



IADS Calibration Tool User Guide

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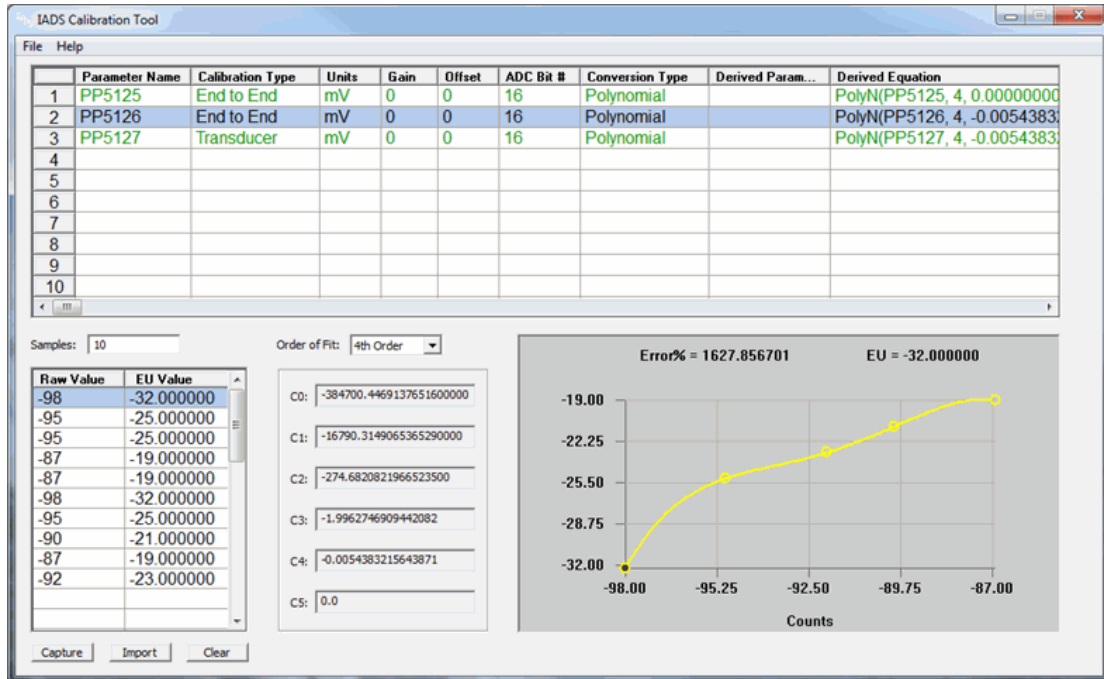
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1. IADS Calibration Tool

The IADS Calibration Tool simplifies the process of sensor calibration by integrating the components needed to perform such calibrations directly into the existing IADS Client Workstation. The system will create derived EU parameters which can be added to the Parameter Defaults Table; or all data can be saved to a CSV file.



The IADS Calibration Tool interface has four major components:

Raw Parameters Table – The table at the top of the dialog that contains a list of raw signal parameter names and various parameter attributes.

Raw and EU Values Table – This table contains two columns, one showing the raw value of the parameter as averaged over N points, and the equivalent EU value. These values can be hand entered or imported from a text file.

Coefficient List – Up to six polynomial coefficients (C0 – C5), as determined by the *Order of Fit* selection, are calculated. Note: Currently, only polynomial calibration is available.

Graph – Displays the curve fit of the Raw / EU values. The graph will update when the Order of Fit is selected; and there are at least three valid point pair rows in the Raw / EU table. Also, The number of ADC bits must be defined for the parameter in the table, either manually or from importing metadata, to show the Error% and EU value in the graph.

To open the IADS Calibration Tool:

1. Click the Configuration button on the Dashboard.
2. Select the **Tools** drop down menu > **Calibration Dialog**.

The calibration tool file menu:

Select Parameters - Opens the IADS Parameter Selection dialog to select parameters from the IADS configuration for calibration.

Import:

Saved Calibration Data - Import parameters that have already been calibrated using the IADS Calibration Tool and saved to a file. The calibration tool supports the import of comma-separated text format .csv or .txt.

Metadata - Import user data for selected parameters. The calibration tool supports the import of comma-separated text format .csv or .txt.

Export:

Calibration Data To File - Saves calibration data to a file.

