to be increased by a specific number of items to allow for spares or runover. This is ideal for tube and/or unions where it may be appropriate to allow some additional quantity to ensure the site has some extra items.

Enter an exact number (e.g 2 or 10 etc) or a percentage by entering a number and the percentage character '%' (e.g 2% or 5% etc).

Check the **Allow use on Project** checkbox to allow the item to be selected and used on the project. If the checkbox is not checked, the item will not be listed in the **Find a Component** window, used to add items to Hookup templates (refer to [Assign Hookup Items to Templates](#)).

Details

Description is the detailed description of the item that will be seen on hookup drawings.

Manufacturer and **Catalogue No** are the manufacturer and model number details used to purchase the item.

Size and **Material** are more information to describe the item.

Unit is the unit of measure (e.g each, metre, ft etc).

Import from Excel

Hookup items can also be imported from Excel.

For a description of this functionality, refer to the [Common Functionality User Guide](#).

Import from another Project

Items can also be imported from another project. This works the same way as the facility for importing Hookup templates from another project. Refer to [Import Hookup Catalogue](#) for details.

7.8 Hookup Reports

The following reports related to Hook-ups are available in Designer:

- BOM/Material Take Off
- Tags Assigned
- Tags not yet Assigned

These are accessed from the [Reports](#) grid.

The BOM/Material Take Off report lists the Hook-up items that comprise the project Bill of Materials.

The report is displayed in the **Hookup Bill of Materials** window:

Bill of Materials - 6 unique items						
Total	Category	Description	Size	Material	Unit	Manufacture
16	Typical	Elbow 90°	1/2" OD	SS 316L	EA	
16	Typical	Instrum. Manifold Valves	1/2" NPTF	SS 316L	EA	
16	Typical	Instrum. Tubing	1/2" NPTM	SS 316L	m	
8	Typical	Instrum. Tubing	1/2" OD	SS 316L	m	
8	Typical	Instrum. Tubing Caps	1/2" NPTM	SS 316L	EA	
4	Typical	Union Male Connector	1/2" OD - 1/2" NPTM	SS 316L	EA	

An item is added to the BOM by assigning it to a Hookup drawing and unchecking its **No.** checkbox (see [Assign Tags to a Hookup](#)).

The Tags Assigned report lists the tags assigned to Hookup drawings in the project:

Dwg No.	sheet	Drawing Type	Title1	Title2	Title3
01-00001	1	GeneralHookup	AREA 01	HOOKUP DIAGRAM	ORIFIC
01-00001	1	GeneralHookup	AREA 01	HOOKUP DIAGRAM	ORIFIC
01-00001	1	GeneralHookup	AREA 01	HOOKUP DIAGRAM	ORIFIC
01-00001	1	GeneralHookup	AREA 01	HOOKUP DIAGRAM	ORIFIC

The Tags not yet Assigned report lists the tags not yet assigned to Hookup drawings in the project:

Description	Project Status	Tag No	P&ID No.	Plant Connection
Orifice Plate	New	01-FE-520	01-220-004	01-P103-50-A1
Orifice Plate	Existing	01-FE-510	01-220-004	01-P007-80-B1
Sulphur Analyser		01-AE-100		
Pressure Gauge	Existing	01-PI-527	01-220-004	V-525

Only those tags that are pre-assigned via Hookup type (template) are listed.

For descriptions of the toolbar buttons of the Tags Assigned and Tags not yet Assigned report window, refer to [Reports](#).

8 Engineering Data

AVEVA Instrumentation Designer allows access to the Instrument Engineering data normally created by the Engineer application.

Refer to the *Instrument Engineer User Guide* for further details.

8.1 Loop Data

Loop data is viewed in the **Loop Data** window.

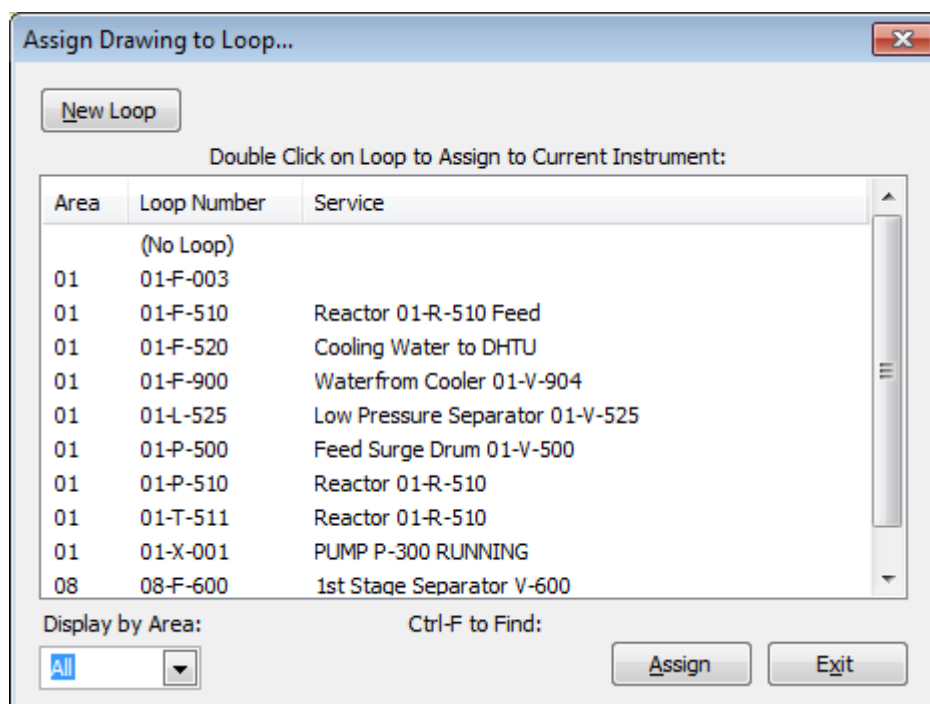
This window can be accessed from two places in Designer:

1. In the **Drawing Information** window (refer to [Add a New Drawing](#)), click the button in the **Loop No** field (only available if the Drawing is a Loop Diagram).

Or:

2. From the [Drawing List](#) grid list, click the button in the **Loop No** cell, which appears when the mouse hovers over the 'Loop No' cell.

If the drawing has not been assigned to a loop, the **Assign Drawing to Loop** window is displayed, which provides a list of Loops defined in the Instrument Engineer application.

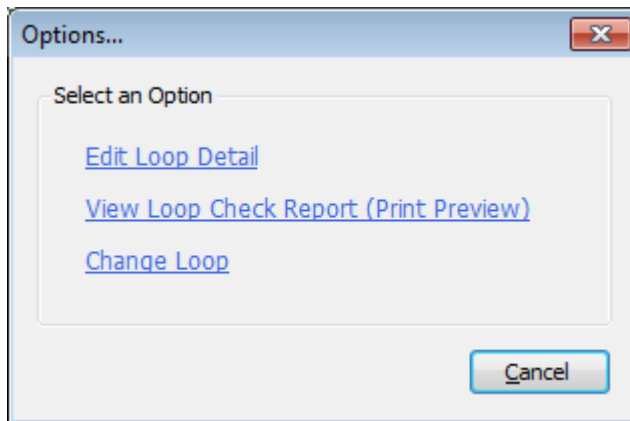


Double-click on the required Loop, or select it and click **Assign**.

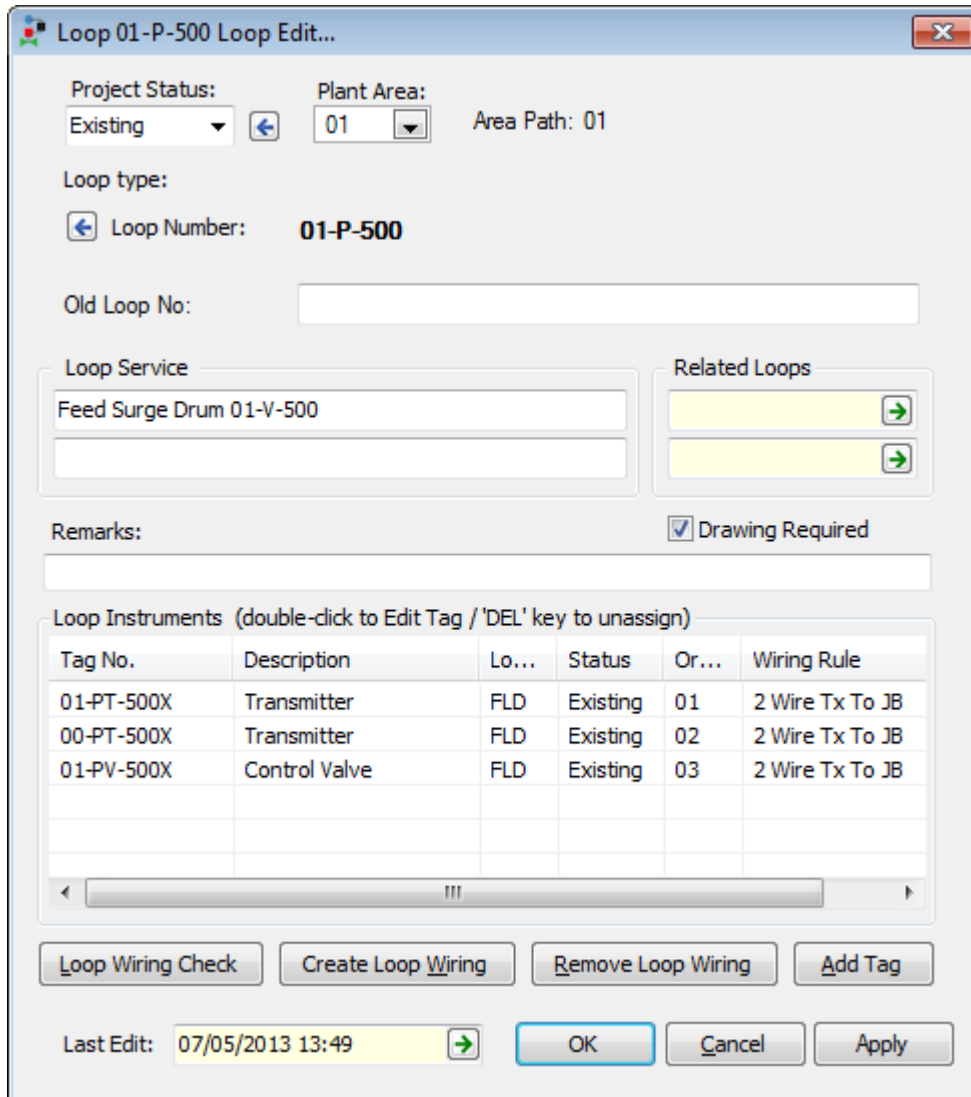
Use the **Display by Area** list to filter the list of Loops by an area.

