

SONO Guide Interfacing SM-USB Command Batch

Last Updated: April 19, 2018

Before Beginning:

Required Equipment and Software:

- **SM-USB** (M100020) module connected to one or more SONO probe(s).
- **SONO-VARIO** (M308070, M308074, M308090) probe(s) powered by a 24 VDC or 12 VDC power supply.
- **SONOConfig software**, available via MESA USB drive or <http://mesasystemsco.com>
- **Command Batch Panel** with a MPI (moisture probe interface) module
- **SONO cable**, available in 4m (M308029) or 10 m (M308032)
- 500 Ohm precision resistor, attached to probe

Required Actions:

- Ensure **SONO-VARIO** probe(s) are properly installed according to MESA guide “**SONO Guide_Installation**”
- Ensure SONO-VARIO probe is properly wired to SONO-VIEW according to MESA guide “**SONO Guide_Wiring_SM-USB**”

Overview:

- SONO-VARIO probes can be successfully interfaced to a Command Alkon Batch E-Z CAL manual station.
- Notify MESA that you are interfacing to a Command Alkon Manual Station upon ordering to ensure the probe is correctly set up before shipping. If not, the required changes can be made with the SM-USB and SONOConfig software.
- Using the SM-USB and SONOConfig software, you will need to adjust the probe offset to correspond to a Bake-off moisture (reference moisture).
- The next step is to set E-Z Cal to correspond to the SONO probe moisture reading.
- For additional questions please refer to the paper manual (also available at <http://mesasystemsco.com>) or contact MESA Systems Co.

Step-by-step guide:

Part 1: Ensure settings are correct for interfacing

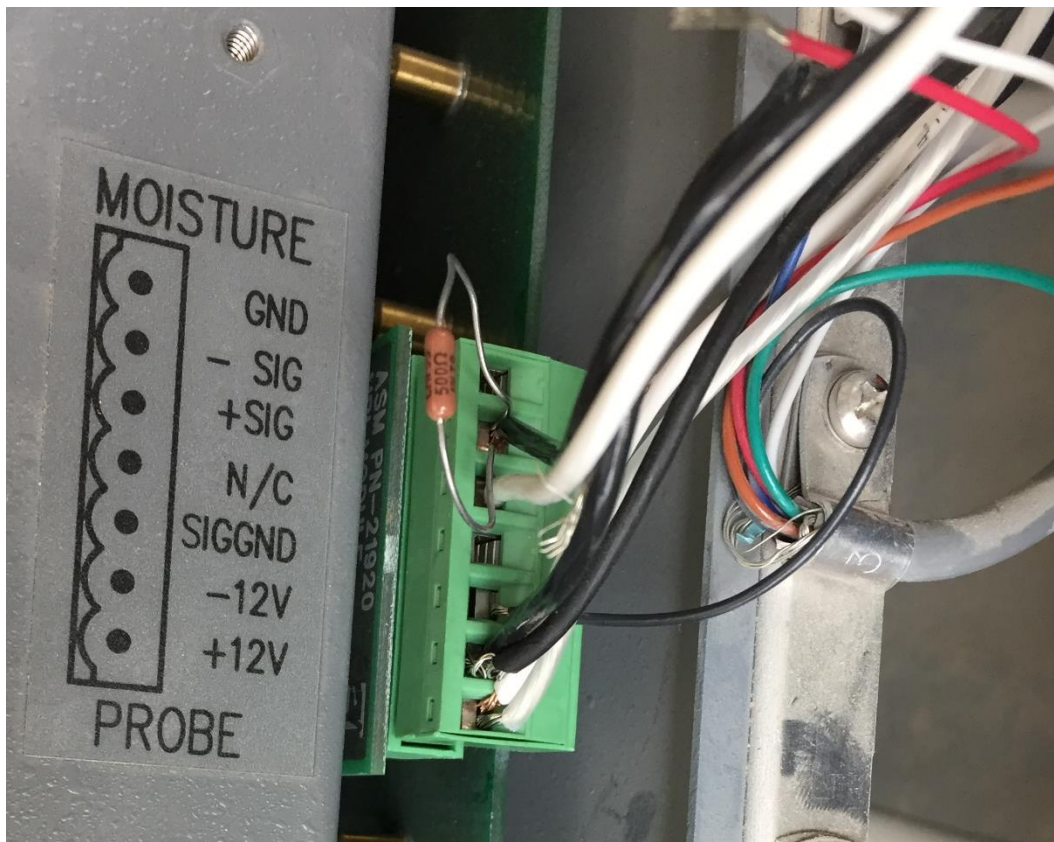
- 1) The Command Batch Panel must have a MPI (moisture probe interface) module. The MPI-modules accepts an analog signal input of 0...10 VDC.
- 2) To interface the analog output of a SONO-VARIO probe to the Command Batch manual station the SONO-VARIO probe needs to be scaled to 4...20 mA over a moisture range of 0...26%. The scaling is for compatibility to the MPI-module and Batch Panel interface.
- 3) Ensure the Command Alkon factor is set to 1.0, this is required for all SONO probes
- 4) If your packing slip states that the probe(s) is set for Command Batch, the probe was delivered with the correct settings. The chart below shows the moisture range compatibility.

