



**Application Bulletin: #171**

**Date: August 2012**

## **Sentinel I28 and Blackbelt** **Mass Flow Calibration and Verification**

**Summary** – This Application Bulletin will give a short synopsis of the purpose of a calibration and verification for a mass flow test. It will also give instructions on how to conduct a calibration and verification in the Sentinel I28 and Blackbelt instruments.

Note: Only conduct a Flow Calibration routine if the instrumentation does not meet your flow rate accuracy requirements, a new flow meter has been installed, or a Flow Verification process has failed.

### **What is Flow Calibration?**

Short Answer – Calibration is used to ensure that the instrument is accurate.

Slightly Longer Answer –Our instruments are calibrated to full range for transducer and flow sensor when assembled at CTS. The internal values are measured against, known external references which produce precise test results. Without this calibration the test data would be inconsistent. These references are called leak standards or orifices.

It may be possible to increase precision by calibrating to specific test parameters. Calibration is required if a new flow sensor has been installed. Once an instrument has been effectively calibrated, flow verification is used to maintain accuracy.

A calibration will overwrite the existing calibration so performing a system backup prior to any changes is a good practice. It may be preferable to begin with flow verification rather than calibration.

### **What is Flow Verification?**

Short Answer – Flow Verification checks your calibration.

Slightly Longer Answer – Flow verification ensures that the instrument is calibrated properly. One can use a variety of leak standards to prove that the calibration is correct and that the instrument is measuring consistently. The procedure for flow verification is very similar to flow calibration.

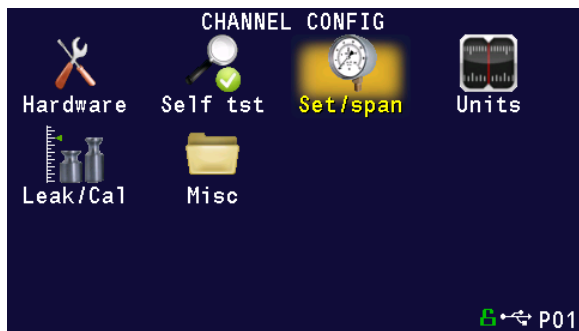
The frequency of verification will be determined by the specific quality control needs of a particular environment or corporation.

## Mass Flow Calibration Instructions:

From Main Menu - Choose **Channel Config**

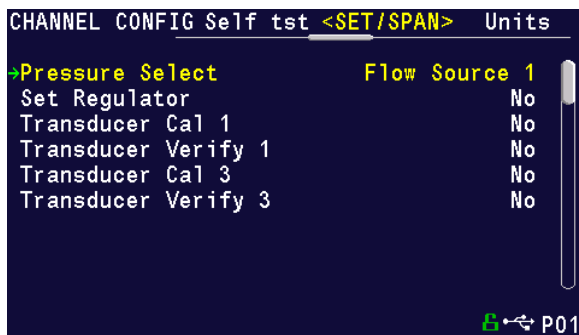


Choose **Set/span**



Choose **Transducer Cal 3** (I 28)

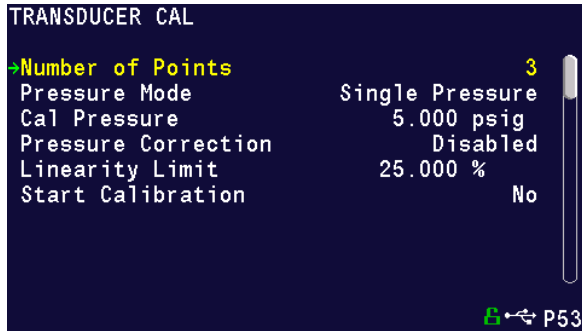
Choose **Transducer Cal 2** (Blackbelt)



### Choose Number of Points

Determine the number of leak standards that you will use and then add one. (It is preferable to calibrate to a “zero leak” condition by using a test cap and your leak standards.)

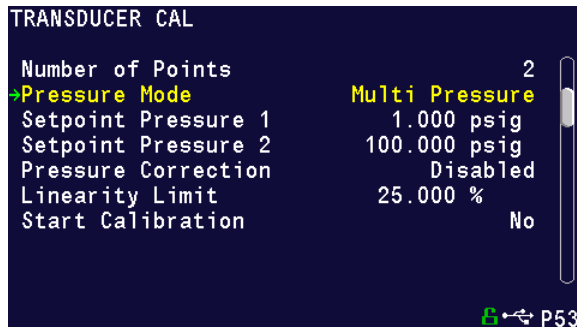
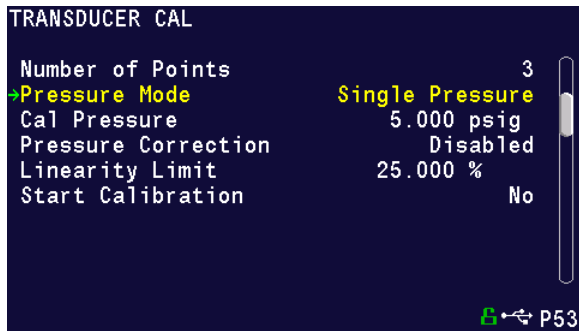
If you have 2 leak standards, **Select 3.**



### Choose Pressure Mode

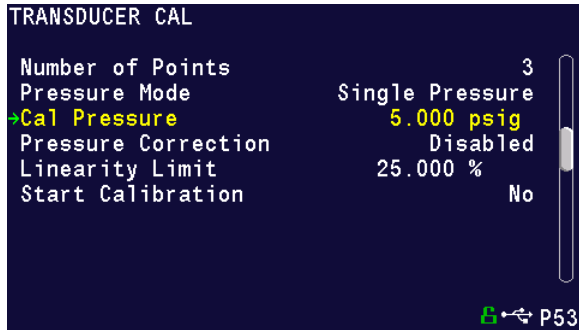
If all leak standards are at the same pressure, select **Single Pressure**

