IQS7211E Arduino Example Code

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Introduction

This Arduino example code demonstrates how to set up and use the IQS7211E Integrated Circuit (IC). The IQS7211E is a Versatile Trackpad/ touchscreen controller with proximity, touch, trackpad and gesture outputs.

This example code is specifically aimed at the IQS7211E Evaluation Kit (PCB number *AZP1190B1*).

This example code is intended for an Arduino Compatible board that uses 3.3 V logic, such as Sparkfun's Pro Micro (3.3V, 8 MHz). If a 5V logic Arduino board is used, a logic-level translator will be required between the Arduino-based board and the IQS7211E.

Arduino Code Configuration

The behaviour and pin assignments of the Arduino code can be configured with the `#define` settings at the start of `iqs7211e-example-code.ino`.

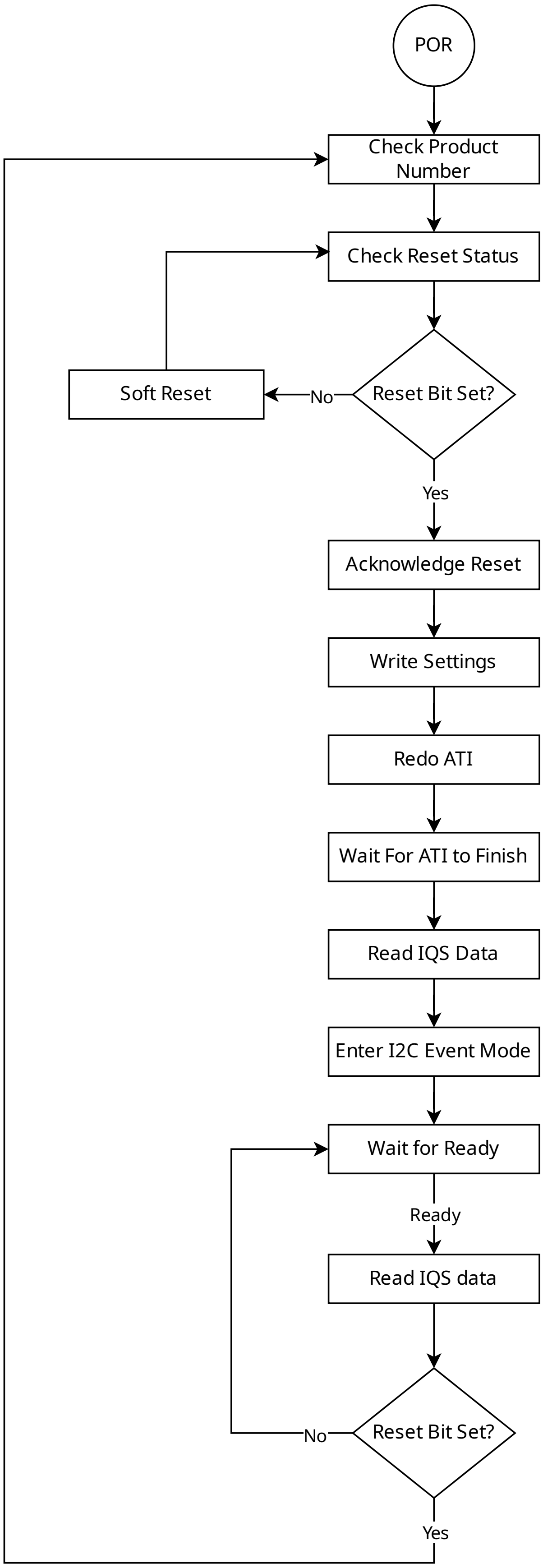
Change the following pin assignments and parameters to suit your hardware:

```
/*** Defines ***/
#define DEMO_IQS7211E_ADDR                           0x56
#define DEMO_IQS7211E_POWER_PIN                      4
#define DEMO_IQS7211E_RDY_PIN                        7
```