SONO Analog Output in 0...10V	SONO Moisture Output When 4...20mA	Command Alkon Probe Factor 1.0
0	-6.5	-6.58
1	-3.25	-3.43
2	0	-0.07
3	3.25	3.29
4	6.5	6.65
5	9.75	10
6	13	13.36
7	16.25	16.71
8	19.5	N/A
9	22.75	N/A
10	26	N/A

Part 2: Wiring adjustments for interfacing

Notes:

- The instructions below are to be followed after completing MESA guide “**SONO Guide_Wiring_SM-USB**”
 - These steps are specific for interfacing to the Command Batch E-Z CAL Manual Station
- 1) Install the 500 Ohm precision resistor to the j-box, which you can find attached to the probe cable.
 - 2) Connect the resistor across the +SIG (SONO Green lead wire) and -SIG terminals (SONO Yellow lead wire). See below.



- 3) Confirm wiring is consistent with diagrams below.

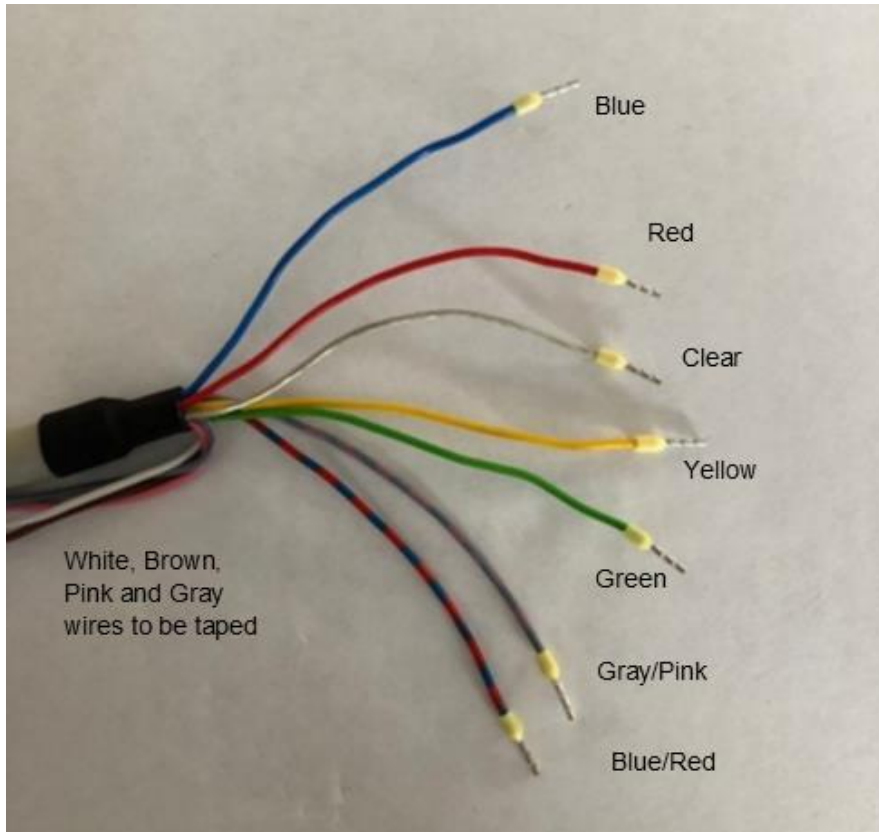


Image: Cable tail end of the SONO-VARIO cable M308029

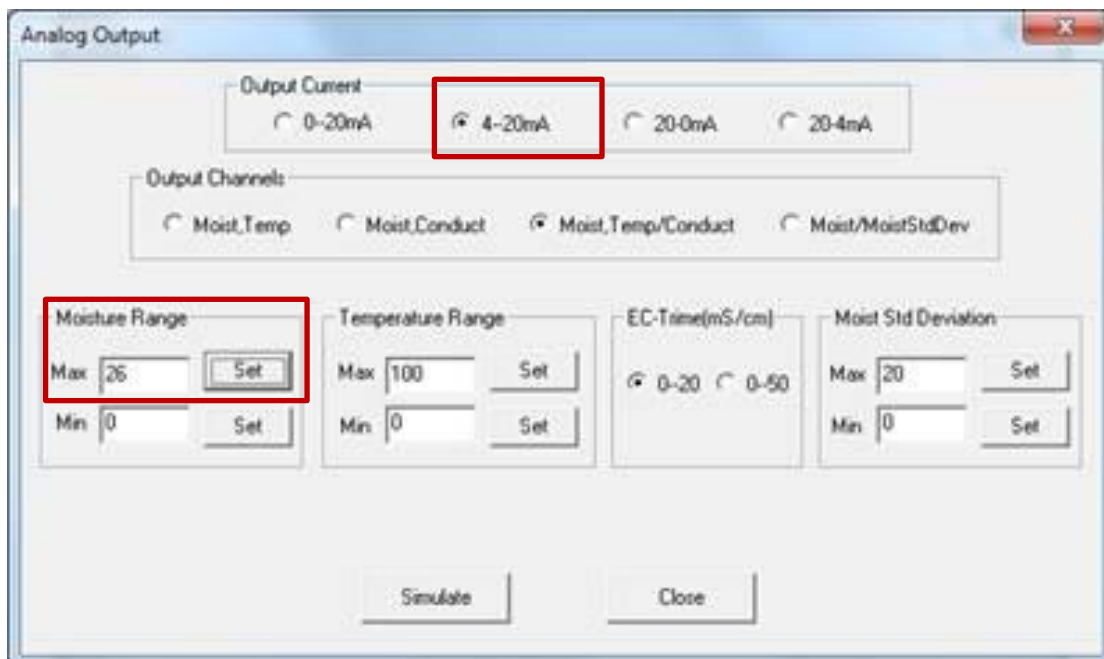
Probe Connection to PLC of Control System	M308029 SONO-VARIO Cable Wire Lead Colors	Resistor 500 ohms	E-Z CAL Panel 7-PIN Connection # PN-20757
24 VDC Power:	Red		7 (+12V)
0 VDC Power:	Blue		6 (-12V)
Cable Shield:	Clear		Ground Bar
Percent Moisture: + (26 mA) plus 500 ohms resistor = 10 VDC	Green		3 (+SIG)
Percent Moisture: (0 mA) plus 500 ohms resistor = 0 VDC	Yellow (Yellow)		2 (-SIG)
IMP-Bus RT (for SONO-VIEW only)	Gray/Pink (multicolored)		Not connected to panel
IMP-Bus COM (for SONO-VIEW only)	Blue/Red (multicolored)		Not connected to panel
NOTE: The White, Brown, Pink and Gray wires are not used.			

