Smart Instrumentation Training

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John Dressel, Fluor
Control Systems Fellow

Smart Instrumentation Training

- The single most important factor in using Smart Instrumentation effectively, is having **Well Trained Users!**
- Evolution of Smart Instrumentation requires user training to leverage the new features and old functionality
- This presentation will introduce you to some of the procedures to consider when developing a new Smart Instrumentation training program

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Reasons for Smart Instrumentation Training

- Consider your reasons for having a Smart Instrumentation training program:
- Update training for new Smart Instrumentation Versions, features and functionality
- Consistency in use of Smart Instrumentation on Projects or in Operations
- Optimizing existing Smart Instrumentation functionality
- Expanding the work processes for better use
- Maintain the quality of Implementation

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Smart Instrumentation Training Targets

- Target Your Smart Instrumentation training audience
  - Introductory Training for New users
  - Update Training for Existing users
  - Module Training for Specific users
  - Function Training for Super Users
  - As-Built Training for O/O Users
  - Cross Training for other Disciplines
  - Administration Training
  - Project Managers

Smart Instrumentation Training Focus

- Supplemental or Focused Smart Instrumentation Training
  - Instrumentation Training
  - Control Systems Engineers
  - Control Systems Designers
  - Process Engineers
  - Process Technicians
  - Maintenance Users
  - Operations Users
  - Project Management

Smart Instrumentation Training Formats

- Consider the most viable formats for your training program
  - Presentation type Instructor Led Classroom training
  - Hands on Instructor Led Classroom training
  - Self Paced Online Based user training
  - Lunch and Learn short sessions
  - Just in Time user training
  - One on One user training
  - On the Job user training
  - Guest instructors

Smart Instrumentation Training Budget

- Establish and Maintain a Smart Instrumentation Training Budget
  - Is Smart Instrumentation Training Project Billable?
  - Included costs for Smart Instrumentation training:
    - Workhours of Instructors and Students
    - Time for Preparation of materials
    - Cost of Software Licensing
    - Cost of Accommodations
    - Cost of Hardware
    - Cost of Travel

Smart Instrumentation Training Instructors

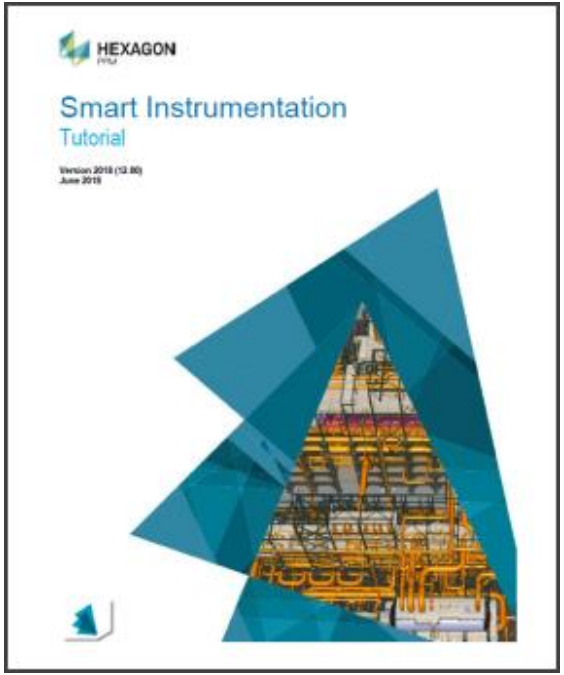
- When Developing or Hiring SPI Training Instructors
  - Will the class require more than one instructor?
  - Consider the Trainers knowledge base
  - Look for Outside Training resources
  - Develop Super Users as Trainers
  - Develop Specialty Trainers
  - Train the Trainers
  - Availability

Smart Instrumentation Training Instructors

- The instructor should be competent in Instrumentation theory and Control Systems Engineering practices
- The instructor should have excellent communication skills
- The instructor needs to have a solid working knowledge of the Smart Instrumentation software or the module in which they are instructing
- The instructor should have knowledge of the instrumentation work processes they are teaching

