MESA Systems Co. 8 Broad Street, Unit 1, Stonington, CT 06378 Phone: 508-655-6372 support@mesasystemsco.com http://mesasystemsco.com

### SONO Guide\_Interfacing\_SM-USB

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 <u>http://mesasystemsco.com</u>
- **SONO cable**, available in 4m (*M308029*) or 10 m (*M308032*)

### **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"
- Install SM-USB drivers and SONOConfig Software on a Notebook computer or PC.
- Identify analog input the PLC or batch panel accepts.

### **Overview:**

- Using the SM-USB module and SonoConfig software, you will interface your SONO probe(s)
- You will need to complete a bake-off to get a reference moisture value for calibration
- Before you can make an offset adjustment the SONO probe should be measuring and the moisture visible on the SONOConfig.

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### Step-by-step guide for New Installations: Part 1: Establishing a connection

- 1) Open SONOConfig software. Navigate to **Bus** for the drop-down menu, then select **Configuration**.
- The following window will open. Select the appropriate Serial Port (for example COM4) from the drop-down menu. Select OK. Note:
  - a. Use Window's Device Manager located in your computer's control panel to identify the **COM port** number. For example: USB Serial Port (COM4).

General		
Serial Port	COM4	•
	COM1 COM2 COM3	
	COM4 COM5 COM6 COM7	the port
	COM8 COM9 COM10 COM11	
	COM10 COM10 COM11 COM12 COM13 COM14	

General			
	Serial Port	COM4	
		<ul> <li>Use the selected port</li> </ul>	
		C Automatically search the port	
		1 1	

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3) Alternatively, you can select Automatically search for port. Select OK.

General		
	Serial Port COM1	
	Use the selected port     Automatically search the port	

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### Part 2: Configuring the probe

1) Next you must Scan the bus for probes. Selecting **Scan Probes** from the **Bus** menu.



 SONOConfig will display all probes connected to the Bus. You will see a Probe List by serial number. If there is more than one probe, highlight to select the probe you wish to work with,

NO. [	SerialNo	ResetBaudrate	ProbeName	HWVersion	FwVersion
	33433	9600	SONO-VARIO	2.06	2.200603

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3) Under **Config**, in the drop-down menu, select **Analog Output**.

Probe List	:				x
Exit Co	onfig Calibration Test Measu	re			
	Measure Mode & Parameters				
N	Analog Output	ProbeName	HWVersion	FWVersion	
1	Bus	50N0-VARIO	2.06	2.200603	
1					
				Close	

4) This step allows you to confirm/configure each SONO probe's analog output and to simulate the analog outputs to the PLC or Batch Panel. You must know what analog input the PLC or batch panel accepts, to confirm these settings. This SONO probe is set as follows, which are the default settings:

> Output Current 4...20mA Output Channels: Moist, Temp. Moisture Range: Max 20%, Min 0.0%

Outp	ut Current C 020mA (* 420mA	C 20-0mA C	20-4mA
Output Channel	s P C Moist,Conduct C Mo	ist,Temp/Conduct C	Moist/MoistStdDev
Moisture Range 1ax 20 Set Min 0 Set	Temperature Range       Max     100       Set       Min       0	EC-Trime(mS/cm)	Moist Std Deviation Max 0 Set Min 0 Set
	Simulate	Close	

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5) To confirm that the analog output (**Output Current**) is set correctly and **Moisture Range** is scaled correctly, **Simulate** the moisture to the PLC or Batch Panel. Select **Simulate** and the window **Simulate Analog Output**, will open.

	Output Co	urrent 20mA (• iimulate Analog O	420mA lutput	<u>20-0mA</u>	20-4mA
	Moist,Temp	Moisture	0100.0	4-20mA: 04mA	oist/MoistStdDev
Moisture	Range	Temperature	0	5012mA 7516mA 10020mA	Moist Std Deviation
1ax 20 Min 0	Set		Set		Max 0 Set
			Close		
		Simulate	1	Close	

### Notes:

This allow you to simulate the moisture to the Analog output connected and displayed on the batch panel as a percent of scale.

Example: Enter **50** and select **Set**, **Moisture 50** = 50% of the 0...20% **Moisture Range** = 10% moisture. On the control panel you should see 10% moisture.

- Outr	Output Curre	ent DmA (• ulate Analog C	420mA ( Output	20-0mA C	20-4mA
•	Moist,Temp	Moisture	0100.0	4-20mA: 04mA 258mA	oist/MoistStdDev
Moisture Range Max 20	s Set	tenperature	Set	5012mA 7516mA 10020mA	Moist Std Deviation
Min 0	Set		Close		Min 0 Set
		Simulato	1	Close	

6) Once you have confirmed that the analog output is scaled correctly, and you can close the **Simulate Analog Output**, and the **Analog Output** windows.