Part 3: Connecting to SONO-VARIO probe using SM-USB and SONOConfig software

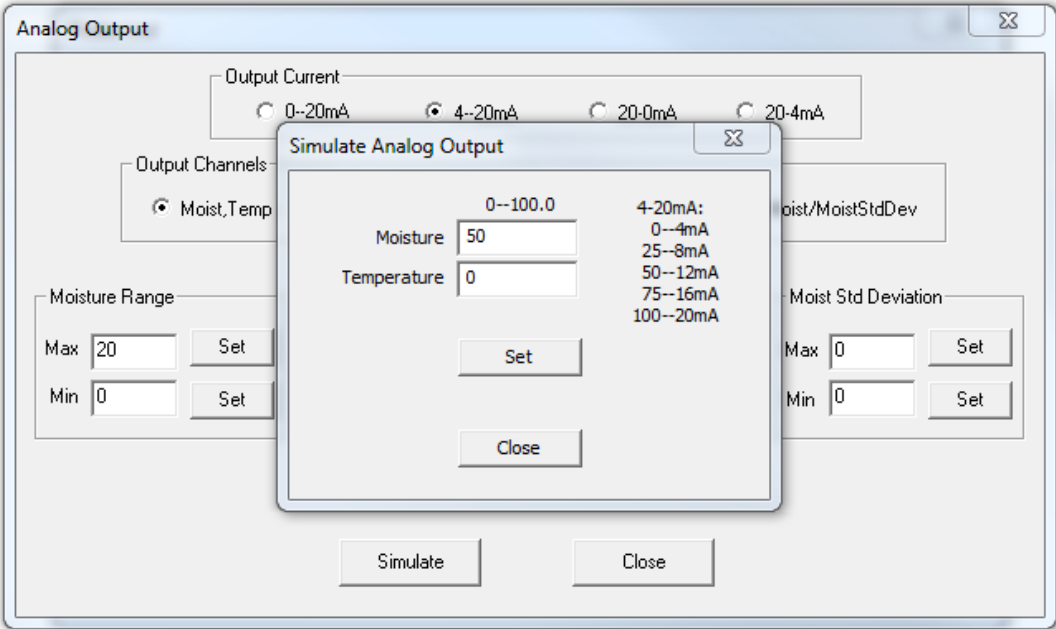
- 1) Install drivers, available via MESA supplied thumb drive, to your laptop to communicate with the SM-USB
- 2) Install SONOConfig software on your computer, available via MESA supplied thumb drive or at <http://mesasystemsco.com>
- 3) Once SONOConfig is installed, you can identify the **COM port #** (if unknown, search with Device Manager).
- 4) Open SONOConfig software. Go the **Bus Configuration** and set the **COM port number**, then OK.
- 5) Got to **Bus, Scan Probes**. If successful you will see the SONO-VARIO probe serial number in the Probe List.

Part 4: Adjusting SONO-VARIO probe to Command Batch using SONOConfig software

- 1) Use the dropdown menu. Select **Config** then, **Analog Output**. The follow window will open.
- 2) Make sure the **Output Current** is set to **4-20mA**. If necessary, change the **Moisture Range Max** to **26mA** then **SET**. The correct settings are shown below.



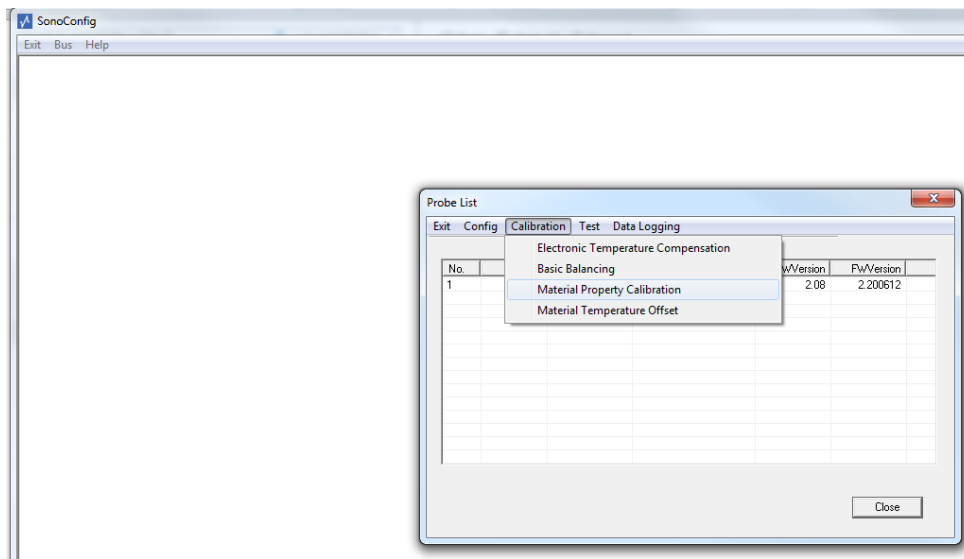
- 3) To confirm that the probe's analog output is scaled correctly you can simulate the analog output in the SONOConfig menu by utilizing the SONOConfig feature **Simulate Analog Output**.
- 4) In the **Moisture** dialog box, entering **50** then **Set** (percent of the mA scale), shown below. The 50 values will simulate 5 VDC or 10 percent moisture to the Command Batch Manual Station. When finished select **Close**.