- `DEMO_IQS7211E_ADDR` is the IQS7211E I2C Slave address. For more information, refer to the datasheet and application notes found on the IQS7211E Product Page
- `DEMO_IQS7211E_POWER_PIN` can be used to power the IQS7211E directly from an Arduino GPIO. This parameter sets which pin to use. This is an optional setting and can be removed if the IQS7211E is powered from the VCC pin or an external power supply.
- `DEMO_IQS7211E_RDY_PIN` sets the pin assignment for the IQS7211E ready pin. This must support external interrupts. On the SparkFun Pro Micro, pins 0, 1, 2, 3, and 7 support interrupts.

> ℹ Please note that powering an IQS device directly from a GPIO is *generally* not recommended. However, the `DEMO_IQS7211E_POWER_PIN` in this example could be used as an enable input to a voltage regulator.

Example Code Flow Diagram

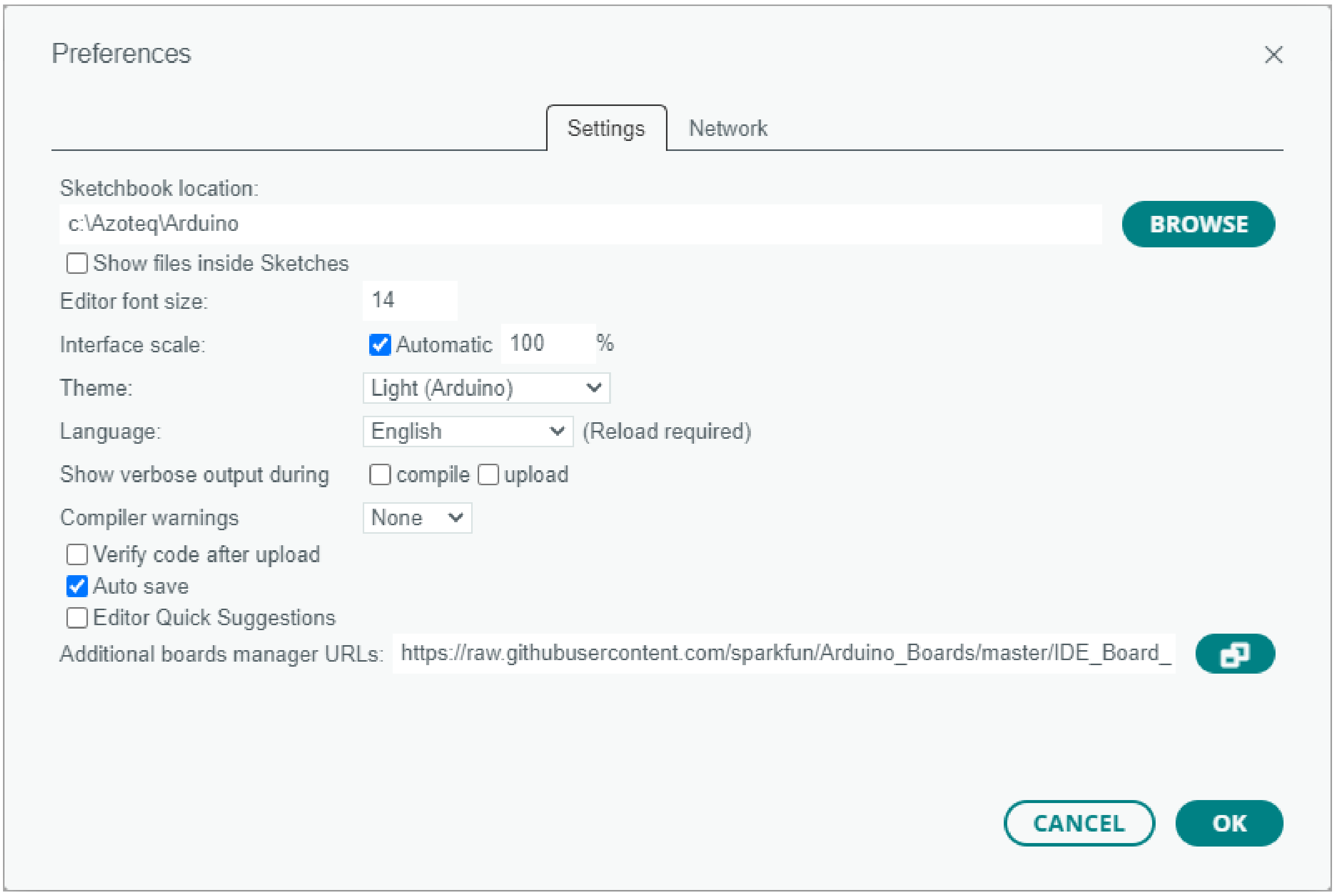


Sparkfun Board Library Installation

To use the SparkFun Pro Micro, the SparkFun Board Library must be installed in the Arduino IDE.

Add the SparkFun Board Library by opening Preferences (**File** > **Preferences**), and to paste the following URL into the "Additional Board Manager URLs" text box.

```
https://raw.githubusercontent.com/sparkfun/Arduino_Boards/master/IDE_Board_Manager/package_sparkfun_index.json
```



Preferences

Sketchbook location: c:\Azoteq\Arduino

□ Show files inside Sketches

Editor font size: 14

Interface scale: ☑ Automatic 100 %

Theme: Light (Arduino)

Language: English (Reload required)