Using the Smart Instrumentation Tutorial

- The Smart Instrumentation 2019 client installation Documentation comes with a complete and comprehensive ***Schem SPI Tutorial.pdf***
- The SPI Tutorial is based on the In_demo.db database installed as a stand-alone Sybase or an Oracle or SQL Server
- Recommended supplemental material available from in the Client Installation documentation include:
  - *Schem SPI Detailed Engineering Users Guide.pdf*
  - *Schem SPI Basic Engineering Users Guide.pdf*



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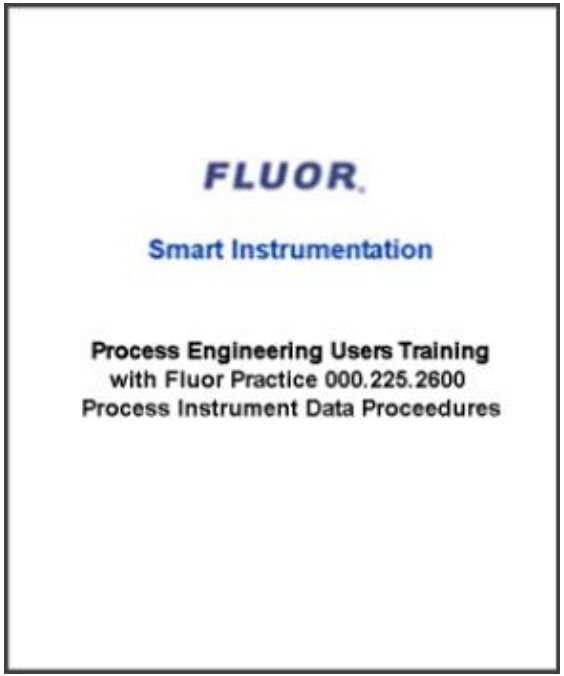
Smart Instrumentation Customized Training

- The SPI Tutorial is limited and will need to be supplemented with customized courses as required:
  - Training for specific users - Process, Design, Maintenance, Managers etc…
  - Training for specific tasks - Fieldbus, Spec Sheets, Process data etc…
  - Training scaled to purpose - Lunch & Learn, Manager training etc…
  - Training for consistency - Seed and Standard Practices training etc…
  - Training in additional modules - External Editor, Import Module, Enhanced Reports, etc…

Smart Instrumentation Custom Tutorial Package

- To Create a Custom Tutorial requires the gathering of the resources that are the basis for the class:
  - Create a Training syllabus for defining the course scope, content and goals
  - Extracting “on topic” pages from the Hexagon Tutorials and User Guides for inclusion
  - Add company specific standard practices and procedures pertinent to the topic
  - Include any supporting graphics and reference documents for inclusion in the course materials
  - Assemble the course materials, presentations and documentation into a training package