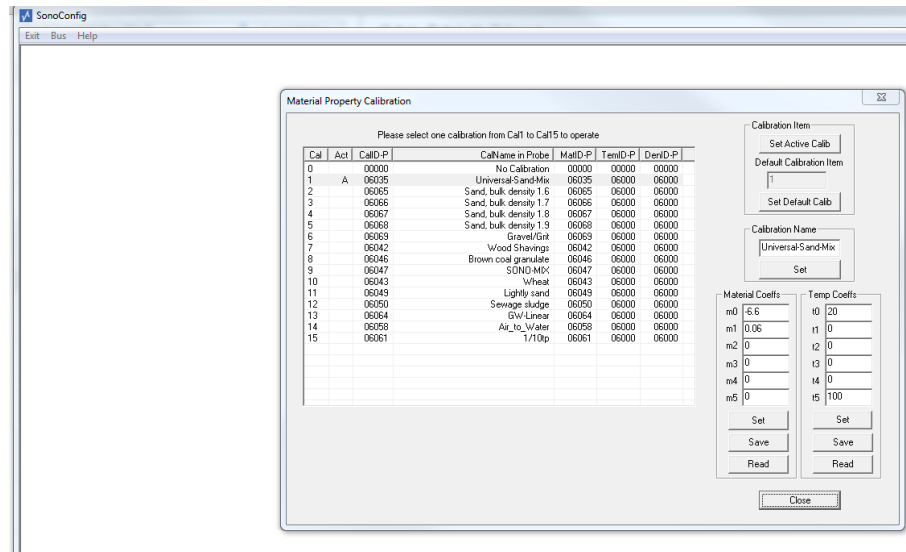
Part 5: Selecting a material specific calibration or adjusting offset of a standard calibration using SONOConfig software

Notes:

- All SONO probes are delivered set to: **#1 Universal-Sand-Mix** calibration, used in the measurement of sand moisture. If you are working with coarse aggregate 5/32-inch up to 1-1/4-inch you should change the calibration to **#6 Gravel and Grit**.
- Once SONOConfig is running, go to the drop-down menu and select **Material Property Calibration**. It will take a few second for the window to open.