Show verbose output during □ compile □ upload

Compiler warnings None

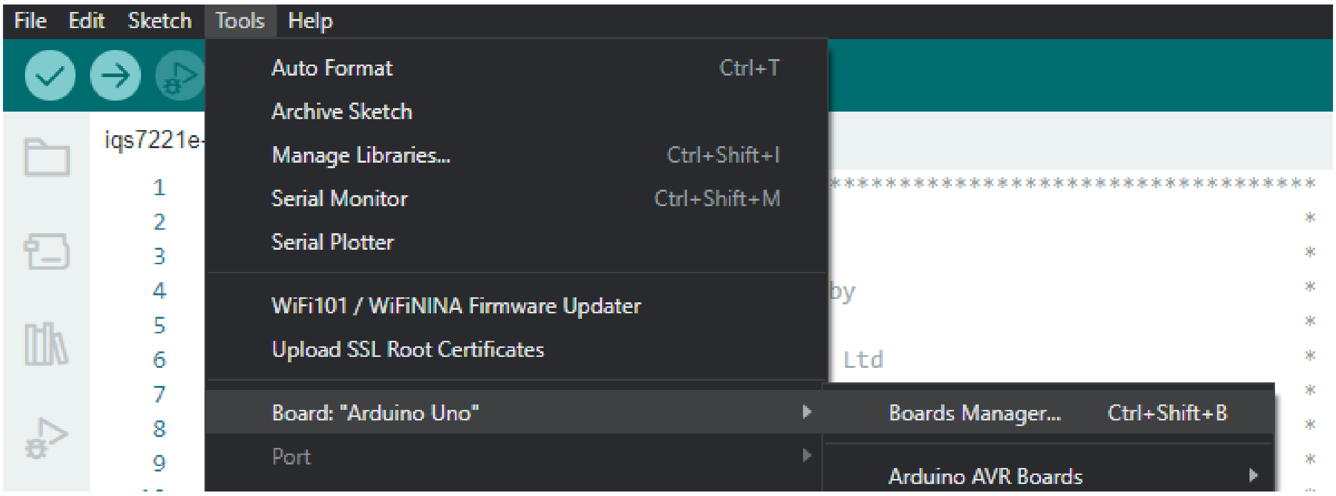
□ Verify code after upload

☑ Auto save

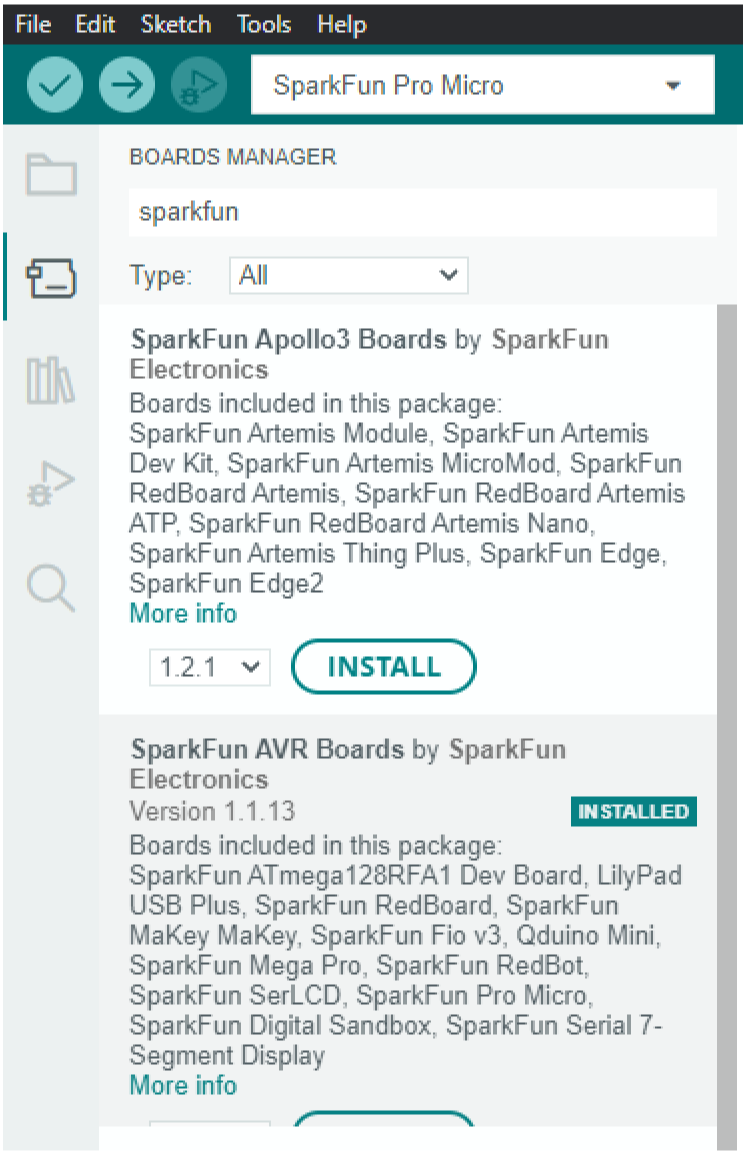
□ Editor Quick Suggestions

Additional boards manager URLs: https://raw.githubusercontent.com/sparkfun/Arduino_Boards/master/IDE_Board_

Click "OK". Then open the Board Manager under **Tools** > **Board** > **Boards Manager...**.


File
Edit
Sketch
Tools
Help
iqs7221e
Auto Format Ctrl+T
Archive Sketch
Manage Libraries... Ctrl+Shift+I
Serial Monitor Ctrl+Shift+M
Serial Plotter
WiFi101 / WiFiNINA Firmware Updater
Upload SSL Root Certificates
Board: "Arduino Uno"
Port
Boards Manager... Ctrl+Shift+B
Arduino AVR Boards

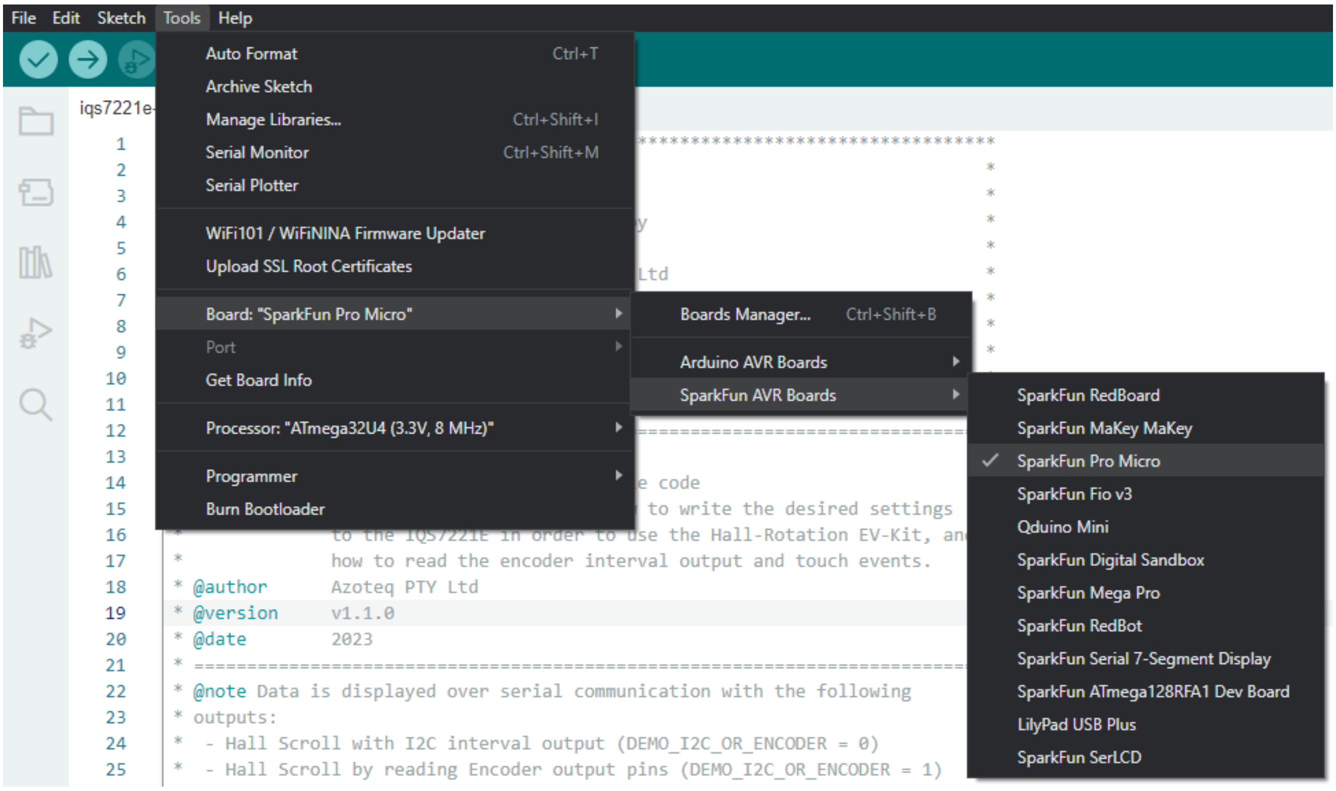
Search for "SparkFun", and install "SparkFun AVR Boards by SparkFun".



SparkFun Apollo3 Boards by **SparkFun Electronics**
Boards included in this package:
SparkFun Artemis Module, SparkFun Artemis Dev Kit, SparkFun Artemis MicroMod, SparkFun RedBoard Artemis, SparkFun RedBoard Artemis ATP, SparkFun RedBoard Artemis Nano, SparkFun Artemis Thing Plus, SparkFun Edge, SparkFun Edge2
More info

