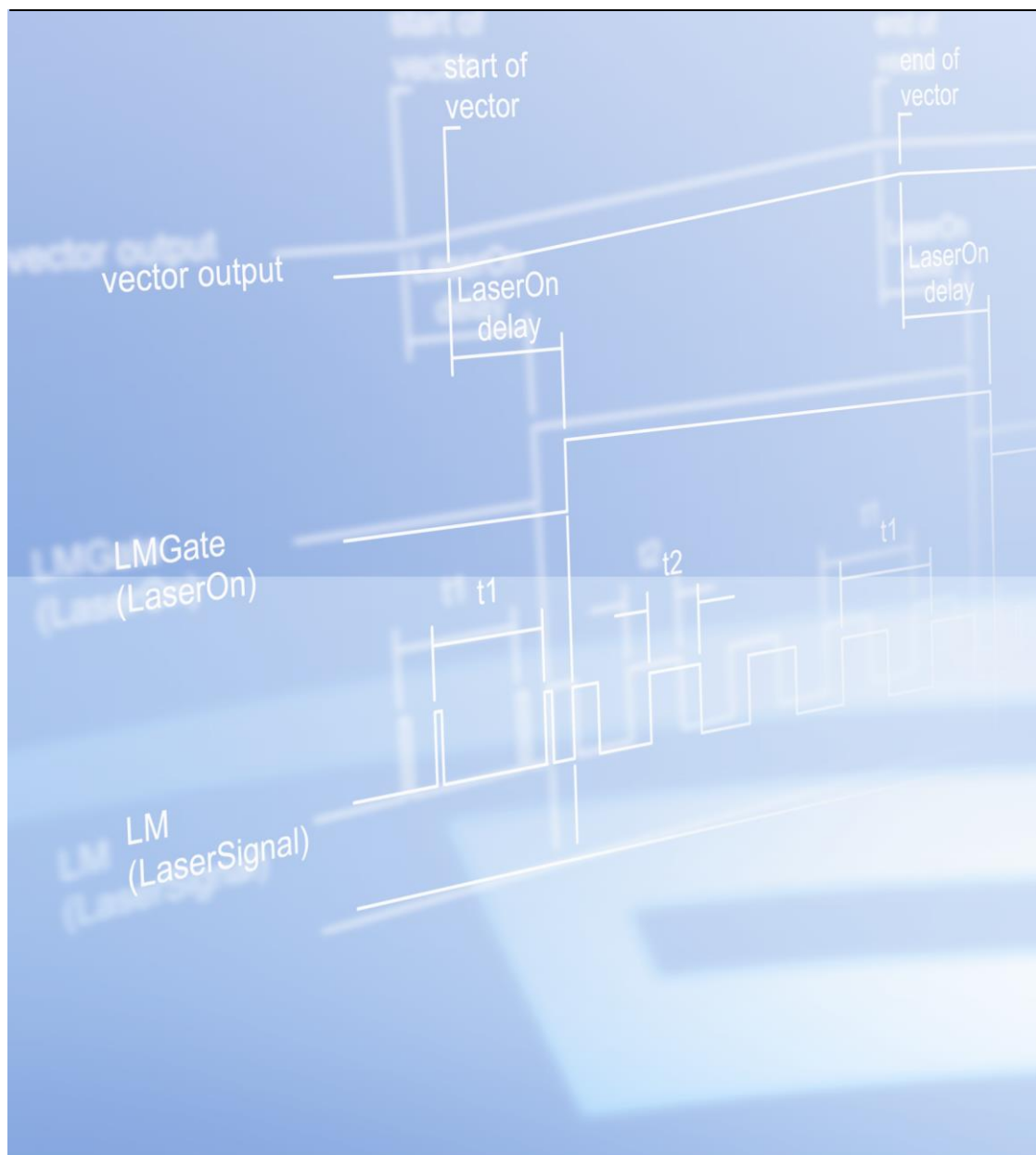


Application Note

APP095

SPICE3 Power Calibrator



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Document Change history

Rev	Date	Description
1.0.0	15.09.2016	First official version
1.0.1	30.09.2016	Update for v1.1.0; Open file added

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1 SPICE3 POWER CALIBRATOR

1.1 General

The SPICE3PowerCalibrator generates a laser calibration file for the SPICE3, which contains a header and 1025 integer values from 0 to 65536. The header stores the input data and is only used for loading the file with the SPICE3PowerCalibrator. As only the power array will be sent to the card, the header will be lost, when downloading the calibration file from the card.