If the leak standards are set at varying pressures select **Multi Pressure**

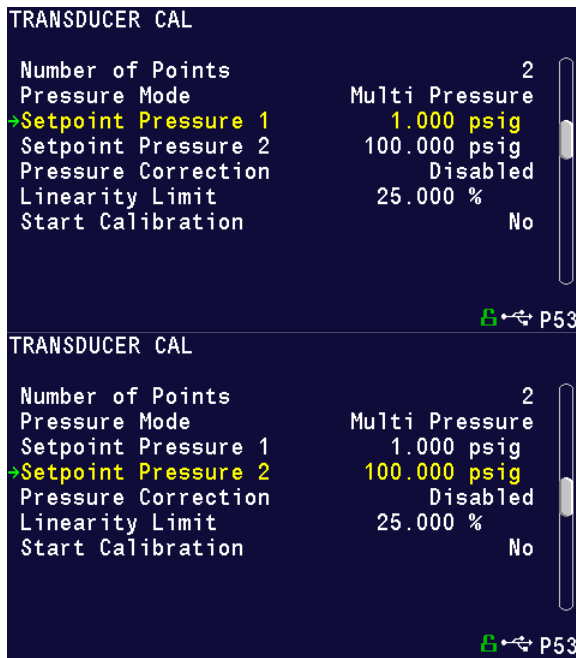


## Choose Cal Pressure

Select appropriate pressure related to your leak standards

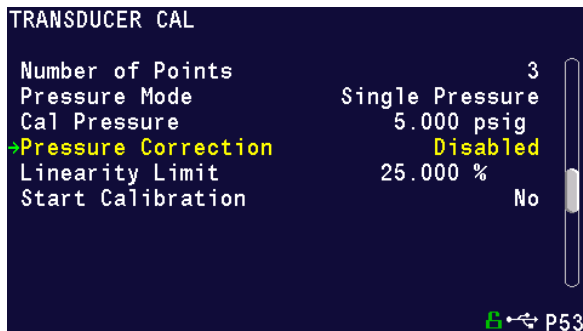


If you select Multi Pressure the screen will look like this:



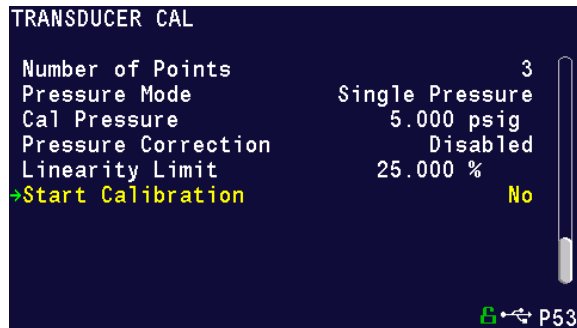
## Choose Pressure Correction

Select Disabled



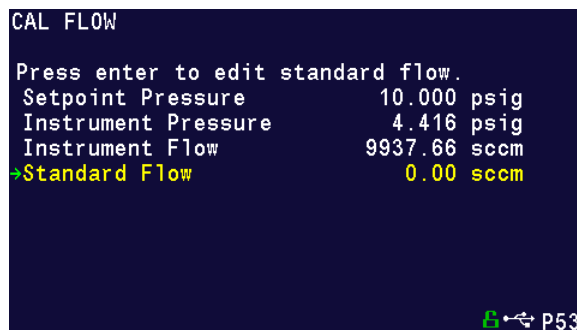
## Choose **Start Calibration**

Select **Yes**



The instrument will now direct you to **insert a test plug**, and it will take a reading.

Following that it will direct you to **insert your first leak standard** and **enter the flow rate** of the leak standard



You will repeat this for as many leak standards as you are using.

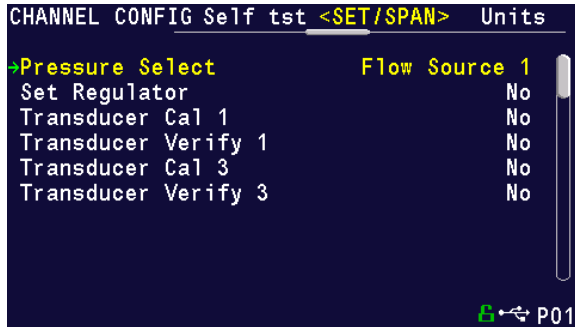
Calibration will then be complete.

## **Mass Flow Verification Instructions:**

The process to verify the transducer is almost identical to the above process for calibration except with fewer options.

### **Choose Transducer Verify**

Select Yes



### **Choose Number of Points**

Select according to the number of leak standards that you will use

### **Choose Pressure Mode**

Select pressure according to the leak standards that you will use

### **Choose Cal Pressure**

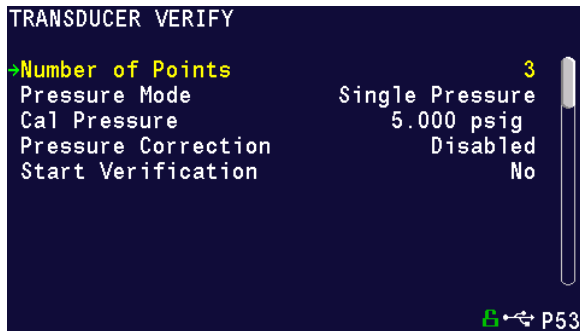
Select appropriate pressure related to your leak standards

### **Choose Pressure Correction**

Select Disabled

### **Choose Start Verification**

Select Yes



**Insert test plug** when directed.

**Insert leak standards and flow rate** when directed

Verification will complete.