



# Mangan - MSS SPInspector Software

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# History for the SPInspector Software

- One of the Mangan's major customers in the Oil & Gas field approached Mangan to create a set of audit procedures to ensure all of their SPI database sites (7 sites in the USA) have:
  - Data Consistency
  - Healthy Database
  - Project Review before merging (QA/QC)
  - Project management review before close out.
- The customer evaluated other SPI audit software; however, due to the additional setup steps, configurations, and IT involvement, it was determined that it is best to build the SPI audit procedures using SQL statements and then develop an easy software to manage, execute, and report.

# Purpose of the Audits and Software

- The audits and the SPInspector software will ensure the following:
  - A stronger communication between the SPI admin and the SPI users
  - Provide a strong gap analysis and the health of the SPI database
  - Allows the SPI users to review their project work before issuing (As-Built and Projects)
  - Allows the SPI admin to review project work before merging projects
  - Allows project managers to review project work before signing off on a project
- The SPInspector audit queries are not designed or customized based on the customer databases. It is designed to query all SPI databases based on previous experienced issues with other databases (10+ years of experience with other customer databases and issues).

# SPInspector Software GUI

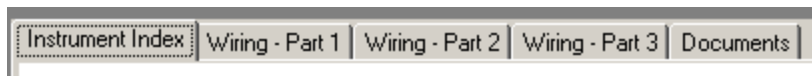
- The SPInspector software is a windows (.exe) application. The installation is very easy (4 wizard steps).



- The GUI looks similar to SPI. The Groups will reflect the Audit Items “Similar to SPI modules”

