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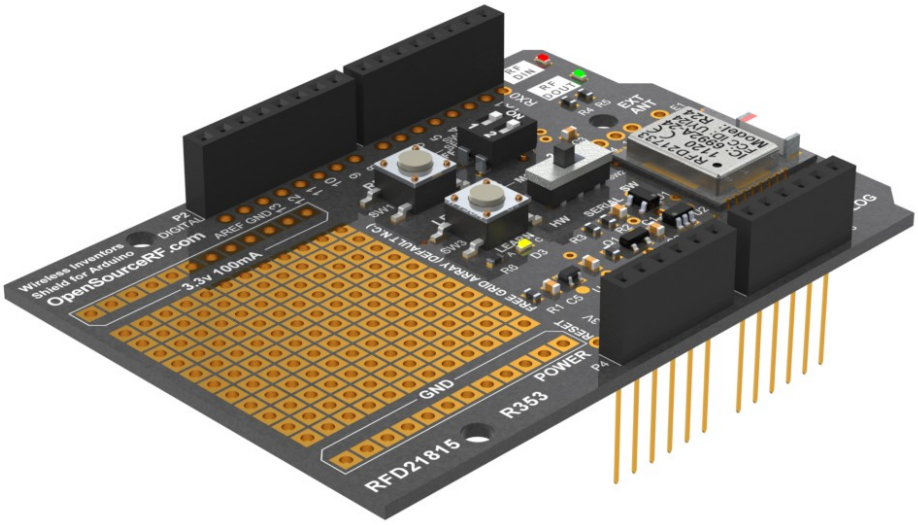
RFDP8
Shield for Arduino
RFD21815

RFD21815 Shield for Arduino



The inventors shield uses a **wireless pipe**, which is a special wireless RF module that allows you to easily and reliably, send and receive error-free wireless data between two or more Arduino boards. The inventors shield “Just Works”, no complicated channels to select, to setup or initialization. Just plug it in and its ready to go. No extra libraries are required.

It's Long Range - distances up to 500 feet.

It's Error Free - built-in forward error correction and data recovery, you only ever receive cleaned and CRC verified data.

It's Simple To Use - anything you input, is wirelessly transmitted, then cleanly outputted for you on the other end. Compatible with the Arduino serial and software serial library.

It's Immune To Noise - your data inside the wireless pipe is protected from the elements outside such as interferences like WiFi, Bluetooth, Zigbee, cordless phones, cellular phones, all types of servo and motor noise, etc. All things which typically stop your wireless project in its tracks, are no longer an issue.

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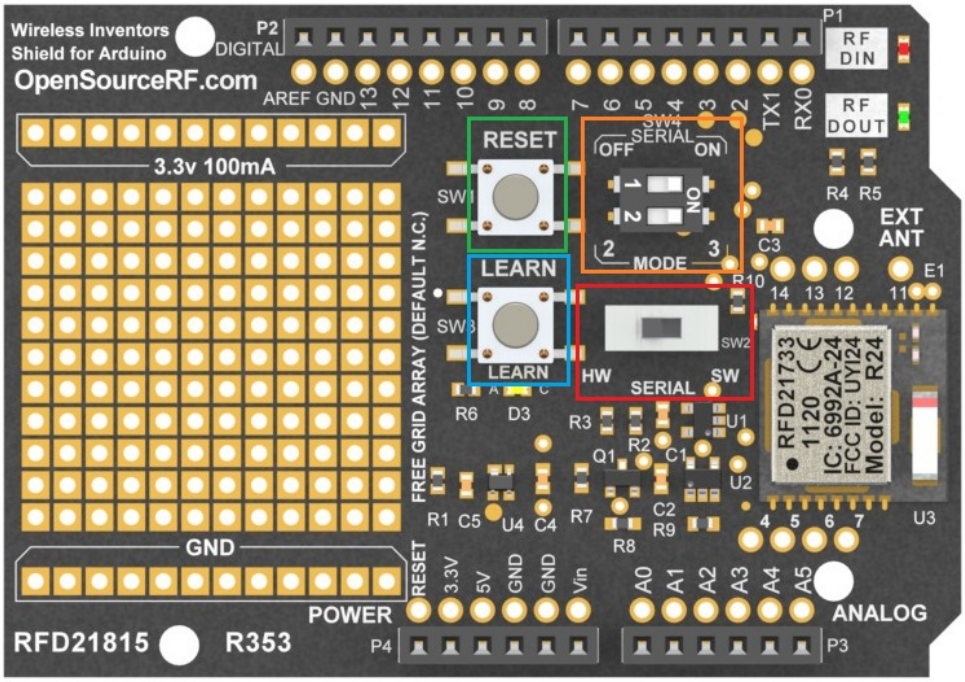
Setup



