



**DENSITY METER AND TRANSMITTER (DMAT)
OPERATION MANUAL**

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Date of original publication: September 2008

Revision	Date	Description
1		
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About this Manual

This manual is not a textbook on mechanics, electronics, or hydraulics. Sufficient descriptive material and illustrations are included to enable the operator to understand the basic construction and theory of operation of this equipment. The intent of this manual is to guide the operators and maintenance personnel in the proper use of the equipment. This manual is not a substitute for properly trained personnel or common sense.

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Please read through this manual in its entirety before attempting to operate the equipment. Supreme Electrical Services, Inc. assumes no liability for failure to do so.

All information in this manual is based on the latest production information available at the time of publication.

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Density Meter and Transmitter

Overview

The Supreme Electrical Density Meter and Transmitter (DMAT) is capable of displaying Slurry densities and two calculated concentrations. The DMAT has 2 analog outputs (0-16 mA) and a text stream output via Ethernet. The DMAT uses the same connector set and pin out as the TN display for easy integration. The DMAT system allows user to easily calibrate detectors “on the fly” reducing field repairs and job problems.

The DMAT is an embedded microprocessor-based system with a touch screen operator interface that can be mounted in a panel or handle rail via vesa mount. The display is a touch sensitive 8.4” direct sunlight viewable display.

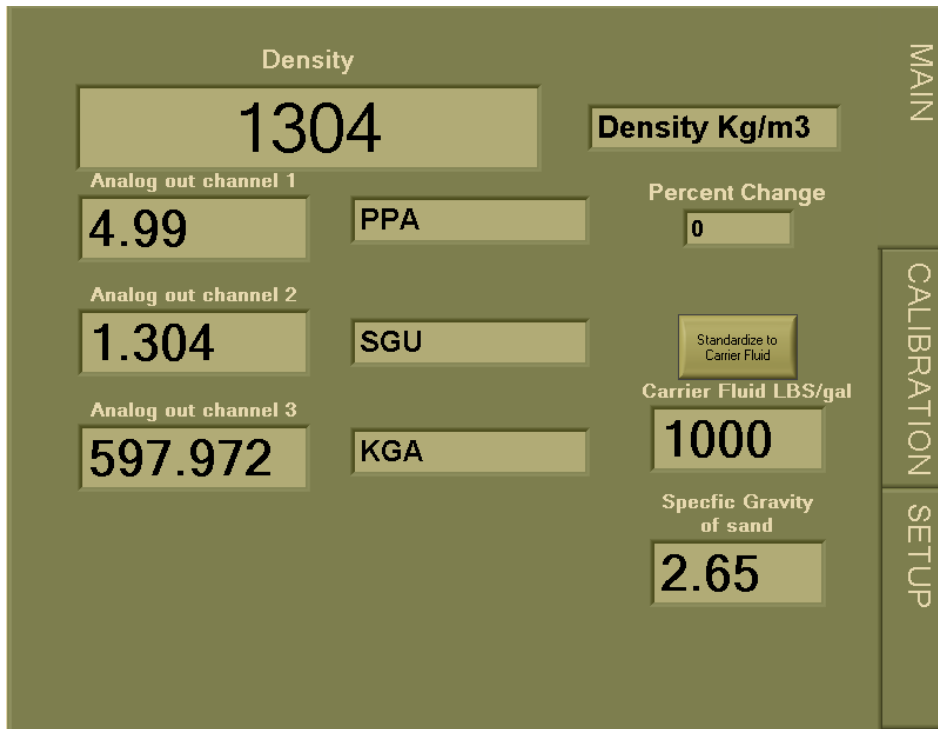


Figure 1 - Main Screen

Display Features

- Percentile change
- Push Button fluid Standardization
- Ten step calibration (Analog outputs)
- Change units of measure “on the fly”
- Two step push button detector calibration