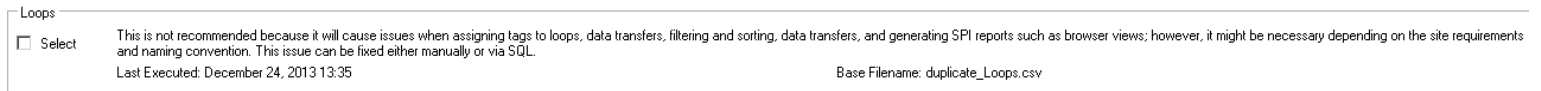


- Within each group, there are Sub-Groups

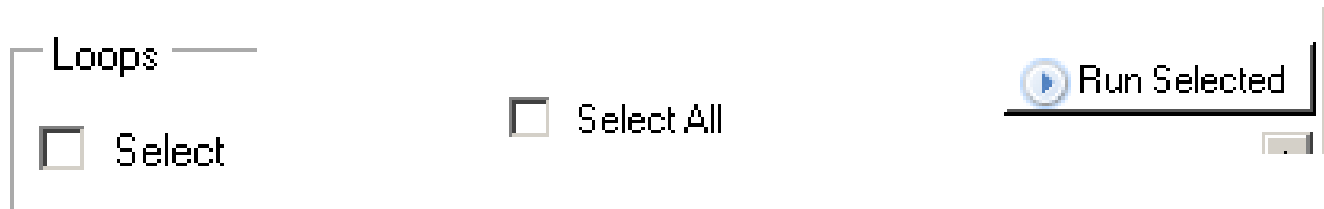


# SPI Inspector Software GUI

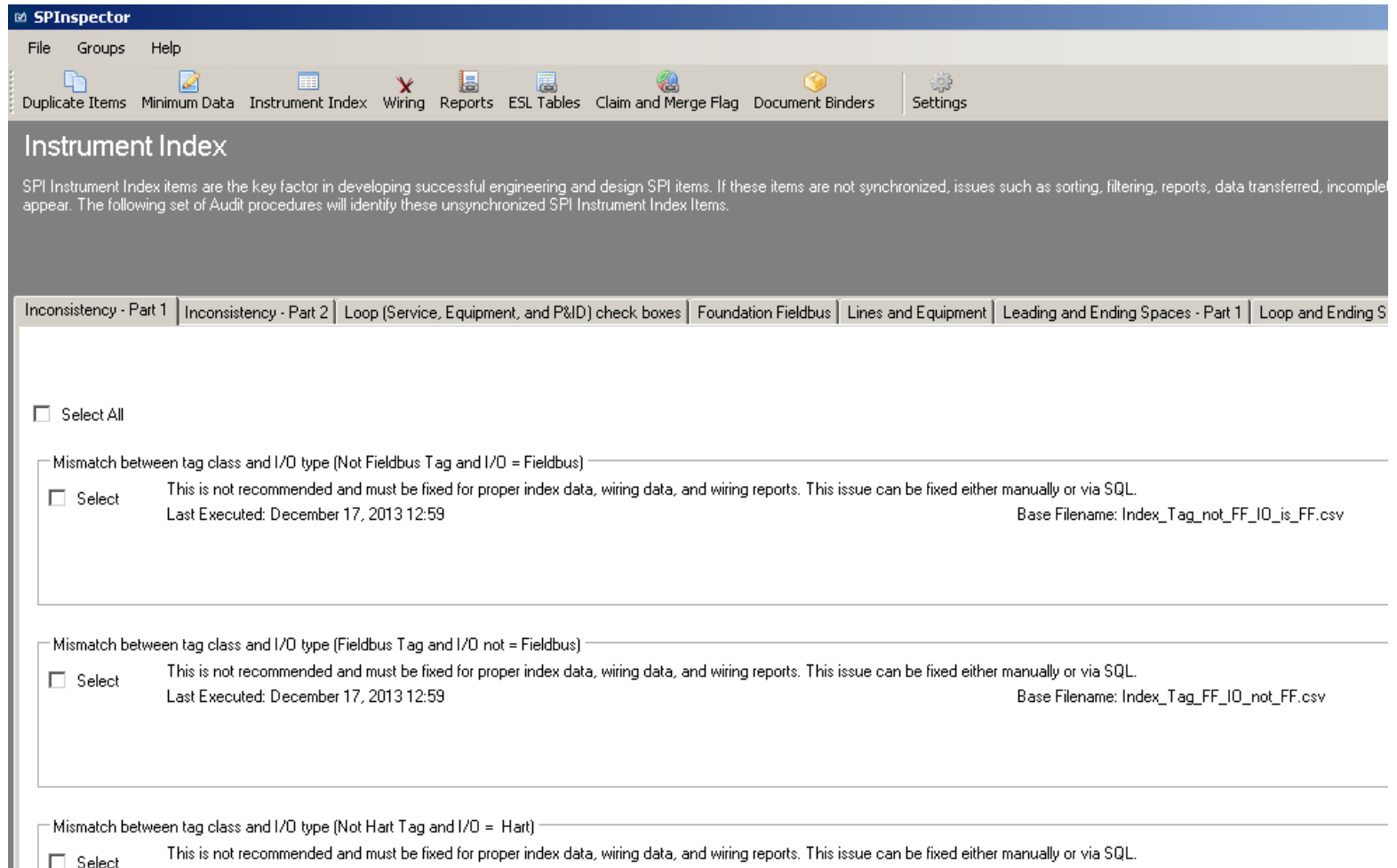
- Each Audit Group, and Audit Items will have a description, pros and cons or the issue, and method to fix the issue (SQL vs. manual).



- The Audit Items are executed by selecting check boxes. They can be run one by one or in batch mode (Per Sub-Group)



# SPIInspector Software GUI



**SPIInspector**

File Groups Help

Duplicate Items Minimum Data Instrument Index Wiring Reports ESL Tables Claim and Merge Flag Document Binders Settings

## Instrument Index

SPI Instrument Index items are the key factor in developing successful engineering and design SPI items. If these items are not synchronized, issues such as sorting, filtering, reports, data transferred, incomplete appear. The following set of Audit procedures will identify these unsynchronized SPI Instrument Index Items.

Inconsistency - Part 1 | Inconsistency - Part 2 | Loop (Service, Equipment, and P&ID) check boxes | Foundation Fieldbus | Lines and Equipment | Leading and Ending Spaces - Part 1 | Loop and Ending S

Select All

Select Mismatch between tag class and I/O type (Not Fieldbus Tag and I/O = Fieldbus) This is not recommended and must be fixed for proper index data, wiring data, and wiring reports. This issue can be fixed either manually or via SQL.  
Last Executed: December 17, 2013 12:59 Base Filename: Index\_Tag\_not\_FF\_IO\_is\_FF.csv

Select Mismatch between tag class and I/O type (Fieldbus Tag and I/O not = Fieldbus) This is not recommended and must be fixed for proper index data, wiring data, and wiring reports. This issue can be fixed either manually or via SQL.  
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Select Mismatch between tag class and I/O type (Not Hart Tag and I/O = Hart) This is not recommended and must be fixed for proper index data, wiring data, and wiring reports. This issue can be fixed either manually or via SQL.



# SPIInspector Software GUI

- The software allows connection to SPI domain, location to result files, and format of file name.

