

Thermometer Calibration Files

SUPPORTED FILES TYPES

The following files types are supported for loading thermometer calibration data from a file. The file extension must be set properly as the file extension is used when processing the file contents during import. The specific details about the contents of each file type are covered below, but the process for importing any of the file types is the same.

Currently the following file types are supported:

1. .cfg
2. .txt
3. .curve (LakeShore)

LOADING CALIBRATION FILE FROM USB

Calibration files should be placed in the top-most directory (root directory) of a USB drive. The USB can then be inserted into the system and the file loaded into the system by navigating to Menu->Customize System. In the Customize System menu page, locate the settings for the User temperature sensor to load the file for and press the “Thermometer Calibration” Load button and a dialog will pop up showing the recognized files found on the root directory of the USB. Select the proper file from the USB and press the “Load File” button to start the import process. After importing, the software should notify the user of any errors encountered while importing the data.

.CFG FILES

The .cfg format is typically used with thermometers provided directly by Montana Instruments. These files should be used as provided and the details of the contents is not covered here as the .txt file format is simpler for creating custom calibration data files.

.TXT FILES

The .txt file format has a header area that is used to specify configuration settings for the calibration. Each line of the header includes the field name, then a ‘:’ separator, followed by its value. The field names and values are case insensitive. Comments can be added anywhere in the file using the ‘#’ character. All characters on any line after a comment character are ignored.

Currently, the following header fields are supported:

- **Interp** - defines the type of interpolation used to fit a continuous line to the provided calibration data samples. Possible values are:
 - **QD** - uses a curve fitting technique typically used with Cernox thermometers calibrated by Montana Instruments or Quantum Design. Requires a minimum of 30 data points.
 - **Linear** - uses a simple linear fit to interpolate the data. This is the easiest interpolation method to use. Recommended for off-the-shelf silicon diode sensors, self-calibrated sensors, data migrated from another format, etc. Requires a minimum of 2 data points.

After the header is the actual calibration data. The data is specified as comma separated data pairs (Measurement, Temperature), with one pair per line. The Measurement value should be in either Ohms (for Resistive type thermometers) or Volts (for Diode type thermometers) and the Temperature value should be in Degrees Kelvin.

Example 1

Example .txt file that uses Linear interpolation for an off-the-shelf diode sensor:

```
# Diode thermometer calibration on 2019-09-18
Interp : Linear

# Measurement (Volts), Temperature (Deg K)
1.644290, 1.4
1.642990, 1.5
1.641570, 1.6
```

*Full data set not shown for brevity

Example 2

Example .txt file that uses QD curve-fitting interpolation for a Cernox sensor:

```
# Cernox thermometer data
Interp : QD

# Measurement (Ohms), Temperature (Deg K)
36.63253, 442.39731
39.61541, 400.02808
42.95378, 361.71643
```

*Full data set not shown for brevity

.CURVE (LAKESHORE) FILES

LakeShore .curve files are supported specifically for importing LakeShore calibration data that is provided when purchasing an individually calibrated silicon diode thermometer. The details of this file format are not covered since this format is not intended to be used by customers for importing thermometer data other than individually calibrated silicon diodes directly from LakeShore.