Density Meter and Transmitter- Overview

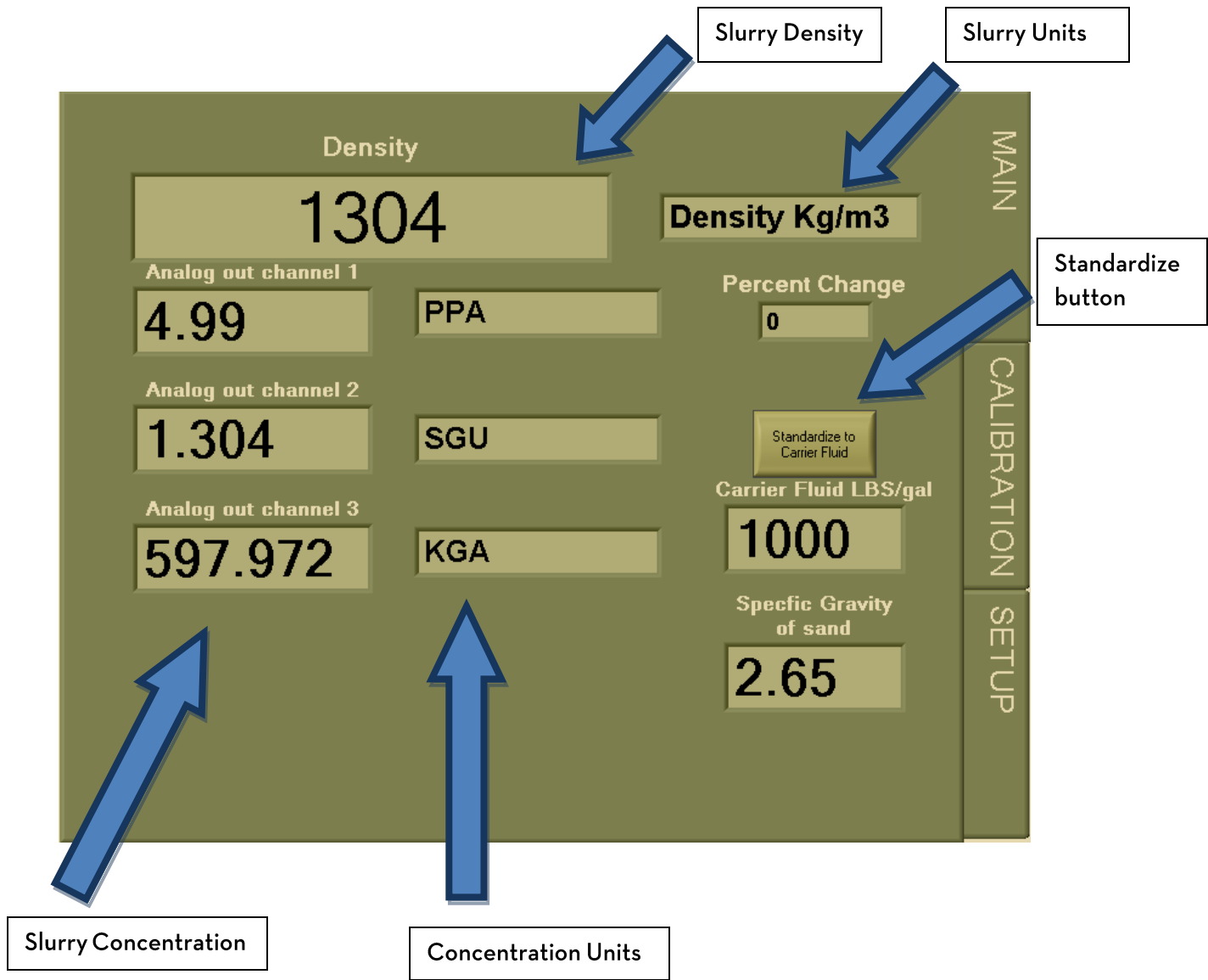


Figure 2 - Density Meter - Overview

Density Meter and Transmitter- Overview

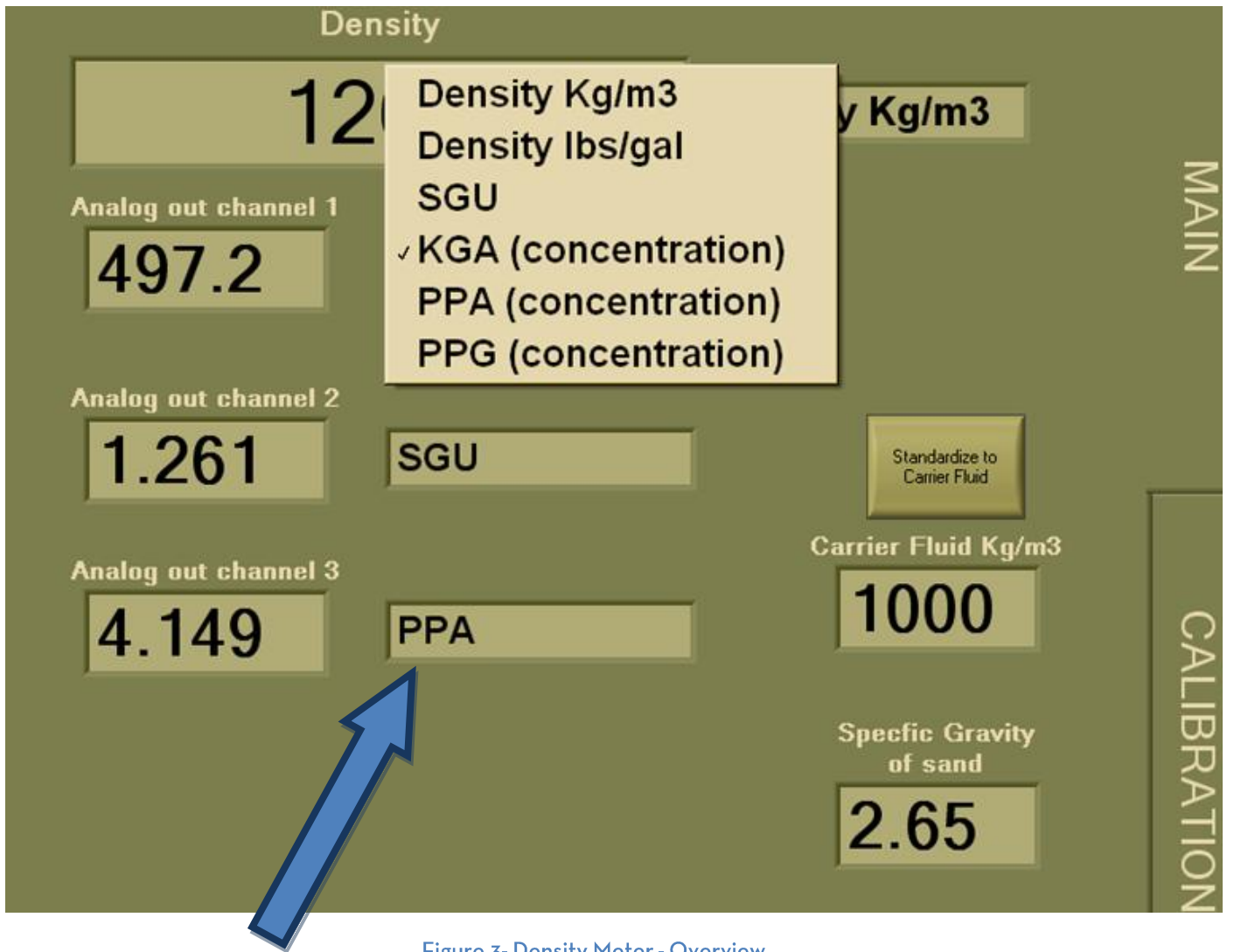


Figure 3- Density Meter - Overview

Touch inside the analog out unit's box to change the units

Calibrating to a detector:

- 1.) Ensure that there is no fluid in the detectors pipe
- 2.) Once the voltage has stabilized press the “Cal to empty pipe “ button
- 3.) Fill the detector line with water wait for the voltage to stabilize
- 4.) Press the “Standardize to H2O” button
- 5.) Calibration complete! You may want to record the Vempty and Vwater values for future reference.

