Sigma Controls, Inc.
PROCESS CONTROLS AND INSTRUMENTATION

USER MANUAL

'CALMATE' V4.1 CALIBRATION KIT

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SIGMA CONTROLS, INC.

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SIGMA CONTROLS, INC.

1.0 CONTACT INFORMATION

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2.0 PRODUCT DESCRIPTION

PRODUCT OVERVIEW

The 'CALMATE' calibration kit is provided to enable field personnel to recalibrate Sigma Controls level transducer products (MFG. After January 2011 and previous units bearing the letter 'K' in the serial number).

This manual was written to accompany Version V4.1 of the software.

3.0 DESCRIPTION OF OPERATION

The 'CALMATE' system consists of two components: The software which is included on the enclosed CD and the local converter "dongle" which connects to the PC USB port and to the transducers' cable.

3.1 GETTING STARTED

1) Load the CD on the PC or laptop and make sure there is an available USB port.

2) Open the file identified as 'Sigma_Calmate_End_User' the software will open the 'End User' program page.

3.2 MAKING THE CONNECTIONS

Every Sigma Transducer has 4 conductors in the cable, Red + 24VDC, Black – 24 VDC, Blue and Yellow which are the Modbus connections.

The protocol converter "dongle" has 4 spring loaded connectors clearly marked with the color of the connection. Strip the wires back approx. 3/8" and insert into the dongle connectors.

Plug the USB cable into the dongle and then into the USB port on the computer.

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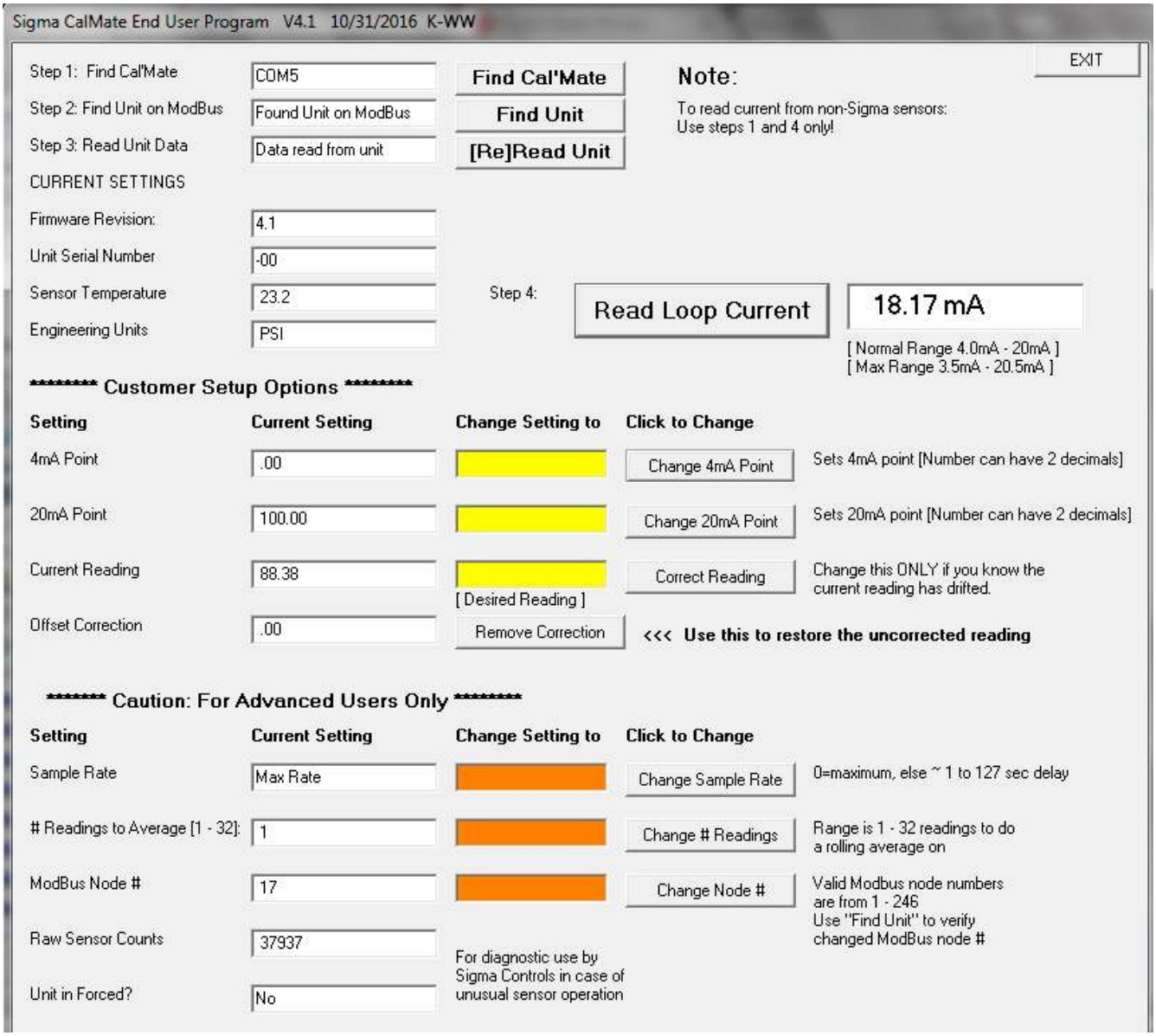
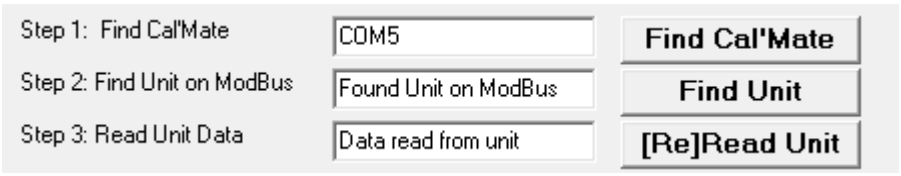
3.3 STARTING THE PROCESS