Create EU Parameters in Config - Creates EU parameters in the Parameter Defaults Table (PDT), from calibrated raw parameters. Note: Only highlighted parameters (rows) that have a valid calibration can be exported to the PDT.

Exit – Closes the IADS Calibration Tool dialog.

To add raw parameters to Raw Parameters table:

1. In the IADS Calibration Tool, select the **File** drop down menu > **Select Parameters**.
2. Select one or more parameters using the Parameter Selection dialog and click **OK**.

To calibrate a single parameter using end to end calibration:

1. In the Raw Parameters table, select a row number to highlight that parameter for calibration.
2. Select the *Calibration Type* drop down and choose **End to End**.
3. In the **Samples** field enter the number of samples to average, when a value is added to the Raw Value table (next step). For example, if the selected parameter has an update rate of 1 sample per second, and the *Samples* entry is 10, the process will require ten seconds to retrieve all ten values to average.
4. Click the **Capture** button to enter a value in the *Raw Value* table. This is the averaged result of N samples; based on the *Sample* field entry. The process uses the current time as the start time.
5. Repeat as necessary to calculate all required points. Note: Any row in the Raw / EU Point Pairs table can be edited.
6. Click in the EU Value field to hand enter the EU values, or load the EU values from a file by clicking the **Import** button. The calibration tool supports the import of comma-separated text format .csv or .txt. Note: EU values can be edited or re-imported at any time.
7. Select the **Order of Fit** drop down to change the order of the curve fit and update the graph. The number of ADC bits must be defined for the parameter in the table, either manually or from importing metadata, to show the Error% and EU value in the graph. Note: Currently only Polynomial calibration is available.
8. Repeat the previous steps as necessary until you are satisfied with the results.
9. Select any other row in the Raw Parameters table to highlight it. If the parameter you just worked on is green, the calibration was successful. Once a parameter has been calibrated (green) you can select it at any time to show the data. If the parameter is red, the dialog was unable to calibrate the parameter or obtain data.

To calibrate a single parameter using transducer calibration:

1. In the Raw Parameters table, select a row number to highlight that parameter for calibration.
2. Select the *Calibration Type* drop down and choose **Transducer**.
3. Click the **Import** button to load both the raw and EU values. The calibration tool supports the import of comma-separated text format .csv or .txt. Note: EU values can be re-imported at any time.
4. Select the **Order of Fit** drop down to change the order of the curve fit and update the graph. The number of ADC bits must be defined for the parameter in the table, either manually or from importing metadata, to show the Error% and EU value in the graph. Note: Currently only Polynomial calibration is available.
5. Repeat the previous steps as necessary until you are satisfied with the results.
6. Select any other row in the Raw Parameters table to highlight it. If the parameter you just worked on is green, the calibration was successful. Once a parameter has been calibrated (green) you can select it at any time to show the data. If the parameter is red, the dialog was unable to calibrate the parameter or obtain data.

Note: The graph requires valid point pairs in at least the first three rows of the Raw / EU Point Pairs table to plot the graph. To clear the Raw / EU Point Pairs table click the **Clear** button.

To calibrate multiple parameters:

The process of calibrating multiple parameters is similar to calibrating a single parameter. Hold down the **Ctrl** key to select individual rows or the Shift key to select a block of rows. Importing the EU values will apply to all selected parameters (rows). Select each parameter in the list to input the Raw values and view the calibration results.

To edit parameter data values in the Raw / EU Point Pairs table:

1. Select a row (highlight) in the Raw / EU Point Pairs table.
2. Right-click on the selected row.
3. Choose **Cut** to remove a row, or **Edit** to bring up a dialog which displays all the point values that were averaged to create the Raw value (not available for Transducer calibration type). If any points are removed, the average will be updated automatically.

Note: For End to End calibration only. Values in the Edit dialog are not saved; they are available for the current session only. After import, a raw value can be re-calculated in the Raw / EU Point Pairs table by selecting the row and clicking the Capture button. The edit dialog will now be available for this row.

