APPLICATION NOTE

APP #155

"Vane Position Sensor Calibration Procedure"

The following will walk you through calibrating an actuator feedback through the MCS Connect software.

When starting up new equipment or replacing a bad actuator it's important to do the following steps to calibrate the feedback sensor input. You must be authorized to complete all steps.

Before calibrating a new or replacement actuator, you should familiarize yourself with the adjustments from the manufacture. Different actuators will have limit switches, which are preset to the design limits of the unit.

Follow how to set the limits of the stroke for the actuator installation.

Note the vane actuator limit switch needs to have been calibrated first so the movement of the actuator matches the stroke of the vanes.

This procedure will walk you through the steps needed for calibrating the vane position sensor input

To calibrate the vane position sensor, we are going to manually control the vane actuator and record the voltages on the sensor input. To perform this calibration you will need either a laptop with MCS-Connect or a MCS-Touchscreen.

1. Start MCS-CONNECT - Connect via Serial, Ethernet, or Remote

2. Click on the tab to load into the controller you need to calibrate the vanes for.

3. Get authorized by clicking on the red "View Only" button and inputting your password.

4. Click on the "View" button at the top of Connect. On the drop down click on the 'SERVICE' window. In the service window click on the 'SI Diag.' tab. Drag the service window to the center of your screen.

5. Scroll down/up until you find the sensor input for your vane% feedback.

6. Click on the "View" button at the top of Connect. Open the Relay Outputs window and locate the 'Open Vane' and 'Close Vane' relay outputs.

7. Set the Relay Output 'Open Vane' to 'MANON'. Set the Relay Output 'Close Vane' to 'MANOFF'.

RO #	Relay Outputs	Value	Manual Status
M- 1	Comp Enbl	OFF	AUTO
M- 3	Open Vane	ON	MANON
M- 4	Close Vane	OFF	MANOFF

OPEN VANE - 'MANON'

8. Looking at MCS-CONNECT **on your computer**, record the **VALUE** and **VOLTAGE** showing when the **VANE is OPENED**.

SI #	Sensor Inputs	Value	Voltage
M- 4	Cond Psi		
M- 5	Hi		
M- 6	Lo		
M- 7	Sp		
M- 8	Di		
M- 9	SpareM-9	----	-------
M-10	SpareM-10	----	-------
M-11	OilSumpTmp	48.8C	0.005V
M-12	Vane%	99.0%	3.032V
M-13	VaneClosed	YES	LOW

EXAMPLE ONLY
(Record numbers from your computer's SI Diag.window)

WHEN VANE IS OPENED
Record VALUE AND VOLTAGE

Send Comm. Changes to Controller

9. Change relay '**Open Vane**' to '**MANOFF**', Change relay '**Close Vane**' to '**MANON**', to retract the vane.

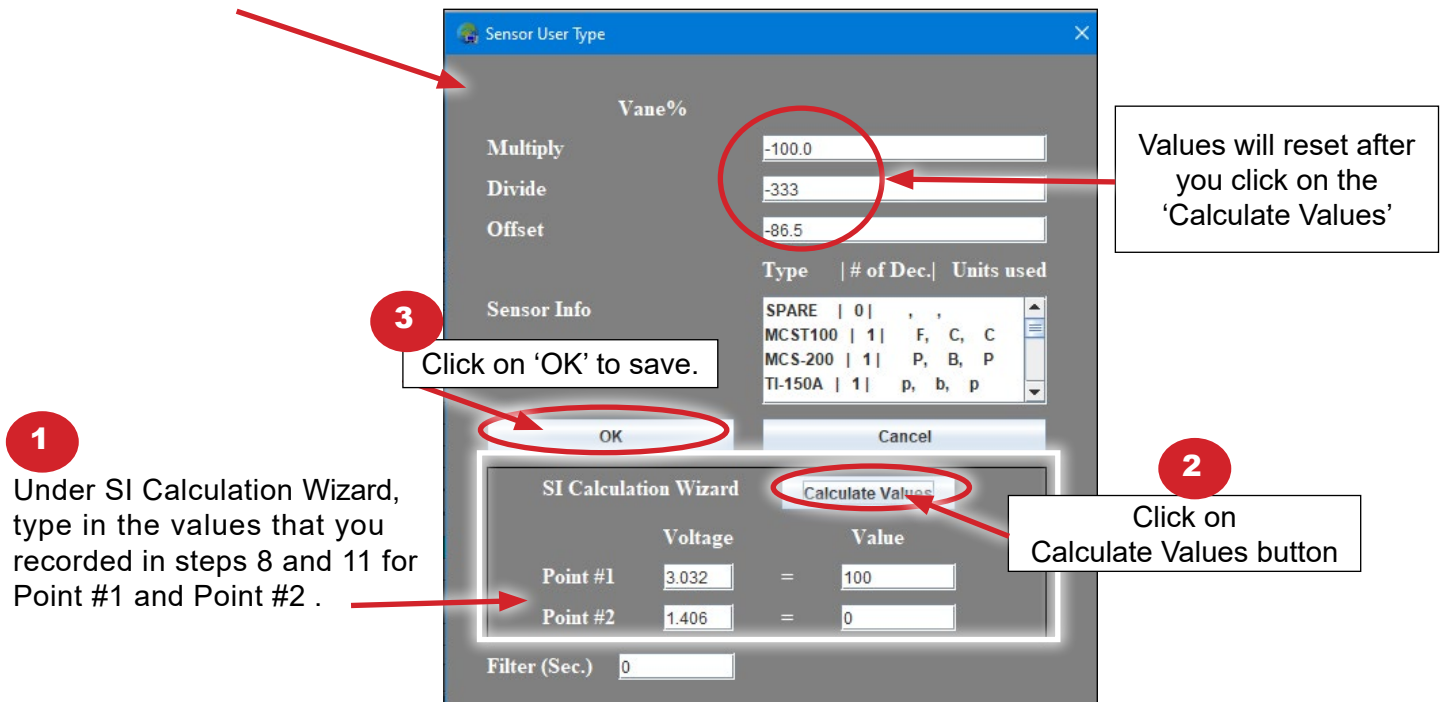| RO #	Relay Outputs	Value	Manual Status
M- 1	Comp Enbl	OFF	AUTO
M- 3	Open Vane	OFF	MANOFF
M- 4	Close Vane	ON	MANON