Version 4.1 was designed so that you can follow the steps in a descending direction. With the most common functions at the top. The advanced, riskier settings are kept at the bottom and are seldom used.



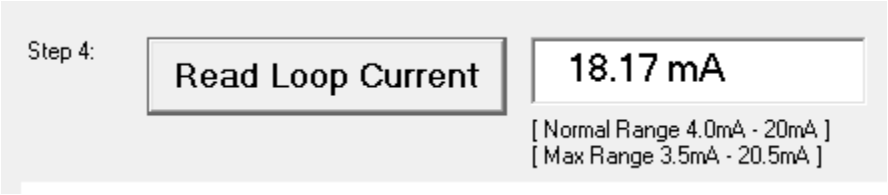
Step 1 With the CalMate connected to the computer's USB port start the .EXE file, version 4.1, Click on Find CalMate. If the CalMate is not found, there is probably a problem with the USB driver. Go to the CD and look under the Dongle Driver folder click on CDM2080setup. Then try again to find the CalMate.



Step 2 Click on Find Unit, a confirmation will be seen on the screen, 'Found unit on ModBus'.

Step 3 Click on Read Unit, a confirmation will be displayed 'Data read from unit.'

Step 4 click on Read Loop Current. The loop current will be displayed as measured across the red and black wires of the CalMate. This measurement can be used on a non-Sigma product as a simple milliamp read out.



CURRENT SETTINGS.

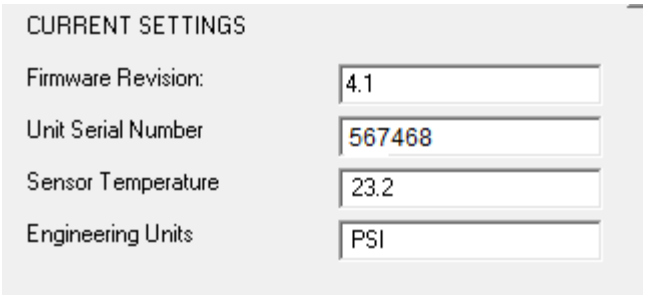
These readings are not adjustable.

Firmware Revision. This is the revision level of the MP processor in the sensor.

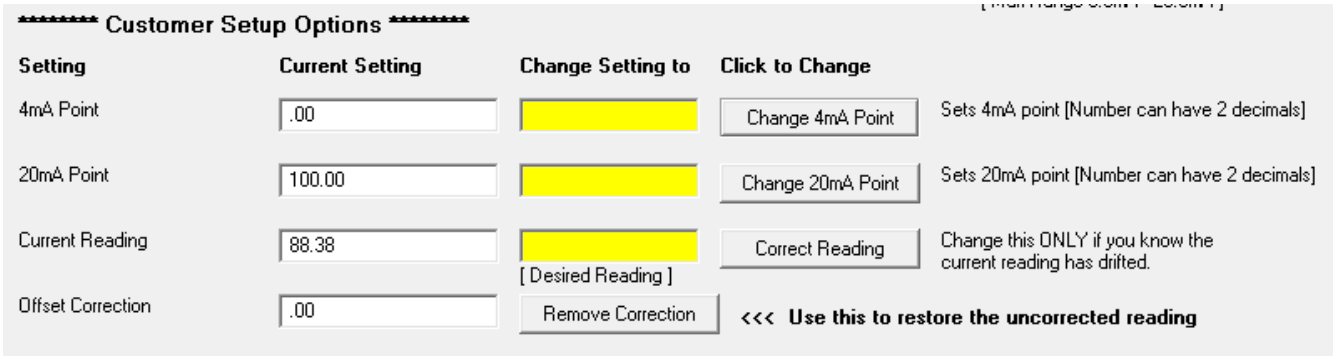
Unit Serial Number. This is the sensors serial number as entered in the factory.