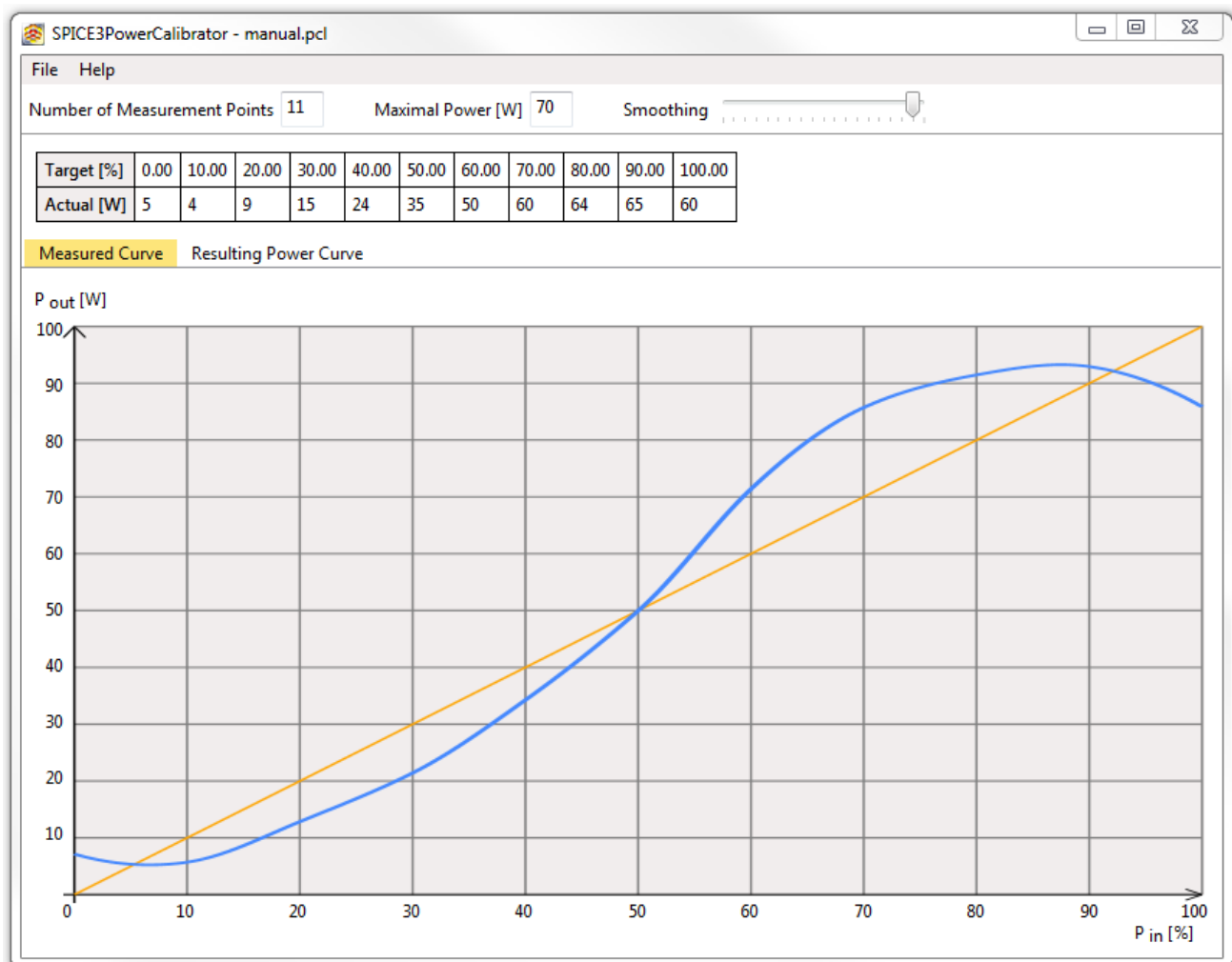
Each value is separated by a new line and saved as a UTF-8 file with the file ending .pcl.

SPICE3PowerCalibrator basic functionality:

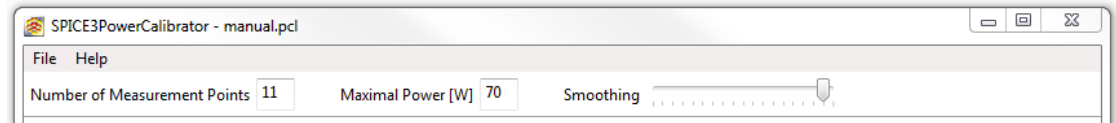
- Define the number of measurement points
- Fill in the measured values
- Check the plausibility of the resulting power curve
- Smooth the curve

The resulting calibration file can be sent to the card via weldMARK or the SPICE3Config tool.

1.2 GUI



1.2.1 Measurement Settings



- Before starting the measurement, define the number of measuring point and the maximal power of the laser. The new values will be applied to the calibration table. As the values of the current table will be lost on changing the measurement points, you may get a warning.
- The *Smoothing* slider can smooth the resulting power curve (see chapter 1.3).