The **Loops** button accesses facilities for creating new Loops. Refer to the *Instrument Engineer User Guide* for further details.

If the drawing has been assigned to a loop, the **Options** window is displayed:



Clicking **Edit Loop Detail** displays the **Loop Edit** window, displaying details of the Loop:



This window enables users to:

- Edit Loop information (including checking **Drawing Required**).
- Editing Instrument Tag data (double-clicking on any tag in the Loop Instruments list will display the *Instrument Data* window).
- Add new tags/instruments to the current loop (use the **Add Tag** button to display the *Assigning Tags to Loops*).
- Check the loop instrument wiring including terminations (via the **Loop Check Wiring** button).
- Create Loop wiring for current Loop based on user defined Wiring Rules (via the **Create Loop Wiring** button - refer to *Using Wiring Rules to Create Data* for more information).
- Remove existing Loop wiring using the **Remove Loop Wiring** button.

Note: The **Last Edit** field displays the date and time when the loop data was last edited. The user name of the individual that performed the edit is displayed in a tool-tip when the mouse cursor is hovered over the field. Click the button in the field to display the

[Audit Manager](#), which will display a list of all the changes to the loop data.

Related Loops

Up to two 'related loops' may be assigned. This enables AVEVA Instrumentation to place information for related loops (including their instrument tag data) on any Loop Diagram created with Designer. To assign a related loop, click the button inside a **Related Loops** field. This displays a **Select a Related Loop** window, from which a Loop may be selected. This window works in the same way as the **Assign Drawing to Loop** window (see above).

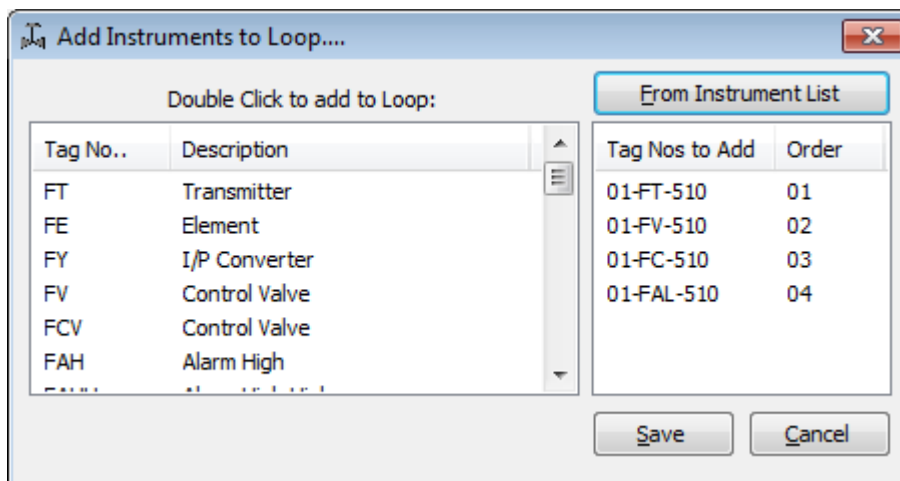
Loop Instruments List

The **Loop Instruments** list shows all instruments assigned to the current Loop.

- To assign Instrument Tag Numbers to the Loop click **Add Tag**. The **Add Instruments to Loop** window. Refer to [Assigning Tags to Loops](#) for further information.
- To edit instrument data, double-click on the desired tag number. Refer to [Instrument Data](#) for further information.
- To remove a tag from the current loop, select the instrument tag record and press the <Delete> key.
- To change the loop order of instruments drag and drop each to the required position.

8.1.1 Assigning Tags to Loops

In the **Edit Loop** window (see [Loop Data](#)), click **Add Tag** to display the **Add Instruments to Loop** window.



The left hand list shows typical tags and descriptions for the Engineer's ISA tag catalogue built using the current Loop function prefix in the **Edit Loop** window.

The right-hand list shows all tags assigned to the current loop (if any).

To assign a tag to the current loop use one of the two following methods:

1. Build a Tag Number using the ISA tag catalogue (left list)

Double-click on the required tag and the full tag number is added to the right-hand list.

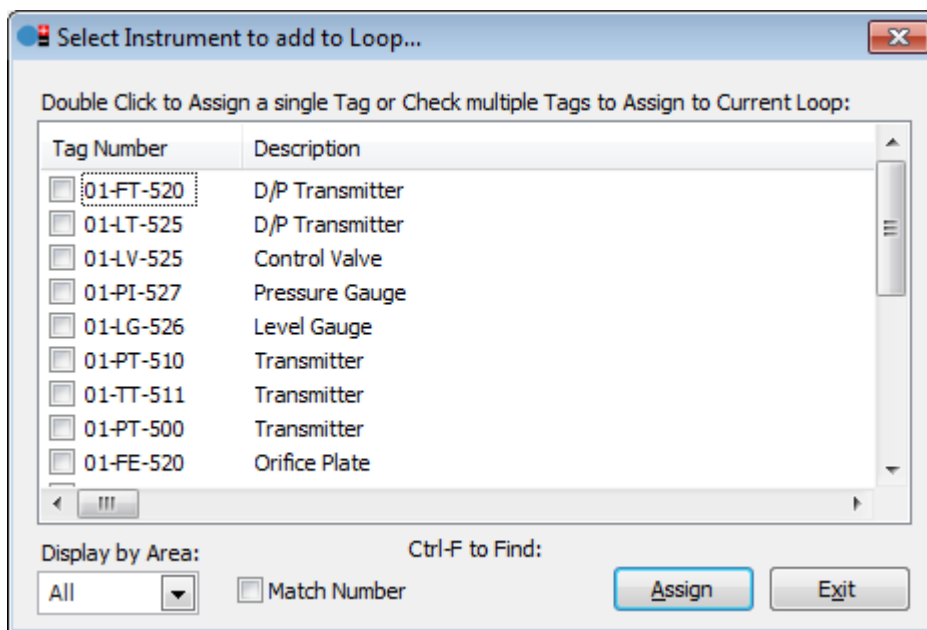
Note: If the tag being built does not exist in Engineer's Instrument List it will be added. If it does exist, AVEVA Instrumentation will reassign the tag to the current loop.

2. Pick an existing tag number from the Instrument List

Click the **From Instrument List** button, which displays the **Select Instrument to add to Loop** window, used for selecting tags not assigned to any loop. Continue at [Select Existing Tags](#) for details.

8.1.2 Select Existing Tags

When the **From Instrument List** button in the **Add Instruments to Loop** window is clicked (see [Assigning Tags to Loops](#)) the **Select Instrument to add to Loop** window is displayed:



This window contains only those tags yet to be assigned to a loop. The tag list can be filtered to enable easy access to tags by area, using the **Display by Area** list.

Assign a Tag to the Current Loop

To assign a single tag, double-click on a tag number to assign the selected tag to the current Loop.

To assign multiple tags, check the checkboxes for all the tag numbers to be assigned, and click the **Assign** button.

The **Match Number** checkbox filters the list of loops by the tag number. 'number' field. In the example above selecting Match Number would limit the list of loops to only those containing '510' if the current instrument was numbered '510'.

8.2 Instrument Data

Designer provides access to the Instrument Engineering data normally created by the Instrument Engineer module. The **Edit** window for instruments is accessed from the **Loop Edit** window (see [Loop Data](#)).

