AMSVU User Manual

Accumulator Management Verification Unit

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Overview

The purpose of the AMSVU is to simplify the programming and verification procedure. The system is capable of detecting the address of an unknown board, setting a new the address, setting the voltage calibration factors, setting the serial number, and running a board through a predefined test procedure.

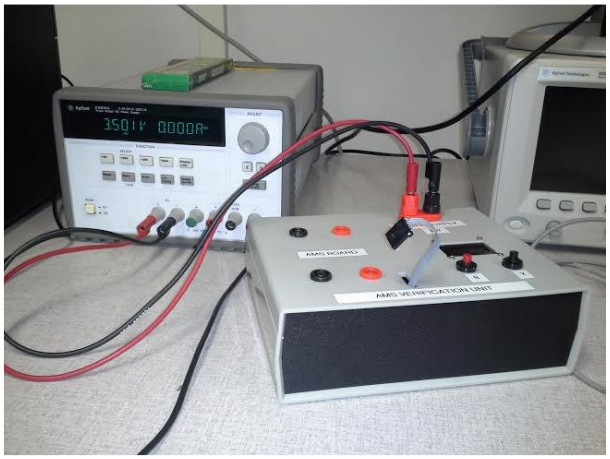
AMS Board Commands

COMMAND	ENUM	DESCRIPTION
RESET_BY	0x00	Clear bypass mode, and reset the bypass timer.
SET_BY	0x01	Place device in bypass mode, and reset the bypass timer.
PANIC	0x02	Rapidly blink LED at a period of ¼ second.
RELAX	0x03	Exit panic mode, the ACT led will stop blinking
SET_ADDR	0x04	Set device I2C address
SET_BYTIME	0x05	Set the bypass timer value (Period = ¼ * (timer value) seconds)
SET_V_CAL	0x06	Set the voltage calibration factors
SET_SERIAL	0x07	Set the serial number for the AMS board
CHANGE_READ_TYPE	0x30	Change what info will be sent from the AMS on the next read

See the readme located at https://bitbucket.org/ece492fall2016/ams for more details about the commands.

AMS Board Verification

STEP 1)

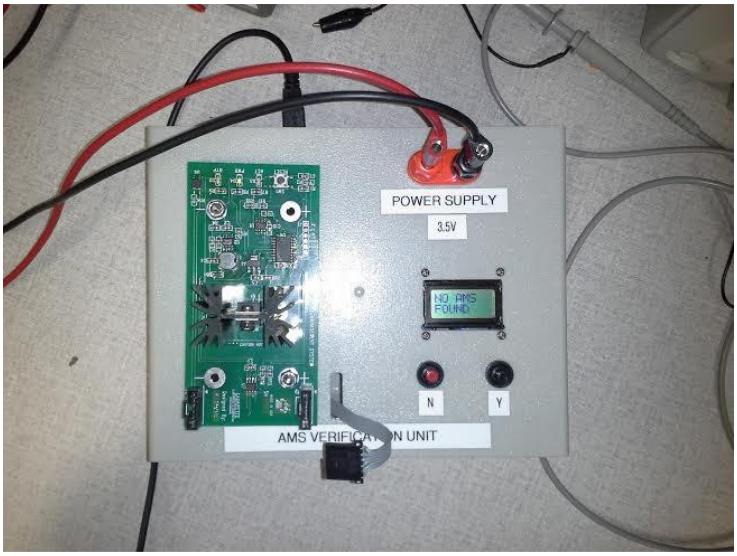


The AMSVU must be supplied with power from a bench top power supply. The recommended voltage and current limits are 3.5V and 3.00A respectively.

STEP 2)

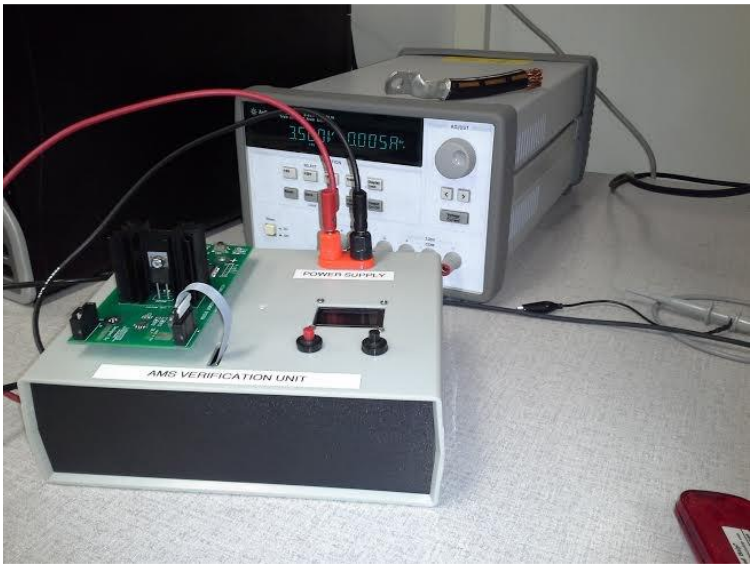
The Arduino microcontroller found within the AMSVU must be powered from either a USB port, or DC jack. Ensure power is applied to one of these sources before continuing.

