IQS7221E Arduino Example Code

Copyright © 2023 Azoteq (Pty) Ltd. All rights reserved. Any redistribution, reproduction or storage of any part of this content is prohibited, without the express, prior written permission of Azoteq.

Table of Contents

Introduction 1
Arduino Code Configuration 2
Example Code Flow Diagram 3
SparkFun Board Library Installation 4
Install Encoder and Mouse Libraries 7
Serial Communication and Interface 9

© 2023 Azoteq (Pty) Ltd
All rights reserved

Introduction

This Arduino example code demonstrates how to set up and use the IQS7221E Hall encoder using either I2C or the quadrature pins. The Arduino can also be configured to emulate a mouse scroll wheel using the Mouse library by providing mouse scroll commands over HID. This example code is specifically aimed at the IQS7221E Evaluation Kit (PCB number *AZP1276A2*).

The following external Arduino libraries are needed to compile the example pack:

- Encoder: by Paul Stoffregen version 1.4.2.
- Mouse

This requires an Arduino board that supports HID over USB and 3.3 V logic, such as Sparkfun's Pro Micro (3.3V, 8 MHz).

© 2023 Azoteq (Pty) Ltd
All rights reserved

Arduino Code Configuration

The behaviour and pin assignments of the Arduino code can be configured with the `#define` settings at the start of `iqs7221e-example-code.ino`.

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

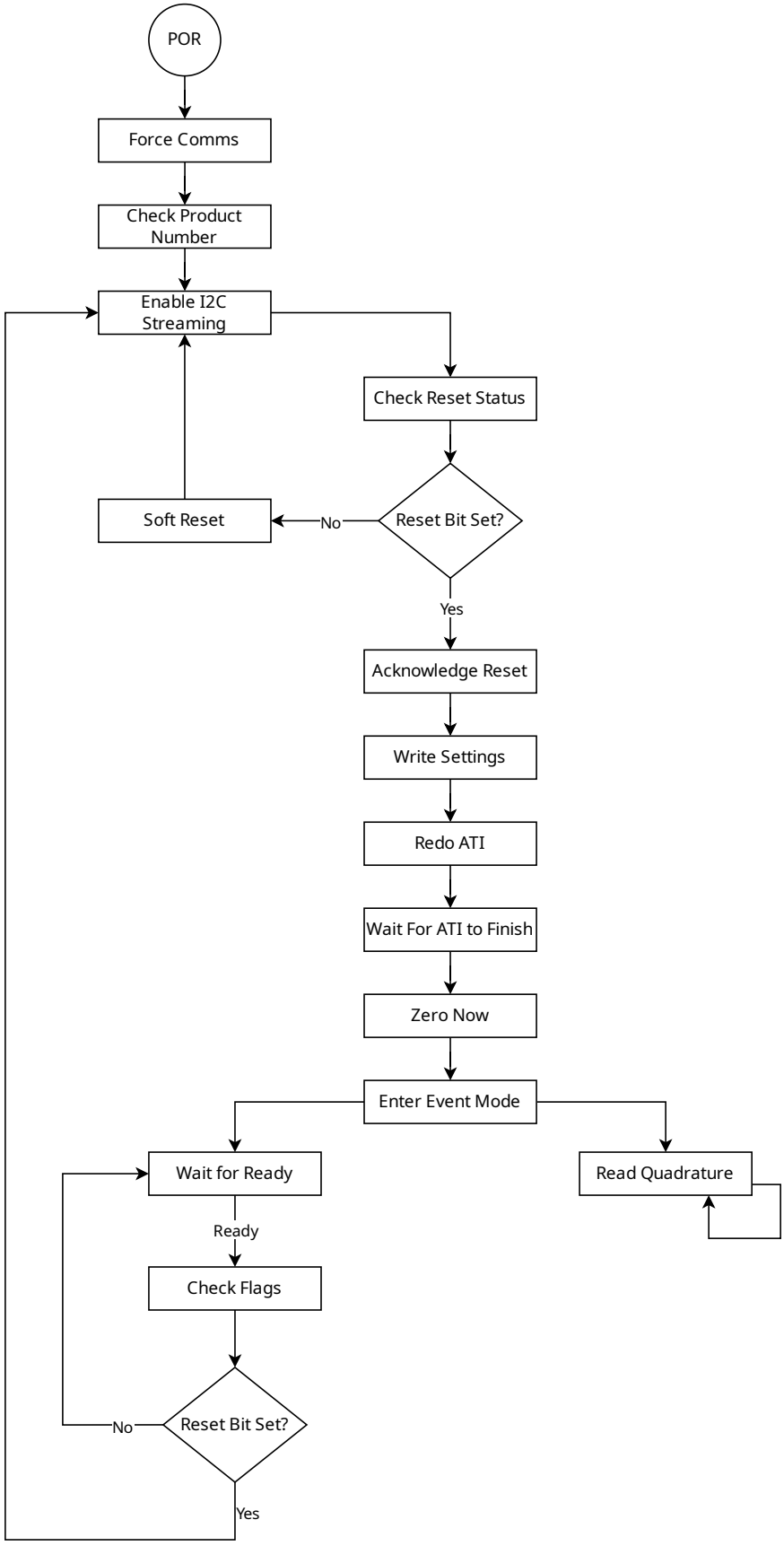
```
/*** Defines ***/
#define DEMO_IQS7221E_ADDR          0x56
#define DEMO_IQS7221E_POWER_PIN     4
#define DEMO_IQS7221E_RDY_PIN       7

/* Encoder Input Pins (needs to be interrupt-capable pins) */
#define DEMO_ENC_PIN_A              0
#define DEMO_ENC_PIN_B              1

/* UI Selection */
#define DEMO_I2C_OR_ENCODER         0 // 0 - I2C, 1 - Encoder
#define DEMO_HID_ON                 1 // Turn on HID and give mouse scroll commands over
USB.
```

- `DEMO_IQS7221E_POWER_PIN` can be used to power the IQS7221E directly from an Arduino GPIO. This parameter sets which pin to use. This is an optional setting and can be removed if the IQS7221E is powered from the VCC pin or an external power supply.
- `DEMO_IQS7221E_RDY_PIN` sets the pin assignment for the IQS7221E ready pin. This must support external interrupts. On the SparkFun Pro Micro, pins 0, 1, 2, 3, and 7 support interrupts.
- `DEMO_I2C_OR_ENCODER` determines whether the Arduino reads the current encoder interval from the IQS7221E over I2C or from the quadrature pins. Using the quadrature pin requires the Encoder library.
- `DEMO_HID_ON` sends mouse scroll events over USB HID to the computer to emulate a mouse wheel. Enabling this requires the Mouse library.
- `DEMO_ENC_PIN_A` and `DEMO_ENC_PIN_B` sets the pin assignments for the IQS7221E quadrature pins, and allows the Arduino to read the encoder interval using the Encoder library. These pins must be interrupt-capable. On the SparkFun Pro Micro, pins 0, 1, 2, 3, and 7 support interrupts.

Please note that powering an IQS device directly from a GPIO is *generally* not recommended. However, the `DEMO_IQS7221E_POWER_PIN` in this example could be used as an enable input to a voltage regulator.

© 2023 Azoteq (Pty) Ltd
All rights reserved

Example Code Flow Diagram



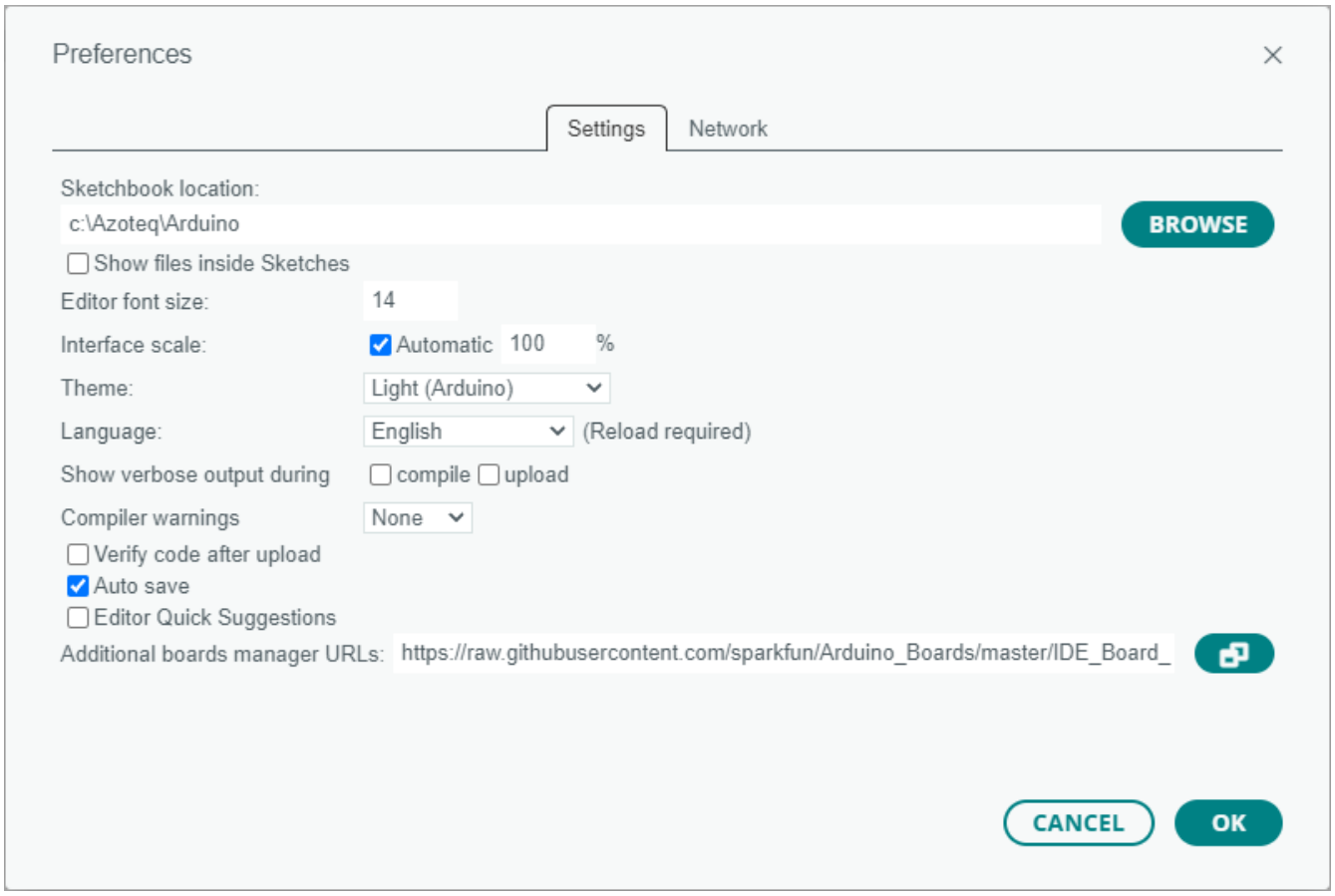
© 2023 Azoteq (Pty) Ltd
All rights reserved

SparkFun Board Library Installation

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

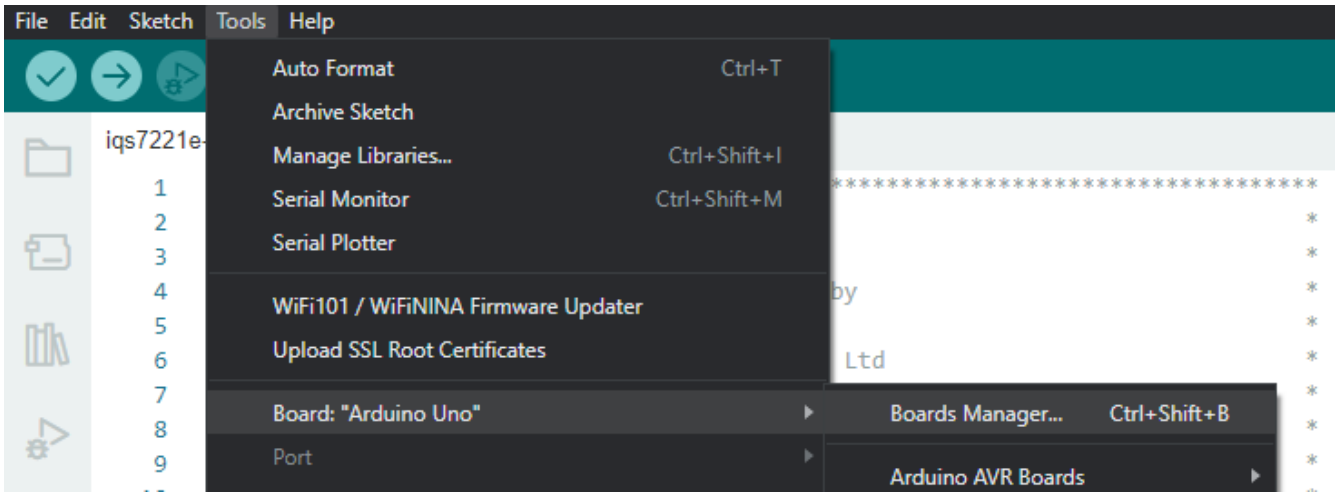
Add the SparkFun Board Library by opening Preferences (**File** > **Preferences**), and paste the following URL into the "Additional Board Manager URLs" text box.

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

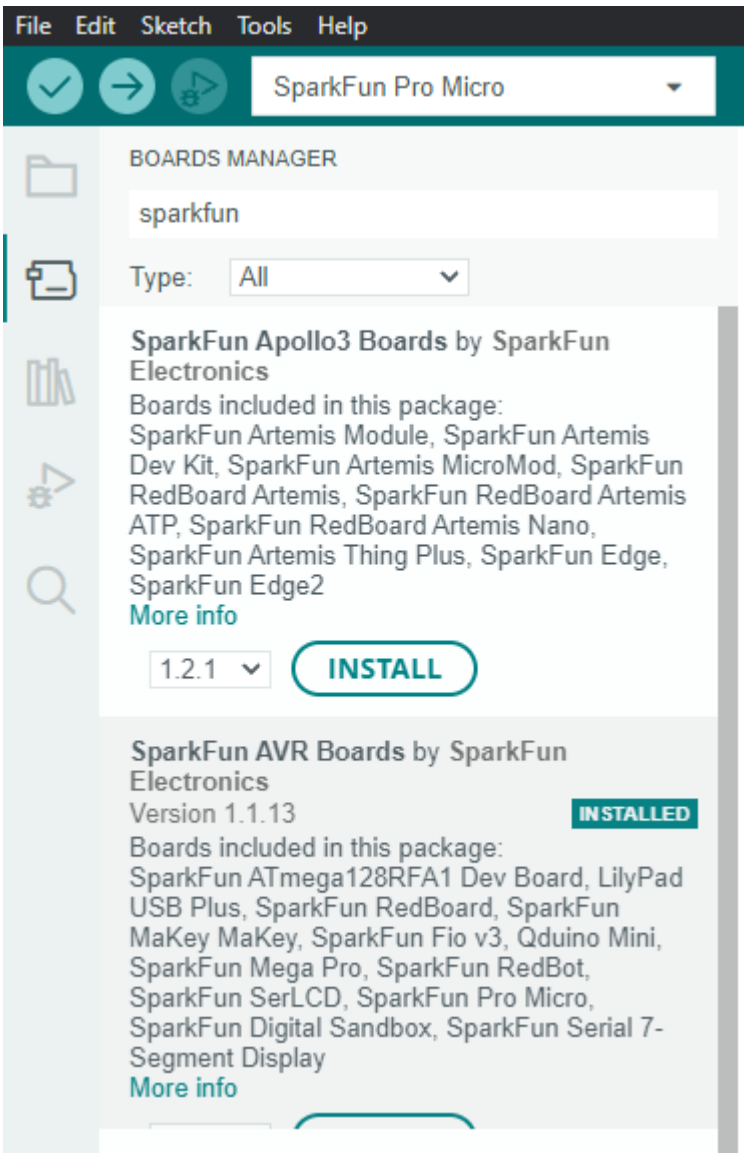


Click "OK". Then open the Board Manager under **Tools** > **Board** > **Boards Manager...**.