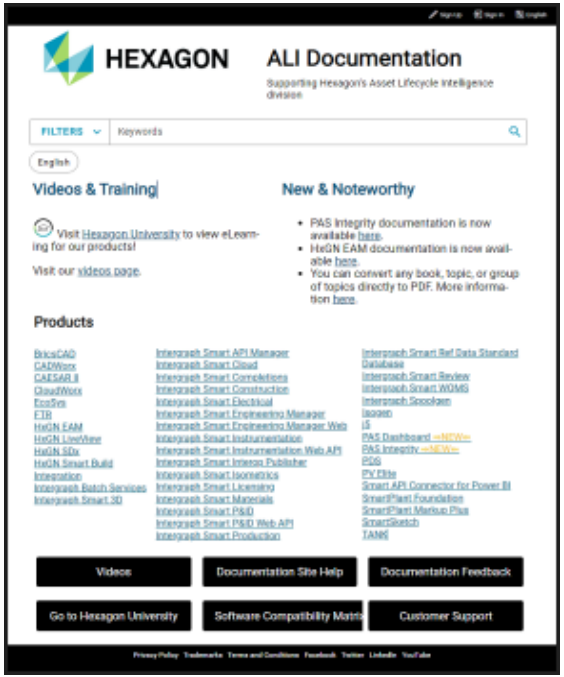


Smart Instrumentation Customized Training Program

- By customizing your training program with a combination of outside instructor led training and internally developed user training, you can make your Smart Instrumentation implementation more effective
- Customized training will allow you to incorporate your work processes into your specific training program
- Using in house trainers will help develop more users and the skill level of the trainers will also increase
- When planning your budget for custom training – don't forget the cost of training the trainer and time to develop the training programs

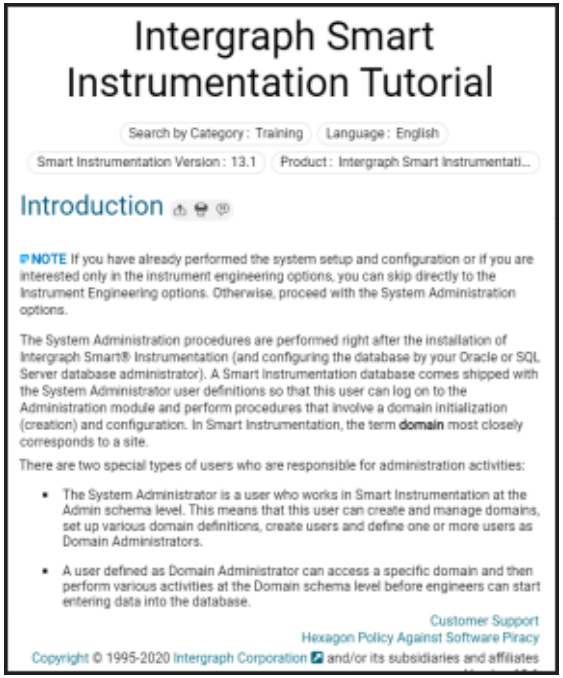
Smart Instrumentation Online Documentation

- Hexagon's Asset Lifecycle Intelligence (ALI) division
  https://docs.hexagonali.com/home
- Link to Hexagon University and PPM Videos
- Document Links to All Intergraph Products including:
  - Intergraph Smart P&ID
  - Intergraph Smart Electrical
  - Intergraph Smart Construction
  - Intergraph Smart Instrumentation :
    - Intergraph Smart Instrumentation Help
    - Intergraph Smart Instrumentation Tutorial



Smart Instrumentation Tutorial Content

- Administration Tasks
- Getting Started with Smart Instrumentation
- Creating Instruments and Control Loops
- Query Builder and the Engineering Data Editor
- Defining Process Data
- Performing Calculations and Sizing
- Working with Specifications
- Managing Documents
- Performing Wiring Operations
- Generating Loop Drawings
- Working with Hook-Ups



Intergraph Smart Instrumentation Tutorial

Search by Category : Training | Language : English

Smart Instrumentation Version : 13.1 | Product : Intergraph Smart Instrumentati...

Introduction

NOTE If you have already performed the system setup and configuration or if you are interested only in the instrument engineering options, you can skip directly to the Instrument Engineering options. Otherwise, proceed with the System Administration options.

The System Administration procedures are performed right after the installation of Intergraph Smart® Instrumentation (and configuring the database by your Oracle or SQL Server database administrator). A Smart Instrumentation database comes shipped with the System Administrator user definitions so that this user can log on to the Administration module and perform procedures that involve a domain initialization (creation) and configuration. In Smart Instrumentation, the term **domain** most closely corresponds to a site.

There are two special types of users who are responsible for administration activities:

- The System Administrator is a user who works in Smart Instrumentation at the Admin schema level. This means that this user can create and manage domains, set up various domain definitions, create users and define one or more users as Domain Administrators.
- A user defined as Domain Administrator can access a specific domain and then perform various activities at the Domain schema level before engineers can start entering data into the database.