Sensor Temperature. This is the sensors internal temperature reading.

Engineering Units. This is the unit of measurement that was used when the unit was calibrated in the factory this is not adjustable.



3.4 **Customer set up options**.

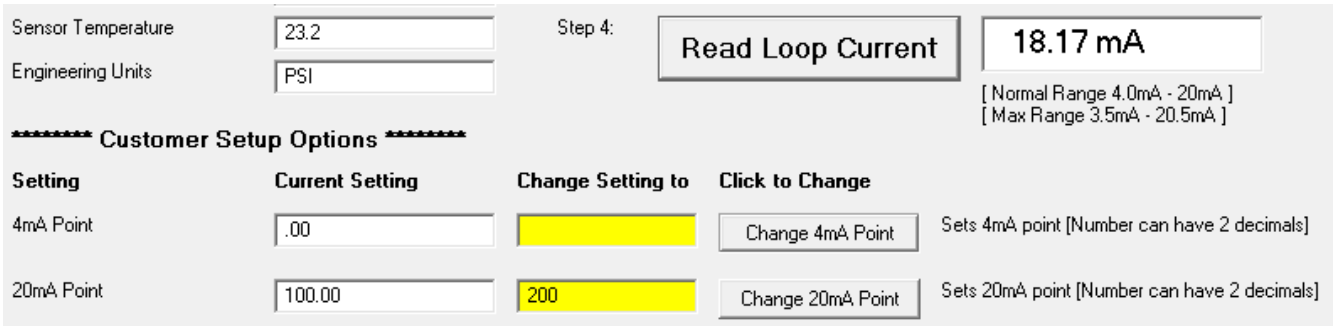


The white fields on the left are read only information obtained from the sensor. The yellow fields in the middle are where you enter values. The buttons on the right are how you enter those values.

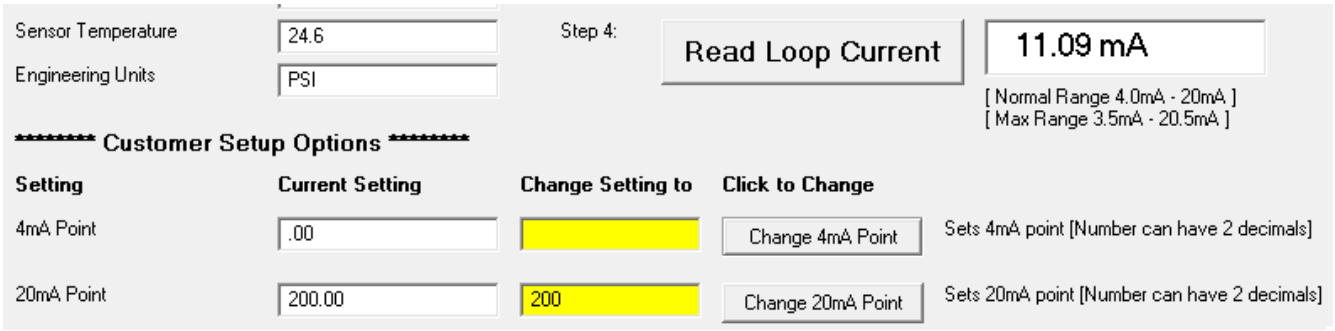
4mA point
This is the value in engineering units, inches, feet, or psi that will equate to 4mA of current on the output.
20mA point
This is the value in engineering units, inches, feet, or psi that will equate to 20mA of current on the output.

Current Reading.
This is not a reading of milliamps. This is the present reading from the sensor in engineering units.
Offset Correction.
This is a display showing any corrective measures that have been taken since the unit was factory calibrated. It is a good practice to remove this correction using the Remove Correction Button prior to applying a new offset with the Correct Reading Button.

<u>Example one:</u> Changing the range of the sensor.
In this example we have a sensor range from 0 to 100 psi. We wish to change its range 0 to 200 psi. We enter 200 in the 20mA yellow field. And we press the change 20mA button.