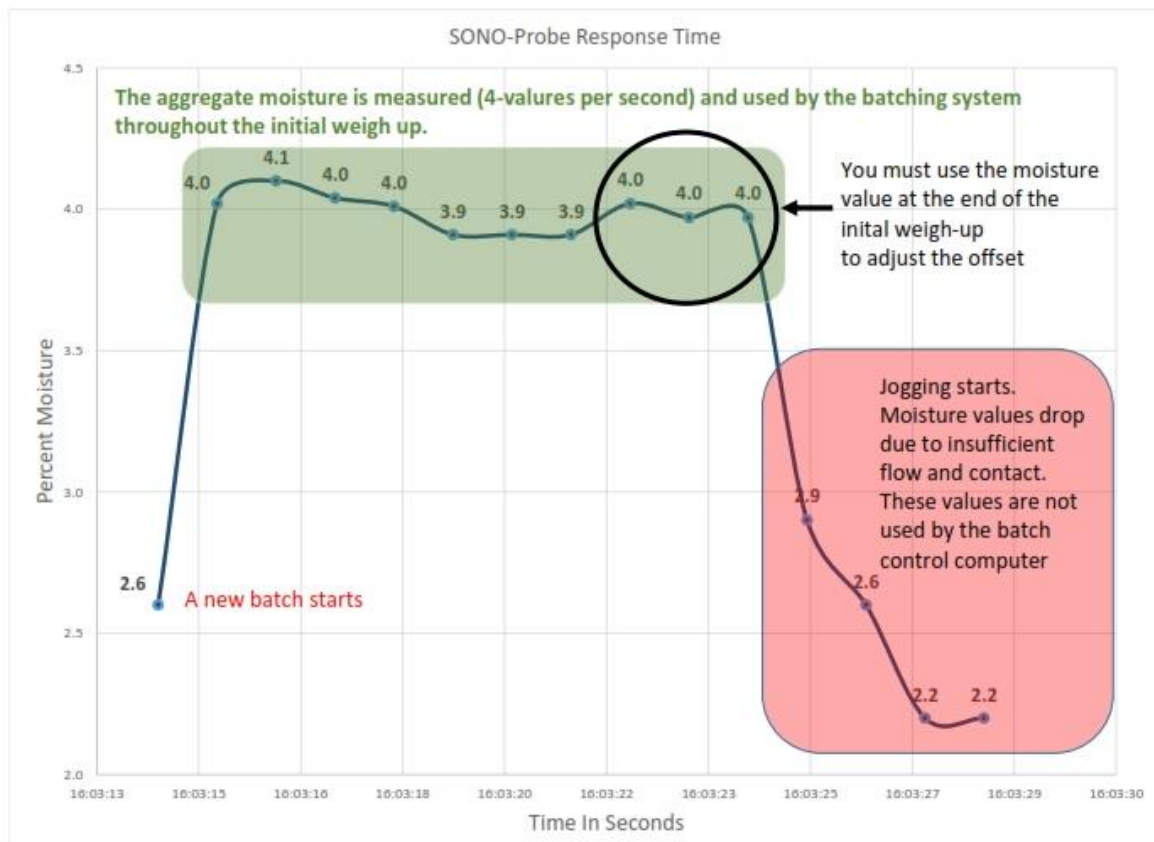


- A window will open showing the 15 available material calibrations installed in this SONO probe (example below).