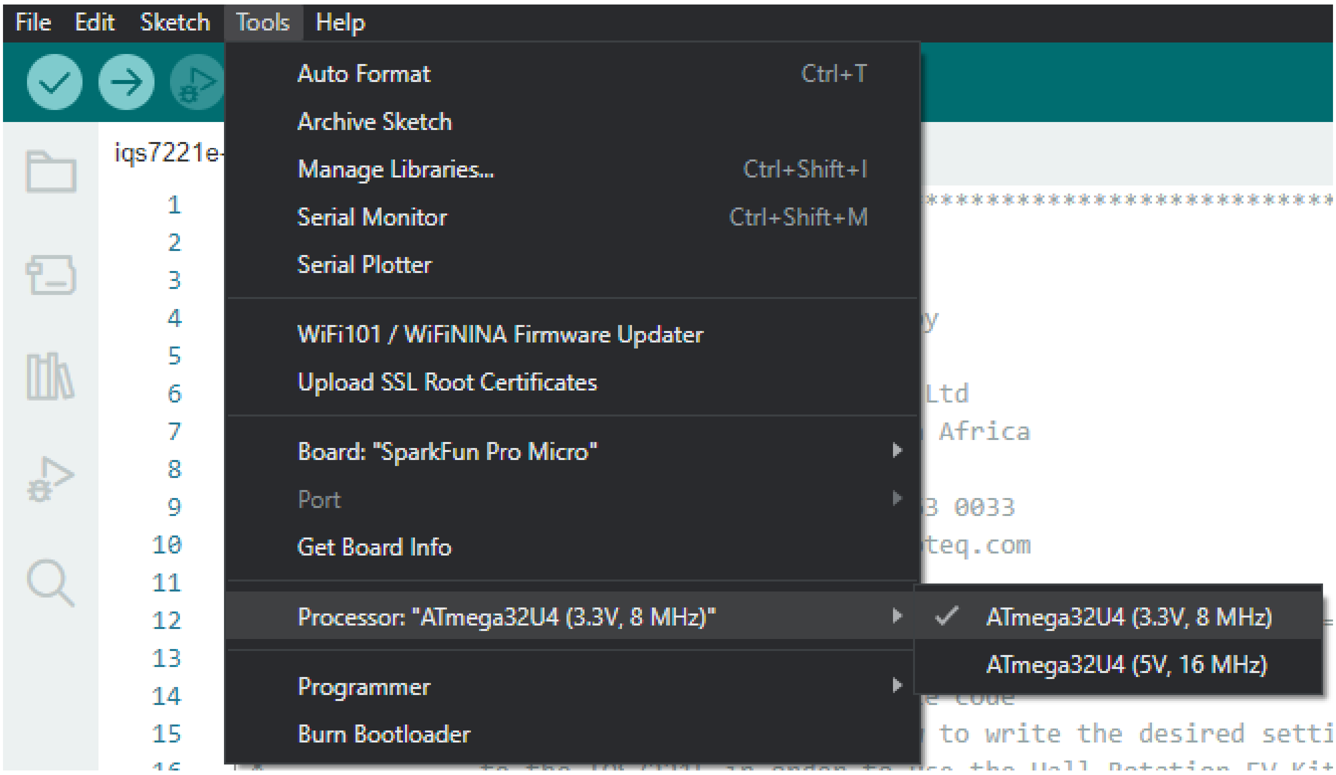
SparkFun AVR Boards by **SparkFun Electronics**
Version 1.1.13 INSTALLED
Boards included in this package:
SparkFun ATmega128RFA1 Dev Board, LilyPad USB Plus, SparkFun RedBoard, SparkFun MaKey MaKey, SparkFun Fio v3, Qduino Mini, SparkFun Mega Pro, SparkFun RedBot, SparkFun SerLCD, SparkFun Pro Micro, SparkFun Digital Sandbox, SparkFun Serial 7-Segment Display
More info

You can now select the "SparkFun Pro Micro" in the Board selection menu.