In the **Loop Edit** window, double-click on any tag listed in the Loop Instruments list. The **Edit** window for instruments is then displayed. For example:

The screenshot shows the '01-FT-510 - Edit' window with the following fields and values:

- Project Status:** Replace
- Location Code:** FLD
- Plant Area:** (empty)
- Area Path:** 01
- Tag No:** 01-FT-510
- Old Tag No:** (empty)
- MOC No:** (empty)
- Description:** D/P Transmitter
- Loop Number:** 01-F-510
- Loop Order:** 1
- Instrument Service:** Reactor 01-R-510 Feed
- Loop Service:** Reactor 01-R-510 Feed

The **Detail** tab is selected, showing the following fields:

- P&ID Dwg No:** 01-220-004
- Plant Connection:** 01-P007-80-B1
- Process Connection:** (empty)
- Size:** (empty)
- Ex Rating:** (empty)
- Ex Certification:** (empty)
- Ex Cert Authority:** (empty)
- Remarks:** (empty)
- Instrument Range:** Low: (empty), High: (empty), Units: (empty)
- Calibration Range:** Low: (empty), High: (empty), Units: (empty)

Buttons at the bottom include 'Copy Data', 'Copy From Catalogue', 'OK', 'Cancel', and 'Apply'. The 'Last Edit' timestamp is 07/05/2013 13:49.

The two important fields for loop drawing generation are found on the Detail tab:

General	Detail	Datasheet	DCS System	PLC/ESD System	User	Alarms/Settings	Properties	Power Supply
Signal Type:	<input type="text"/>							Work Pack No: <input type="text"/>
Signal Volts Level:	<input type="text"/>							Ingress Protection: <input type="text"/>
Power Supply:	<input type="text"/>							Fail Position: <input type="text"/>
Loop Dwg Code:	<input type="text" value="1"/>							Loop Dwg No: <input type="text" value="01-F-510"/>
Wiring Config:	<input type="text" value="2 Wire Tx To JB"/>							<input type="button" value="Create Tag Wiring"/>
Junction Box:	<input type="text" value="01-JB-001"/>							<input type="button" value="Tag Wiring Check"/>
General Hookup:	<input type="text" value="00000-1"/>							Process Hookup: <input type="text"/>
Pneumatic Hookup:	<input type="text"/>							Mounting Hookup: <input type="text"/>
GeoLocation:	<input type="text"/>							

1. **Wiring Config** - this applies the selected Wiring Rules to the instrument. See [Wiring Rules Overview](#).
2. **Loop Dwg Code** - this is the code number used when Designer creates [DataLinks](#). In the example above the Loop Dwg Code is 1 meaning that all tag DataLinks will be created prefixed '{TAG1}'. If the code was 51 then all DataLinks would be created prefixed '{TAG51}' This field is only used for generation of DataLinks used to create loop drawings from templates.

Note: AVEVA Instrumentation recommends using the same Loop Dwg Code for each instrument type. e.g. Always use 10 for transmitters, 50 for Control Valves etc. This means the Datalinks users embed into the CAD symbols can be copied without to much thought since it is likely that users will use the same CAD symbol for each transmitter, control valve etc.

Click on this link to view information on [Edit Tag Details - Tabs](#).

Many field options have a user definable PickList associated. Clicking on the # command button next to a combo box displays the PickList Management window.

Note: The Last Edit field displays the date and time when the instrument data was last edited. The user name of the individual that performed the edit is displayed in a tooltip when the mouse cursor is hovered over the field. Click the button in the field to display the [Audit Manager](#), which will display a list of all the changes to the instrument data.

8.2.1 Edit Tag Details - Tabs

General

The General tab is used to enter typical common data for most instruments on the project.

Detail

The Detail tab is used for more detailed design data and includes data typically required for wiring and installation information.

The **Wiring Config** PickList is used to assign a Wiring Rule to the instrument. The name is used to auto generate the instrument termination arrangement including terminal details, cable type, connection arrangement and wire ferrule numbers etc. Typically this choice is made by the person responsible for detail wiring design. It can also be edited from the Designer and Wiring Manager applications.

The **Junction Box** in-cell command button displays an **Assign** window which allows the user to assign the current instrument to a Junction Box.

Click **Create Tag Wiring** to display the **Create Tag Wiring for** window. Refer to [Using Wiring Rules to Create Data](#) for further information.

Clicking **Tag Wiring Check** displays a report showing wiring connectivity for the current tag.

Datasheet

Operating Principle:	<input type="text"/>	<input type="button" value="Sizing Calculation"/>
Datasheet No:	<input type="text" value="700002-1"/>	<input type="button" value="→"/>
Requisition No:	<input type="text"/>	
Requisition Date:	<input type="text" value="01/01/1900"/>	
Manufacturer:	<input type="text" value="Fisher"/>	<input type="button" value="←"/>
Model No:	<input et"="" type="text" value="3"/>	<input type="button" value="←"/>
Supplier:	<input type="text"/>	<input type="button" value="←"/>
Cost:	<input type="text" value="0"/>	Vendor Supplied: <input type="text"/>
Installation Cost:	<input type="text" value="0"/>	

The **Operating Principle** PickList is used to pre-assign an instrument to a data sheet form type.

The **Sizing Calculation** button is used to display windows used to perform sizing calculations for the instrument. If no sizing calculations have been performed for the instrument, the button will display a list of sizing calculation types to select from.

If a sizing calculation or calculations have been performed, the last type of calculation performed is displayed under the button. The button will open the window used to perform that calculation.

To select a different calculation to perform, double-click on the calculation type name under the button. The list of calculation types is then displayed.

The button in the **Datasheet No.** field provides access to the datasheet (if it exists). If the tag is not yet assigned to a datasheet the user is allowed to assign the current tag to an existing datasheet using the **Add Datasheet** for window.

For more details of sizing calculations and datasheets, refer to the [Instrument Engineer User Guide](#).

DCS System

DCS I/O Type:	<input type="text" value="AO"/>	DCS I/O Status:	<input type="text"/>
DCS I/O Location:	<input type="text"/>		
DCS Field 1:	<input type="text"/>	DCS Field 7:	<input type="text"/>
DCS Field 2:	<input type="text"/>	DCS Field 8:	<input type="text"/>
DCS Field 3:	<input type="text"/>	DCS Field 9:	<input type="text"/>
DCS Field 4:	<input type="text"/>	DCS Field 10:	<input type="text"/>
DCS Field 5:	<input type="text"/>	DCS Field 11:	<input type="text"/>
DCS Field 6:	<input type="text"/>	DCS Field 12:	<input type="text"/>

The DCS System tab is used to assign DCS I/O information for the current tag (if the current tag will be connected to the DCS System).

Important: The DCS I/O Type must contain a non-blank value for the current tag to be assigned to an I/O Module in Wiring Manager and to allow wiring to be completed to the I/O terminals.

PLC/ESD System

PLC I/O Type:	<input type="text"/>	PLC I/O Status:	<input type="text"/>
PLC I/O Location:	<input type="text"/>		
PLC Field 1:	<input type="text"/>	PLC Field 7:	<input type="text"/>
PLC Field 2:	<input type="text"/>	PLC Field 8:	<input type="text"/>
PLC Field 3:	<input type="text"/>	PLC Field 9:	<input type="text"/>
PLC Field 4:	<input type="text"/>	PLC Field 10:	<input type="text"/>
PLC Field 5:	<input type="text"/>	PLC Field 11:	<input type="text"/>
PLC Field 6:	<input type="text"/>	PLC Field 12:	<input type="text"/>

The PLC/ESD System tab is used to assign PLC or ESD (Emergency/Safety Shutdown) I/O information for the current tag (if the current tag will be connected to the PLC or ESD System).

Important: The PLC I/O Type must contain a non-blank value for the current tag to be assigned to an I/O Module in Wiring Manager to allow wiring to be completed to the I/O terminals.

User

User Field 1:	<input type="text"/>	User Field 9:	<input type="text"/>
User Field 2:	<input type="text"/>	User Field 10:	<input type="text"/>
User Field 3:	<input type="text"/>	User Field 11:	<input type="text"/>
User Field 4:	<input type="text"/>	User Field 12:	<input type="text"/>
User Field 5:	<input type="text"/>	User Field 13:	<input type="text"/>
User Field 6:	<input type="text"/>	User Field 14:	<input type="text"/>
User Field 7:	<input type="text"/>	User Field 15:	<input type="text"/>
User Field 8:	<input type="text"/>	User Field 16:	<input type="text"/>

Instrument Engineer has twenty-four user defined fields (UserField1 to UserField24). The User tab shows sixteen of these user fields (the others can be added to any grid view).

Alarms/Settings

Alarms		Settings	
High High:	<input type="text"/>	Setpoint:	<input type="text"/>
High:	<input type="text"/>	Outer Limit - High:	<input type="text"/>
Low:	<input type="text"/>	Outer Limit - Low:	<input type="text"/>
Low Low:	<input type="text"/>	Gain:	<input type="text"/>
Dev High High:	<input type="text"/>	Integral Time:	<input type="text"/>
Dev High:	<input type="text"/>	Derivative Time:	<input type="text"/>
Dev Low:	<input type="text"/>	Action (Rev/Dir):	<input type="text"/>
Dev Low Low:	<input type="text"/>		

Use this tab to enter Alarm and Settings data required for the instrument.

Properties

Select Properties Type

Instrument Properties Process Data Properties

Property Name	Property Caption	Property Value
Field01	Field01	-
Field02	Field02	Choked at Min flow Condition
Field03	Field03	82 dBA
Field04	Field04	Hydrotest
Field05	Field05	Intermittent Service Only.
Field06	Field06	-
Field07	Field07	-

Use this tab to enter additional instrument and process data properties as required. Click on the appropriate **Select Properties Type** option and enter or edit values as required.

