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Alamode Manufacturing test plan

Overview

Assumes assembled alamode with Uno bootloader and test code loaded on the Unit Under Test (UUT).
A tester is supplied with a Seeed TFT touch shield to display test results. The tester has a ribbon cable with connector for plugging in to the Alamode UUT, and a USB serial connection to a host computer for logging if necessary.

Functionality to be tested

1. Power on (do the 5V and 3.3V light)
2. RTC functionality
3. SD functionality (requires card insert)
4. Serial communication over the GPIO port
5. I2C Communication between the host (tester or Raspberry Pi) and UUT

Incidentally, general system operation is also tested.

Automated tester

RTC, I2C, SD, GPIO serial and general operation are tested by plugging the Automated test unit into the GPIO connector of the Alamode UUT.

The test unit consists of a Sparkfun Arduino Mega Pro 3.3v, alamode adapter shield (bottom) and SeeedStudio TFT touch screen for test status reporting. The Mega 3.3v platform was selected because:

1. Raspberry Pi GPIO interface requires 3.3v interfaces
2. The extra serial ports allow us to both test the GPIO Uart functionality and report status to a host computer.

The Automated tester can be powered by the included Adafruit FTDI Friend USB-serial adapter configured for 3.3V operation. Some FTDI cables use 5V Vcc and should not be used. Power could theoretically also be applied to the DC in port, but this has not been tested. If the USB cable connected to the FTDI friend is connected to a host computer, status will also be reported via the associated virtual comm port at 9600 baud.

The Alamode Automated tester is programmed with AlamodeTester.ino. Note that programming of the 3.3v 8mhz Arduino Mega Pro requires the installation of a board support package located here: http://dlnmh9ip6v2uc.cloudfront.net/datasheets/Dev/Arduino/Boards/mega-pro-3.3V-v10_.zip

The library for the SeeedStudio TFT shield should also be installed.

The tester is pre-programmed, and this information is provided in case Seeed wishes to enhance the test code. It can be re-programmed via the

Preparation of the Board to be tested

1. The microcontroller should be preprogrammed with the UNO bootloader and the AlamodeTest.ino code. This can be preprogrammed with AlamodeTest.hex
2. Insert formatted fat 16 microsd card into the slot (one is supplied)
3. Plug the board into the test fixture
4. apply power to the USB port of the board to be tested.

Test Sequence

1. Plug the Ribbon cable from the Tester into the Alamode GPIO connector (P1). Pin 1 indicated by the red stripe on the cable should be aligned with the outer corner of the UUT board.
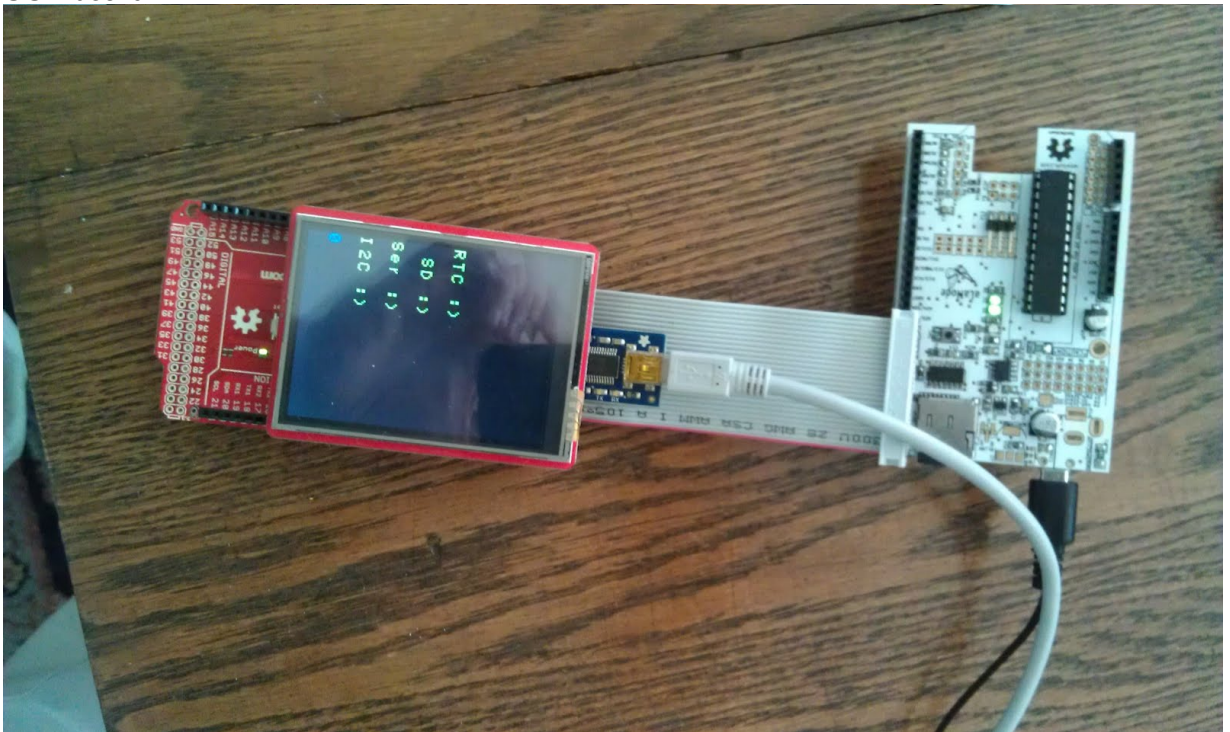
2. Apply power to the USB connector on the UUT.
3. Diodes D1 (5V power indicator) and D2 (3.3V power indicator) should light. Failure of either of these either indicate a power supply problem, or incorrectly installed LEDs
4. In a few seconds all the tests will run and change from Red with a :(frown to Green with a :) smile.
5. If the I2C test fails, then RTC, and SD will also fail because those test results are communicated via I2C. This probably indicates a problem with the Voltage translation chip (U6 - TXS0108), or a general system failure.
6. After the completion of a successful test the USB connector can be unplugged from the UUT, followed by the Ribbon cable, and the next unit tested. Don't forget to transfer the SD card to the next unit.
7. If the SD card isn't properly inserted, the SD test will fail. Reinsert the SD card and then push the reset button on the UUT. This will reinitialize the test code and after a few seconds, the tests should all read green.

Here is a video giving a run through of operation of the automatic tester.

http://www.youtube.com/watch?v=49R9GfPw5Fc