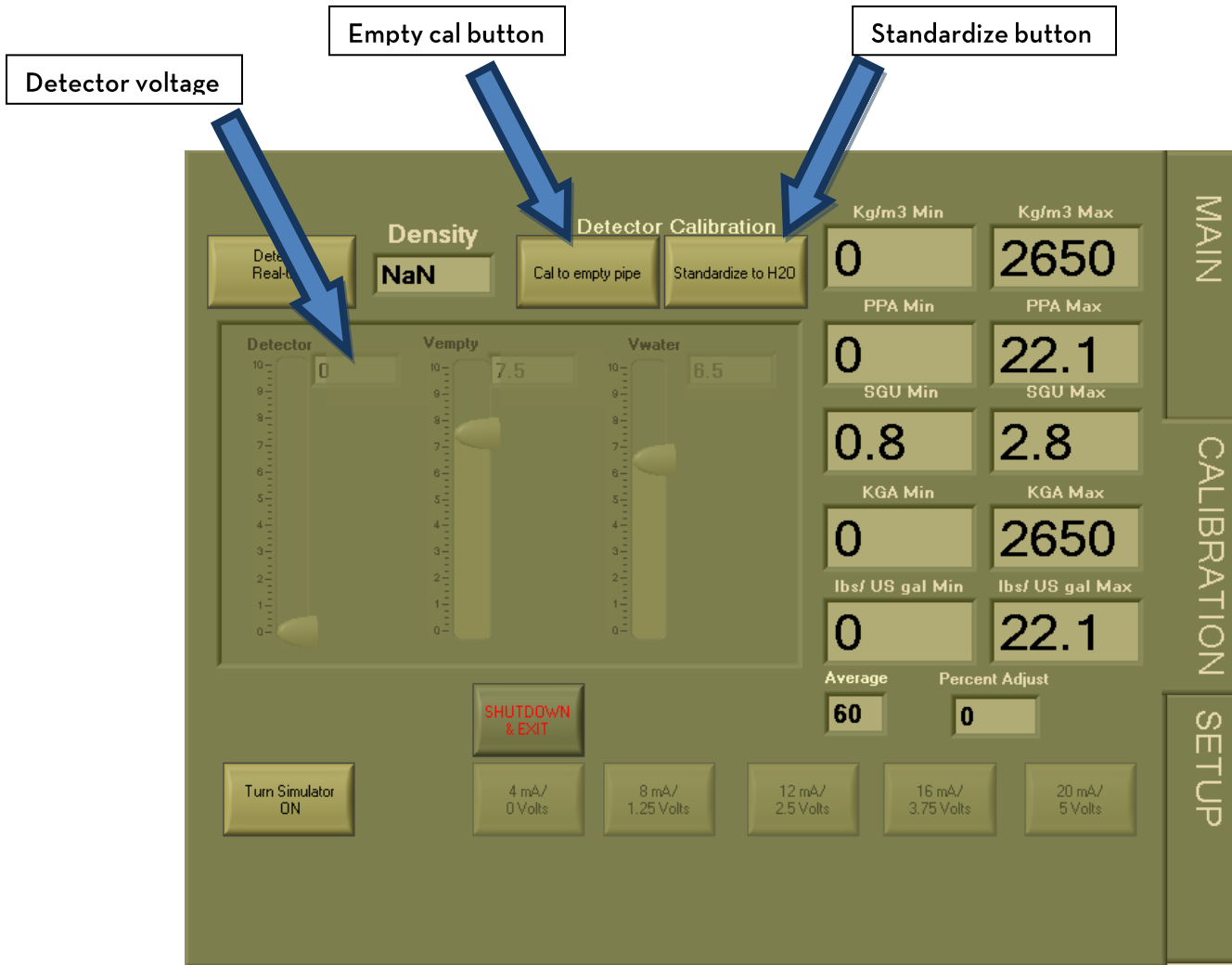


Figure 4 -Calibration Screen

Touch which range you want change and enter in the new value

The interface displays the following data:

Density	
Detector Real-time	NaN

Detector Calibration	
Cal to empty pipe	Standardize to H2O

Detector	Vempty	Vwater
0	7.5	6.5

Range Settings	
Kg/m3 Min	Kg/m3 Max
0	2650
PPA Min	PPA Max
0	22.1
SGU Min	SGU Max
0.8	2.8
KGA Min	KGA Max
0	2650
lbs/ US gal Min	lbs/ US gal Max
0	22.1

Average	Percent Adjust
60	0

MAIN
CALIBRATION
SETUP

SHUTDOWN & EXIT

Turn Simulator ON

4 mA/ 0 Volts 8 mA/ 1.25 Volts 12 mA/ 2.5 Volts 16 mA/ 3.75 Volts

To adjust the percent touch inside the box and enter in the percent you want

Figure 5 - Range Setting

Forcing Analog outs

The screenshot shows a control panel interface with several sections:

- Density:** Simulating Detector Voltage, Density 1303.75
- Detector Calibration:** Cal to empty pipe, Standardize to H2O
- Detector Calibration Values:** Kg/m3 Min (0), Kg/m3 Max (2650), PPA Min (0), PPA Max (22.1), SGU Min (0), SGU Max (22.1), KGA Min (0.8), KGA Max (2.8), lbs/ US gal Min (0), lbs/ US gal Max (22.1)
- Detector Readings:** Detector (6.25), Vempty (7.5), Vwater (6.5)
- Control Buttons:** Turn Simulator OFF, SHUTDOWN & EXIT, 4 mA/ 0 Volts, 8 mA/ 1.25 Volts, 12 mA/ 2.5 Volts, 16 mA/ 3.75 Volts, 20 mA/ 5 Volts
- Other Settings:** Average (60), Percent Adjust (0)

Annotations with blue arrows point to the 'Turn Simulator OFF' button and the output selection buttons. A text box at the bottom left says: "To simulate outputs first press 'Turn Simulator ON' button". A text box at the bottom center says: "Choose which value you want".

