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## Satron VCT Consistency Transmitter Startup Guide

Satron VCT provides several calibration options to set up the transmitter to meet your operational needs. The chosen option depends upon the application and the expected performance needed by the mill. VCT has a calculation function included in the Display Unit to calculate the calibration constants itself or the user may calculate their own values and enter them into the VCT software through the Display Unit keyboard. Both of these methods adjust the same calibration parameters; **Slope (Gain)** and **Offset**. The VCT transmitter comes from the factory pre-calibrated for the range of 0-7% Consistency. To set it up for your process conditions the calibration method may be selected as a One Point calibration (the slope is fixed) or two point calibration (Both slope and Zero are adjusted) using manual(offline) or the internal (Automatic) calculation method.



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The user interacts with the VCT Transmitter through the Display Unit using its internal keyboard (shown above). This display and keyboard allows the user to set up the measurement conditions, filtering, ranges etc. in the display and to configure the transmitter for any measurement application.

**The 8-character liquid crystal display (LCD)** with backlight allows you to display information using the alphabet or by numbers.

### **OPERATING KEYS:**

Use UP/DOWN arrow keys, ENTER and ESC to move through the menus.

#### ENTER:

Press ENTER to move to a lower level in a menu or to accept a command or enter a parameter value into the SW.

#### UP:

Use the UP arrow key to move to a higher menu level or to increase a parameter value.

DOWN:

Use the DOWN arrow key to move lower in a menu level or to decrease a value.

ESC:

Press the ESC to move back towards the top of the main menu or cancel the current action.

## **One Point Calibration using the internal calculator**

This method is utilizes water as the (Zero) calibration value. This value is set at the factory before it is shipped.

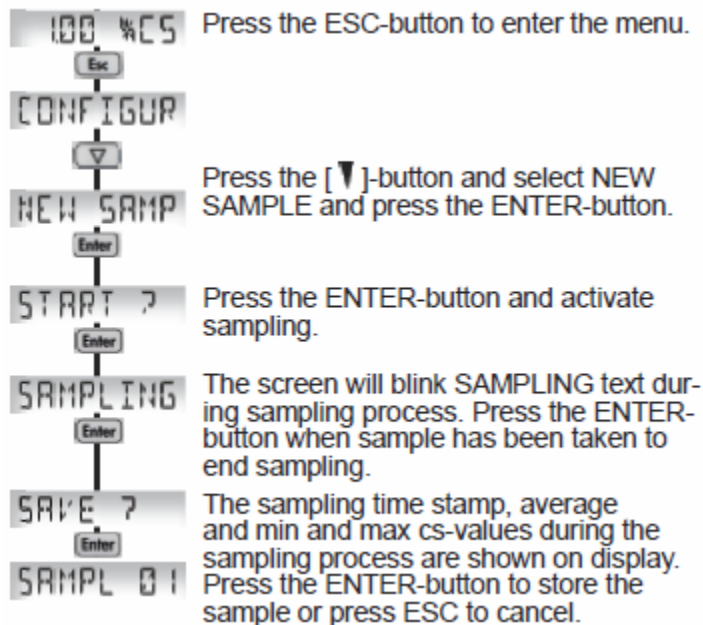
**This method has 3 steps:**

- 1. Collect Sample**
- 2. Enter Lab sample**
- 3. Calculate Gain (Slope) and Offset.**

**Valid calibration data can be obtained by:**












1. Moving dilution valve 10% lower than the current setting for 15 seconds and take a sample by following the instructions below.
2. Then Move dilution valve 20% higher for 15 seconds and take another sample.