1.2.2 Calibration Table

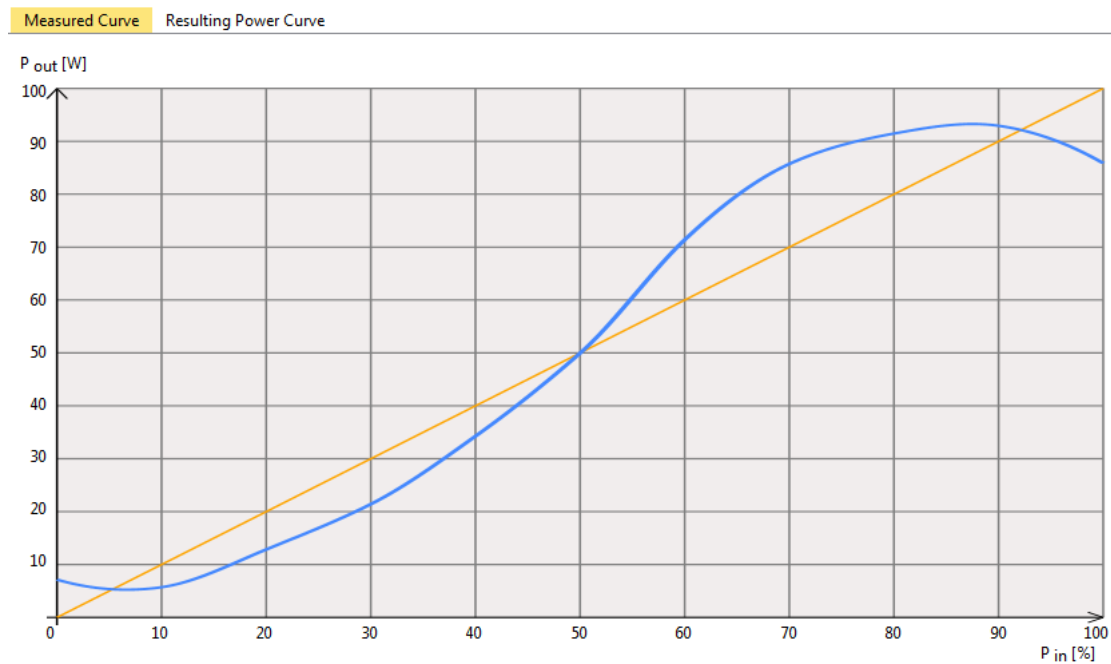
Target [%]	0.00	10.00	20.00	30.00	40.00	50.00	60.00	70.00	80.00	90.00	100.00
Actual [W]	5	4	9	15	24	35	50	60	64	65	60

The calibration table will be filled with the specified number of measuring points and the corresponding expected power values.

The first row (*Target*) displays the desired number of equidistant power percentages. If desired, these values can be manually changed.

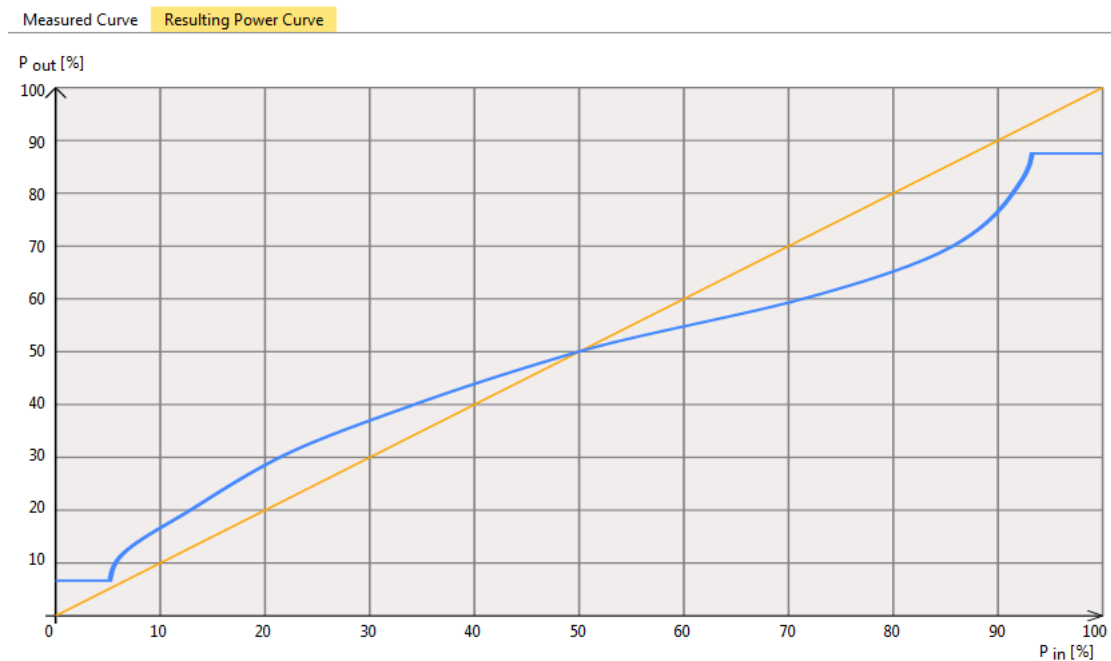
The second row (*Actual*) shows the expected power at the corresponding measuring point. Complement these values with your measured data. The data will immediately be visualized on the curve graphs.