© 2023 Azoteq (Pty) Ltd
All rights reserved

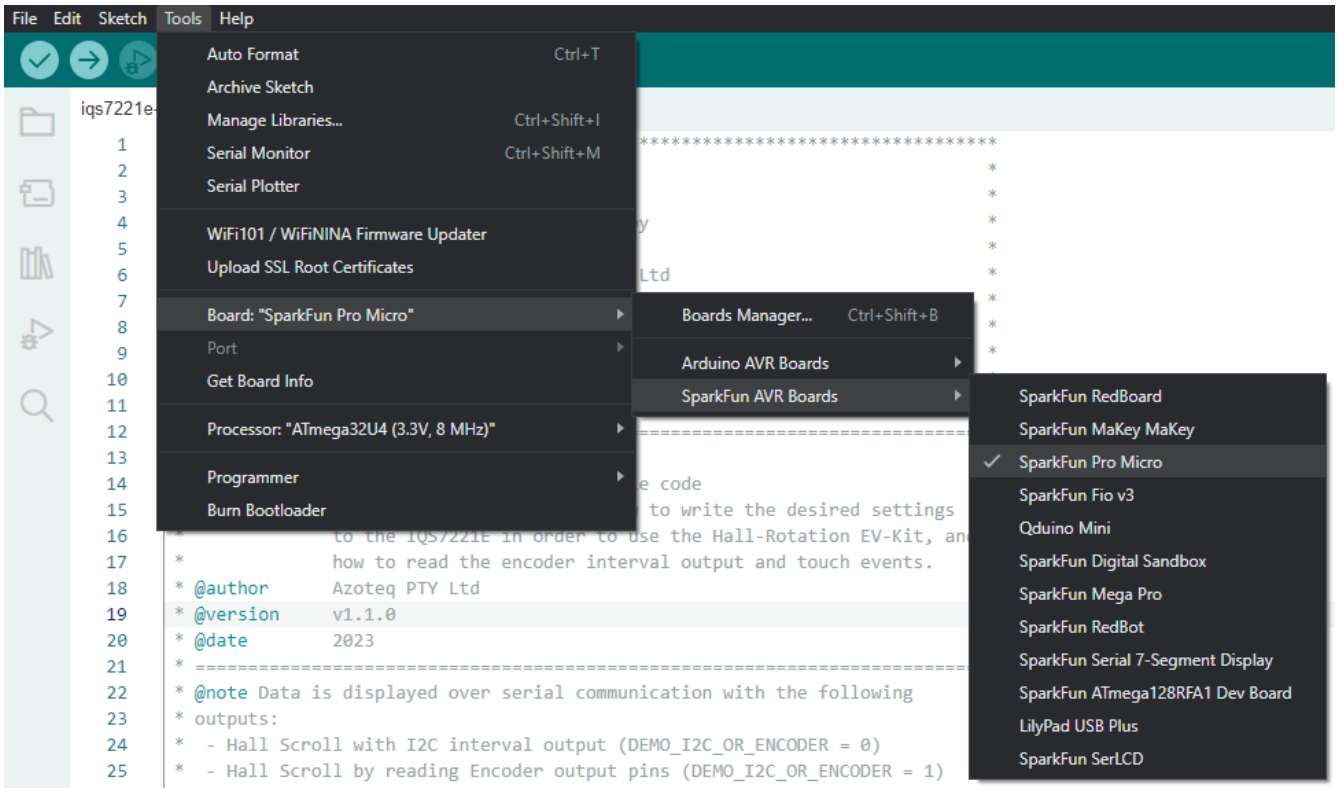


Search for "SparkFun", and install "SparkFun AVR Boards by SparkFun".