Figure 63 - Forcing Analog outs

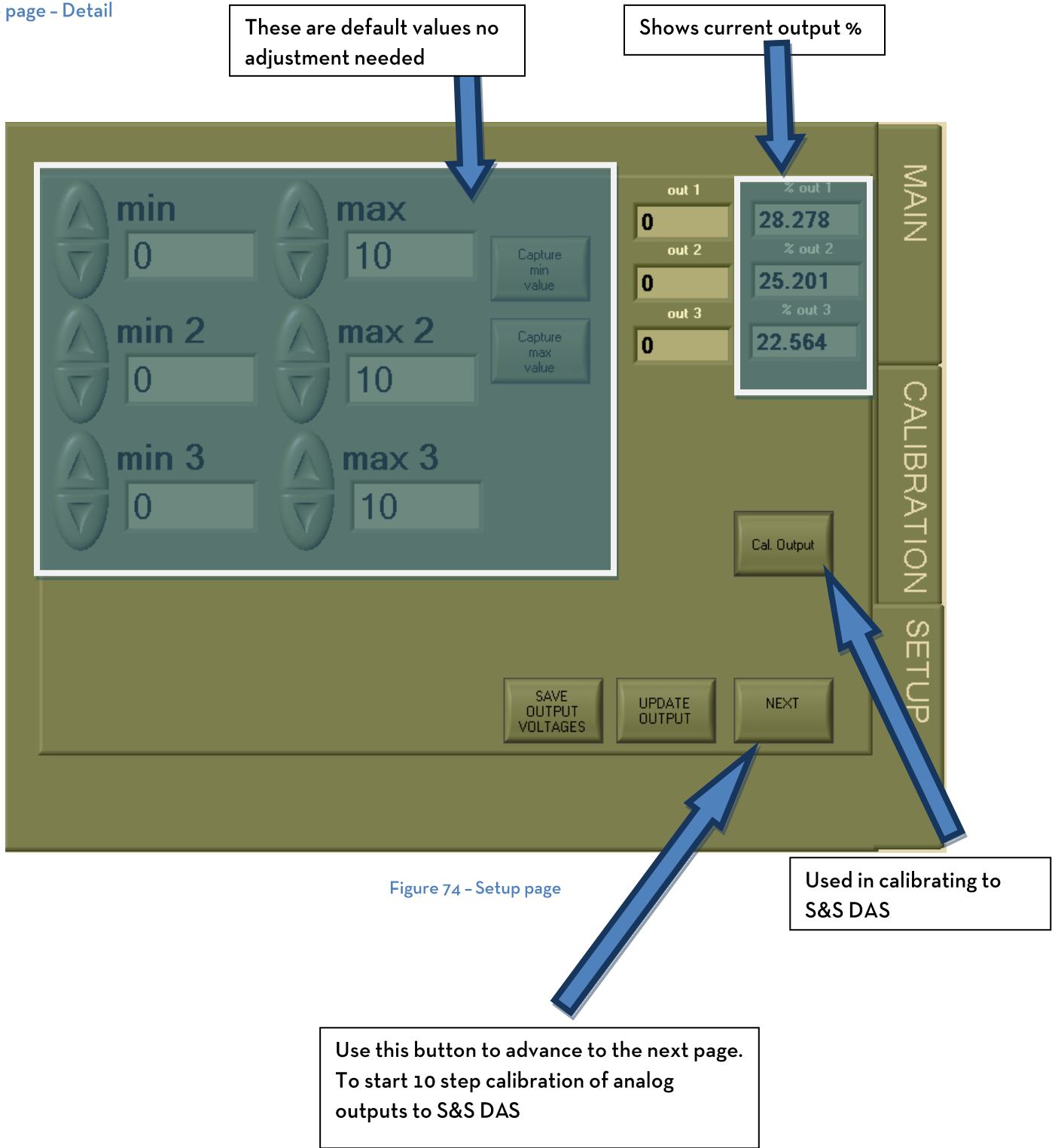


Figure 74 - Setup page

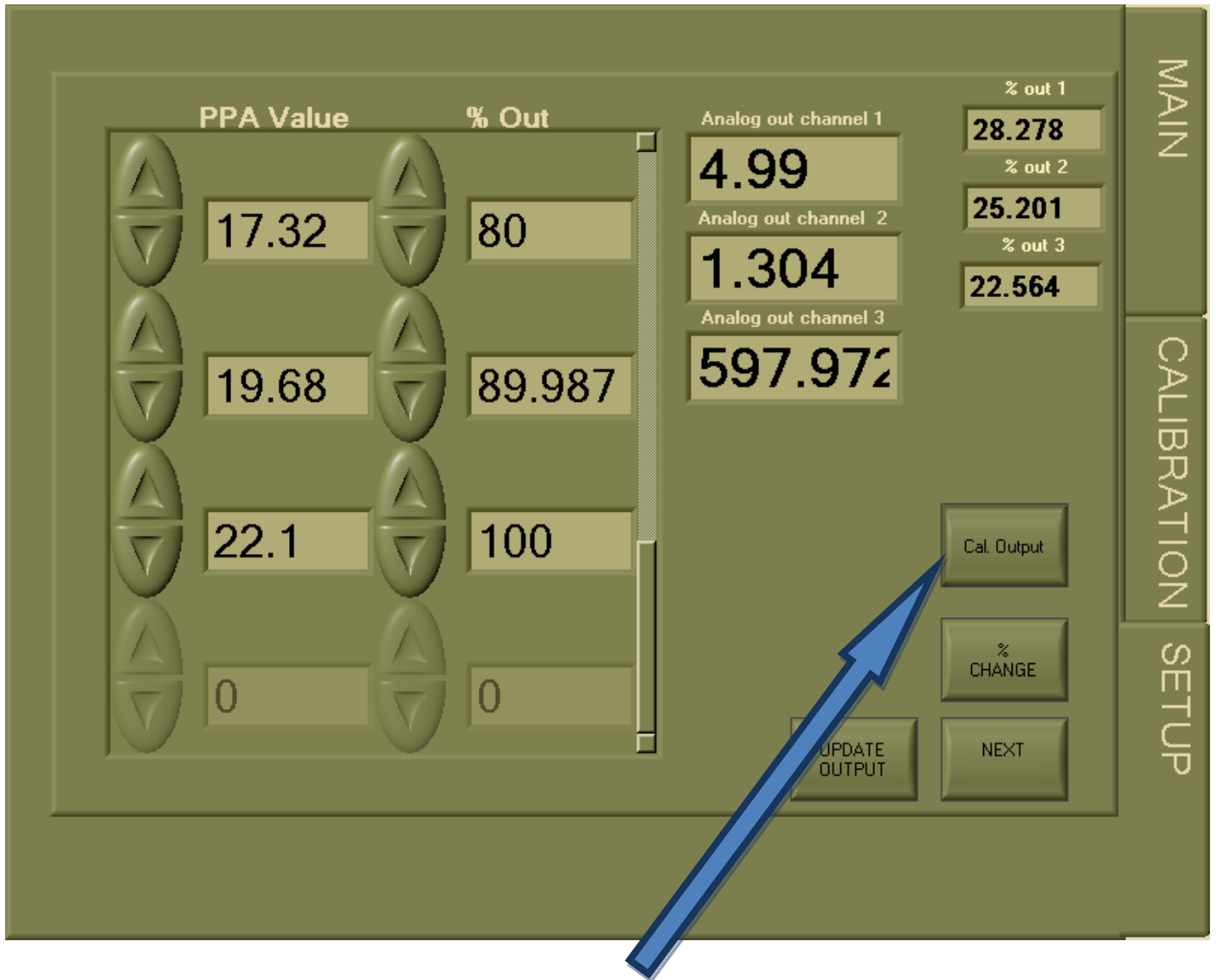


Figure 8 - Calibrating Outputs

Start by pressing the Cal Output button

Connect up the analog outputs to the DAS you wish to calibrate.

Calibrating output - Setting up

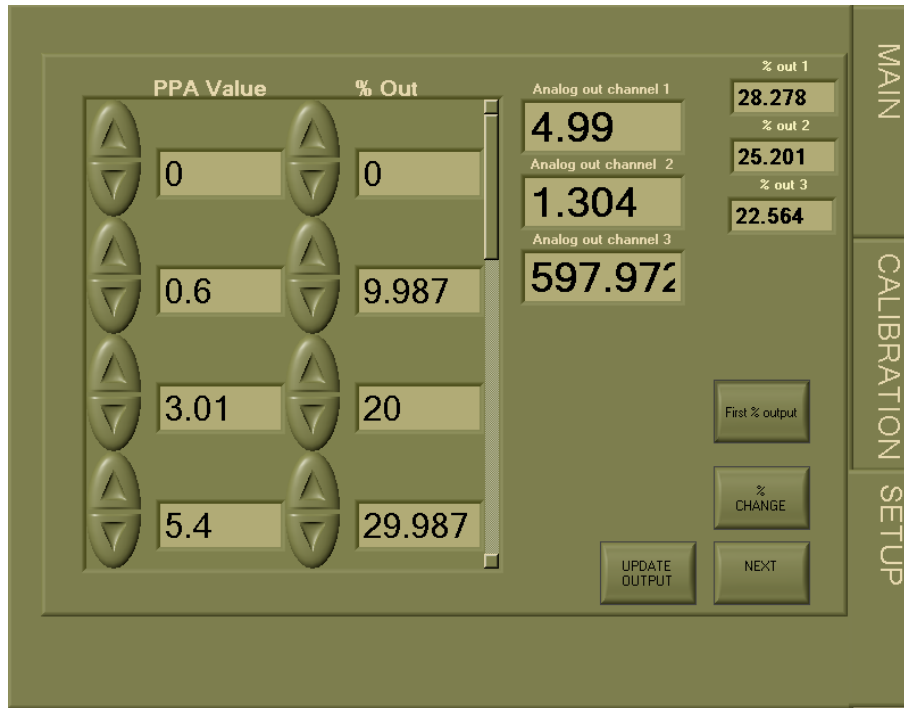
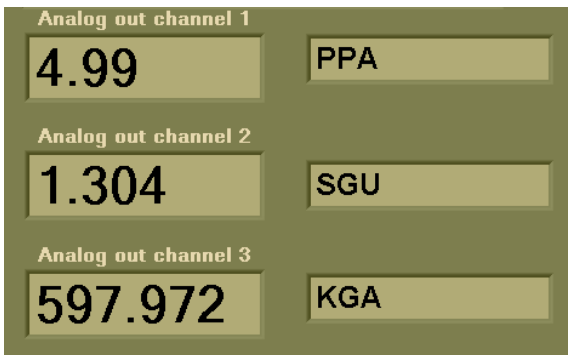