Customer Support

Hexagon Policy Against Software Piracy

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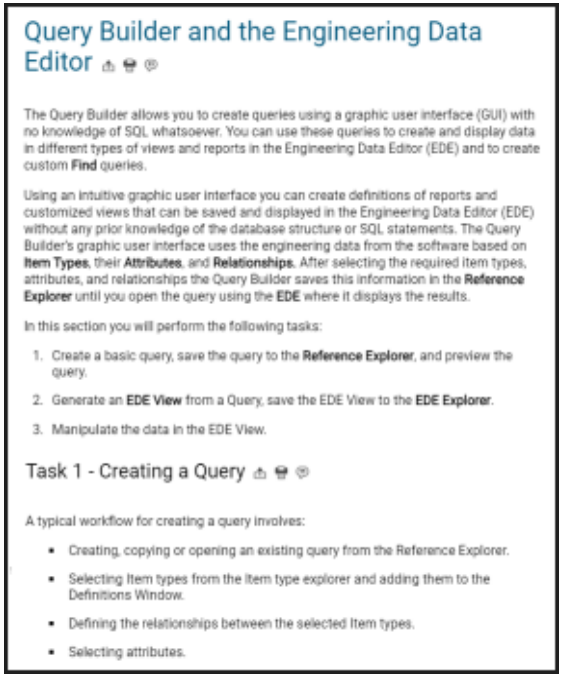
Smart Instrumentation Query Builder and EDE Tutorial

- In the “Intergraph Smart Instrumentation Tutorial” select “Query Builder and Engineering Data Editor”
- Query Builder
  - Opening a New Query
  - Adding Item Types
  - Defining Relationships
  - Adding Attributes
  - Working with Filters
- Engineering Data Editor
  - Generating an EDE View from a Query
  - Manipulating the Data in the EDE View
  - Working with the Complex Filter



Query Builder and the Engineering Data Editor

The Query Builder allows you to create queries using a graphic user interface (GUI) with no knowledge of SQL whatsoever. You can use these queries to create and display data in different types of views and reports in the Engineering Data Editor (EDE) and to create custom **Find** queries.

Using an intuitive graphic user interface you can create definitions of reports and customized views that can be saved and displayed in the Engineering Data Editor (EDE) without any prior knowledge of the database structure or SQL statements. The Query Builder's graphic user interface uses the engineering data from the software based on **Item Types**, their **Attributes**, and **Relationships**. After selecting the required item types, attributes, and relationships the Query Builder saves this information in the **Reference Explorer** until you open the query using the **EDE** where it displays the results.

In this section you will perform the following tasks:

1. Create a basic query, save the query to the **Reference Explorer**, and preview the query.
2. Generate an **EDE View** from a Query, save the EDE View to the **EDE Explorer**.
3. Manipulate the data in the EDE View.

Task 1 - Creating a Query

A typical workflow for creating a query involves:

- Creating, copying or opening an existing query from the Reference Explorer.
- Selecting Item types from the Item type explorer and adding them to the Definitions Window.
- Defining the relationships between the selected Item types.
- Selecting attributes.