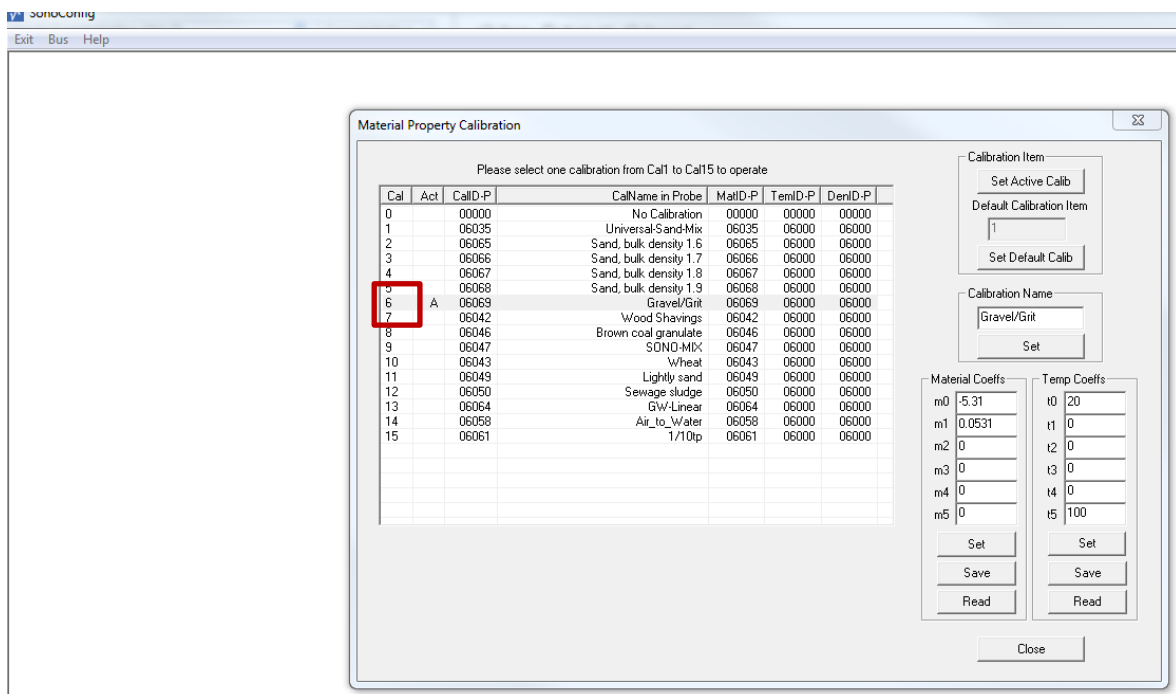
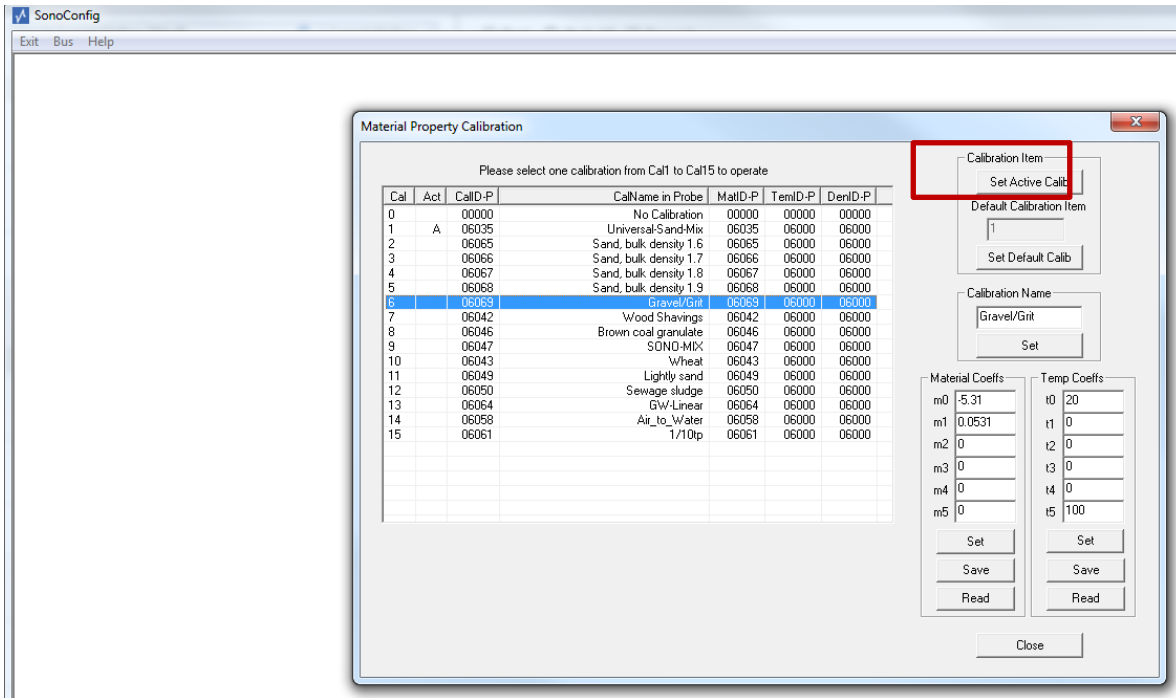
- 3) In the main window, you will note an “A” in front of the active calibration #1. The SONO is delivered from the factory with default calibration #1: **Universal-Sand-Mix**. A “1” is shown in the small window under **Default Calib Item**.
- 4) When you permanently want to change to a new calibration, you must enter the new calibration number and confirm the change.
- 5) The slope/gradient and offset of the active calibration is shown next to **m0** (offset) and **m1** (slope/gradient). For calibration #1: Universal-Sand-Mix $m_0 = -6.6$ and $m_1 = 0.06$. The SONO probe calibrations are linear. If you find that you need to adjust the offset, follow instructions in step 6. This will shift the slope/gradient to fit the results of you burn off.

The graph below shows how the SONO probe measures during one batch.