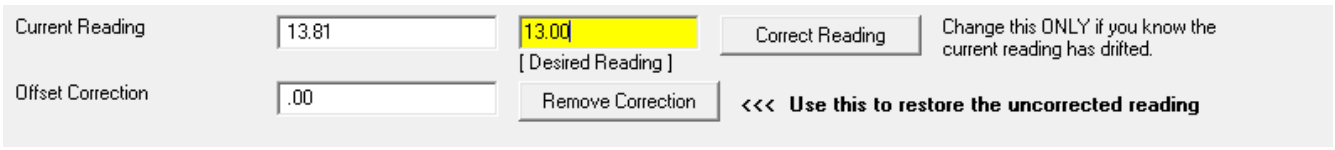


Press the Read Loop Current button or the Read Unit button to refresh the readings. You can see that the milliamps have dropped to half of the original value.

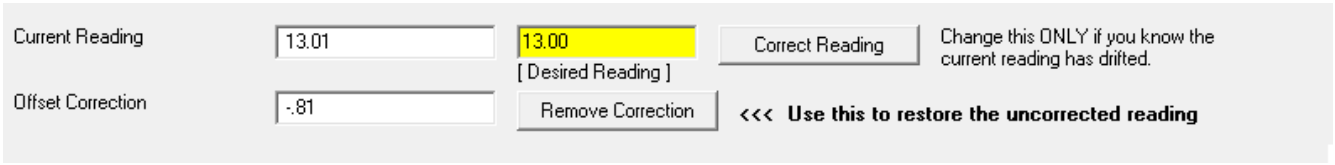


Example 2: Offset Correction

After a sensor has been in the field for a number of years, drifting can occur. If the actual reading is known or you desire to offset the current reading to a different value, this function is very useful.

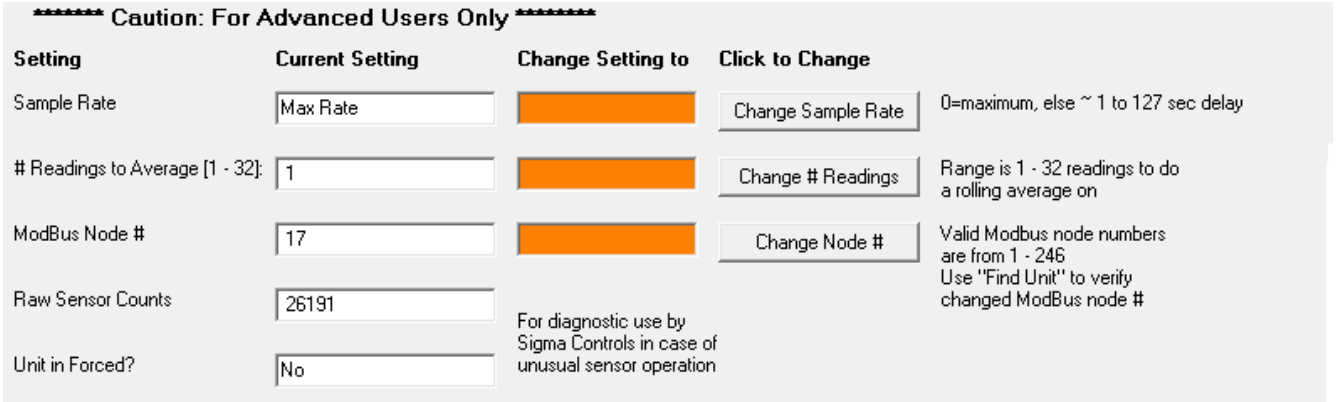


In this example the Current Reading is 13.81 we desire to have the reading at 13.00 as measured with a gauge. Enter 13.00 in the yellow field and press Correct Reading. Notice that the Offset Correction has changed to -.81 and the current reading has change to 13.01.



3.5 **Advanced Users Section.**

The settings should not need to be changed in most cases. But these adjustments may come in handy in some cases. The white fields on the left are read only. The orange fields in the middle are for data entry. The buttons on the right are action buttons that enter the data from the orange fields.



Sample Rate.
The sensor has an averaging function built inside to slow rapidly changing readings or to compensate for electrical noise. The sample rate sets how often a sample will be taken.
Readings to Average.
The averaging function has a number of readings that can be taken, from 1 to 32 readings. This can be set along with the sample rate, to mold a custom averager.
ModBus® Node.

Multiple ModBus® slaves can be put on to the same network. The way to address each slave is to give it a unique Node number. The MP sensor's default Node is 5.
Raw sensor counts.
This is used by Sigma controls to help diagnose the health of the sensing element.
Unit in Forced.
It is possible to force a sensor into a manual output mode. This Field assures that it is not in a fixed output mode.

Example 3: Changing the ModBus® Node.
The current ModBus® Node is 17. We enter a 5 in the orange field and press the button. Then press Read Unit or Read Loop Current buttons to refresh the node number. This changes our unit ID back to the default node of five.

To disconnect, simply click on the EXIT button.

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