Power Supply

Requires Power Supply

Requires Power Supply Details

Voltage: 110V DC

Power: 0 kW

Current: 0 A

Power Factor: 0 Lag

Share with Electrical

Used to enter details of any power supply requirements for the instrument. If appropriate, check the **Requires Power Supply** checkbox and enter the details in the fields provided.

If the instrument data is to be shared with AVEVA Electrical, click **Share with Electrical**.

Note: Unless sharing with AVEVA Electrical is enabled for the project the checkbox will be disabled. Sharing with AVEVA Electrical may be enabled during project setup, or afterwards (using the **Project** tab > **Edit Project** option). Refer to the *Installation User Guide* for details.

Associated Items

Process Item Type
 Process Equipment Process Lines

TagNo	AreaNo	Type	Number	Suffix
<input checked="" type="checkbox"/> A	A	A	A	A

Used to view the process equipment and lines associated with the instruments, to add further associations, and to remove associations.

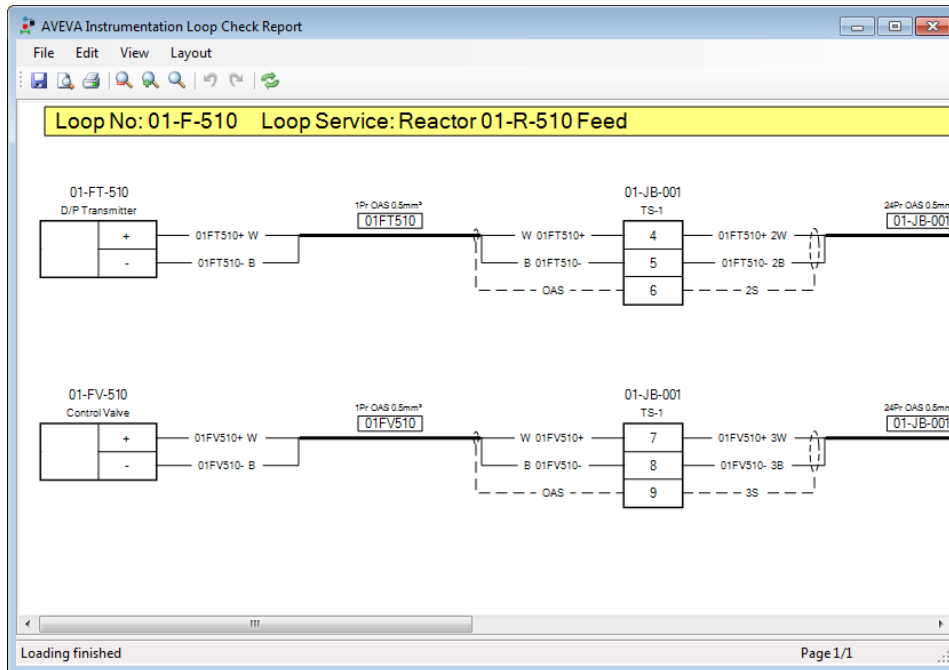
The **Properties** button is used to open the **Edit Process Equipment** or **Edit Process Lines** window for the process item selected on the tab, in which further details of the item can be viewed. Refer to the *Process Engineer User Guide* for further details.

8.3 Loop Check Wiring Reports

Loop Wiring Check Reports show a graphical 'loop diagram' type report of all wiring for current loop. The report may be printed and saved as a PDF file. This report is only available if the drawing has a valid loop number and wiring exists in the project wiring database for the instruments in the current loop.


Create a Loop Wiring Check Report

Click on the **Loop Wiring Check** button in the **Loop Edit** window (see *Loop Data*). The **Loop Check Report** window is then displayed. For example:



The report may be sent to a printer saved the to a file in Adobe Acrobat PDF format by clicking the **Print** and **Export to PDF** buttons. From the **Setup** button, facilities are available to change print properties such as page size and orientation etc.

When exporting to PDF format, AVEVA Instrumentation creates a file named after the Loop Number. The file name for this example would be: 00-F-510.pdf.

Double-click on the report to zoom in or select a zoom ratio from the list of options after selecting the Zoom button: .

Note: If the PC has a license for Wiring Manager, on any equipment tag is right-clicked on, AVEVA Instrumentation will display an option to allow access to the Wiring Manager's **Terminations** window, which provides drag and drop editing of cable/wire terminations, and an option to generate a termination report for the selected equipment.

Note: If the PC has a license for Wiring Manager when any cable is right-clicked on, AVEVA Instrumentation will display an option providing access to Wiring Manager's **Cable Detail** window, which is used to view and edit the details of the cable.

8.4 Equipment Data

Designer provides access to the following equipment and termination viewing and editing facilities in Wiring Manager:

- The **Layout** window, which is used to view internal equipment component layouts in a graphical user interface.
- The **Terminations** window, which is used to edit wiring terminations and rearrange terminal strips etc.
- The **Termination Report** window, which is used to preview, print a graphical representation of the equipment termination, and export it to various file formats.

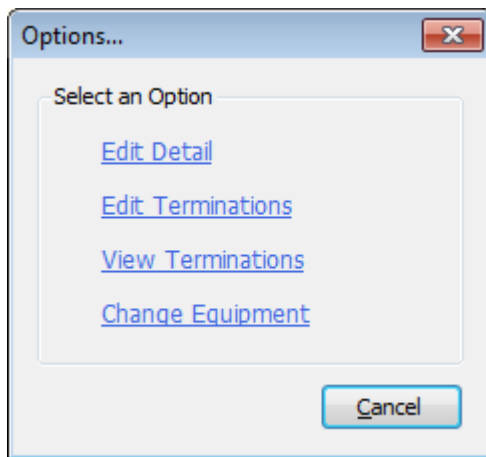
- The **Select Equipment** window, used to select or change the equipment that the termination drawing is for

Accessing Wiring Manager Facilities

Either click on the command button next to **Equipment No** field in the **Drawing Information** window (see [Add a New Drawing](#) - only available if the Drawing is a Termination Diagram).

Or click on the button in the **Equipment No** cell in the [Drawing List](#), which is displayed when the mouse cursor is hovered over it.

The **Options** window is then displayed:



- Click **Edit Detail** to display the **Layout** window.
- Click **Edit Termination** to display the **Terminations** window.
- Click **View Termination** to display the **Terminations Report**.
- Click **Change Equipment** to display the **Select Equipment** window.

Refer to the [Wiring Manager User Guide](#) for details of these facilities.

9 Using Wiring Rules to Create Data

AVEVA Instrumentation uses 'Wiring Rules' to auto generate typical field instrument wiring/cabling.

Continue at:

- [Wiring Rules Overview](#)
- [Using Wiring Rules](#)
- [Create Loop Wiring using Wiring Rules](#)
- [Assign a Junction Box](#)

9.1 Wiring Rules Overview

AVEVA Instrumentation uses 'Wiring Rules' to auto generate typical field instrument wiring/cabling. Using the Wiring Rules features can save many hours otherwise required to build devices and their associated terminal arrangements, cables, terminations etc in Wiring Manager.

For how to apply a Wiring Rule refer to [Create Loop Wiring using Wiring Rules](#).

When a Wiring Rule is applied to a field instrument, the following are defined:

- Terminal Arrangement - number of terminals, their markings, sequence.
- Default wire numbers to be used on wire terminations.
- Default Cable Type - type of cable (individual cores, pairs or triad etc), whether shielded/screened, and whether armoured etc.
- Default Cable Number, based on the instruments tag number fields from Instrument Engineer.
- Default Wire terminations at field device - how the cable is connected to the field device terminals (core 1 to terminal 1, core 2 to terminal 2 etc).
- Default wire terminations at non-field device - how the cable is connected at the other end.

When Wiring based on a Wiring Rule is created, AVEVA Instrumentation creates all the above automatically. Prior to saving this data AVEVA Instrumentation also enables users to:

- Change the default Cable Number created by the Wiring Rule.
- Select equipment the cable will terminate to at the other end (provides a list of Junction Boxes, Cabinets etc).

After accepting defaults (or making changes as required) the Field Device and terminals are created, cable created and terminated at both ends (if equipment has been selected at the other end). At the other end, AVEVA Instrumentation always uses the next available spare terminals.

At any time after a Wiring rule is applied, the data that has been generated can be edited by:

1. Re-running the Create Wiring command using same Wiring Rule - this enables users to reassign a Cable No, reassign a Junction Box etc.
2. Re-running the Create Wiring command using a new Wiring Rule - this updates terminal arrangements, cable type, terminations and enables users to reassign a Cable No, reassign a Junction Box etc.
3. Edit the cable details/type (using the AVEVA Instrumentation Cable Schedule user interface).
4. Edit terminations (using the AVEVA Instrumentation Terminations editing user interface).

Note: Equipment Terminations can also be accessed directly from Designer. Refer to [Equipment Data](#) for details.