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### Part 3: Confirm the material calibration

 From the Calibration drop-down menu select Calibration then Material Property Calibration. PLEASE WAIT! It will take a few seconds for the calibrations to be displayed on the screen.

robe List Exit Config	Calibration Test Data Logging		X
No.	Electronic Temperature Compensatio Basic Balancing	n wVersion	FWVersion
1	Material Property Calibration Material Temperature Offset	2.08	2.200615
			Close

- 2) Identify the active calibration. An "A" is found in front of the Active Calibration, Universal Sand-Mix. Universal Sand-Mix is also set as the Default Calibration.
- If you wish to select a new calibration, highlight the new calibration and select Set Active Calibration and Set Default Calibration Item. Notes:
  - a. To permanently change the calibration, you must **Set** it as the **Default Calibration Item.**

	Please select	one calibration from Cal1 to Cal1	5 to operate	e		- 1	Calibratic	Astive Calls
Cal	Act CallD-P	CalName in Probe	MatID-P	TemID-P	DenID-P	- 1	Set	Active Calib
0	00000	No Calibration	00000	00000	00000		Default	Calibration Item
1	A 06035	Universal-Sand-Mix	06035	06000	06000		1	
2	06065	Sand, bulk density 1.6	06065	06000	06000			
3	06066	Sand, bulk density 1.7	06066	06000	06000		Set	Default Calib
4	06067	Sand, bulk density 1.8	06067	06000	06000			
5	06068	Sand, bulk density 1.9	06068	06000	06000		— Calibratia	un Marria
6	06069	Gravel/Grit	06069	06000	06000		Calibratio	on reality
7	06042	Wood Shavings	06042	06000	06000		Unive	rsal-Sand-Mix
8	06046	Brown coal granulate	06046	06000	06000			
9	06047	SÕNO-MIX	06047	06000	06000			Set
10	06043	Wheat	06043	06000	06000	. L		
11	06049	Lightly sand	06049	06000	06000	- Material Coeffs	Temp Coeffs	
12	06050	Sewage sludge	06050	06000	06000		0.0	
13	06064	GW-Linear	06064	06000	06000	mU	-6.6	10 20
14	06058	Air_to_Water	06058	06000	06000	m1	0.06	11 0
15	06061	1/10tp	06061	06000	06000			
						m2	U	62 0
						m3	0	13 0
							0	
						m4	0	14 0
						m5	0	t5 100
							Set	Set
							Save	Save
							Read	Head

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b. All SONO probes are delivered set to: **#1 Universal-Sand-Mix** calibration. If this probe is to be used to measure the moisture of sand, you need not make a change. 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**.

		Please selec	t one calibration from Cal1 to Cal15	5 to operate	e		Calib	Sat Astive Calib
Cal	Act	CallD-P	CalName in Probe	MatID-P	TemID-P	DenID-P		Set Active CallD
0	1.0.1	00000	No Calibration	00000	00000	00000	Def	ault Calibration Item
1	А	06035	Universal-Sand-Mix	06035	06000	06000		1
2		06065	Sand, bulk density 1.6	06065	06000	06000		
3		06066	Sand, bulk density 1.7	06066	06000	06000		Set Default Calib
4		06067	Sand, bulk density 1.8	06067	06000	06000		
5		06068	Sand, bulk density 1.9	06068	06000	06000	– Calib	ration Name
6		06069	Gravel/Grit	06069	06000	06000		
7		06042	Wood Shavings	06042	06000	06000	U	niversal-Sand-Mix
8		06046	Brown coal granulate	06046	06000	06000		
9		06047	SONO-MIX	06047	06000	06000		Set
10		06043	Wheat	06043	06000	06000		
11		06049	Lightly sand	06049	06000	06000	🗆 Material Coe	effs — Temp Coeffs —
12		06050	Sewage sludge	06050	06000	06000	a 3. 0m	H0 20
13		06064	GW-Linear	06064	06000	06000	110 -0.0	
14		06058	Air_to_Water	06058	06000	06000	m1 0.06	t1 0
15		06061	1/10tp	06061	06000	06000	m2 0	
							m3 U	t3 U
							m4 0	t4 0
							m5 0	.5 100
							Set	Set
							Save	Save
							Read	Read
								Class

- After selecting the desired calibration, you will need to adjust the SONO probe's moisture reading to a reference moisture (bake-off). This is done by adjusting the offset value m0.
- 5) Do a bake-off moisture of sample collected from below the hopper to determine the moisture percent.

Notes:

- You need to write down the moisture values shown in the batch panel display, at the time you collect a sample from below the hopper.
- The SONO probe is reading the total moisture percent.

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 Calculate the offset between the SONO probe moisture reading and the bake-off moisture.

Notes:

- Determine the total dry weight percent moisture (%M) using the formula:
  - (Wet weight Dry weight) / Dry Weight = M x 100 = %M.
  - For example: (940 gram 915 gram) / 915 gram = 0.027 x 100 = 2.7 %M.
- *For example:* The batch panel displayed a moisture of 3.2%, during the batch, when the sample was collected, and the bake-off moisture was determined to be 2.7%. The offset of the SONO probe must be adjusted -0.5%.
- 7) To adjust the offset for the calibration, Universal-Sand-Mix we enter a new value in the **Material Coeffs m0**.

Notes:

- The current value is -6.6.
- To reduce the moisture values by -0.5% (difference between the panel and the back-off), you need to subtract 0.5 from -6.6: (-6.6 + -0.5 = -7.1).
- Enter -7.1 in m0 press **Set**. You have now adjusted the SONO probe moisture to the bake-off moisture reference.



8) Select **Close** and **Close** again, you may now Exit out of SONO-Config and safely remover the USB cable from your computer.

For complete technical details visit <u>http://mesasystemsco.com</u> for manuals and support documentation.

Additional Questions? Contact MESA at <a href="mailto:support@mesasystemsco.com">support@mesasystemsco.com</a> or +1 (508) 655-6372.