

Dostmann Calibrator Users Guide

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Introduction

The Dostmann Calibrator is a small utility that can be used to generate sensor calibration codes for certain models of Dostmann thermometers such as the PT-750. This utility allows the use of more than two samples of input data.

Overview

The Dostmann Calibrator is a simple dialog with temperature sample inputs. The two calibration codes are automatically created based on the input data. All input temperatures are assumed to be in Celsius.

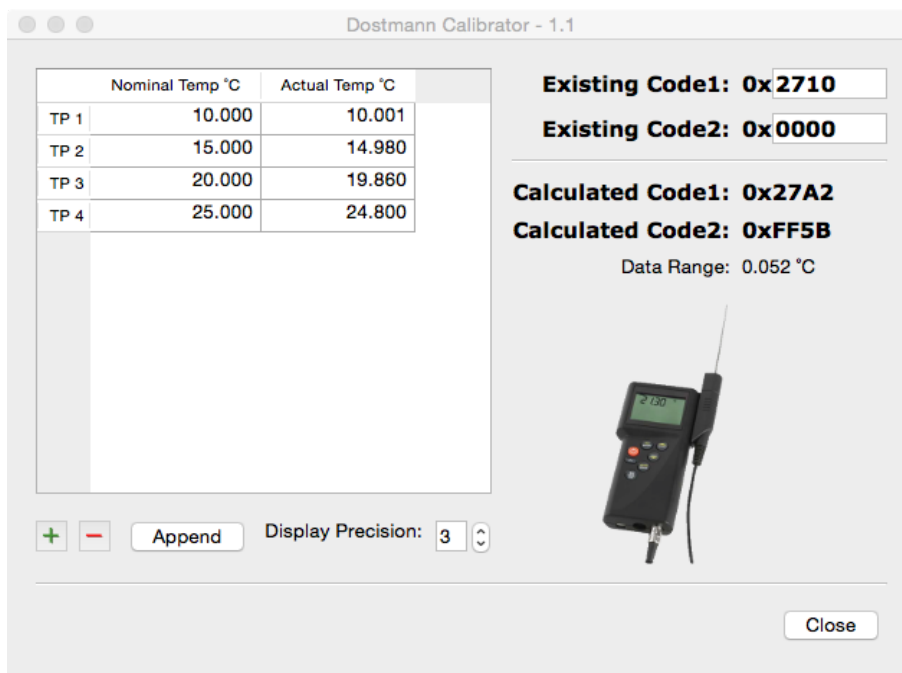


Illustration 1: Main window of the Dostmann Calibrator

Entries in the input table can be added or removed using the '+' or '-' button at the bottom of the table. The display precision can be set as required.

The input data is kept internally at the resolution entered and is not rounded by the display precision setting.

Adding or removing options are always done at the end of the input table. Sections of entries for each column can be copied and pasted if required although the order the data is entered is not important provided the nominal and actual input for each row is aligned.

Existing input data that is removed with the '-' button is stored internally and will be restored to the table when a new row is added.

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All input settings and options are stored when the program is closed.

Append Replace Option

For cases where existing correction codes exist the option to append was added to allow cumulative updates. The option is enabled or disabled by toggling the *Append/Replace* button at the bottom of the temperature input table. With Append enabled the *Existing Code* fields are active allowing the user to enter the current correction codes active during the measurements.

Without the option to append to existing correction codes it is necessary to clear all existing correction values within the meter prior to temperature measurements otherwise the new correction codes will be offset by the existing correction.

The values in the Existing Code fields are ignored unless Append mode is active. A null correction entry for Existing Code1 and Existing Code2 is 0x2710 and 0x0000.

Calculation Of Codes

Two hexadecimal codes are created based on the input temperature samples. The two codes describe the compensation slope and offset of the temperature sensor to established nominal reference temperatures.

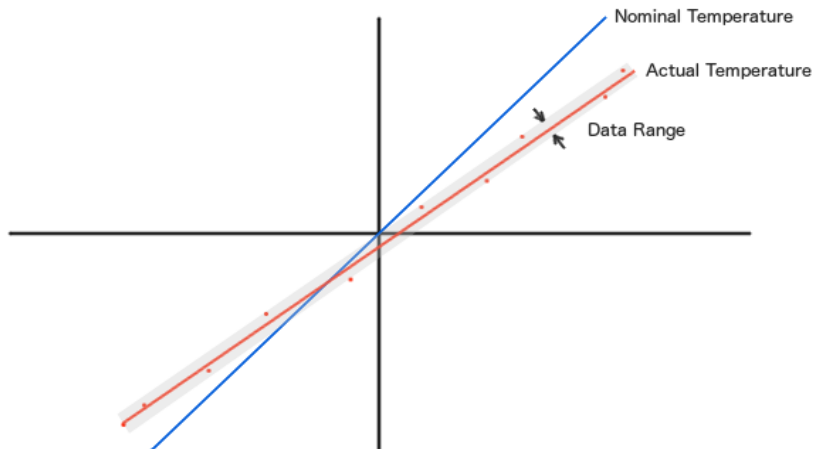


Illustration 2: Example input data showing slope, offset, and data range.

Code 1

Code 1 represents the slope of the actual input temperature relative to the slope of the nominal input temperature. When the slope of the actual measurement temperature is identical to the slope of the nominal temperature the slope has a decimal value of one (1.00000).

$$\text{Code 1} = \text{nominal}_{\text{slope}} / \text{actual}_{\text{slope}}$$

The hexadecimal version of the slope is created by multiplying the slope ratio by 10,000 and

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converting the integer component into a 16 bit hexadecimal value.

Example:

```
Input slope ratio = 1.0000
Multiply input slope ratio by 10,000: = 10,000.00000
Integer component of slope ratio: 10,000 or 0x2710
```

Code 2

Code 2 represents the offset constant between the nominal and actual input temperatures at temperature 0 °C. The hexadecimal version is created by multiplying the temperature offset by 1000 and converting the integer component into a 16 bit hexadecimal value.

$$Code2 = nominal_{zero} - actual_{zero}$$

Example:

```
Input offset = 0.5
Multiply offset by 1,000: = 500.0000
Integer component of offset: 500 or 0x01F4
```

Data Range

The data range describes the band of the input temperatures around the best fit line of the actual data. This output is provided in order to help spot input entry errors and can also be useful in uncertainty calculations.

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Revision History

Date	Version	Changes
Jan 16, 2016	1.0	New Program
May 18, 2016	1.1	Added option to append to existing correction codes.
Aug 16 ,2016	1.1-1	Correction of documentation for null code values.