File Edit Sketch Tools Help
iqs7221e
Auto Format Ctrl+T
Archive Sketch
Manage Libraries... Ctrl+Shift+I
Serial Monitor Ctrl+Shift+M
Serial Plotter
WiFi101 / WiFiNINA Firmware Updater
Upload SSL Root Certificates
Board: "SparkFun Pro Micro"
Port
Get Board Info
Processor: "ATmega32U4 (3.3V, 8 MHz)"
Programmer
Burn Bootloader
Boards Manager... Ctrl+Shift+B
Arduino AVR Boards
SparkFun AVR Boards
SparkFun RedBoard
SparkFun MaKey MaKey
✓ SparkFun Pro Micro
SparkFun Fio v3
Qduino Mini
SparkFun Digital Sandbox
SparkFun Mega Pro
SparkFun RedBot
SparkFun Serial 7-Segment Display
SparkFun ATmega128RFA1 Dev Board
LilyPad USB Plus
SparkFun SerLCD

```
*           to the IQS7221E in order to use the Hall-Rotation EV-Kit, an
*           how to read the encoder interval output and touch events.
* @author   Azoteq PTY Ltd
* @version  v1.1.0
* @date     2023
* ==========================================================================
* @note Data is displayed over serial communication with the following
* outputs:
*  - Hall Scroll with I2C interval output (DEMO_I2C_OR_ENCODER = 0)
*  - Hall Scroll by reading Encoder output pins (DEMO_I2C_OR_ENCODER = 1)
```

Also be sure to select the "3.3 V, 8 MHz" version under **Tools** > **Processor**.


File Edit Sketch Tools Help
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Serial Plotter
WiFi101 / WiFiNINA Firmware Updater
Upload SSL Root Certificates
Board: "SparkFun Pro Micro"
Port
Get Board Info
Processor: "ATmega32U4 (3.3V, 8 MHz)"
Programmer
Burn Bootloader
✓ ATmega32U4 (3.3V, 8 MHz)
ATmega32U4 (5V, 16 MHz)