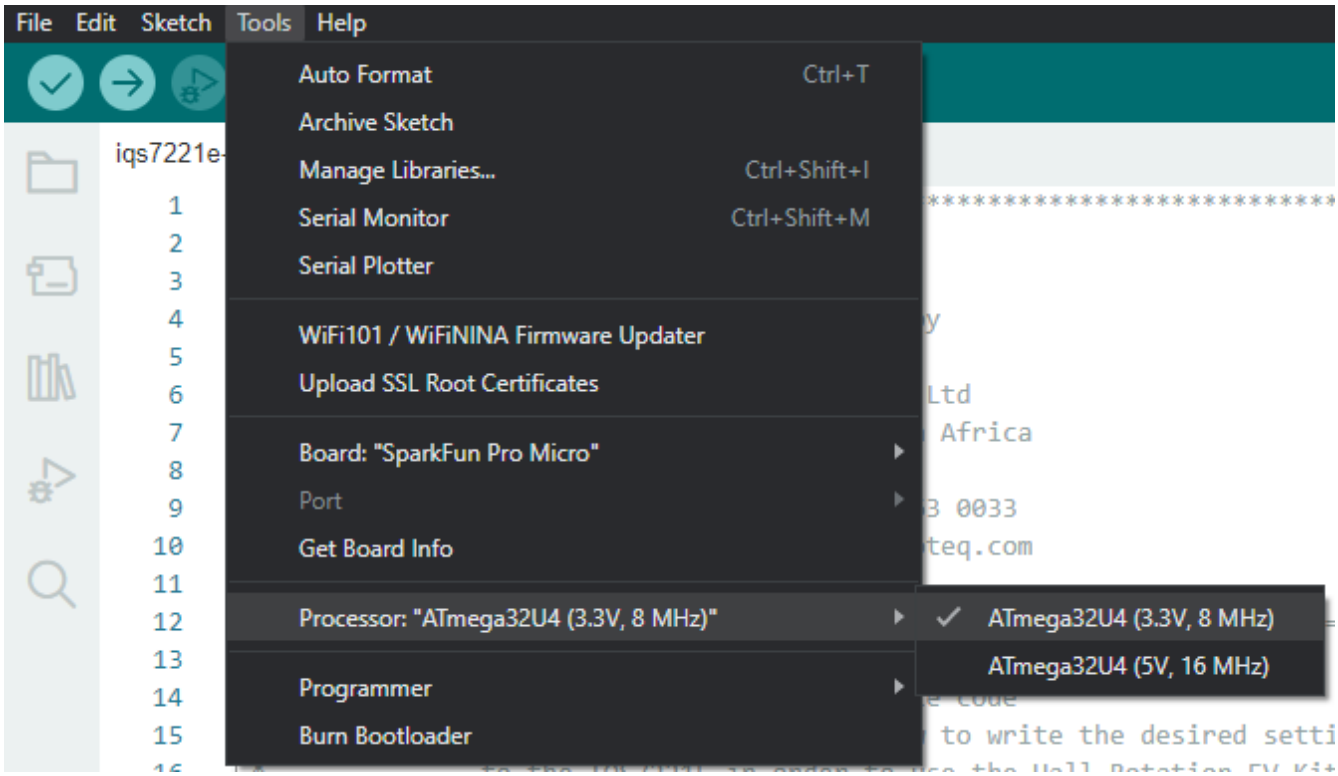


You can now select the "SparkFun Pro Micro" in the Board selection menu.