### **Step 1. Collecting the samples:**

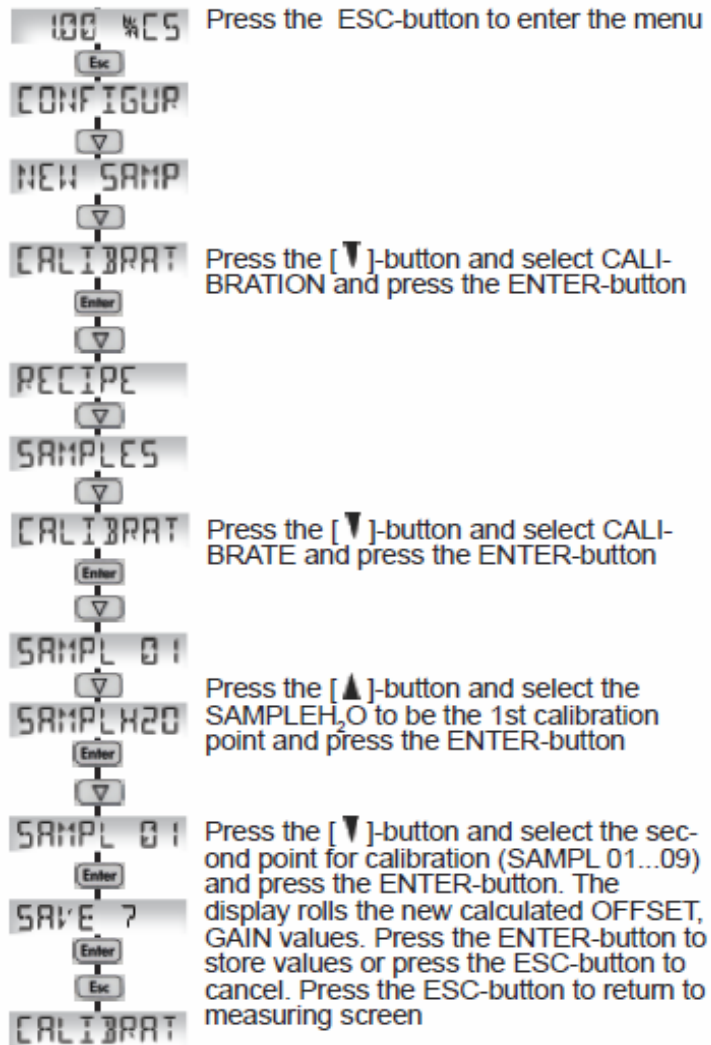


After the Lab analysis is completed enter the laboratory determined Cs values into the Display Unit as shown below:

### Step 2. Enter Lab value:

	Press the ESC-button to enter the menu.
	
	Press the [▼]-button and select CALIBRATION and press the ENTER-button.
	Press the [▼]-button and select SAMPLES and press the ENTER-button.
	
	Select with the [▼][▲]-buttons the desired sample point to which laboratory value will be inserted and press the ENTER-button.
	Place the decimal separator with [▼][▲]-buttons and press the ENTER-button.
	
	Insert the laboratory value with the [▼][▲] and the ENTER-buttons and press the ENTER-button until upper separator reaches the right end of display.
	
	Press the ESC-button to return to the main measuring screen.

### Step 3. Calculate Gain (Slope) and Offset:



## Two Point Calibration using the internal Calculator (Auto)

This method has 3 steps:

1. Collect Samples
2. Enter Lab samples
3. Calculate Gain (Slope) and Offset.

Valid calibration data can be obtained by:

1. Moving dilution valve 10% lower than the current setting for 15 seconds and take a sample by following the instructions below.
2. Then Move dilution valve 20% higher for 15 seconds and take another sample.

### Step 1. Collect samples:

100 %CS Press the ESC-button to enter the menu.

Esc

CONFIGUR

▼

NEW SAMP

Press the [▼]-button and select NEW SAMPLE and press the ENTER-button.

Enter

START ?

Press the ENTER-button and activate sampling.

Enter

SAMPLING

The screen will blink SAMPLING text during sampling process. Press the ENTER-button when sample has been taken to end sampling.

Enter












SAVE ?

The sampling time stamp, average and min and max cs-values during the sampling process are shown on display. Press the ENTER-button to store the sample or press ESC to cancel.