Figure 95 - Calibrating outputs - First % output

You need to know what units you want to calibrate to and on which output you are transmitting on.

You set the unit's out on the main screen:



Use the TAB Menu to get back to the setup page.

Calibrating output - Step One

Press the “First % output” button and the “% out 1 and 2 and 3” will change to match the second row of the table for that unit.

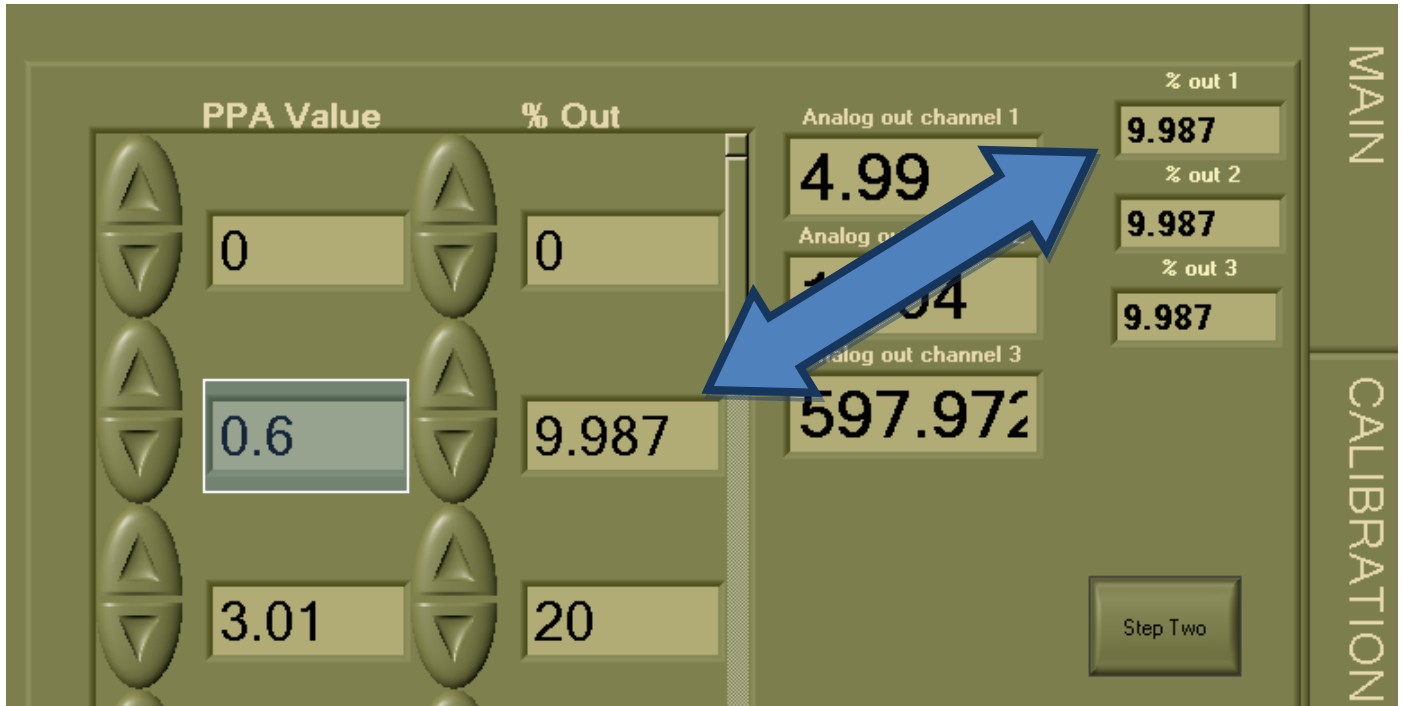


Figure 106 - First step in Calibration

Step 2:

You now should have a value displayed on your remote DAS that corresponds to the percent out

Now enter that value into the “PPA value” which matches the percent being sent out

(Touch inside the display window and use the arrows to change the value)