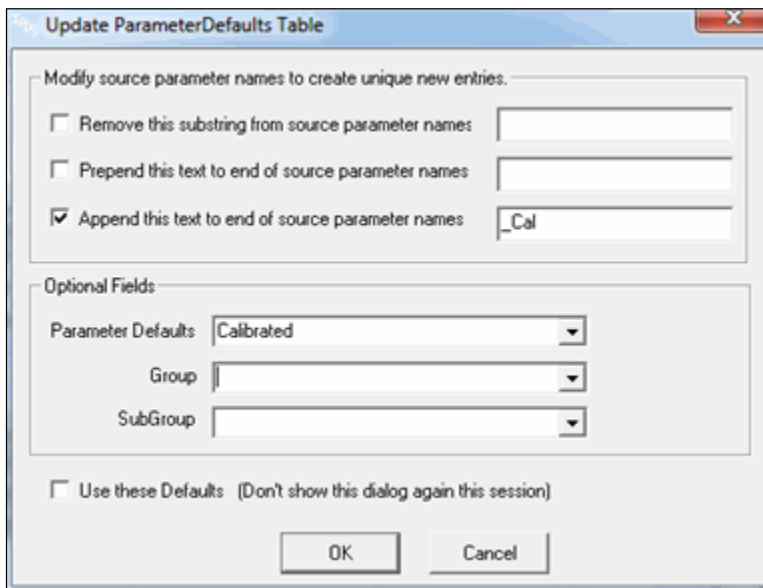
2. Importing and Exporting Calibration Data

The calibration tool supports the import/export of comma-separated text format .csv or .txt.

To create EU parameters in the Parameter Defaults Table (PDT) from calibrated raw parameters:

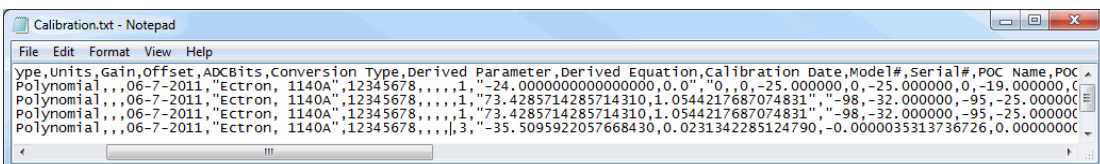
1. In the Calibration Tool, select valid calibrated parameters by holding down the **Ctrl** key and clicking the parameter row numbers.
 2. Select the **File** menu > **Export** > **Create EU Parameters in Config**. Note: Only highlighted parameters (rows) that have a valid calibration will be exported to the PDT.
 3. Select the desired options in the Update ParameterDefaults Table dialog (shown below).
1. Click **OK**. Go to the Parameter Defaults table to view the new parameters; added to the last row(s) of the table.

Note: If you create a new entry in the Parameter Defaults field, will system will automatically activate those parameters (Parameter Defaults State = True).



To save calibration results to a file:

- In the Calibration Tool, select the **File** menu > **Export** > **Calibration Data to File**. This process saves calibrated data to a file.



To import saved calibration data:

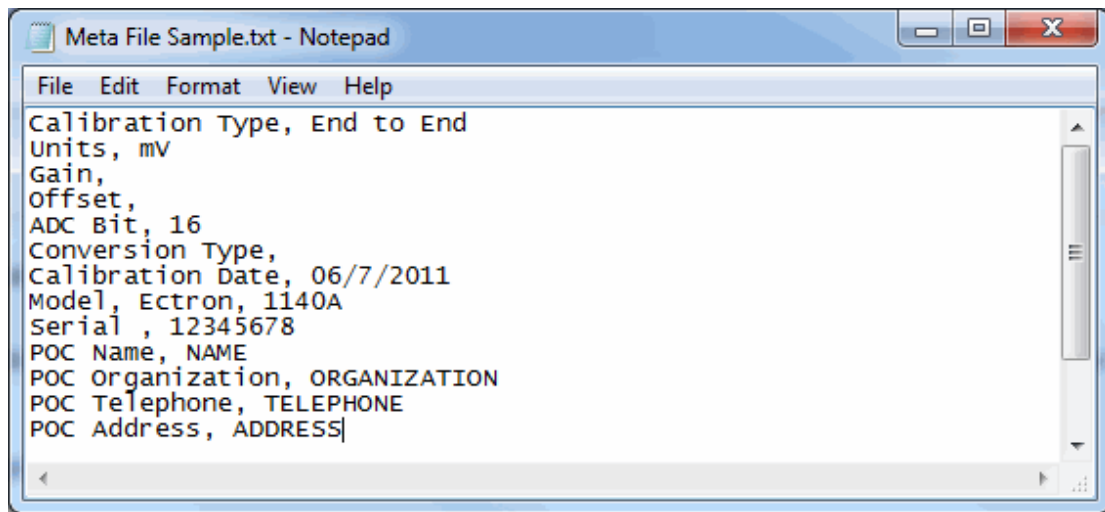
- In the IADS Calibration Tool, select the **File** menu > **Import** > **Saved Calibration Data**.