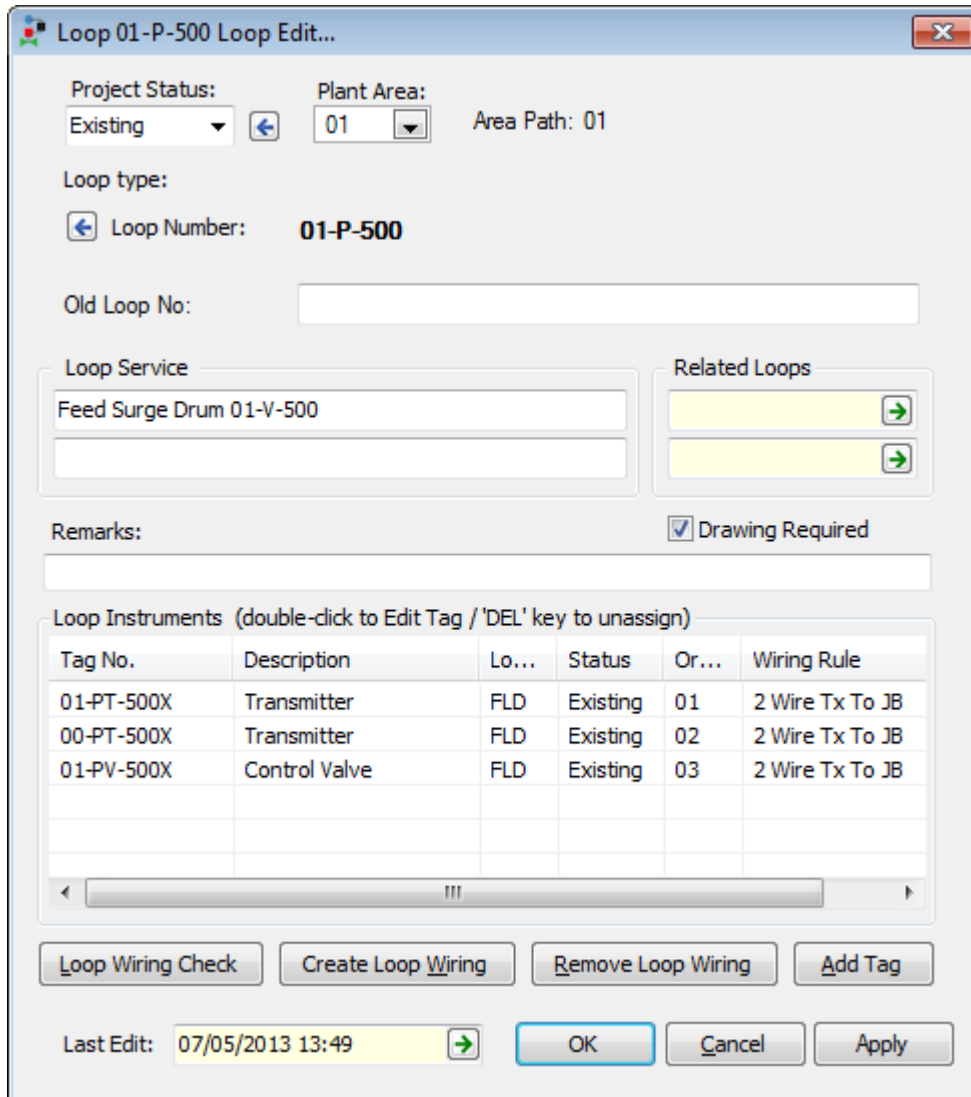
9.2 Using Wiring Rules

Designer provides access to two Wiring Rules commands from the **Loop Edit** window.

Access the Loop Edit Window

From the **Drawing Information** window (see [Add a New Drawing](#)), click the button in **Loop No** field (only available if the Drawing is a Loop Diagram).

The **Loop Edit** window is then displayed:



Below the **Loop Instruments** list there are three buttons:

- **Loop Wiring Check:** Displays a report showing all the instrument wiring associated with the current loop. Refer to [Loop Check Wiring Reports](#).
- **Create Loop Wiring:** Creates loop wiring from the Wiring Rules applied to each instrument in the current loop. Refer to [Create Loop Wiring using Wiring Rules](#).
- **Remove Loop Wiring:** Removes any previously created loop wiring from the field instruments in the current loop.

Note: The **Loop Instruments** list shows the name of a Wiring Rule associated with each instrument (**Wiring Rule** column).

9.3 Create Loop Wiring using Wiring Rules

Note: Although Wiring Rules can be used to create field cables/terminations from Designer, this is limited to working on a Loop by Loop basis. AVEVA recommends creating field wiring using Wiring Rules from the Wiring Manager's Equipment View or Cable Block

Diagram by assigning (allocating) field tags to Junction Boxes, which is more efficient than doing it in Designer by each Loop.

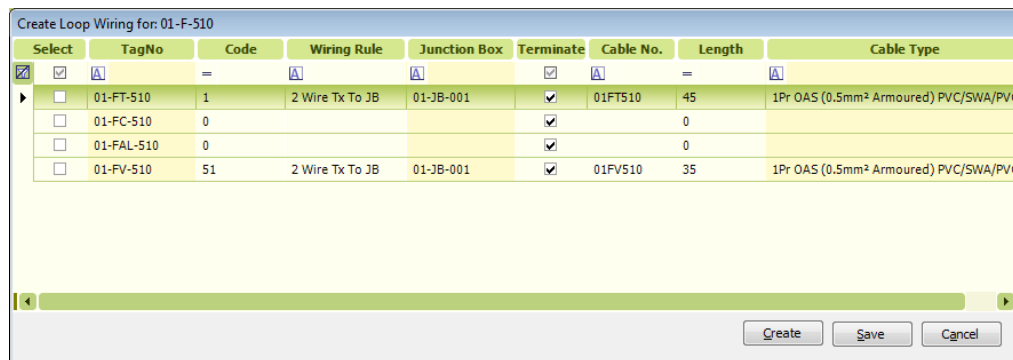
Instrumentation can create the field device, terminals, cables, cores and wire numbers and terminate cable cores at both the field device and Junction box cable ends based on assigned [Wiring Rules Overview](#) for each specific Loop instrument. This effectively completes field wiring in a very efficient and simple manner that can save hundreds on man-hours on a large project.

Note: The loop must have tags assigned. To assign tags to a loop, use the Instrument Engineer application facilities.

Note: AVEVA Instrumentation uses Wiring Rules when tags are assigned to Junction Boxes in Wiring Manager. See the [Wiring Manager User Guide](#) for more information.

Create Loop Wiring using Wiring Rules

In the **Loop Edit** window (see [Loop Data](#)), click the **Create Loop Wiring** button. The **Create Loop Wiring** window is then displayed:



This window lists all the instruments assigned to the current loop.

Columns Explanation

Select	Only those instruments that have their Select checkbox checked are processed when the Create command is used.
TagNo	The instrument tag number - non-editable (tags can only be assigned to a loop using Engineer).
Note: Although the Wiring Rule (Wiring Config) defines the terminal arrangement of the Field Device a different type can be selected by clicking the button in Tag No cell that appears when the mouse hover over this cell.	
Code	The 'Loop Code' is used by AVEVA Instrumentation Datalinks to map information into a loop drawing template when generating CAD drawings. It is ONLY required if CAD loop drawings are to be generated in Designer. This 'Loop Code' must be unique for the current loop for CAD loop drawing creation.
WiringRule	The name of the Wiring Rule to apply to the tag. Select the required rule from the list of available rules (the list is only displayed when the mouse is hovered over the cell).
Junction Box	This displays the name of the equipment the cable will run to. A button is displayed when the mouse is hovered of this cell. Clicking on that button will display a window used to Assign a Junction Box .
Terminate	When this checkbox is checked, cores will be terminated at the Junction Box end (on the next available spare terminals). When it is unchecked, cores will not be terminated at the Junction Box end. The cores will need to be terminated manually, using Wiring Manager, by dragging the cable or cores to the desired terminals.
Cable No.	This shows the default cable number as created by the wiring rule or the actual cable number from the AVEVA Instrumentation Cable Schedule (if the cable has been created previously). Enter a new value if required.
Length	Enter a Cable Length here. This length is saved in Wiring Manager's Cable Schedule.
Cable Type	This shows the base cable type. It can be changed by selecting the cell command button that appears when the mouse is hovered over this cell. The initial cable type comes from the Wiring Rule catalogue cable (if the cable is not yet created) or from the Cable Schedule (if the cable has been created previously). Clicking the cell button displays the Catalogue Cable window allowing a new catalogue cable to be selected.

Command Buttons

Create	Creates all selected tags, cables, termination and other wiring data from the Wiring Rules and data in this grid.
---------------	---

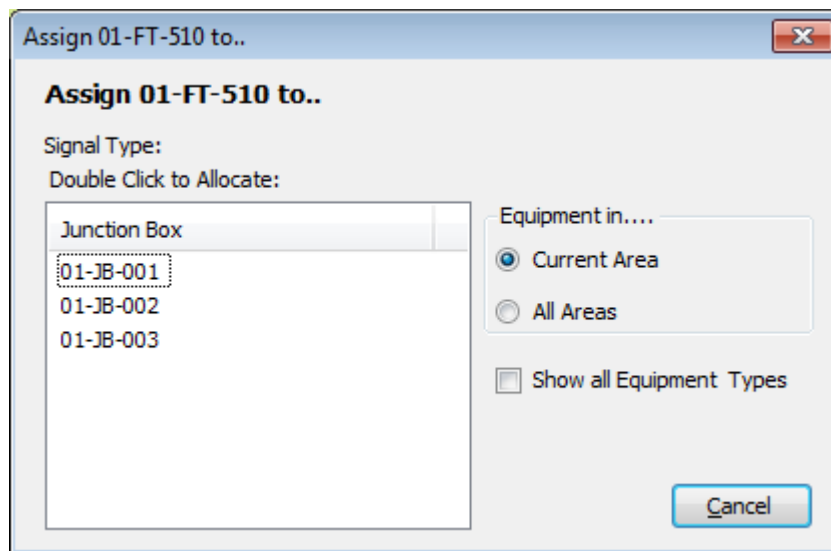
Save Saves the changed data in the grid, but does not create Wiring Rule data. This enables users to pre-assign junction boxes etc prior to cable/device creation.

Cancel Exits the window, not saving or creating wiring.

Note: Wiring Manager allows limited editing of the predefined Wiring Rules. Limitations are that only Cable No, Wire No, Terminal Marking and Cable Types can be changed.

9.4 Assign a Junction Box

When selecting a Junction Box when creating loop wiring (see [Create Loop Wiring using Wiring Rules](#)), the following **Assign** window is displayed, initially listing all junction boxes defined in the current plant area:



Select the **All Areas** option to view equipment in all plant areas.

To assign a Junction Box, double-click on the required equipment tag.

Junction Boxes and other Equipment (other than field devices) can only be created in the Wiring Manager module.

Note: The instrument Signal Type is shown near the top of this window. This comes from the Instrument's Signal Type field in the AVEVA Instrumentation Instrument Data window. However any instrument may be assigned to any junction box, regardless of signal type.

10 Exports

The export options available on the **Manage** and **List Tools** tabs are described below.

Continue at:

- [Export to Excel](#)
- [Export to XPS and PDF Files](#)
- [Export Selected Drawing Files](#)
- [Export to AVEVA NET](#)

10.1 Export to Excel

The contents of the Drawing List, Seed List, Hookup Drawing List, Hookup Catalogue and Hookup Items Catalogue grids can be exported to an Excel spreadsheet with same layout of columns and rows.

Data can also be exported to an Excel spreadsheet from a number of windows that display data in a grid.

For a description of this functionality, refer to the [Common Functionality User Guide](#).

10.2 Export to XPS and PDF Files

The contents of the Drawing List, Seed List, Hookup Drawing List, Hookup Catalogue and Hookup Items Catalogue grids can be exported to PDF and XPS files.

For a description of this functionality, refer to the [Common Functionality User Guide](#).

10.3 Export Selected Drawing Files

The drawing files (.dwg files) of drawings selected in the Drawing list grid can be exported to:

- a folder specified at time of export with file names formed from the drawing number and sheet number in the normal way, and
- a pre-defined folder or folders with file names in a pre-defined, user-defined format. The folder(s) and the file name format are specified using facilities accessed from the **Setup** menu on the **Project** tab, as described below.

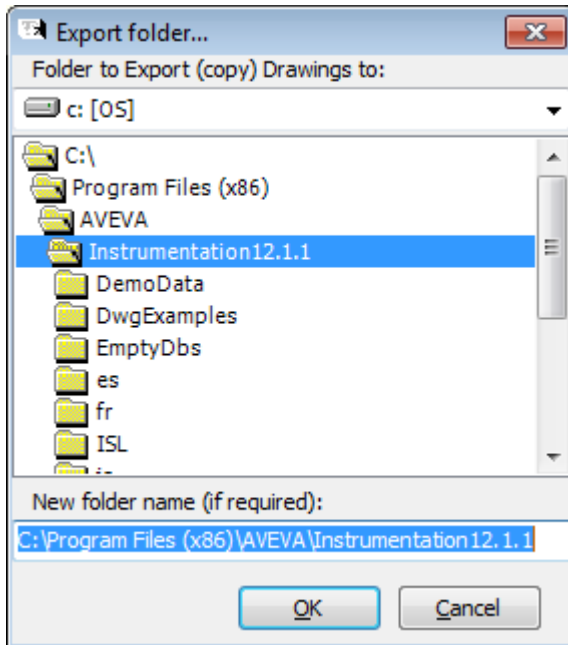
The .dwg files of the selected drawing must be present in the Drawing folder of the project.

10.3.1 Export Drawings to a Specified Folder

Select the drawings in the Drawing grid or the Hookup Drawings grid.

On the **List Tools - Drawing** tab, click **Selected Drawings** in the **Export** section, then **Copy/Archive to a Folder** from the menu that is then displayed.

The **Export folder** window is then displayed:

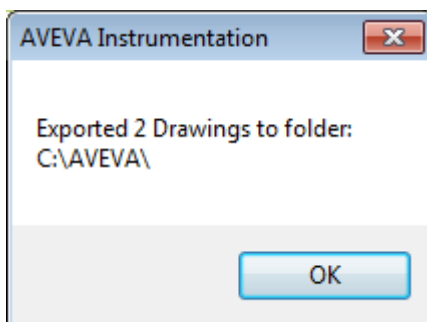


Use the window to select the folder to which the drawings are to be exported. Browse to the required folder and double-click on it to select it.

If drawings are to be exported to a new folder, enter the location and name of the new folder in the **New folder name (if required)** field.

Click **OK**. If it was specified that a new folder is to be created, a message is displayed requesting that this be confirmed.

The export of the selected drawings then takes place. A message is displayed when the export is completed, for example:



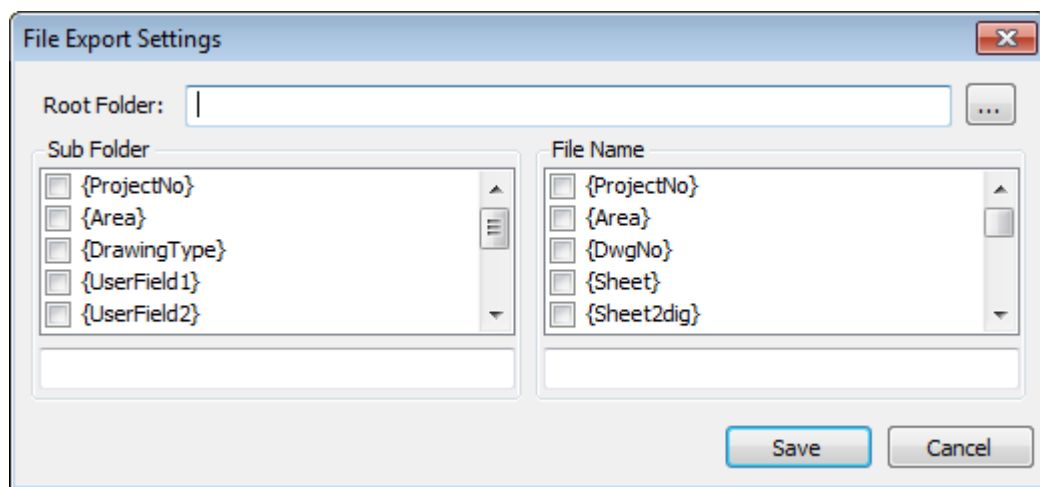
10.3.2 Export Drawings to Pre-Defined Folders with File Names in a Pre-Defined Format

Before drawings can be exported using this option, the folder or folders to which they are to be exported and the format of the drawing file names must be defined.

Setting the Folder Name and File Name Folder

To specify the folder and sub-folders that drawings are to be exported into, and the files names that they will be given, click **Setup** on the **Project** tab. On the **Setup** menu, click **Export File Name/Folders**.

The **File Export Settings** window is then displayed:



In the **Root Folder** field, enter the root folder under which the sub-folders that contain the exported files are to be located. Click the ... button to browse for the required folder.

If no sub-folders are specified, as described below, all the files will be exported into this folder.

To specify the sub-folder structure, select the drawing datalinks that will define the names of the sub-folders and from the Sub Folder list.

To select a datalink, check the appropriate datalink checkbox. The selected datalink is then displayed in curly brackets in the field below the list.

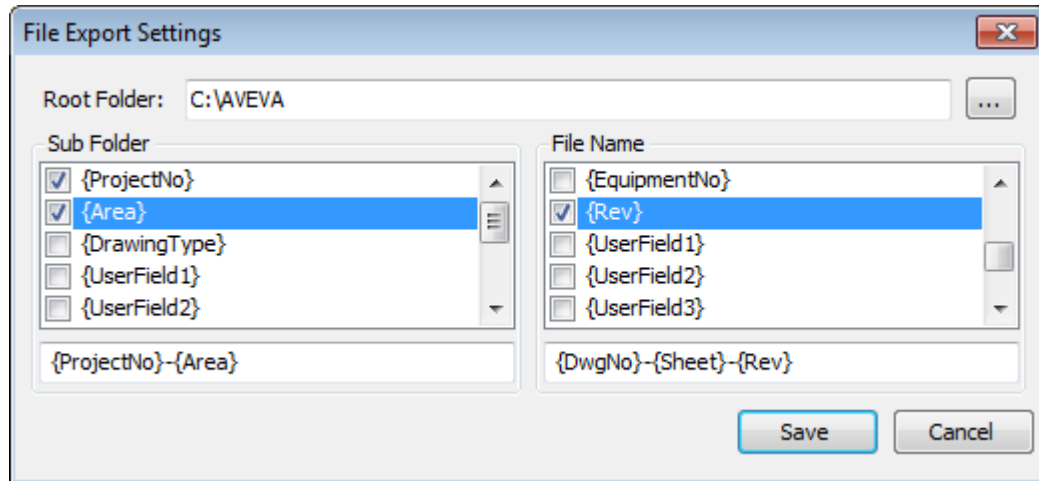
Datalinks are provided to enable users to include sheet numbers and the sheet number totals displayed with 1, 2 or 3 digits. For example, for a drawing with a sheet number of 1 out of a sheet number total of 2, the following datalinks would return the values shown below:

{Sheet}	1
{Sheet2dig}	01
{Sheet3dig}	001
{NoOfSheets}	2
{NoOfSheets2dig}	02
{NoOfSheets3dig}	002

As required, enter delimiter characters or text between the selected datalinks in this field.

