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ISA-5.1-2009 INSTRUMENT IDENTIFICATION NUMBER ENABLER ADMINISTRATION TUTORIAL

**Instrument Specs and Index**

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# 1 OVERVIEW

## 1.1 HISTORICAL PERSPECTIVE

In My experience:

* Originally, “Data Sheets” was in the context of a subcategory of drawings and their data retrieval required a visit to the physical drawing vault.
* Projects maintained a cross-reference ledger book of **reserved numbers**, subjects, etc., with references to the places where they occur.
* Availability of electronic files of Instrument Index cross-references with alphabetical ordering based on **Tag Number**, was instrumental to the index inclusion of **records unrelated to** data sheets.
* Index content was soon **expanded to include** documentation of **Control Loops** and all their tagged child instrument devices
* With the advent of Computer Aided Engineering (**CAE**) applications, their Instrument Index content was expanded to cross-reference all tagged devices or software functions and their related work products.
* Efficient data retrieval in CAE applications requires **Relational Database** technology preceded by standardizing and enforcing many work processes and naming conventions.
* Significant demand still exist for a simpler flat file data structures to cross-reference index data without the structured procedures required for automatically establishing complex data relationships
* The previously published **Integrated Instrument Index** file, addressed the content and viewing of the data, but without standardized Instrument Identification numbers, its data retrieval and editing can be cumbersome.

## 1.2 USERFORM OBJECTIVES

The Administration UserForm worksheet allows configuring the Identification Numbers generator to produce:

* Identical Identification/Tag number on specification Documents as those directly entered in the Instrument Index Data file, so that data will be documented on a single coordinated Instrument Index Data record respective of the origination source.
* Formatted (fixed position) Identification/Tag number used to facilitate simple Index sort A to Z and compatibility with conventional database software applications
* Formatted (fixed position) Loop Identification number used to facilitate simple index sort A to Z and compatibility with conventional relational database software applications
* (Unformatted) Identification/Tag number used to communicate nameplate or HMI display values without segment values with unclear padding spaces
* (Unformatted) Functional Identification Letters to facilitate review and checking for common user entry inconsistency of this field
* Padded identification segments for:
	+ User entered Functional Letters with a length less than the required segment’s project standard length, are padded with trailing spaces
	+ User entered Loop Identification Number numerals less than the required project length, are padded with leading zero’s
* Enhanced compliance with Project Numbering Requirements
* Training utility for reinforcing the meaning of the coded letters in their functional context.

Note: This can be especially effective in engineering organizations that manage multiple client or project files, with different requirements.

# 2 USING THE ADMINISTRATION USERFORMS WORKSHEET

The Instrument Index Data spreadsheet opens with a window to select a Custom View or Close the window. If the intent for this user session is to add new records, then the default “Add Components UserForm” should be enabled by clicking the Show Button. This will allow the appropriate viewing of the data that will be added with the UserForm.



A new spreadsheet will open showing the Instrument Index Data worksheet and the 4 worksheet tabs. Click on the “Administration UserForms” tab to open that worksheet!



## 2.1 VIEW THE DESIGN BASIS

This Add Components UserForm is designed to **enable** implementation of tagging identifications of ANSI/ISA-S5.1-2009 Instrumentation Symbols and Identifications but can be configured to support similar identifications that use 7 or less number segments.

A hyperlink <http://integrated.cc/cse/Instrumentation_Symbols_and_Identification.pdf> is provided to view all the supporting details of this national consensus standard.

Note: “[ANSI/ISA-5.1-2009 Instrumentation Symbols and Identification Standard](http://integrated.cc/cse/Instrumentation_Symbols_and_Identification.pdf) attempts to strengthen this standard published as ANSI/ISA-5.1-1984, and then reaffirmed in 1992. This revision extensively changes the format of ANSI/ISA-5.1-1984 (R 1992). Clauses 1, 2, and 3 are essentially the same as previously written with some additions and modifications. Clauses 4, 5 and 6 and informative Annexes A and B are new or extensively revised.”

However, many organizations must accommodate legacy requirements for their existing data. This application has therefore been designed to accommodate extensive administrative configurations beyond the default ISA standard configurations, as well as unvalidated user inputs that comply with the Project's maximum length requirement. Such flexibility should accommodate most project's need for enabled consistent identification Number generation!