CLOSE VANE - 'MANON'

10. Wait for the actuator rod to stop moving, the vanes should be in the fully closed position.

11. Looking at MCS-CONNECT SI Diag *on your computer*, record the **VALUE and VOLTAGE** showing when the **VANE is CLOSED**.
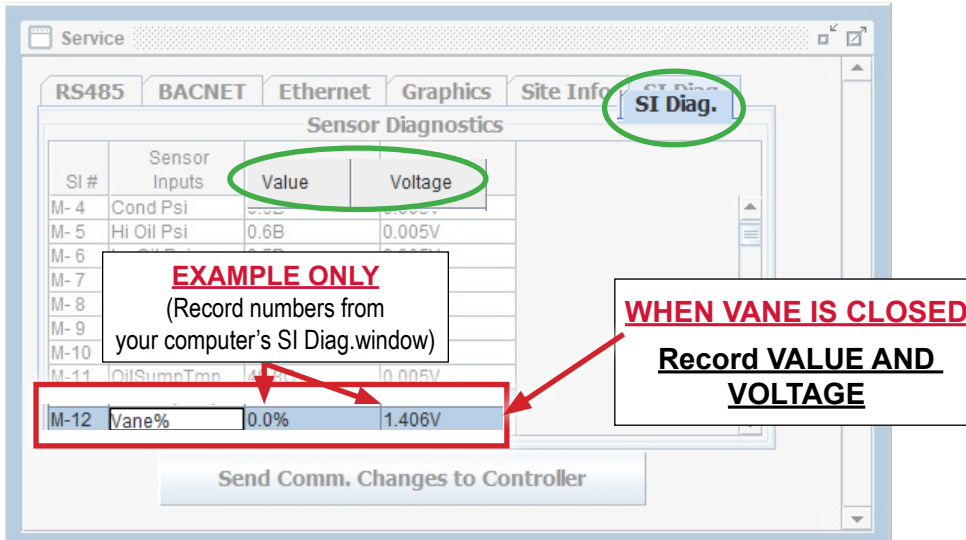
12. Open **'SENSOR INPUTS' window** and double click to open **Vane%,** (in this example M-12).
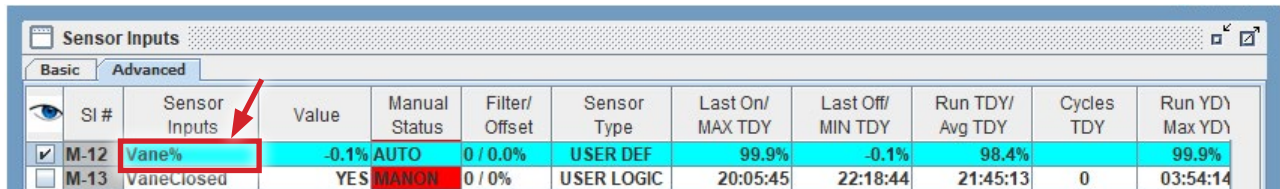
13. POP-UP window will appear, follow the 3 steps below to enter the recorded points.

TEST CALIBRATION ON NEXT PAGE

Test **'Open Vane'** *and* **'Close Vane'** *to verify readings*

15. Set the Relay Output **'Open Vane'** to **'MANON'.** Set the Relay Output **'Close Vane'** to **'MANOFF'.**

#	Outputs	Value	Status
	Comp Enbl	OFF	AUTO
	Open Vane	ON	MANON
	Close Vane	OFF	MANOFF

16. Wait for the actuator rod to stop moving, <u>vanes should be in the fully open position.</u>

	M-12	Vane%		99.9%	AUTO

Vane% should be reading minus or plus 1% of 100% in the shown example.

17. Next, set the Relay Output **'Open Vane'** to **'MANOFF'.** Set the Relay Output **'Close Vane'** to **'MANON'.**

RO #	Relay Outputs	Value	Manual Status
M- 1	Comp Enbl	OFF	AUTO
M- 3	Open Vane	OFF	MANOFF
M- 4	Close Vane	ON	MANON

18. Wait for the actuator rod to stop moving, <u>vanes should be in the fully closed position.</u>

	M-12	Vane%		-0.1%	AUTO

Vane% should be reading minus or plus 1% of 0% in the shown example.

If the vane position sensor input reading is more than 1% off 0.0% when vanes are fully closed or 100.0% when the vanes are fully open check the following:

- Check to see that the Potentiometer is working and is secured in place.
- Make sure the vane actuator limit switch is set as per the defaults and have not been moved.
- Repeat steps 7-18 to re-calibrate the sensor input if they are not correct.

19. RESET RELAY OUTPUT 'MANUALS ONLY'

Reset/Clear
Reset Lockouts
Reset Manuals to Auto ▶

Reset ALL Manuals to Auto
Reset Relay Output Manuals ONLY
Reset Analog Output Manuals ONLY
Reset Sensor Input Manuals ONLY

IMPORTANT