Source: Pro Micro Hookup Guide

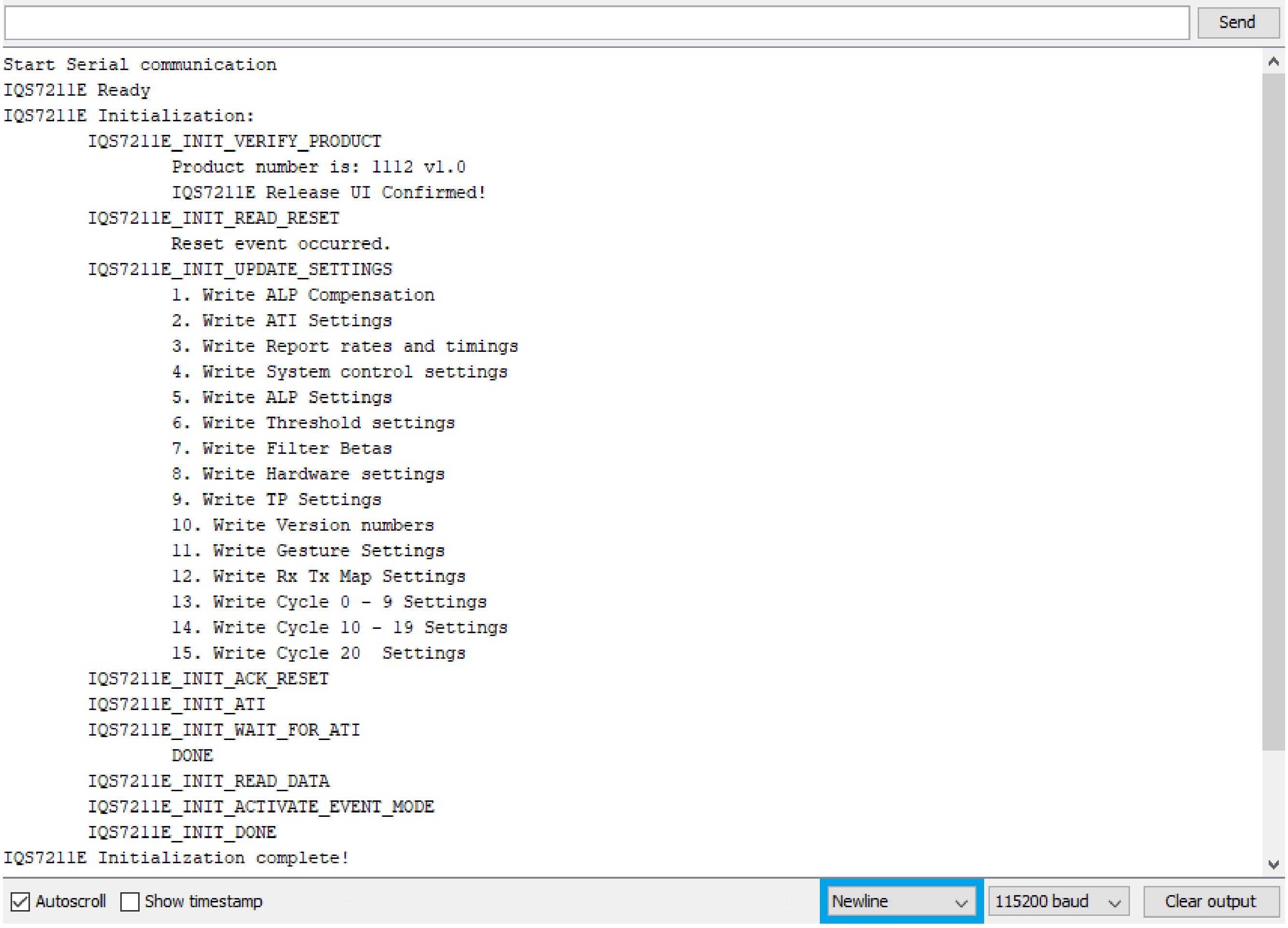
Serial Communication and Interface

The example code provides verbose serial feedback to aid in the demonstration of start-up and operational functions. It also has two built-in commands to demonstrate the IQS7211E device's functionality. To use the built-in commands, the Arduino code simply sends an 'f' or 'r' over the serial interface.

```
1 - "f\n" - Force open a communication(RDY) window
```

```
2 - "r\n" - Request a Software Reset during runtime
```

It is important to take note of the newline ('\n') character that is needed to complete any serial request. It can be activated in the built-in Arduino IDE serial monitor and is shown inside the blue rectangle in the figure below.



```
Start Serial communication
IQS7211E Ready
IQS7211E Initialization:
        IQS7211E_INIT_VERIFY_PRODUCT
                Product number is: 1112 v1.0
                IQS7211E Release UI Confirmed!
        IQS7211E_INIT_READ_RESET
                Reset event occurred.
        IQS7211E_INIT_UPDATE_SETTINGS
                1. Write ALP Compensation
                2. Write ATI Settings
                3. Write Report rates and timings
                4. Write System control settings
                5. Write ALP Settings
                6. Write Threshold settings
                7. Write Filter Betas
                8. Write Hardware settings
                9. Write TP Settings
                10. Write Version numbers
                11. Write Gesture Settings
                12. Write Rx Tx Map Settings
                13. Write Cycle 0 - 9 Settings
                14. Write Cycle 10 - 19 Settings
                15. Write Cycle 20  Settings
        IQS7211E_INIT_ACK_RESET
        IQS7211E_INIT_ATI
        IQS7211E_INIT_WAIT_FOR_ATI
                DONE
        IQS7211E_INIT_READ_DATA
        IQS7211E_INIT_ACTIVATE_EVENT_MODE
        IQS7211E_INIT_DONE
IQS7211E Initialization complete!
```

☑ Autoscroll □ Show timestamp Newline 115200 baud