1.2.3 Measured Curve Graph



The *Measured Curve* tab displays the data of the correction table. The orange line shows the linear power distribution as reference. The blue line visualizes the measured data.

1.2.4 Resulting Power Curve Graph

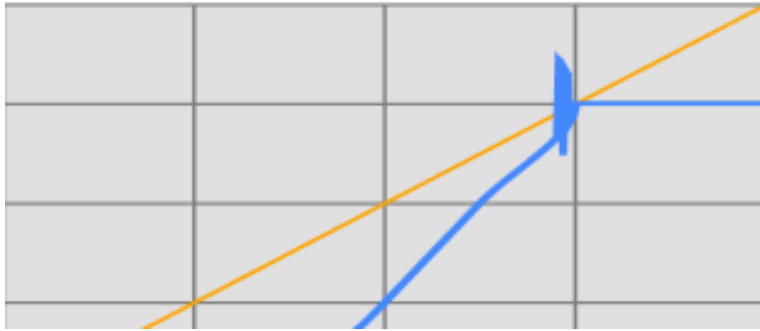


The *Resulting Power Curve* tab displays the calculated power calibration curve.

1.3 Optimization of the calibration file

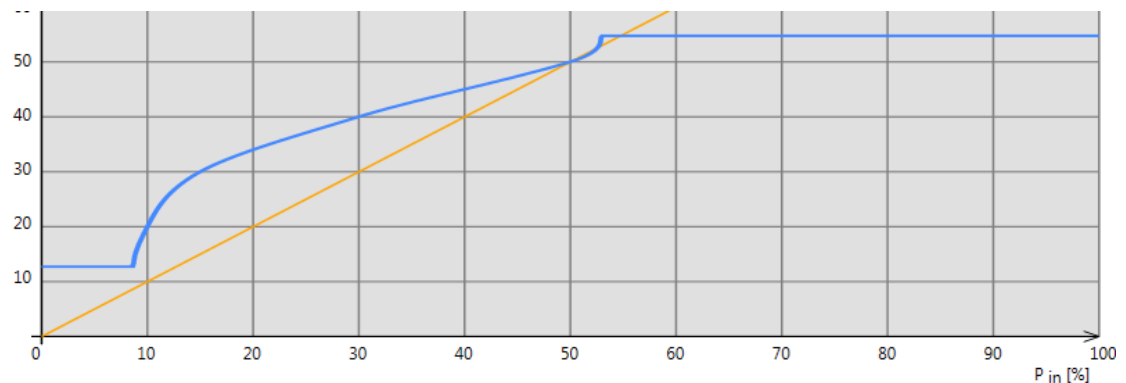
If the measured power curve is not bijective (meaning the slope of the curve is not always greater than or equal to zero) the needed inverse function can't be calculated.

1.3.1 Oscillating Curve



If the resulting power curve is oscillating, try to increase the value of the *Smoothing* slider until the oscillation is gone.

1.3.2 Truncated Curve



If the resulting power curve is truncated in an unexpected value, try decreasing the *Smoothing* slider until the curve gets calculated correctly.

For example: The curve shown at 1.2.3 is expected to be truncated, as the power of the laser is decreasing between 90 and 100%. To get the maximal power, ~87% is send to the laser. As shown in the curve in 1.2.3, the maximal value is at ~87%.

File Operations

1.3.3 Open

To open a File, select *Open* (Ctrl+O) from the *File* menu.

If the header of the power calibration file is missing, the input data will be recreated from the power array. As the curve may not be reversible, the data may differ from the original input data.

The header will be missing if the power calibration file is downloaded from the SPICE3 card, as the card only stores the power array. Therefore it is recommended to keep a local copy of the file, if further editing is desired.

1.3.4 Save

To save the power calibration, choose *Save* (Ctrl+S) or *Save As* (Ctrl+Shift+S) from the *File* menu. After you have supplied the name, the file will be saved as *.pcl.

In some cases the graph of the resulting power curve will slightly alter after saving, as the precision is higher for saving.

2 SOFTWARE CONFIGURATION MANAGEMENT TABLE

The described functionality is available in the following version of the tool:

- SPICE3PowerCalibrator v 1.1.0

3 KNOWN ISSUES

3.1 Documentation

The following documentation is not yet updated to support the new feature:

- This application note is supplied only in English