Reset Button (SW1) : This is tied to the Arduino and will reset the Arduino system

Serial Mode (SW4) Bank 1 : Enables the 5V/3V level translators for the serial connection between the Wireless shield and the Arduino. This is useful when you want to put the RX and TX lines in High-Z and electrically disconnect them from the Arduino.
Serial Mode (SW4) Bank 2 : Sets the RF Mode of the RFD21733. In Mode 2, the shield will receive data from any RFDP8 Wireless Pipe equipped module. In Mode 3, the shield will only receive data from any RFDP8 Wireless Pipe equipped modules which have been “Learned”. See the Network Mode section below.
Learn Button (SW3): This button is used only in Mode 3, when you want to only listen to particular RFD21733 modules. See the Network Mode section below for more details.
HW/SW Serial Switch (SW2): This switch allows you to connect the shield to either the hardware serial pins of the Arduino D0 (Rx) and D1 (Tx) or the software serial pins which in this case are D10 and D11. Refer to the schematic below for more details.

The RF DIN and RF DOUT led indicators are tied to the RX and TX lines and will blink when data is sent or received.

Learn & Network mode

Electronic Serial Number

Every RF Digital Module has its own 32-bit unique identifier (over 4 billion unique values), known as the Electronic Serial Number, or ESN. This value is assigned at the factory and cannot be changed by the user.

Network Mode

The UART and the Receiver with logic output can be configured to accept data only from transmitters with which it has been associated, i.e. in its network. When in network mode, a module must “learn” the ESN of any module which it wishes to “hear." The LEARN signal (listed in the UART and receiver sections below) is usually an input, pulled to GND through an external resistor. When LEARN is driven high for at least 20ms and then allowed to return to GND, the module enters learning mode.

While in learning mode, the LEARN signal is changed to an output and driven high which will light up D3 (learn LED). During this time, the module will learn the ESN of the first module that sends any data; the data will be discarded, the ESN of the transmitting module will be learned by the receiving module. The receiving module indicates that it has learned the ESN by toggling the LEARN LED on and off quickly three times. After learning the transmitting modules ESN, or after 10 seconds pass, the module will exit learning mode by driving LEARN low and changing it back to an input.

Modules can learn up to 60 unique ESN’s. ESN’s cannot be deleted individually. The list of learned ESN’s can be completely cleared by holding the LEARN signal high for at least 10 seconds and then releasing it. The module will erase it’s ESN list, and then drive the LEARN LED in a fast alternating high/low pattern for a few seconds to indicate that the ESN list is now empty.

Once a module has learned the ESN of another module, it will accept any and all data from that module only and not any other modules. Up to 60 unique transmitters can be taught to one receiver. If a module is configured to any of the 3 Network modes and it has not learned any transmitters ESN, then it will not receive and therefore it will not output any data, until it learns at least one transmitter.

This network feature can be used for peer-to-peer networks, point to multi-point networks, multi-point to multi- point networks. The association can be between two units for simple functions like opening a garage door or with many units to form complex networks with multiple nodes.