Calibrating output - Step Two

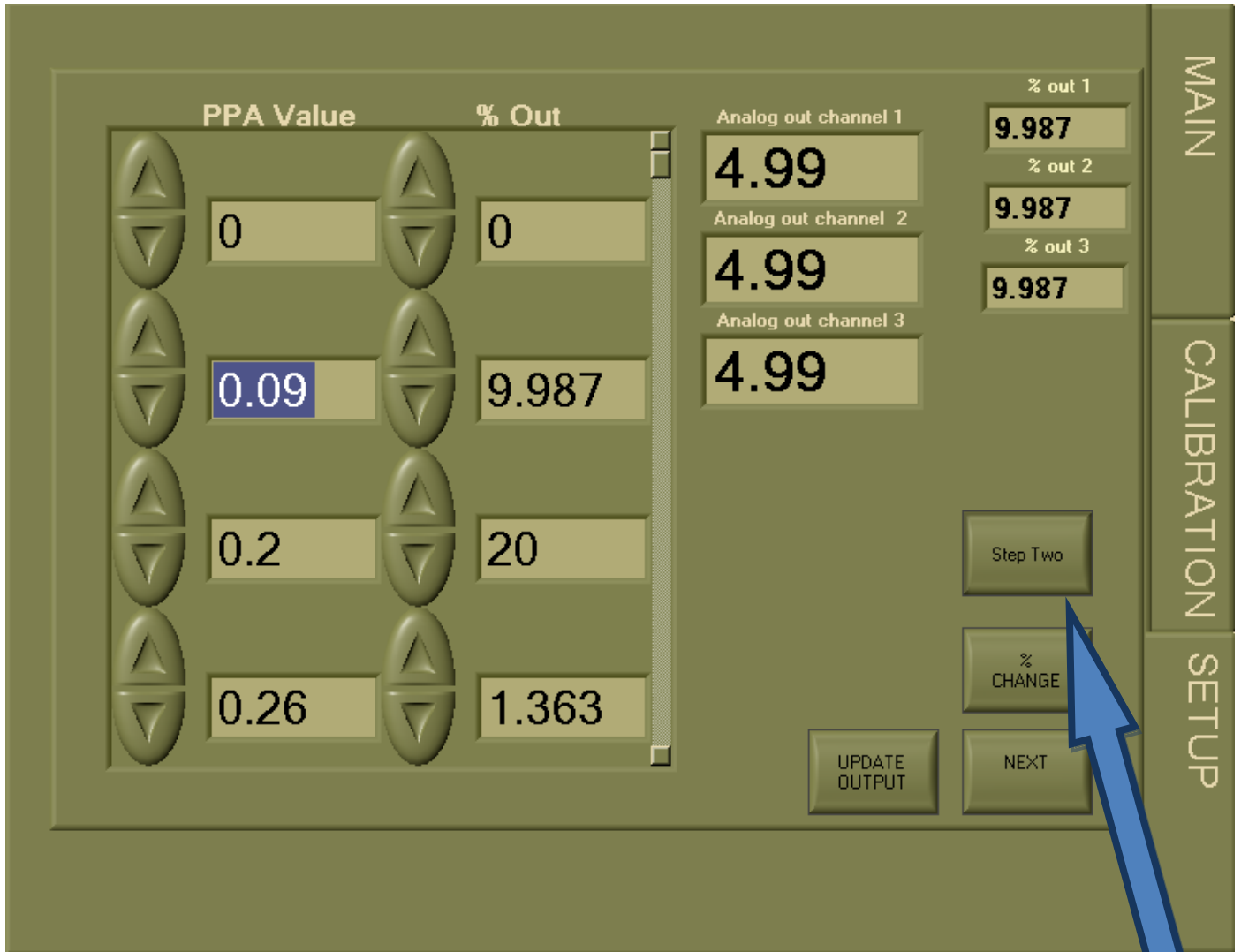


Figure 11 - Step two in Calibration

Press Step two buttons to advance to the next step

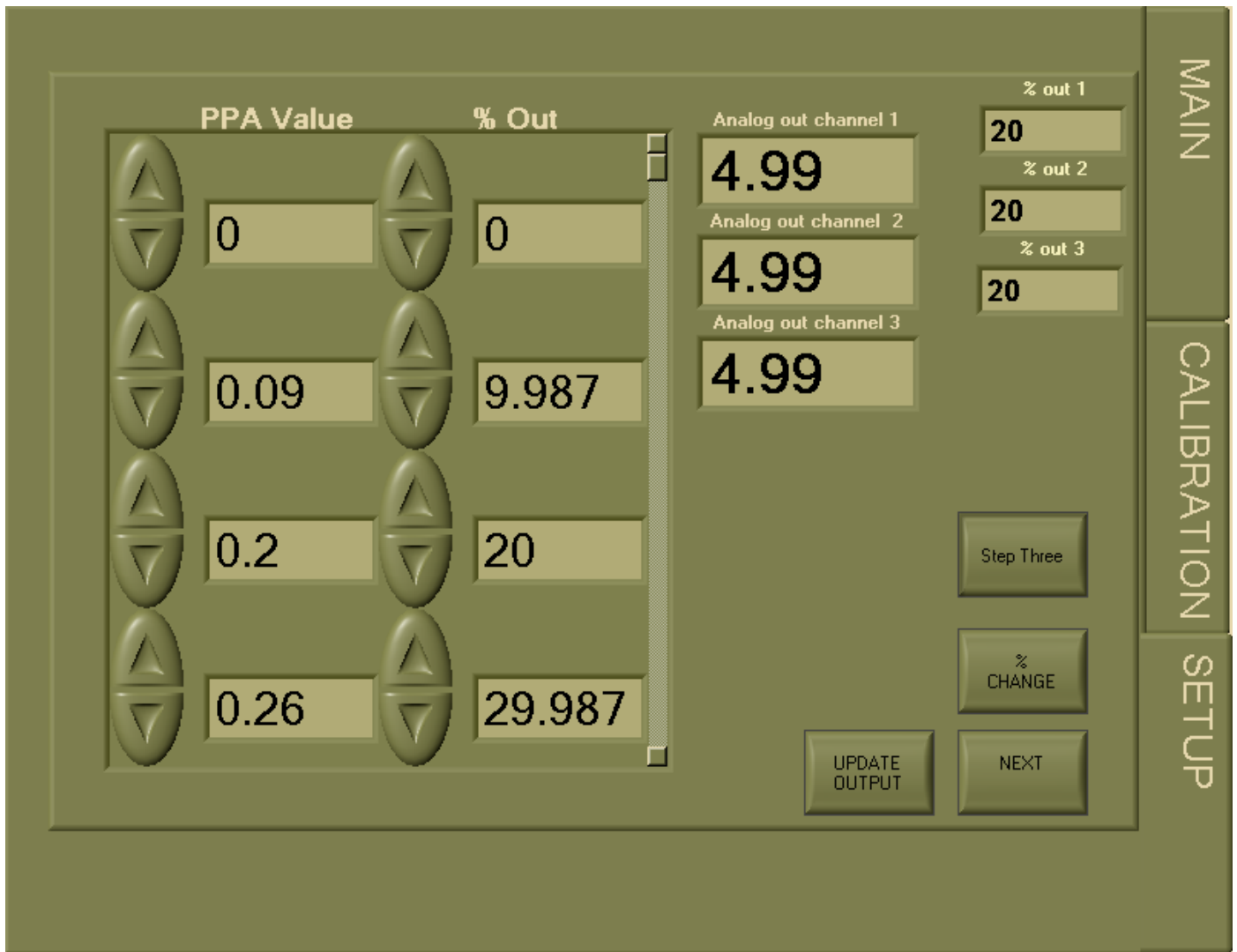
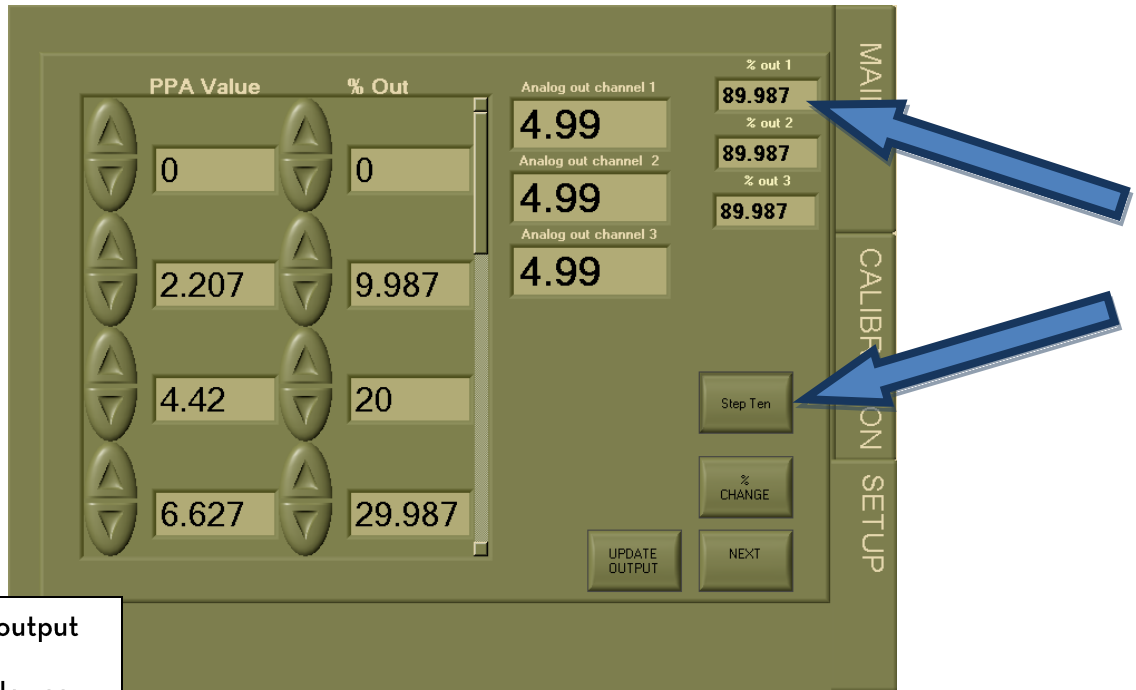