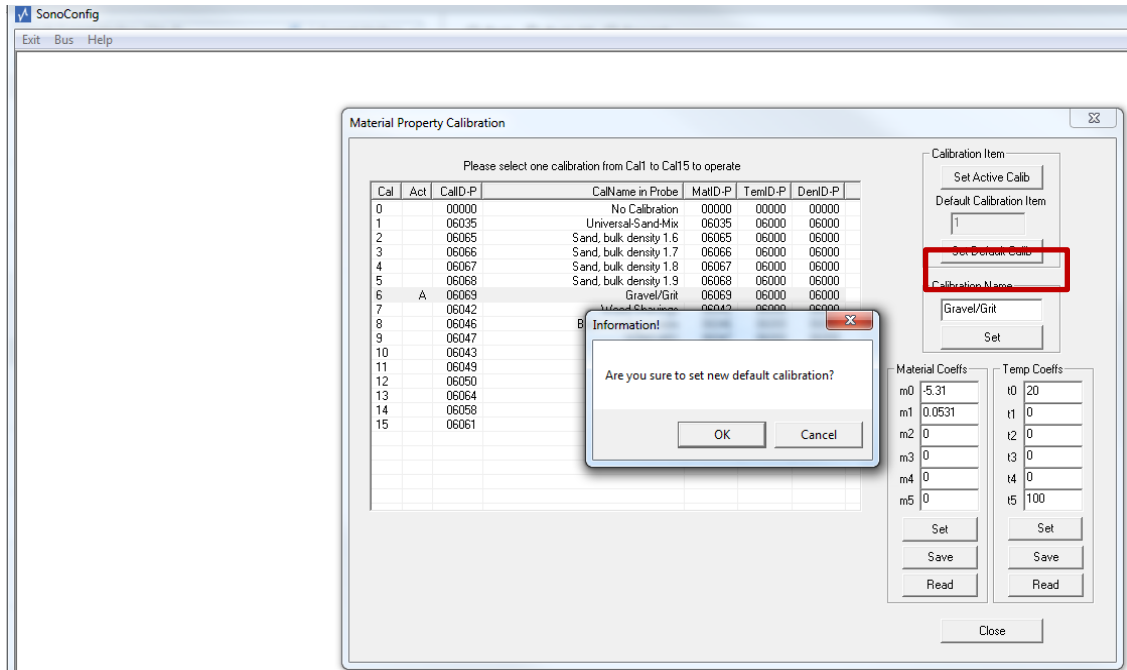


- 6) To permanently change the offset, you need to change the value in m_0 . For example: to increase the offset by 2.0% you would have to enter -4.6, then **Set**. ($-6.6 + 2.0 = -4.6$).

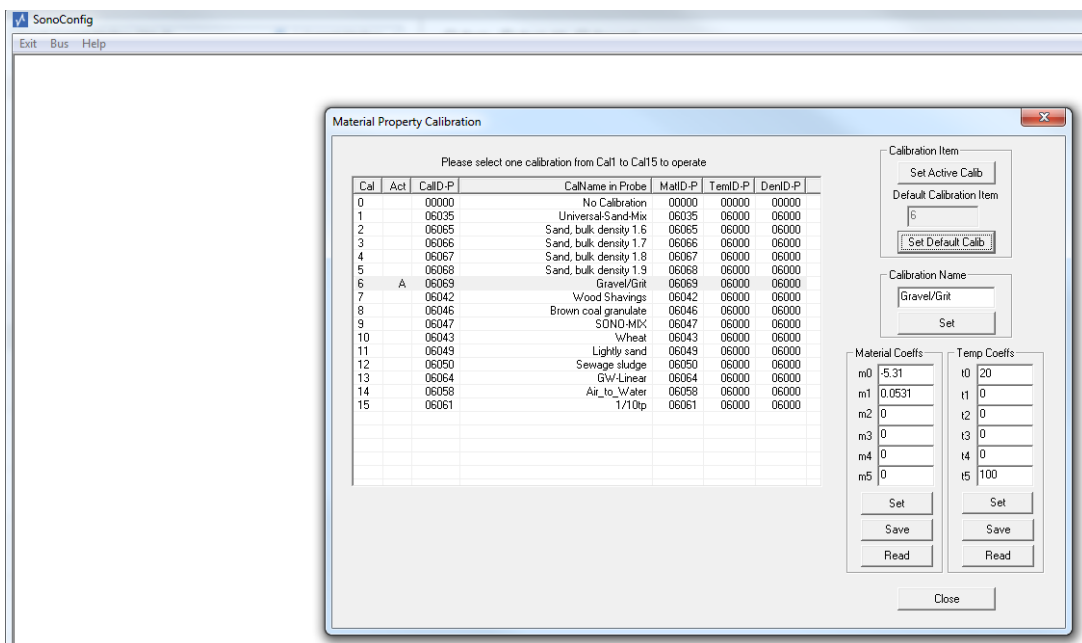
- 7) If you want to change to a different calibration, highlight the new calibration then click on **Set Active Calib.** You will see the “A” change to the new calibration. (See the two screen shots below.)



- 8) To set a calibration as the default calibration click on **Set Default Calib.** The conformation window will open, click **OK**. The new calibration will now be shown in the Default window and the letter **"A"** will be shown in front of the selected calibration.



- 9) Your newly selected calibration will look like the screen below.



Additional Questions? Contact MESA at support@mesasystemsco.com or +1 (508) 655-6372.