STEP 3)



Place an AMS board into the banana jacks of the AMSVU. Ensure that the positive and negative terminals of the AMS are connected properly. The Molex SL connectors on the AMS board should be on the side closest to the operator. Connect the I2C connector to the AMS board as shown above.

STEP 4)



Connect the I2C connector to the AMS board as shown above.

STEP 5)

You should now see the text “AMS 0x__ VERIFY?” displayed on the lcd screen, and the ACT led blinking rapidly. The address displayed on the screen corresponds to the address of the board currently attached.

If you would like to verify the AMS board, press the “Y” button, and follow the directions on the screen. Answer each question with Y for YES, and N for NO.

- It might be beneficial to calibrate the voltage and set the serial number before testing, to do so see optional steps 8 & 9 below.

STEP 6)

Once the tests are complete, you will be returned to the main screen, which displays “AMS 0x__ VERIFY?” You can either run tests again by pressing the Y button, or by pressing the N button you can change the address of the board or set the calibration factors.

OPTIONAL STEP 7)

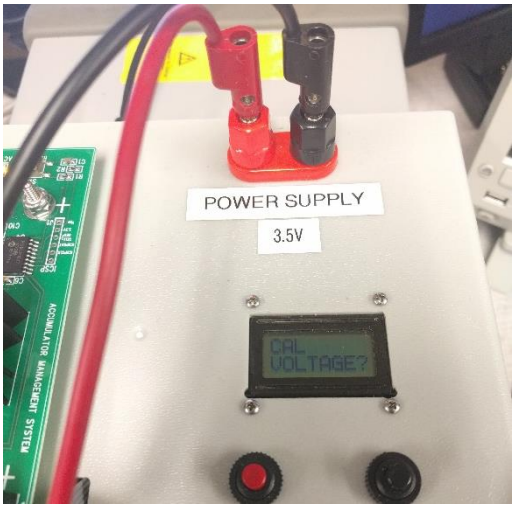
To change the address of the AMS board, press the Y button when the screen shows “CHANGE ADDR?”.

This will cause a new screen to appear displaying “SET ADDR NEW 0x__”

Pressing the N button will increment the address value
Pressing the Y button will write the address to the board

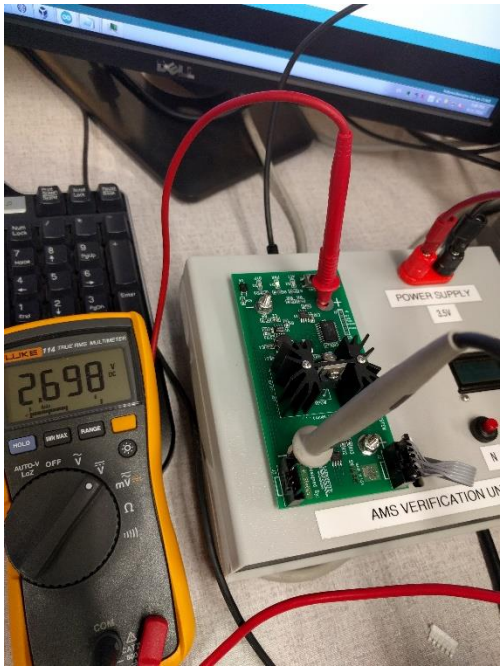
Once the operation is complete you should see the new address on the main screen.

OPTIONAL STEP 8)



To calibrate the voltage hit N twice from the “AMS 0x__ VERIFY?” menu option. You should see “CAL VOLTAGE?” Hit Y to begin the calibration process or hit N to return to the first menu option.

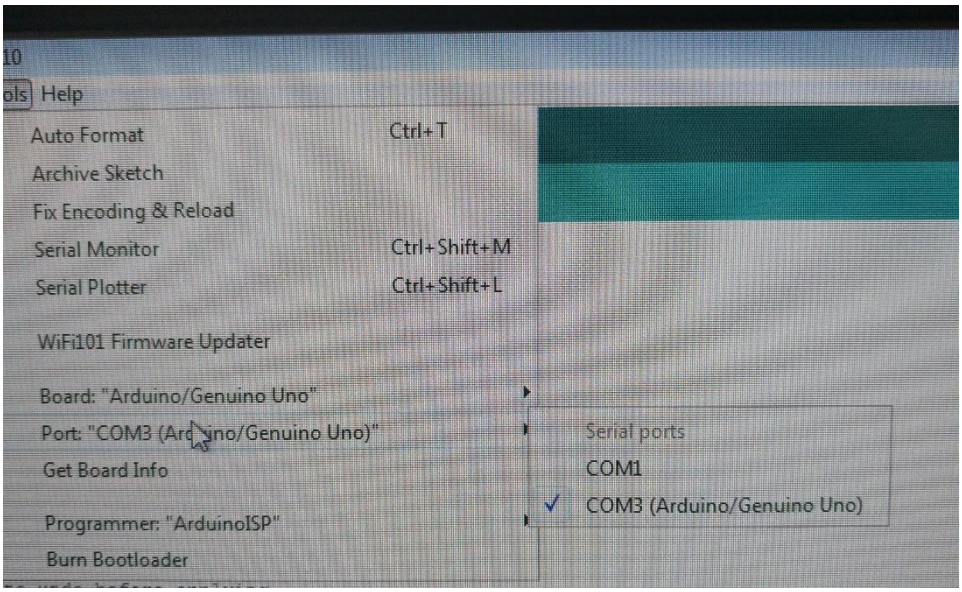
If you hit yes the unit will prompt you to set the voltage to 2.7 V. Connect a Fluke or another voltage measurement device to make sure the power supply is outputting 2.7 V as shown in the picture below.



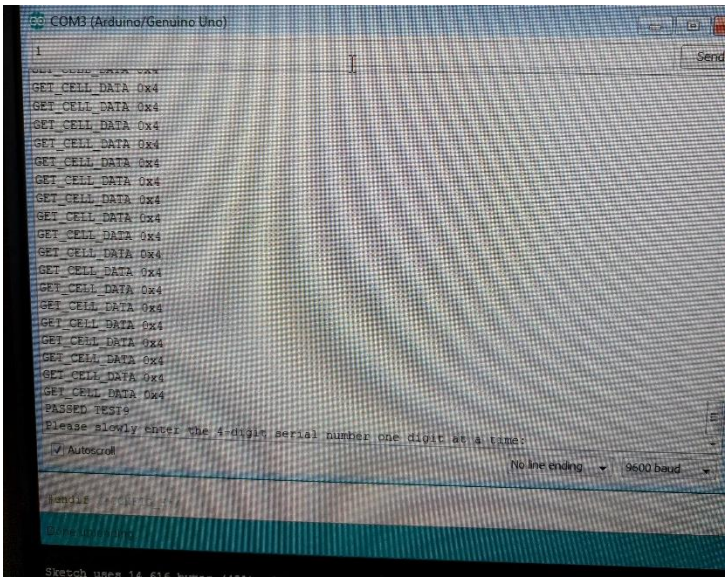
Once you have the power supply set to 2.7 V hit Y. The unit should now prompt you to set the voltage supply to 3.7 V. Follow the same procedure as before to set the power supply to 3.7 V. Then hit the Y button, the verification unit should display “CAL COMPLETE”. test the device and verify that the calibrated voltage in the final test (test 9) is correct.

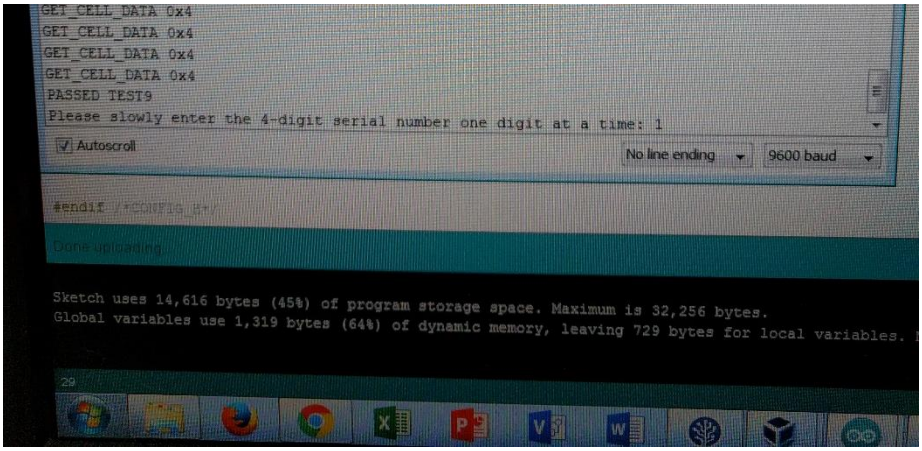
OPTIONAL STEP 9)

To set the serial number for the AMS board you must have the Arduino IDE open and connected to the AMS Verification Unit. Also the serial can only be changed from the first menu option “AMS 0x__ VERIFY?” If you are not already at that menu option press the N button until it is displayed. From the IDE hit Tools > Port (Arduino/Genuino Uno) should be checked. If it is not displayed disconnect then reconnect the USB cord/power cord from the back of the unit.



Open the Serial Monitor (Tools > Serial Monitor or Ctrl + Shift + M). Make sure the Serial Monitor is set to No Line Encoding and 9600 baud. Type “SERIAL” and hit send. The monitor should display “Please slowly enter the 4-digit serial number one digit at a time:” Enter the first digit of the serial number displayed on the AMS board (by the J2 connector) and hit send. Wait until the digit you entered is displayed before entering the next digit.





Once all 4 digits are entered the serial monitor should display the serial you entered and “SET SERIAL 0x__” Test the device and verify the serial number displayed in test 7 is correct.