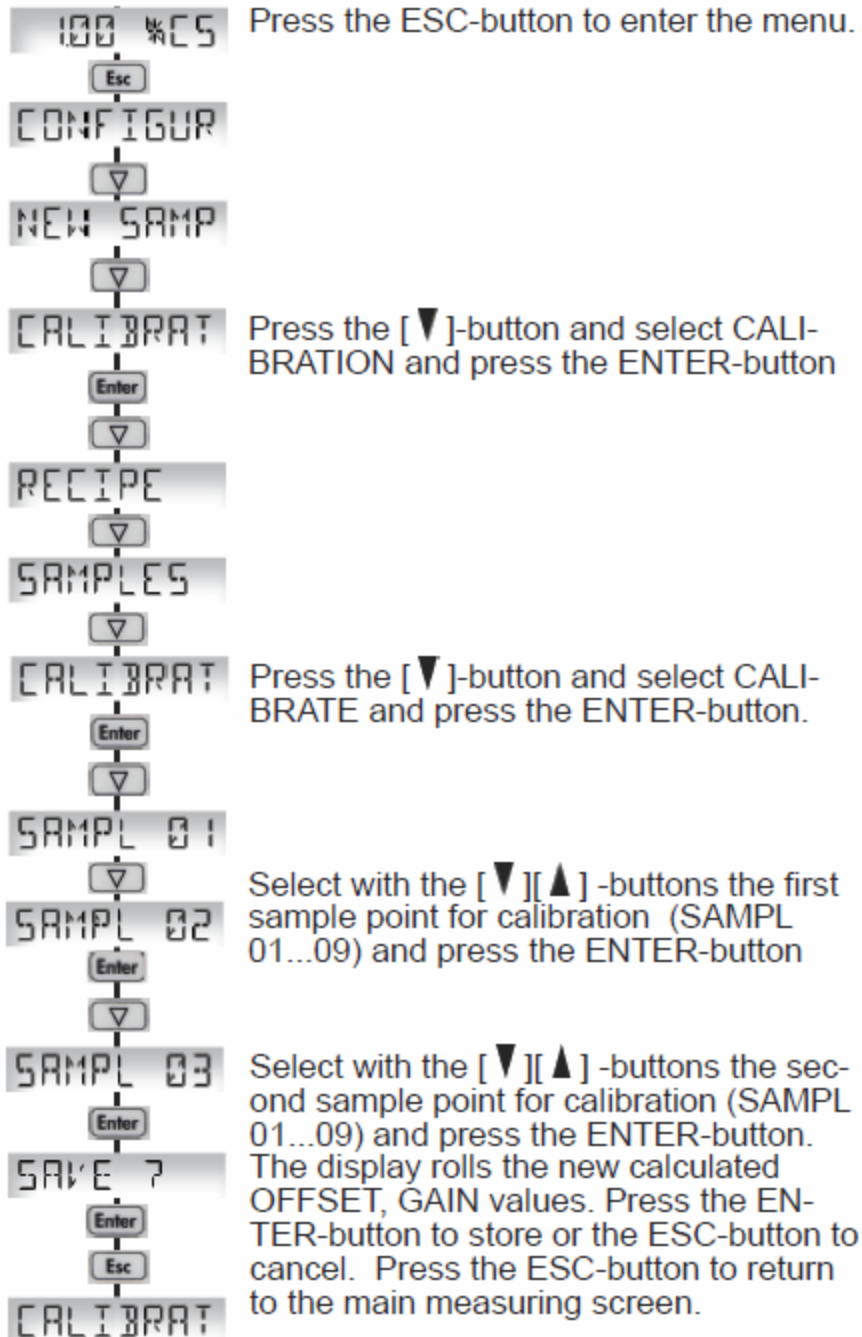
Enter

SAMPL 01

## Step 2. Enter Lab values:

	Press the ESC-button to enter the menu.
	
	Press the [▼]-button and select CALIBRATION and press the ENTER-button.
	Press the [▼]-button and select SAMPLES and press the ENTER-button.
	
	Select with the [▼][▲]-buttons the desired sample point to which laboratory value will be inserted and press the ENTER-button.
	Place the decimal separator with [▼][▲]-buttons and press the ENTER-button.
	
	Insert the laboratory value with the [▼][▲] and the ENTER-buttons and press the ENTER-button until upper separator reaches the right end of display.
	
	Press the ESC-button to return to the main measuring screen.

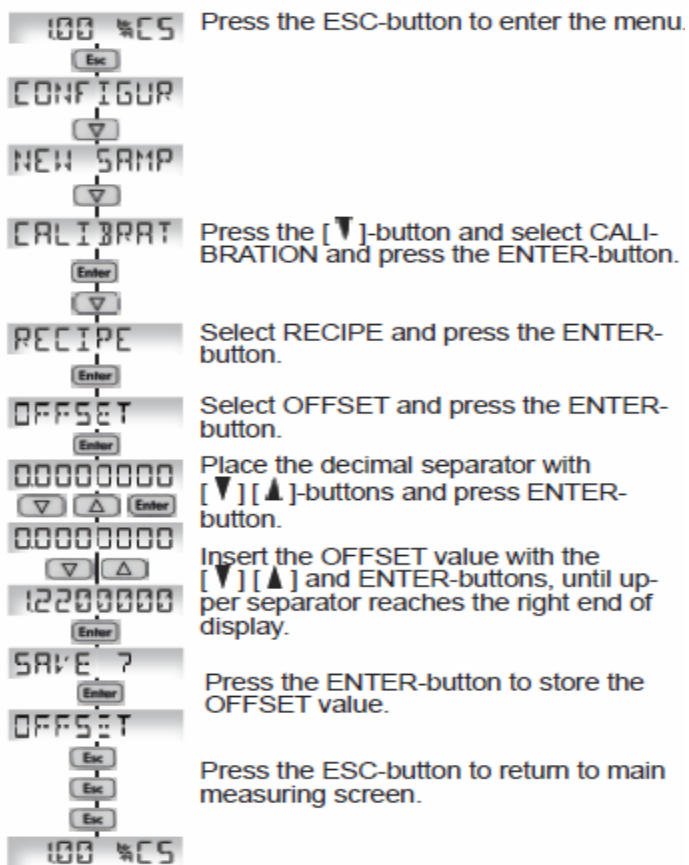
### Step 3. Calculate Gain (Slope) and Offset:



## Two Point Calibration - Manual Method

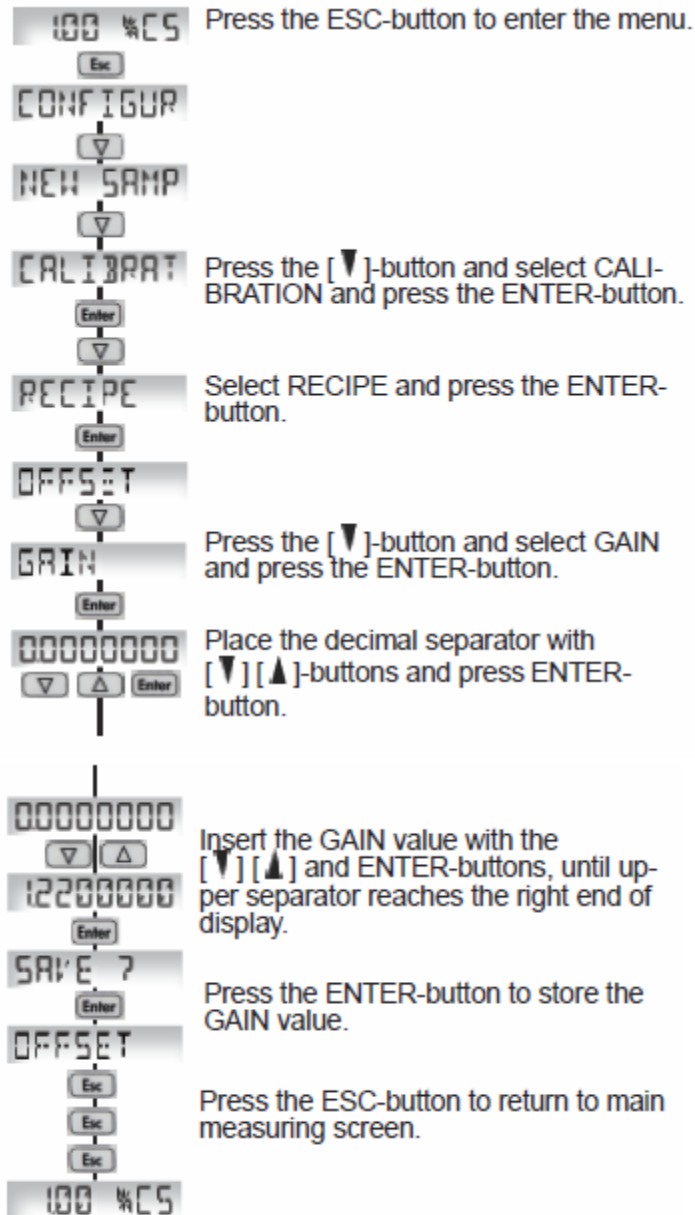
1. Move dilution valve 10% lower than its current setting for 15 seconds and simultaneously take a sample and transmitter reading.
2. Move dilution valve 20% higher than its current position for 15 seconds and simultaneously take a sample and transmitter reading.
3. Return the dilution valve to starting position.
4. Wait for the Lab results.
5. Put the new values into a Excel spread sheet to calculate new Slope and Zero Offset values. *See instructions below page 10*
6. Find the VCT menus that have the Slope (Gain) and Zero Offset settings. Replace those values with the new calculated values. (If the existing values are not 1 and 0 multiply the existing Slope(Gain) value by the new value and add the new Zero Offset value to existing one.
7. Now VCT reading will match the lab samples

### Enter New Zero Offset:











## Enter New Gain (Slope):



## Excel Settings for Slope (Gain) and Offset Calculations

Clipboard		Font		Align		
D2	  	=SLOPE(B2:B3,C2:C3)				
A	B	C	D	E	F	G
	Lab(%)	VCT(%)	Slope	Offset	New VCT	
	2	1.9	0.909091	0.272727	2	
	5	5.2			5	
<b>Replace Current readings for Lab and VCT values with new test results</b> <b>This is for two point manual calibration</b>						

Clipboard		Font		Align		
E2	  	=INTERCEPT(B2:B3,C2:C3)				
A	B	C	D	E	F	G
1	Lab(%)	VCT(%)	Slope	Offset	New VCT	
2	2	1.9	0.909091	0.272727	2	
3	5	5.2			5	
4						
5	<b>Replace Current readings for Lab and VCT values with new test results</b>					
6	<b>This is for two point manual calibration</b>					
7						

## One Point Calibration - Manual Method

1. This method is easiest way to get the have the transmitter reading match the laboratory samples.
2. Take sample and write down the reading from transmitter while the sample is taken.
3. Perform Laboratory analysis to get the consistency value.
4. Determine the difference between Transmitter reading and the laboratory determined Cs.
5. Change the zero offset in the transmitter to match the Lab and transmitter readings or use Excel instructions on the page 10 with replacing lower Cs sample and VCR% reading with 0%
- 6.

### Enter New Zero Offset:

