Programming and calibration of 1-Wire UNI sensors with HWg - Calibrator software

1-Wire UNI sensors enables setting and calibration of the measured values, including an option to change the unit type of the value, an exponent and, based on the sensor's type, up to 8-point calibration chart. This allows us to connect various sensors with voltage or current output to Poseidon units via the 1Wire UNI bus.

Practical application

Many industrial sensors have 0-10V, eventually 0(4)-20mA outputs. A typical example of this sensor is a clamp meter for measuring the AC current with magnetic induction (*30A Current probe 1W-UNI sensor*) or pressure meters.

If you then need to connect this sensor to a Poseidon unit (1-Wire UNI compatible), you can simply use *Sensor 60V 1W-UNI v2* or *Sensor 0-20mA 1W-UNI* converters. From this point, Poseidon shows measured values in volts (V) or mA.

There are also conversion charts for getting the real value, however this is usually not a very practical solution.

HWg-Calibrator software therefore allows an implementation of any conversion chart directly to 1-Wire UNI converters.

Older converters *Sensor 15V 1W-UNI*, *Sensor 60V 1W-UNI* and *Sensor 20mA 1W-UNI* allows 3-point conversion (calibration), newer *Sensor 60V 1W-UNI v2* and *Sensor 0-20mA 1W-UNI* can use an 8-point conversion chart.

## How the calibration works

1) Sensor *30A Current probe 1W-UNI* is made of 2 parts - current transformer *Split Core 30A* with **linear** output 0-5V and a *Sensor 15V 1W-UNI* converter. Only 3 conversion points are then enough to calibrate the sensor

Calibration point	SplitCore output	Measured current
1	0V	0A
2	2,5V	15A
3	5V	30A
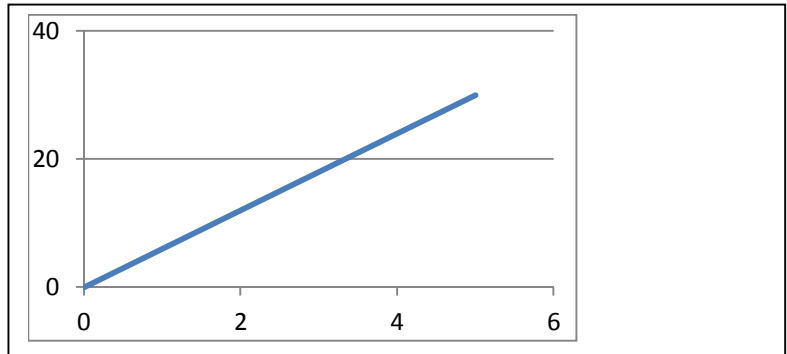
2) Pressure sensor 0-2500kPa with 0-20mA output has a non-linear value chart, therefore *Sensor 0-20mA 1W-UNI* with 8-point calibration should be used.

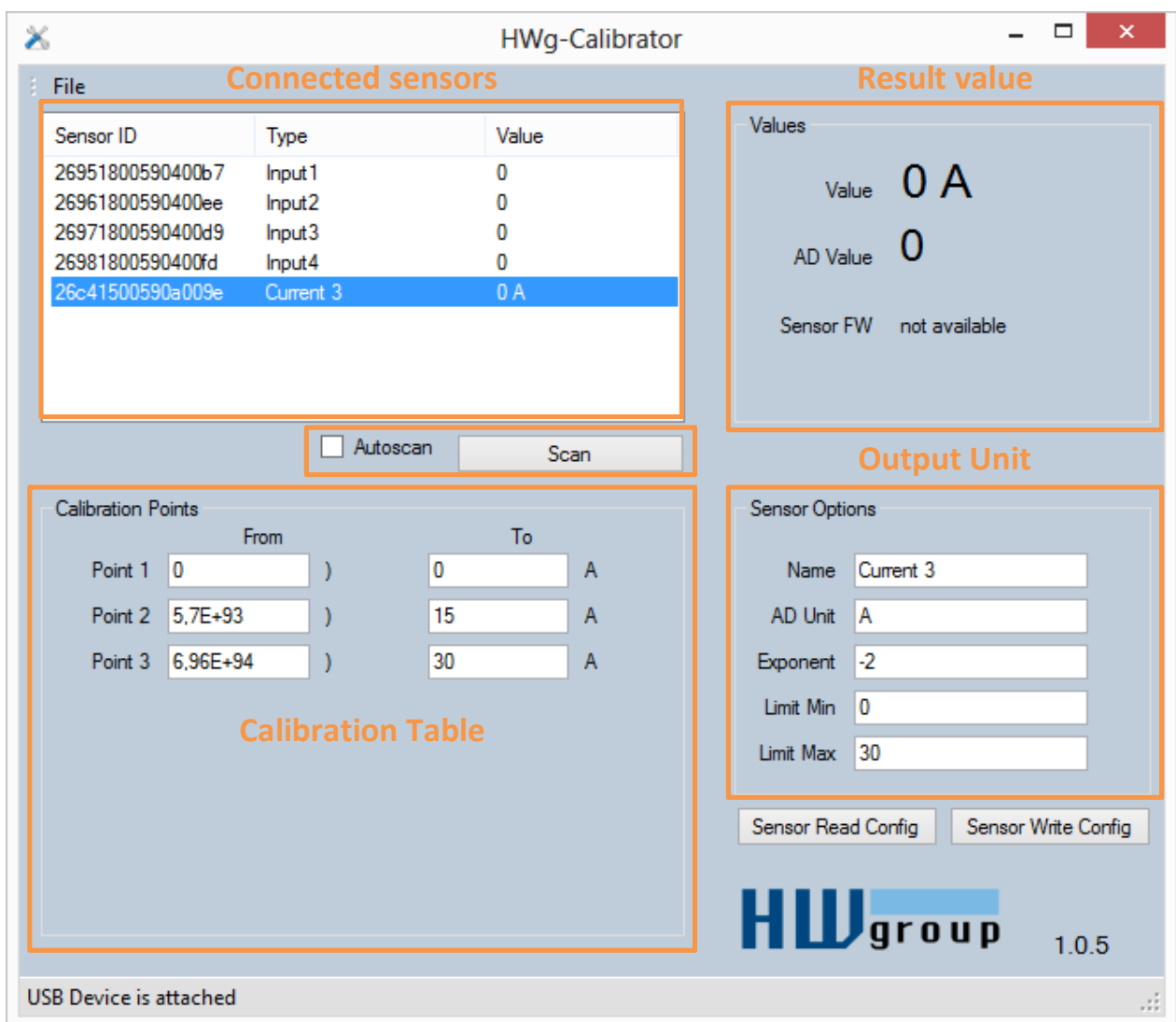| Calibration point	Sensor output	Measured pressure
1	0	0
2	3	100
3	5	200
4	8	400
5	10	500
6	13	600
7	16	1200
8	20	2500
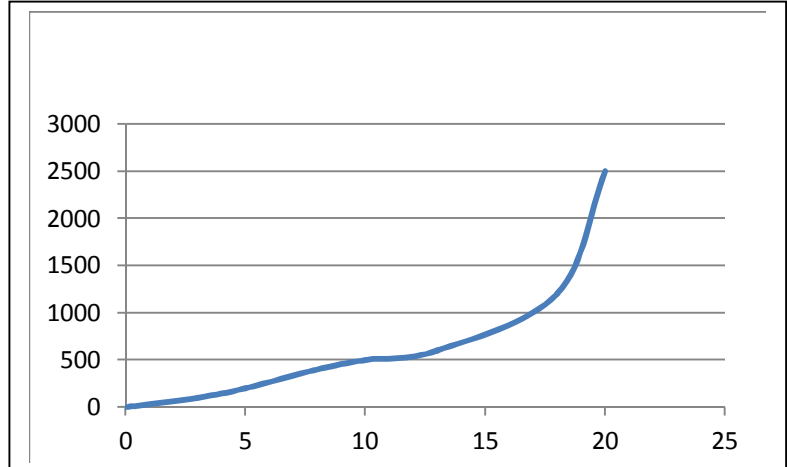
Using the HWg-Calibrator

HWg-Calibrator consists of HW USB/1-Wire UNI transmitter and *HWg-Calibrator software.*

For sensor calibration, the transmitter has to be connected to the PC prior to launching the HWg-Calibrator.

After connecting any 1-Wire UNI sensor to a converter, it is necessary to search for the connected sensors first by pressing the Scan button. The bus is then scanned and all discovered sensors are shown. It is also possible to activate an Autoscan option, which would then repeatedly scan for sensors every 10 seconds.

After clicking on a sensor name, details listed below are shown.

Calibration Points

Determines an interpretation of the final value (page 2 - How the calibration works)

- **From** – input value from the external sensor
- **To** – output value

Based on the sensor type, the conversion chart has 3 or 8 points.

Sensor Options

Sets the output value parameters

- **Name** – Sensor name – An information for further use by the Poseidon units
- **Output Unit** – Sets the output unit. An information for further use by the Poseidon units
- **Exponent** – Sets the exponent for more accurate interpretation of the final value. A relation between the input and output values
- **Safe Range MIN** – Sets the bottom limit of the Safe Range. An information for further use by the Poseidon units
- **Safe Range MAX** – Sets the top limit of the Safe Range. An information for further use by the Poseidon units
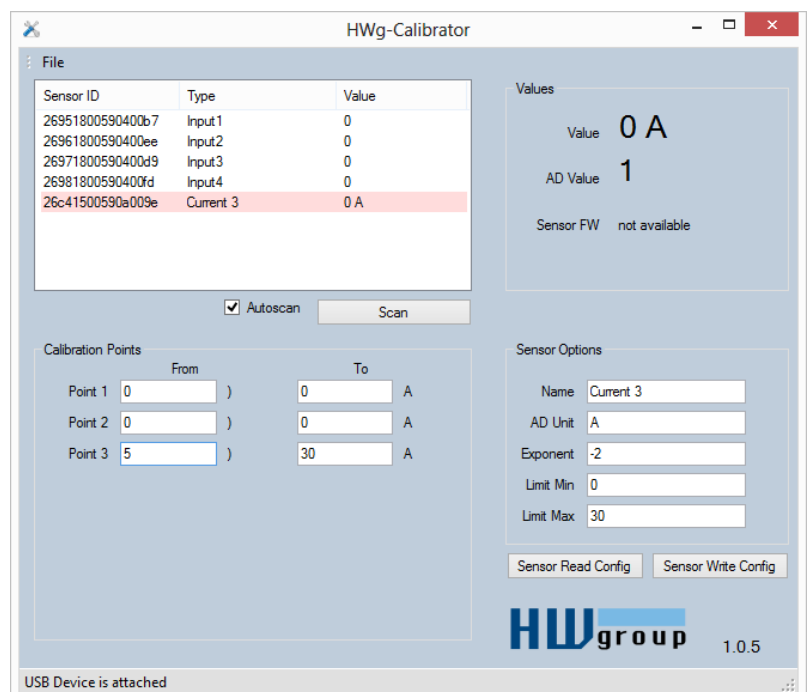
Values

- **Value** – Final value, the result of the conversion and the sensor settings.
- **AD value** – Input value of the sensor
- **Sensor FW** – Firmware version of the sensor. For diagnostic purposes

Controls and other options

- **Sensor Read Config** – Reads the current configuration from a selected sensor. An option for checking a recently saved configuration.
- **Sensor Write Config** – Saves a created configuration to a chosen sensor.
- **Menu File** – Allows saving a configuration as a file or loading an already created one to a sensor. This is a very useful feature in case of setting multiple sensors with a same configuration.

Specific ways of setting the calibration chart

If you use a sensor with a linear output, you do not have to fill in the whole chart, it is enough to set only two points of calibration. Usually the first and the last point of the chart
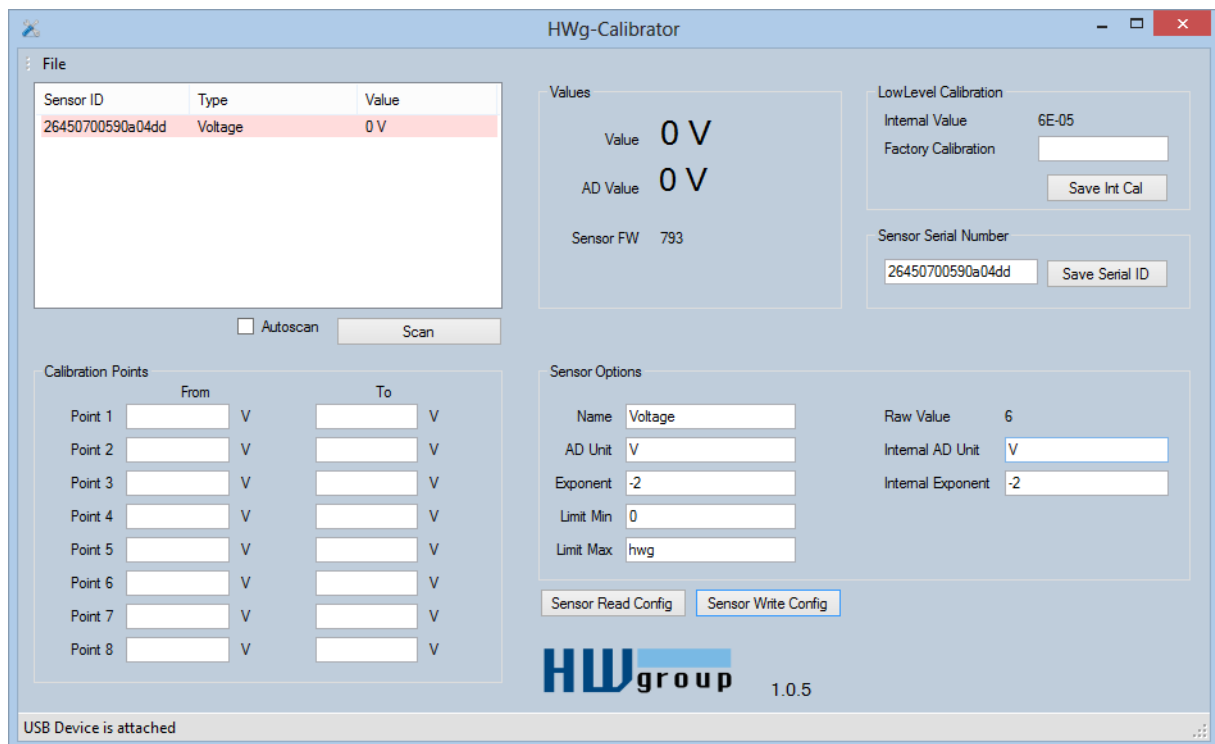
LowLevel Calibration

Hodnota AD

Internal Value – číslo FROM

AD převodník => Raw Value (Obecné číslo AD) => Po interní kalibraci (Jen My – nastavíme 60V a stiskneme Save Int Calibration)

Internal Exponent => Počet desetinných míst