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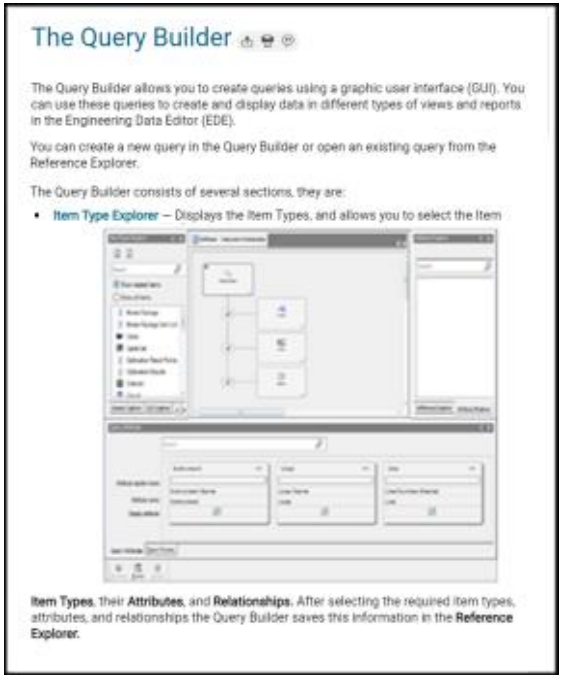
Smart Instrumentation Query Builder (QB) User Guide

- In the “Intergraph Smart Instrumentation Help” select “The Query Builder”
  - Query Builder: Basic Workflow
  - Create a Query
  - Open a Query
  - Edit a Query
  - Using Sort
  - Duplicate a Query
  - Delete a Query
  - Export a Query Builder File
  - Import a Query Builder File
  - Import Multiple Query Builder Files



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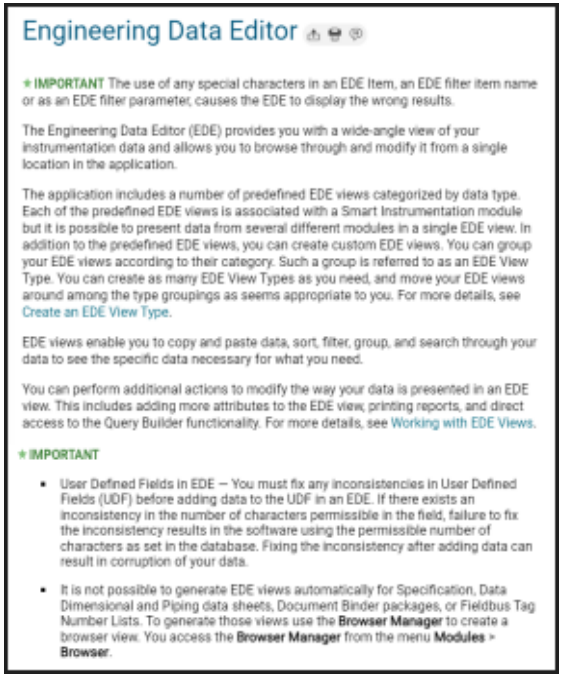
Engineering Data Editor (EDE) User Guide

- In the “Intergraph Smart Instrumentation Help” select “Engineering Data Editor”
  - Open the Engineering Data Editor
  - The EDE Environment
  - Generating EDE Views
  - Print a Report from an EDE View
  - Edit an EDE View
  - Delete an EDE View
  - Working with EDE Views
  - Working with Complex EDE Filters
  - Working with EDE Views in As-Built/Projects



Engineering Data Editor

* **IMPORTANT** The use of any special characters in an EDE Item, an EDE filter item name or as an EDE filter parameter, causes the EDE to display the wrong results.

The Engineering Data Editor (EDE) provides you with a wide-angle view of your instrumentation data and allows you to browse through and modify it from a single location in the application.

The application includes a number of predefined EDE views categorized by data type. Each of the predefined EDE views is associated with a Smart Instrumentation module but it is possible to present data from several different modules in a single EDE view. In addition to the predefined EDE views, you can create custom EDE views. You can group your EDE views according to their category. Such a group is referred to as an EDE View Type. You can create as many EDE View Types as you need, and move your EDE views around among the type groupings as seems appropriate to you. For more details, see Create an EDE View Type.

EDE views enable you to copy and paste data, sort, filter, group, and search through your data to see the specific data necessary for what you need.