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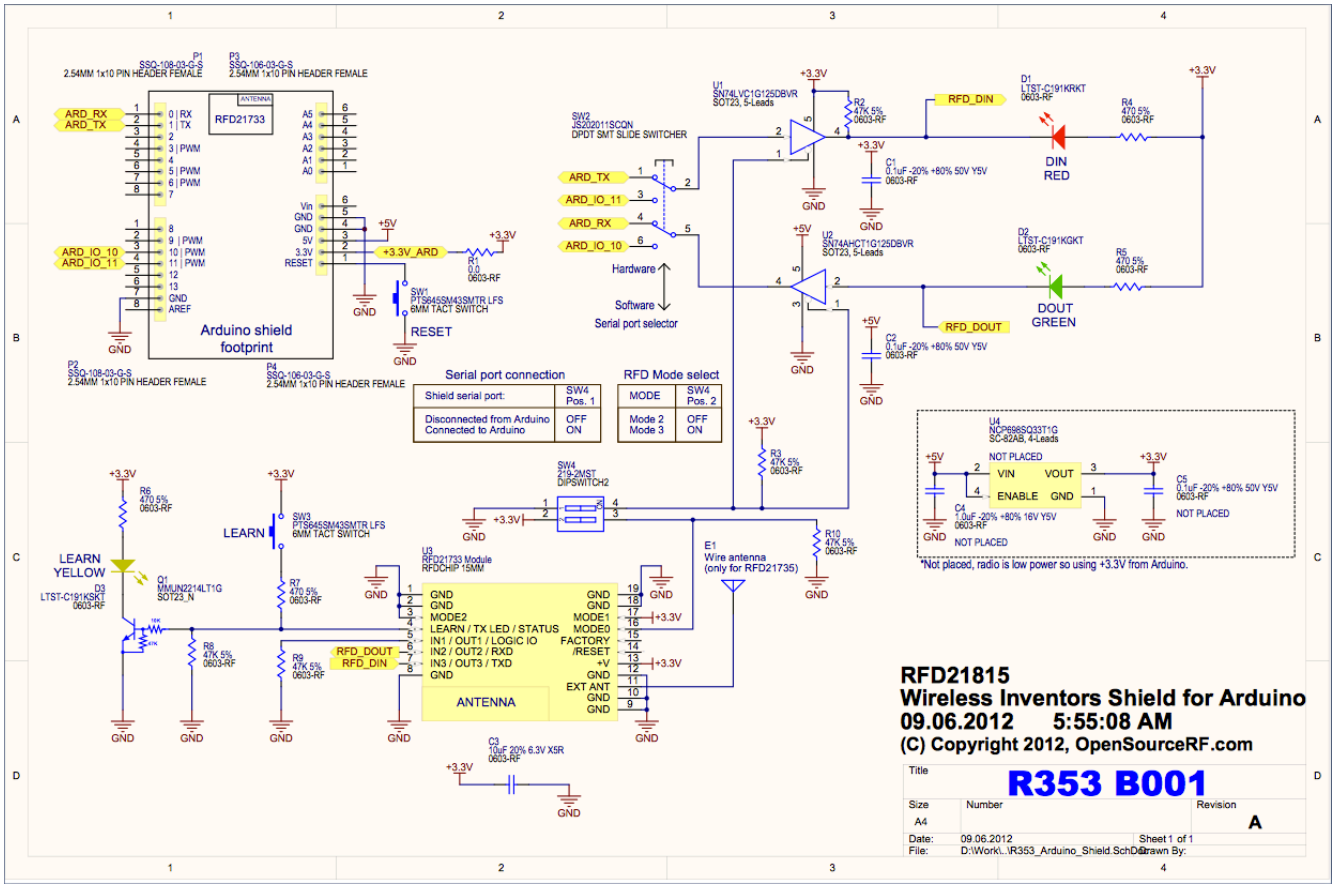
Schematics



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Arduino hardware serial loop sketch