To specify the file name format of exported drawings, follow the same procedure as for sub-folders, but using the File Name list and field.

Example:



In the example above, a sub-folder structure of {ProjectNo}-Area{Area} and a file name format of {DwgNo}-Sheet-Rev} have been selected. The selected root folder is "C:\AVEVA".

Using these settings, from a project called "Project1", drawings are exported with the following details:

Area	Drawing Number	Sheet Number	Revision
00	ABC123	1	A
01	XYZ890	1	B

This will result in the creation of folder structure and files as follows:

```
C:\AVEVA (root folder)
    Project1-Area00 (sub-folder)
        ABC123-1-RevA.dwg (exported drawing file)
    Project1-Area01 (sub-folder)
        XYZ890-1-RevB.dwg (exported drawing file)
```

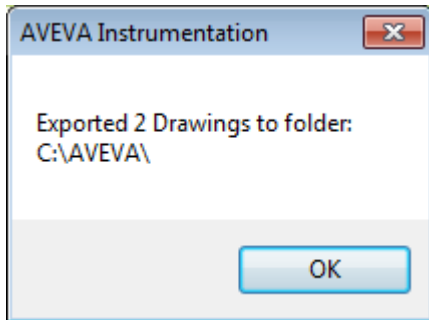
Export Drawings

Select the drawings in the appropriate grid.

On the **List Tools - Drawing** tab, click **Selected Drawings** in the **Export** section, then **Copy to User Defined Names** from the menu that is then displayed.

Note: Drawings may also be optionally exported when they are updated. Refer to [Create or Update Drawings](#).

The export of the selected drawings then takes place. A message is displayed when the export is completed, for example:



10.4 Export to AVEVA NET

AVEVA Instrumentation Designer includes facilities to export files of drawing data and report PDF files for import into AVEVA NET.

The following can be exported:

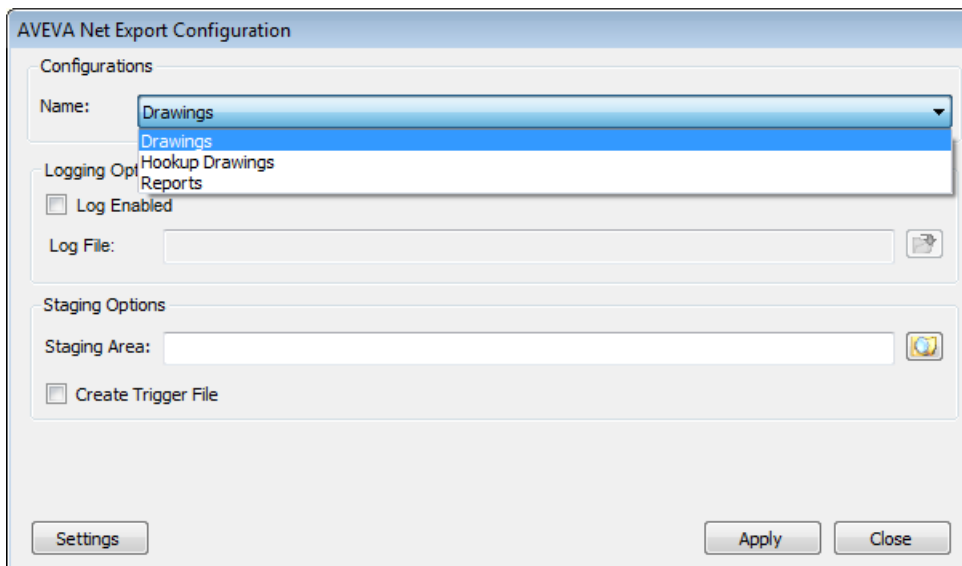
- Drawings data
- Hookup Drawings data
- Reports and associated item data (i.e. of the items on the reports)

The files produced by the exported can subsequently be imported into AVEVA NET Portal (refer to AVEVA NET documentation for details).

10.4.1 AVEVA NET Export Configuration

Before files can be exported for AVEVA NET, the export must be configured.

From the **Project** tab, click **Setup**, then **Publish to AVEVA NET Configuration**. The **AVEVA NET Export Configuration** window is then displayed.



Instrumentation data of various types and from different sources can be exported to AVEVA NET, for example drawing data or data from reports. From the **Name** field, select the type of data export to AVEVA NET to be configured.

If a log file is to be generated for the export type, check the **Log Enabled** checkbox.

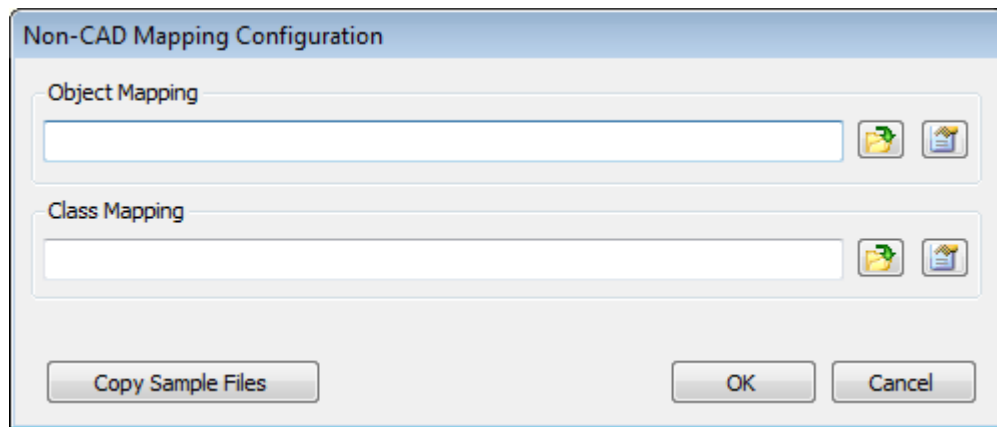
The **Log File** field will then become enabled. In the field, specify the file name and the location of the log file (a .txt file). Click the adjacent button to browse for the required folder.

In the **Staging Area** field, specify the top level folder into which files are to be exported. Click the adjacent button to browse for the required folder.

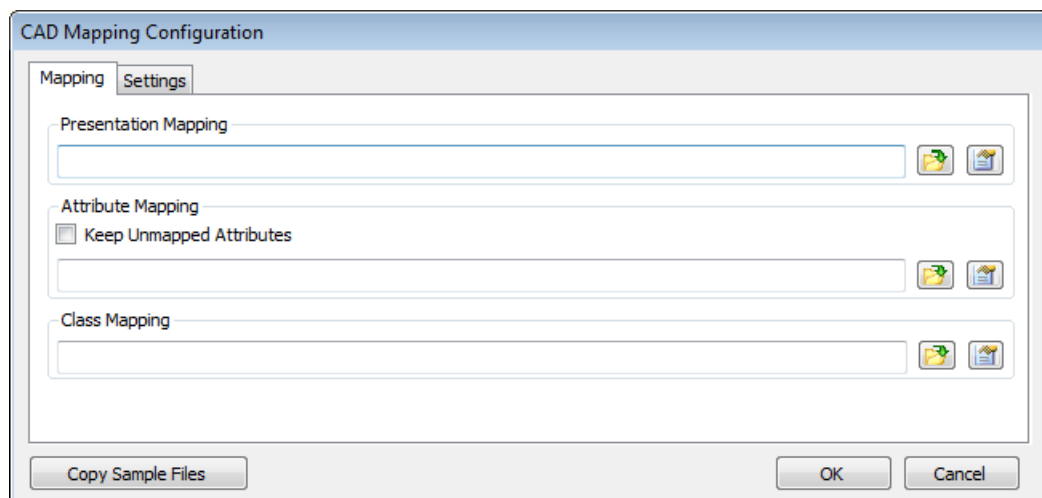
If the **Create Trigger File** checkbox is checked, a trigger.start file (an empty text file) is created in the staging area folder for each file type. The purpose of the trigger.start file is to trigger the AVEVA NET Portal's import controller to automatically process all the files that reside in the same folder.

To select mapping files for the export of data and specify other settings, click **Settings**.

If Report exports are being configured, the **Non-CAD Mapping Configuration** window is displayed.



If Drawings or Hookup Drawings exports are being configured, the **CAD Mapping Configuration** window is displayed.




Mapping Setup

The mappings between Instrumentation data and AVEVA NET Portal format data are stored in XML files, one for each of the types of mapping:

- Presentation Mapping (Drawing and Hookup Drawing exports only)
- Object Mapping
- Class Mapping

For details of these files, refer to [AVEVA NET Export Configurations Files](#).