# 3 VIEW THE ADD COMPONENTS USERFORM

A command button is available to interactively open and view the Add Components UserForm containing the configuration changes being made in this worksheet and test saving records, as appropriate. The UserForm has a Close button to hide the UserForm if it is excessively blocking the view of the worksheet content.



## 3.1 DOCUMENT DATA FRAME

The 6 fields of the Document Data frame are generally incidental to the process of creating Identification Numbers. However, the Related Equipment/Drawing Number field should be used to document the numbering practice when "Coded digits related to drawing numbers, unit numbers, equipment numbers, etc.”, are used for the Loop Identification Number Numerals Basis".

* Document Number
* P&ID/Reference Drawing
* Component Symbol
* Related Equipment/Drawing Number
* Service Description
* Upstream Line/Nozzle Number

All the fields of this frame are important accompanying data that is frequently available or can be inferred form a P&ID/Reference Drawing and is efficient to be entered in the same work process as creating the Identification Numbers.

## 3.2 INSTRUMENT IDENTIFICATION/TAG NUMBER FRAME

### 3.2.1 Managing Identification Numbers Segment Structure

The application Administrator must review the below 17 standardized Project specific formatting options and use their cell drop-down list to select an alternate value, when modifications are required!

Clicking within the highlighted cell will display the drop-down list icon  on the right side of the cell. Clicking this icon symbol will open the list of validated options. The validation list can be modified by invoking the Excel “Data Validation function” if required.

* STD Number Numeral Sequence Method (Information Only)
* STD Loop Numbering Scheme (Disables fields when “without Modified” is selected)
* STD Disable STD Loop Prefix Option (Disables fields when “True is selected)
* 2.1 STD Loop Number Prefix Length
* 2.2 STD Loop Number Prefix Punctuation
* 2.3 STD Measured Initiating Variable Letter Length
* 2.3a STD First Letter Variable Modifier Length
* 2.3b STD Readout/Passive Function Length
* 2.3c STD Output/Active Function Length
* 2.3d STD Function Modifier Length
* 2.3e STD Function Identification Letters Length
* 2.4 STD Optional Loop Number Prefix Punctuation
* 2.5 STD Loop Identification Number Numerals Length
* 2.6 STD Loop Number Suffix Length
* 2.7 STD Recommended Tag Number Punctuation
* 2.8 STD First Tag Number Suffix Length
* 2.9 STD Additional Tag Number Suffixes Length

## 3.2.2 Managing Identification Numbers Segment Content

The application Administrator should review the 10 editable drop-down list data sources to assign:

* Variables to the User's Choice letters when such letters are used
* Meaning to the blanks (undesignated letters) when additional functions or modifiers are assigned

New row values and descriptions can be **inserted** to document project specific requirements

Existing row and values can be **deleted** to meet project specific requirements

* Loop Number Prefix Drop-down List
* Measured Initiating Variable Letter Drop-down List
* First Letter Variable Modifier Letter Drop-down List
* Readout Passive Function Drop-down List
* Output Active Function Drop-down List
* Function Modifier Drop-down List
* Loop Number Suffix Drop-down List
* First Tag Number Suffix Drop-down List
* Additional Tag Number Suffixes Drop-down List
* Component Symbol Drop-down List

### 3.2.3 Rule Generated Identification Numbers

The three rule generated Identification Numbers will have their data built as each keystroke or click event occurs in the UserForm fields:

* Formatted Identification/Tag Number
* Identification/Tag Number
* Formatted Loop Identification Number

Use the **View Add Components UserForm command button** to test the configuration modifications made, with emphasis on the appearance of the rule generated Identification numbers.

Note: that the “Recommended Tag Number Punctuation” is automatically applied by the application’s Save command. Therefore, tag numbers with suffixes can only be fully viewed AFTER clicking the Save button and AUTO FORMAT information window.

### 3.2.4 Test Configuration and Hide Worksheet to Minimize Unauthorized Changes

The application of formatting and content may need a few test and fine tuning to ensure that the combination of configuration options is not misunderstood and meets the project’s requirements.

Such test records can be viewed in the Instrument Index Data worksheet using the Add Components UserForm Custom View. Such test records should be deleted before actual project data is entered.

When satisfied, the Administrator should hide the Administration Tab by right clicking on the tab and select “Hide”. If the Administrator needs to return to this worksheet, right click any available tab and select “unhide”.