The screenshot shows the 'SPIInspector Settings' dialog box with the following configuration:

- Data Source:**
  - Database Type: Oracle
  - Host & Instance: mangan-q3gcebi8
  - Port: 1521
  - DB/Schema: SPIV2009
  - Username: DEMO
  - Password: [masked]
  - Test button
- Inspector Plugin:**
  - Plugin File: Dependencies\spi\_db\_inspector\_plugin.xml
  - Browse... button
- Output Control:**
  - Output Folder: C:\Documents and Settings\Administrator\De...
  - Browse... button
  - Timestamp File: Append Timestamp to Filename
  - File Format: CSV

Buttons at the bottom: OK, Cancel, Apply

Database Connections are Oracle 10, and 11 or MS-SQL 2005 and 2008.

Compatible with SPI 2007, 2009, and 2013

The SPI schema name and password could be the overall SPI schema name and password or a project schema name and password.

Output Format is CSV or Excel:

CSV: Each query will have an individual file

Excel: Sub-Group queries are saved in one file with multiple sheets.

# SPInspector Items

- Identifying Duplicate Items
  - Instrument Index Items (Loops, Tags, P&ID, Lines, Equipment, Manufacturers, Model Numbers, Instrument Types, etc.)
  - Reports (Document Numbers)
  - Wiring Items “Names and Sequences” (panels, cables, terminals, wiring equipment, signals, CS tags, etc.)
- Identifying Minimum Data Requirements
  - Loops (Measure Variable, Type, P&ID, etc.)
  - Tags (Manufacture, Model, Line Number, Equipment Number, I/O, etc.)
  - Panels (Manufacture, Model, Location, etc.)
  - Cables (Class, Type, Description, Type, etc.)



# SPInspector Items

- Instrument Index Data
  - Line Number Insulation letter (Ih, Is, etc). Capital I vs. Lower case L “l”
  - The word (See notes) in the manufacturer and model tables
  - Lines and equipment with no types
  - Fieldbus (tags with no segments, tags with CS tags, VFD tags with no fieldbus tag association or I/O association, etc.)
  - Inconsistency between Tag class and Tag I/O
  - Model numbers and no manufacturer
  - Lines and no piping data
  - Inconsistency between loop and tags for service, P&ID, equipment, and the apply check boxes.
  - Inconsistency between instrument tag and instrument type profile (wiring, I/O type, spec sheets, etc.)
  - Leading and ending spaces (service descriptions, equipment, etc.)
  - External associated documents

# SPInspector Items

- Wiring Data
  - CS tags (no tag association, no I/O association, etc.)
  - Device panels (no connections, I/O signal propagation, etc.)
  - Panels and cables with ? Marks, Copy Of, and Parenthesis
  - Cables, jumpers, and cross wiring and no connections
  - Fieldbus segments (no I/O association, no tags, etc.)
  - Multi-input devices
  - Wiring items with leading and ending spaces
  - Inconsistency between tag I/O and IO card/termination I/O
  - Cables, jumpers, and cross wiring with one end connection
  - Mismatch connections within the same cable set
  - Invalid ID values for wiring equipment associations

# SPInspector Items

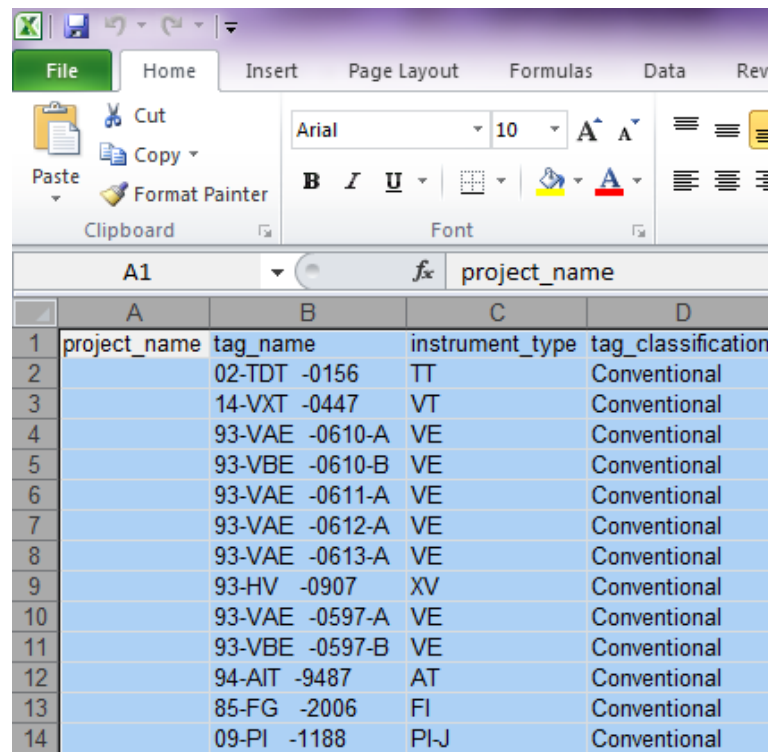
- Reports
  - Reports with no revisions (specs, PD, calculations, loops, wiring, etc.)
  - Reports with no document names (specs, PD, calculations, loops, wiring, etc.)
  - Inconsistency between item PAU and report PAU
- ESL Tables
  - Missing Redlining and Symbols for ESL reports
  - Lost ESL macros and positioning
  - Corrupted ESL default layouts
- Claim and Merge flags (Merge Release flag)