To import raw and EU values:

Raw and EU data is imported during the calibration process by clicking the **Import** button in the IADS Calibration Tool. EU data only can be imported (or entered by hand) for an *End to End* calibration, and both the raw and EU values must be imported for a *Transducer* calibration.

To import metadata to the Raw Parameters table:

1. In the IADS Calibration Tool, select parameters by holding down the **Ctrl** key and selecting the applicable rows.
2. Select the **File** menu > **Import** > **Metadata**. The user data in the file will be added to the selected parameters in the table.

3. Creating a Metadata File**To create a metadata file:**

1. Open Notepad on your computer.
2. Enter the Raw Parameter table column name for the metadata entries and the corresponding value.
3. Save the file.

Metadata file entries:

Calibration Type - End to End

Units - String value

Gain - Numeric value (not currently implemented)

Offset - Numeric value (not currently implemented)

ADC Bit - Integer value

Conversion Type - Polynomial

Calibration Date - 01/13/2013

Model - String value

Serial - String value

POC Name - String value

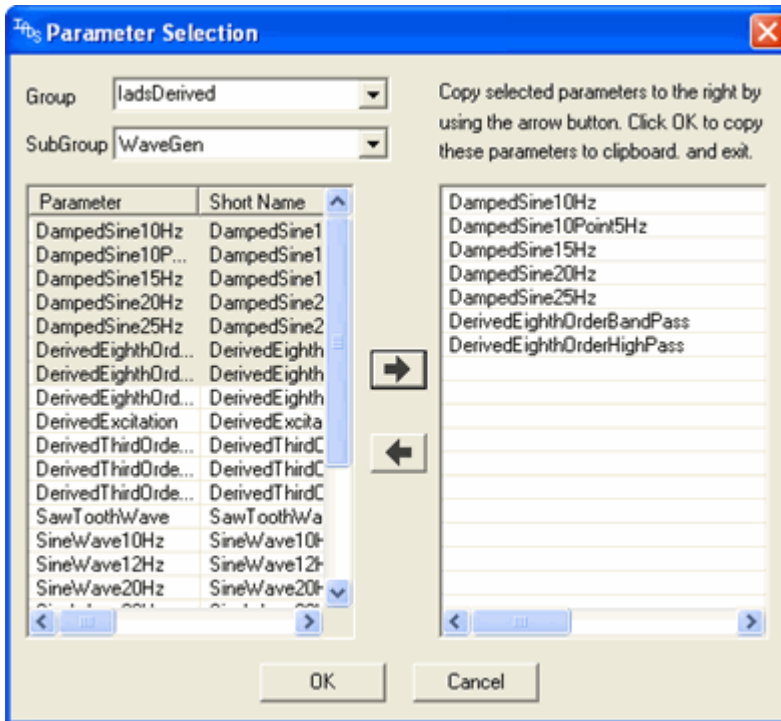
POC Organization - String value

POC Telephone - String value

POC Address - String value

4. The Parameter Selection Tool

The Parameter Selection Dialog automates the tedious task of hand entering lists of parameter names into various IADS tables and dialogs, for example, the *Parameters* field of the DataGroups table. You can choose the parameters from a list of all the active parameters; this subset will be copied into Windows Clipboard for pasting, or in some cases it is automatically copied into the active dialog or window. This dialog can be opened from several IADS controls, or directly from the Configuration Tool.



To open the Parameter Selection Dialog:

1. On the Dashboard, click the **Configuration** button.
2. Click the **Tools** drop down menu > **Parameter Selection Dialog**.
3. Use the Group and Subgroup drop-down menus to define parameters for selection.
4. Select one or more (hold down Shift key) parameters to copy.
5. Click the right arrow button.
6. Repeat steps 3-5 to add parameters from multiple groups/subgroups.
7. Click **OK**.
8. Paste into the IADS table, Notepad, etc. (if this is not accomplished automatically).

To search for a parameter name in the dialog:

1. Define the parameter Group and Subgroup using the drop-down menus.
2. Click anywhere in the left pane and type one or more letters of the parameter name.