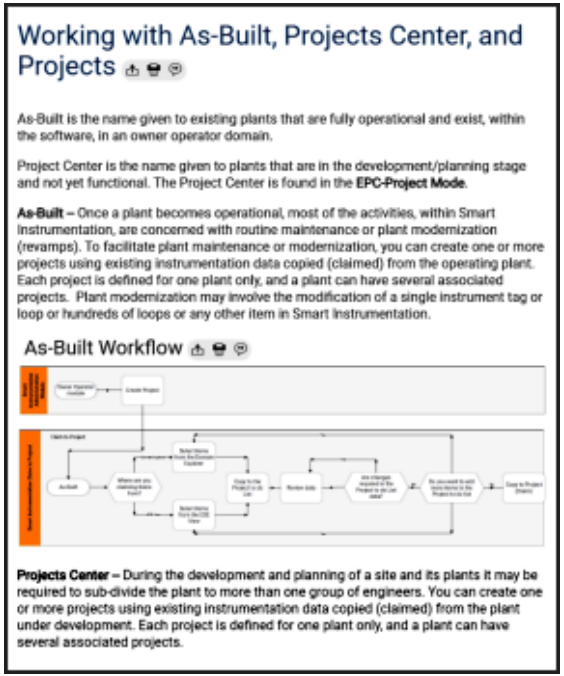
You can perform additional actions to modify the way your data is presented in an EDE view. This includes adding more attributes to the EDE view, printing reports, and direct access to the Query Builder functionality. For more details, see Working with EDE Views.

* **IMPORTANT**

- User Defined Fields in EDE — You must fix any inconsistencies in User Defined Fields (UDF) before adding data to the UDF in an EDE. If there exists an inconsistency in the number of characters permissible in the field, failure to fix the inconsistency results in the software using the permissible number of characters as set in the database. Fixing the inconsistency after adding data can result in corruption of your data.
- It is not possible to generate EDE views automatically for Specification, Data Dimensional and Piping data sheets, Document Binder packages, or Fieldbus Tag Number Lists. To generate those views use the **Browser Manager** to create a browser view. You access the **Browser Manager** from the menu **Modules** > **Browser**.

Projects As-Built (PAB) User Guide

- In the “Intergraph Smart Instrumentation Help” select “Working with As-Built, Projects Center, and Projects”
  - As-Built Workflow
  - Claiming from As-Built/Projects Center
  - Releasing Claimed Items
  - Deleting Items from As-Built, Project Center, or Project
  - Merging Items with As-Built/Project Center
  - Comparing Project To Do List with Target Data
  - Correlating Items in the As-Built
  - Select Target Dialog Box
  - Scope History - Find Items Dialog Box



Working with As-Built, Projects Center, and Projects

As-Built is the name given to existing plants that are fully operational and exist, within the software, in an owner operator domain.

Project Center is the name given to plants that are in the development/planning stage and not yet functional. The Project Center is found in the **EPC-Project Mode**.

As-Built – Once a plant becomes operational, most of the activities, within Smart Instrumentation, are concerned with routine maintenance or plant modernization (revamps). To facilitate plant maintenance or modernization, you can create one or more projects using existing instrumentation data copied (claimed) from the operating plant. Each project is defined for one plant only, and a plant can have several associated projects. Plant modernization may involve the modification of a single instrument tag or loop or hundreds of loops or any other item in Smart Instrumentation.

As-Built Workflow

Projects Center – During the development and planning of a site and its plants it may be required to sub-divide the plant to more than one group of engineers. You can create one or more projects using existing instrumentation data copied (claimed) from the plant under development. Each project is defined for one plant only, and a plant can have several associated projects.

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Smart Instrumentation at Hexagon University

- Hexagon University - Powered by Hexagon's Asset Lifecycle Intelligence division
  - Filter by type, product, or other skill
  - Customer dashboards track learning
  - Forum for questions and comments
  - Comprehensive training records and certificates
  - Configurable customer catalog

  https://university.hexagonali.com/

"Tell me and I forget. Teach me and I remember. Involve me and I learn."

~ Benjamin Franklin