# SPI Inspector Results

- The software does not just inspect one unit or one project, it Audits the entire SPI domain.
- The software can be configured to inspect one project at a time if needed.
- The Audit results will be saved in an excel file or CSV file. The file names are pre-defined.
- The purpose of excel or CVS is for easy data manipulation, sorting, filtering, formulas, etc.
- Also, the purpose of excel or CSV that it can be used to import the manipulated data or creation of SQL statement for fixes.

# SPInspector Results

- Example of an Audit result (mismatch between tag instrument type and the instrument type table)



|    | A            | B              | C               | D                  |
|----|--------------|----------------|-----------------|--------------------|
| 1  | project_name | tag_name       | instrument_type | tag_classification |
| 2  |              | 02-TDT -0156   | TT              | Conventional       |
| 3  |              | 14-VXT -0447   | VT              | Conventional       |
| 4  |              | 93-VAE -0610-A | VE              | Conventional       |
| 5  |              | 93-VBE -0610-B | VE              | Conventional       |
| 6  |              | 93-VAE -0611-A | VE              | Conventional       |
| 7  |              | 93-VAE -0612-A | VE              | Conventional       |
| 8  |              | 93-VAE -0613-A | VE              | Conventional       |
| 9  |              | 93-HV -0907    | XV              | Conventional       |
| 10 |              | 93-VAE -0597-A | VE              | Conventional       |
| 11 |              | 93-VBE -0597-B | VE              | Conventional       |
| 12 |              | 94-AIT -9487   | AT              | Conventional       |
| 13 |              | 85-FG -2006    | FI              | Conventional       |
| 14 |              | 09-PI -1188    | PI-J            | Conventional       |

# SPInspector Future Items

- An additional 150+ audit items that will cover the:
  - Process Data tables
  - Usage of UDF's
  - Hookup Module
  - Claim and Merge Issues
  - Revision comparison (Latest Revision) between As-Built and Projects for Claimed Items
  - Revision comparison (all Revisions) between As-Built and Projects for Claimed Items
- Allow execution for all Audit items at one time
- Creation of a Favorite Group
- Creation of a Custom Group
- \*\*\*Creation of a project percent completion Group \*\*\*



# Customers Comments

- Recently we implemented programs to evaluate each facilities' database and the SPInspector software has provided an opportunity for us to identify areas for improvement and perform an assessment of our instrument engineering information.
- We completed these audits and studied the trends of data to determine the proper approach for resolution.
- Our Company used this software to perform an evaluation of various types of data and implement strategic corrective actions where needed.
- The software collected results including duplicate records and repeated loop or instrument tag properties, multiple instrument specifications and loop diagram documents, or other undesired conditions and attributes of data.
- The results were reviewed and together we've applied effort and dedication to resolve thousands of records.
- **As we continue to interpret the results, complete the validation process and establish new goals; Mangan has continued to support our team and develop enhancements as our initiatives continue to correct the audited information.**

# Customers Comments

- In 1989 when we installed the first DCS system we used an in-house design tool. As a result, we are fortunate to have the entire plant captured in a design system. In 1999 we migrated the data into SPI.
- As a result of 25 years of data entry and the start of a large new project, we decided it was time to do some database clean up.
- SPInspector was selected as one of the tools to help us meet this requirement.
- SPInspector is simply to install and use.
- We have run all the checks and filed the results, but so far have only resolved some. Resolving the discrepancies highlighted by SPInspector is where time and effort comes in.
- We plan to priorities the checks that need to be done regularly and would like to put these into a sub-group. SPInspector will go a long way in helping us maintain a clean database.

# Q&A

## Questions?