In **Non-CAD Mapping Configuration** window and on Mapping tab of the **CAD Mapping Configuration** window, click the appropriate ... button to browse for the required mapping file.

Click the open file button  to open the selected file. It will open in the default text editor, for example Notepad.

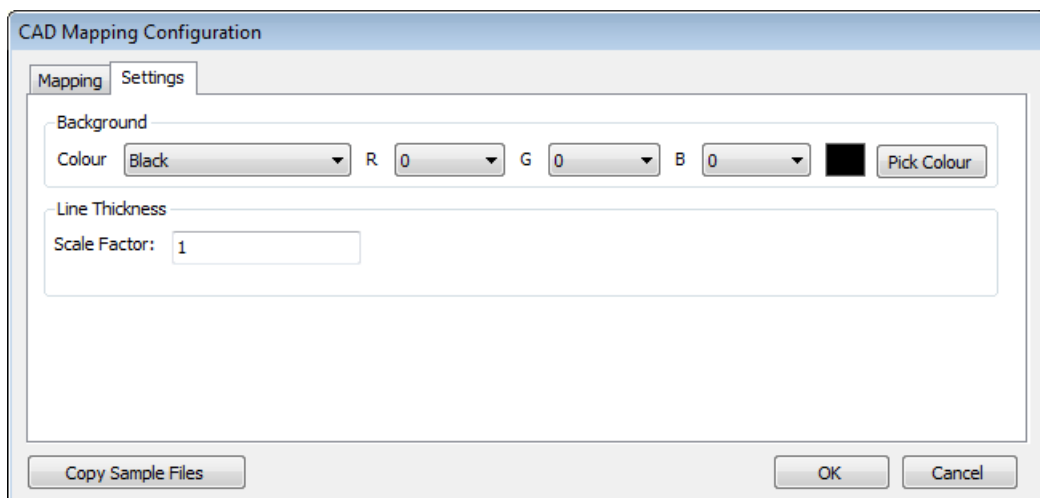
If no file is specified in the field, a new, blank .txt file is opened. If a file is specified that does not exist, the user will be prompted to create that file at the specified location. If **Yes** is clicked, a new blank .txt file is created and opened for editing.

To populate the fields with the default mapping files supplied with AVEVA Instrumentation, click **Copy Sample Files**.

On the Mapping tab of the **CAD Mapping Configuration** window, if unmapped attributes, i.e. Instrumentation attributes not mapped to AVEVA NET Portal characteristics in the Attribute mapping files, are to be exported to export files as characteristics, check the **Keep Unmapped Attributes** checkbox.

Other Settings (for Drawings and Hookup Drawings Exports)

Additional export settings may be specified for the export of Drawings and Hookup Drawings on the Settings tab of the **CAD Mapping Configuration** window.



To select the background colour of the SVG files generated by drawing exports, either:

- select the required colour from the **Colour** field list, or
- enter the RGB values of the colour in the fields provided, or

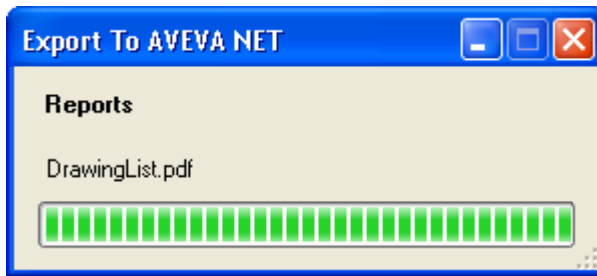
- press the **Pick Colour** button and select the required colour from the standard colour selection dialog.

In **Scale Factor** field, enter the stroke-width attribute value of lines in the output SVG files.

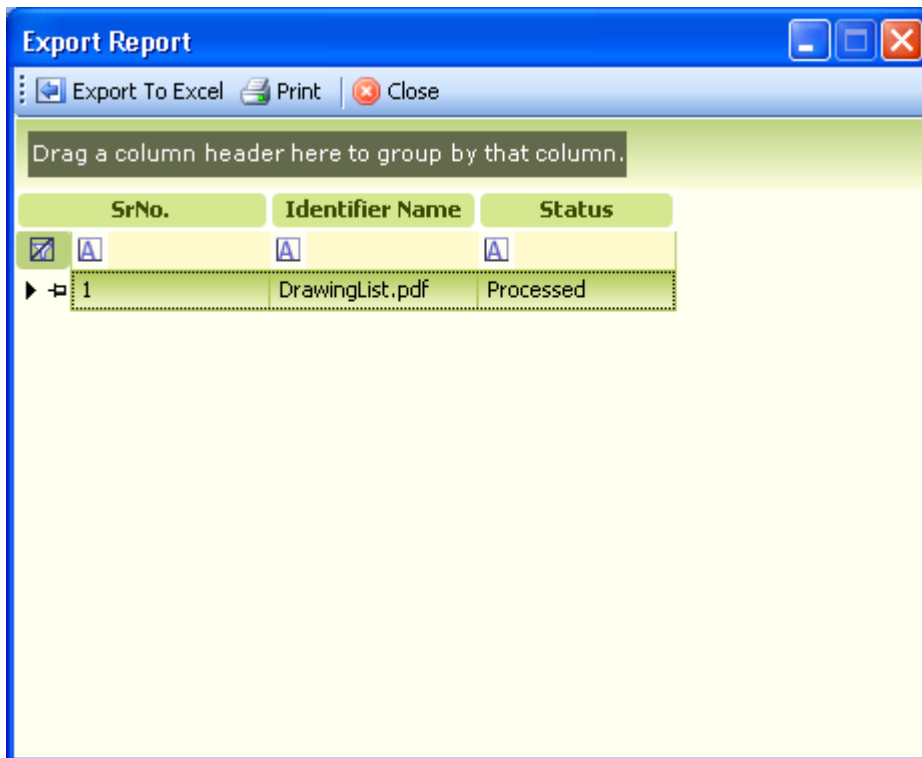
10.4.2 Export Data from Grids

To export data from the *Drawing List* grid, *Hookups* grid or *Reports* grid, select the items from the grid and from the **Manage** tab, click **Publish to AVEVA NET** in the **Integration** section.

The **Export To AVEVA NET** window is then displayed, showing the progress of the import.



Once the export is completed, the **Export Report** window is displayed, listing the items for which the data export was requested and whether or not that export was successful or not:



10.4.3 Export Overview

AVEVA Schematic Gateway is a common Gateway that will be used by different AVEVA schematic applications to export various kinds of data to AVEVA NET. This Gateway refers to various configurations which are provided to it through various configuration files (described in sections below).

As of now, AVEVA Schematic Gateway processes data (provided to it in a form of a Dataset) as well some external files (Excel spreadsheets - xls and xlsx, PDF files).

- Data provided to the Gateway through dataset gets processed and output gets generated into EIWM format.
- Gateway processes excel spreadsheets and produces output in MHTML format.
- Gateway processes PDF files and produces output in PDF format.

11 Work Packs

Work packs can be created which consist of collections of items with shared project management requirements or properties. For example, all the items an individual user or group of users is concerned with may be assigned to a single work pack. Time constraints may be assigned to work packs, for example the required start and completion dates of items in the a work pack, so that work can be more easily prioritised.

For a description of this functionality, refer to the [Common Functionality User Guide](#).

12 Change Reports

The following change reporting facilities are available in AVEVA Instrumentation:

- [Audit Manager](#)
- [Database Revisions](#)

12.1 Audit Manager

AVEVA Instrumentation has an in-built Audit Manager that enables users to view database changes made during the project in the database audit log.

For a description of this functionality, refer to the [Common Functionality User Guide](#).

12.2 Database Revisions

AVEVA Instrumentation allows users to make a copy of the current database state by saving the database as a Database Revision. At any time, the current database can be compared to a saved Database Revision. This feature can be used to track changes between key milestones in the project, for example between data when documents were 'Issued for Tender', 'Issued for Purchase' or 'Issued for Construction'.

For a description of this functionality, refer to the [Common Functionality User Guide](#).

13 Reports

AVEVA Instrumentation provides facilities for creating and modifying reports. These are available with the Reports grid.

For a description of these features, refer to the [Common Functionality User Guide](#).

In addition, the following Designer-specific “fixed” (non-editable) reports are accessible from the Reports grid:

DataLinks for Selected Drawing	If a single Drawing is selected, this command displays the DataLinks Window which displays all the Datalinks available for the drawing, including values returned by each DataLink based on current project data.
Templates Used	Displays the Templates Used in Projects window, which shows all Templates used by Designer, and the number of times they have been used in the project. Refer to Open a Template Drawing with AutoCAD .
BOM/Material Take-off	Displays the Hookup Bill of Materials window. Refer to Hookup Reports .
Tags Assigned	Displays the Tags Assigned to Hookup window. Refer to Hookup Reports .
Tags not yet Assigned	Displays the Tags not yet Assigned to a Hookup window. Refer to Hookup Reports .

A AVEVA NET Export Configurations Files

The following configuration files will be used by the AVEVA Schematic Gateway to process the input:

- Project Configuration
- Presentation Mapping (Drawing and Hookup Drawing exports only)
- Object Mapping
- Class Mapping

For a description of these files, refer to the [Common Functionality User Guide](#).

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