Figure 7 - Step two in Calibration -continued

Notice the “% out” box changes to the next increment in the table. Enter in the new value for this percent out in the table and then go to the next step and repeat

Calibrating output - Finishing Up



Step ten releases the output
To calibrate to full scale use
the simulate outputs in the
calibration" TAB"

Figure 8 Step Ten

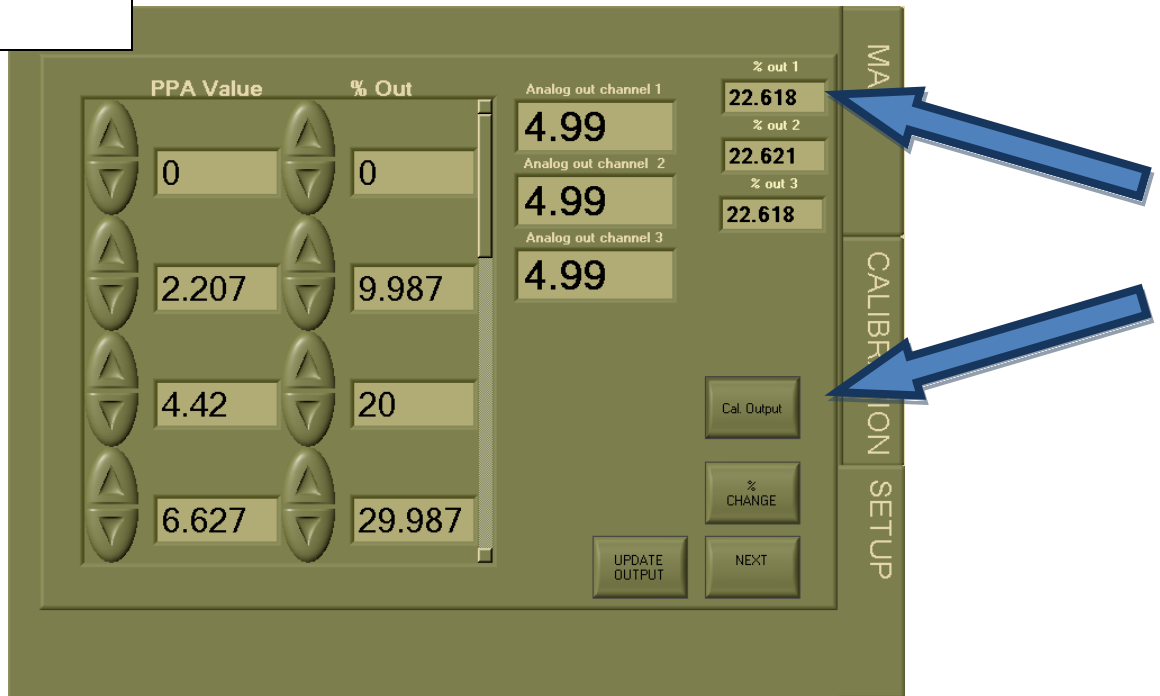


Figure 13 Step Ten - continued

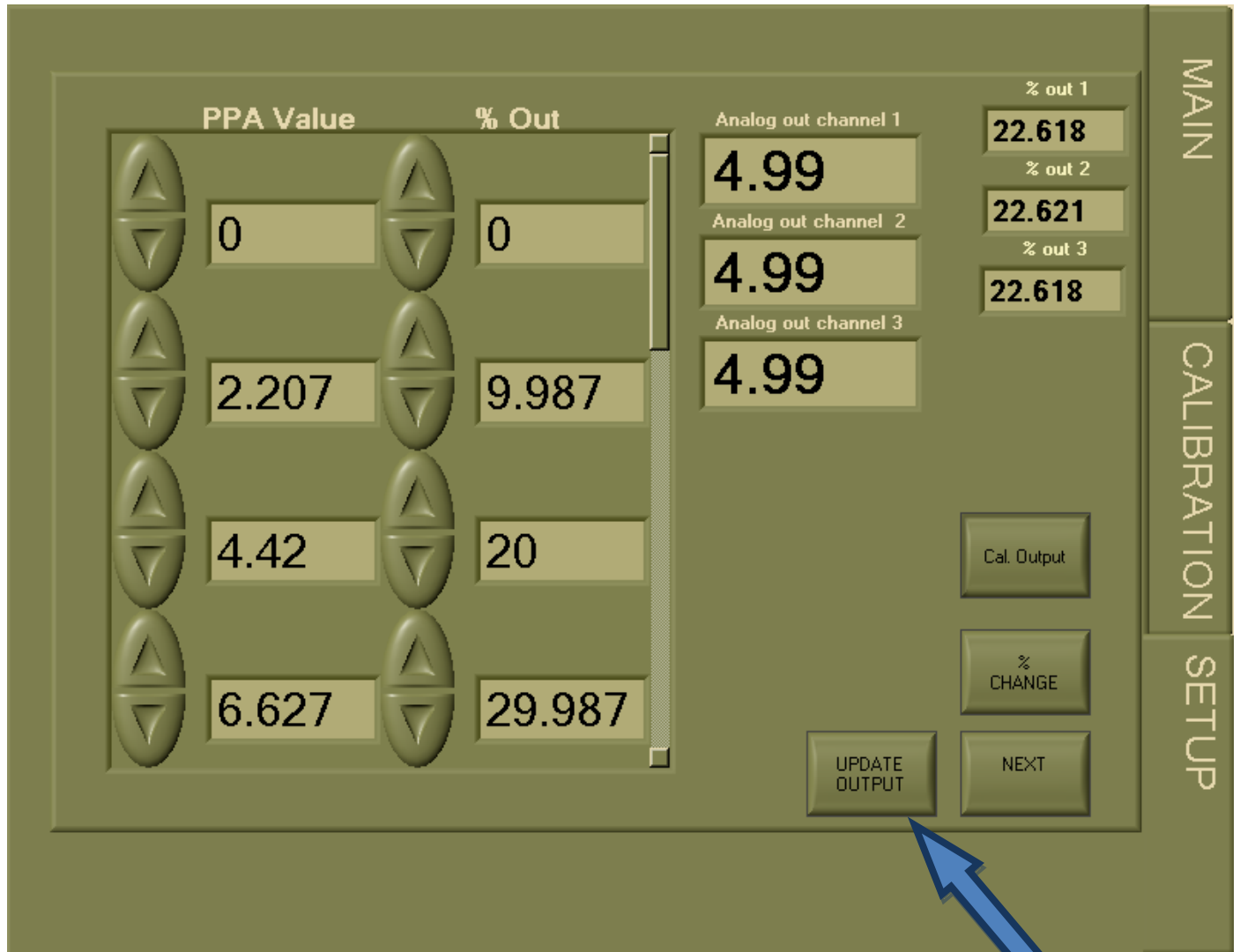