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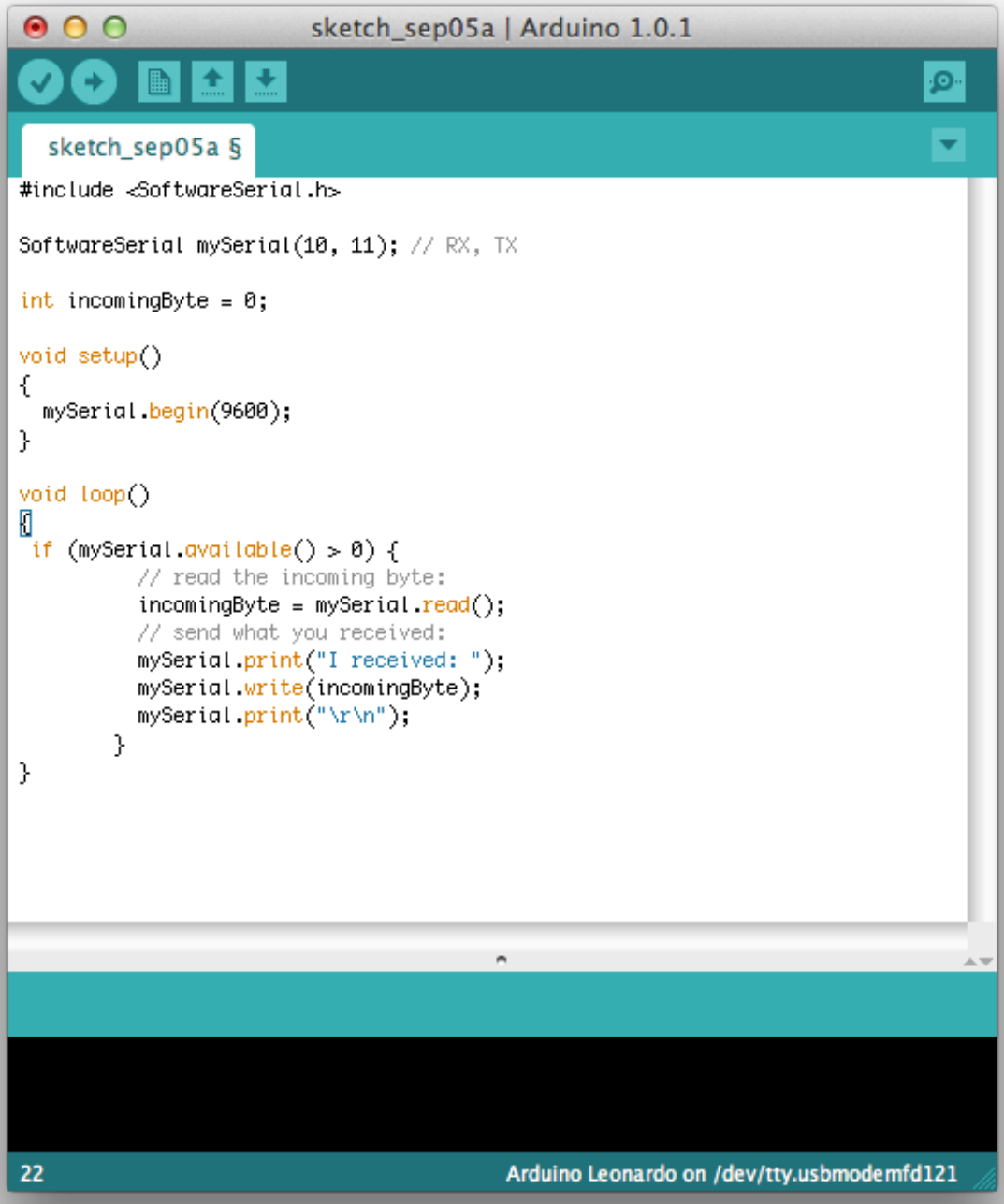
Arduino software serial loop sketch



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Arduino analog read & transmit sketch