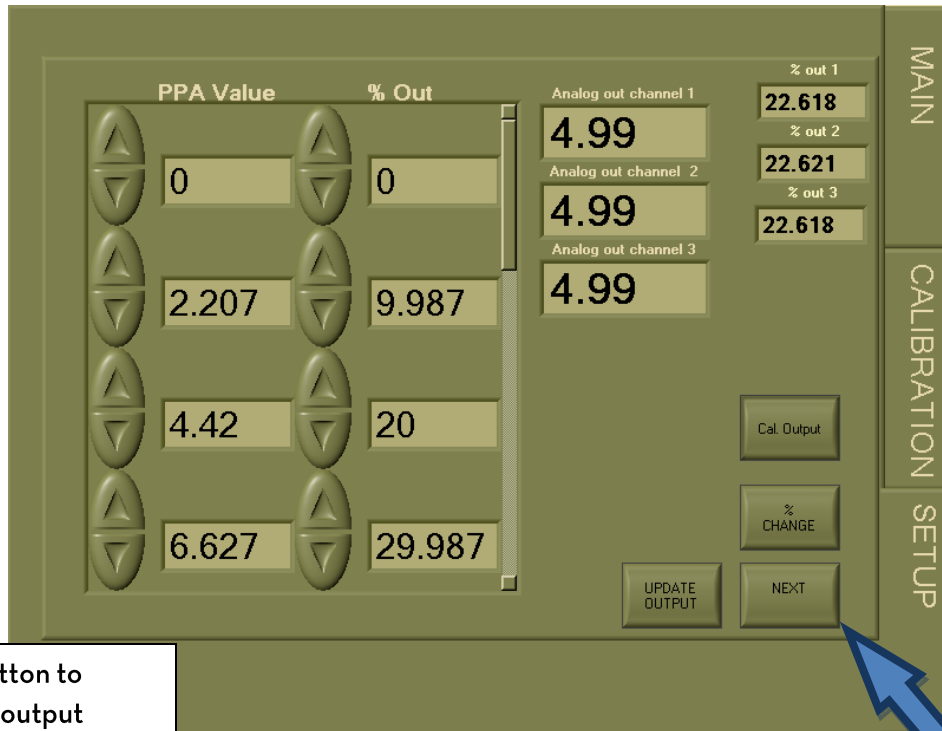
Figure 14 - Calibration - Saving

Last step:

Save the calibration by pressing the "UPDATE OUTPUT" button

If you forget to do this step your calibration will not be saved on exit

Calibrating output - Setting Up Other Outputs



Use the "NEXT" button to advance to the next output

To calibrate other outputs repeat the same steps.

Figure 15 - Calibration - Next outputs

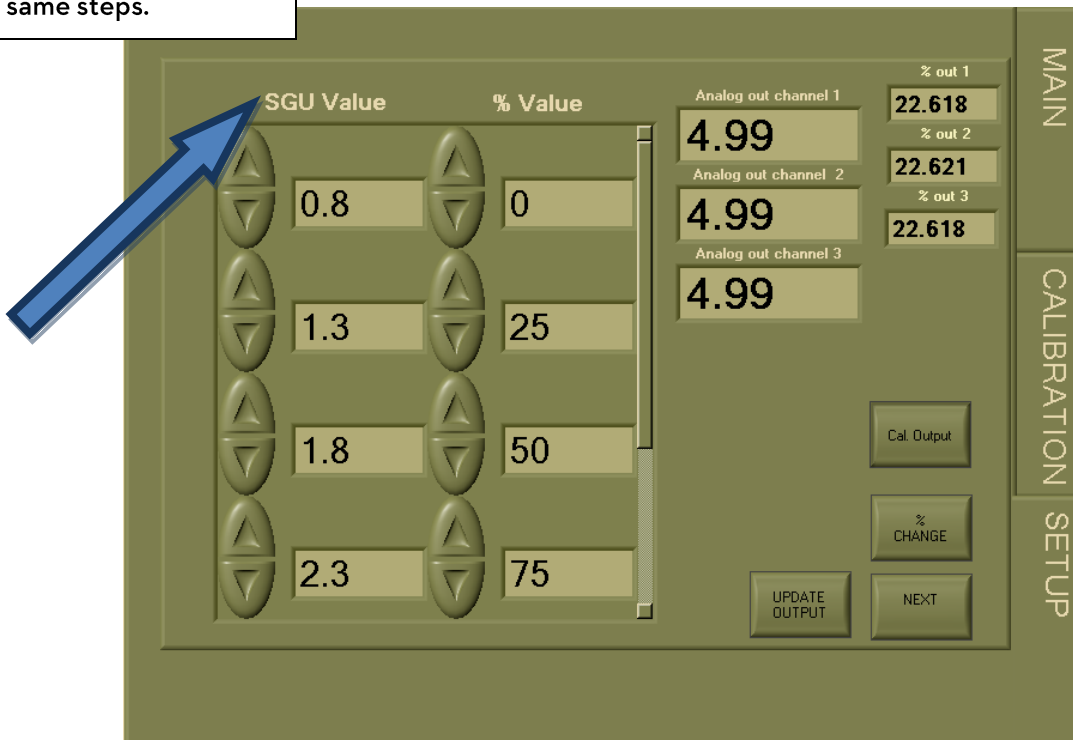


Figure 16 - Calibration - Next outputs continued