© 2023 Azoteq (Pty) Ltd
All rights reserved



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

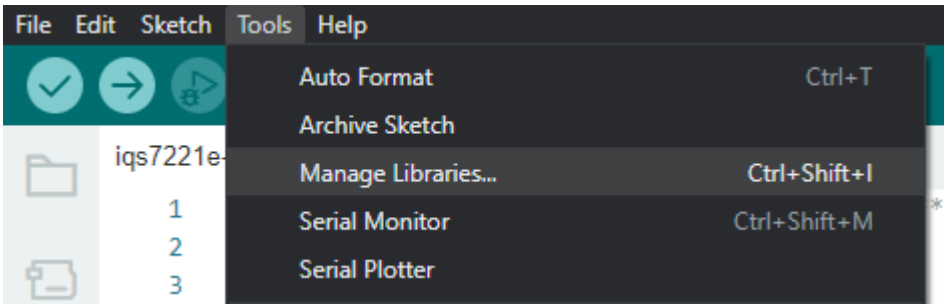


Source: Pro Micro Hookup Guide

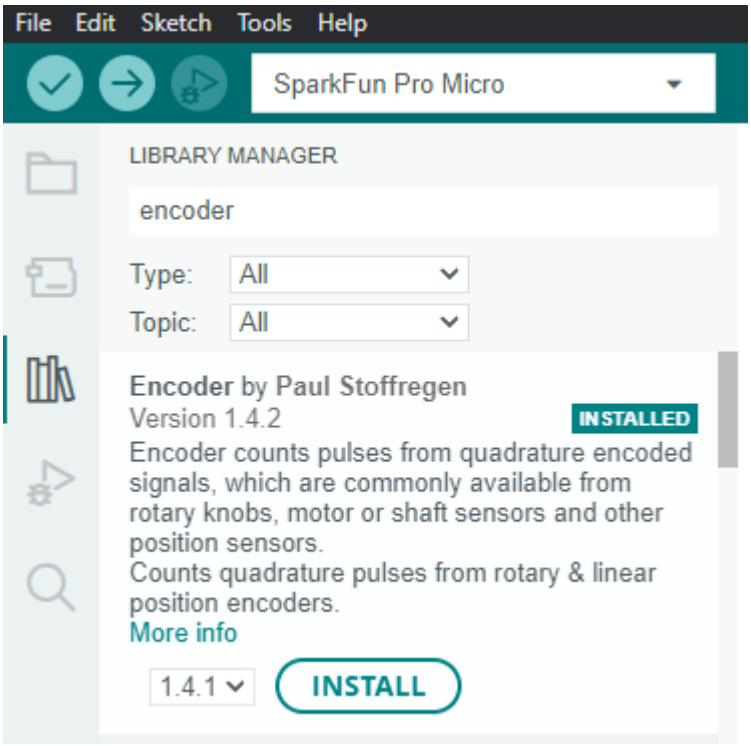
© 2023 Azoteq (Pty) Ltd
All rights reserved

Install Encoder and Mouse Libraries

To install the Encoder and Mouse libraries for the example code, open the Library Manager by navigating to **Tools** > **Manage Libraries...**.

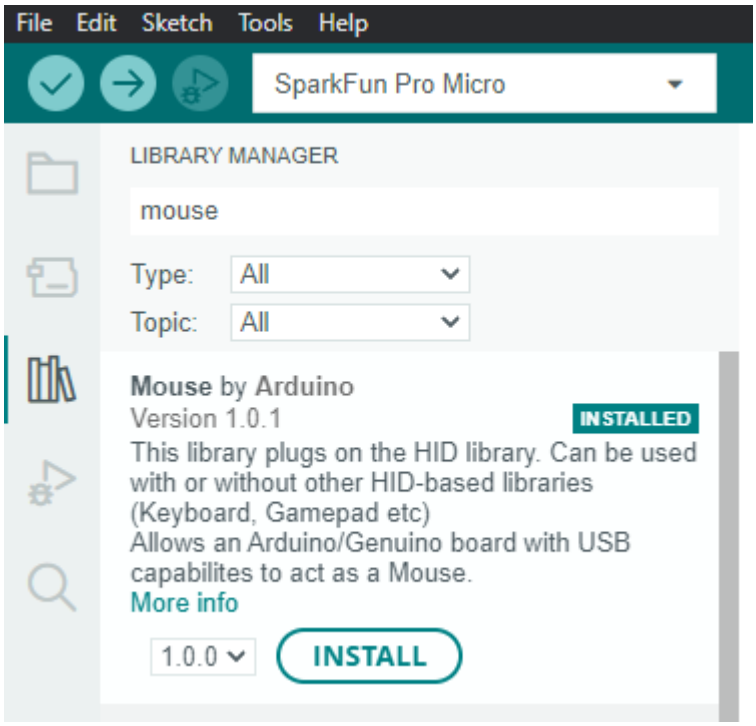


Search for "encoder", and install "**Encoder** by **Paul Stoffregen**".



Search for "mouse", and install "**Mouse** by **Arduino**".

© 2023 Azoteq (Pty) Ltd
All rights reserved



© 2023 Azoteq (Pty) Ltd
All rights reserved

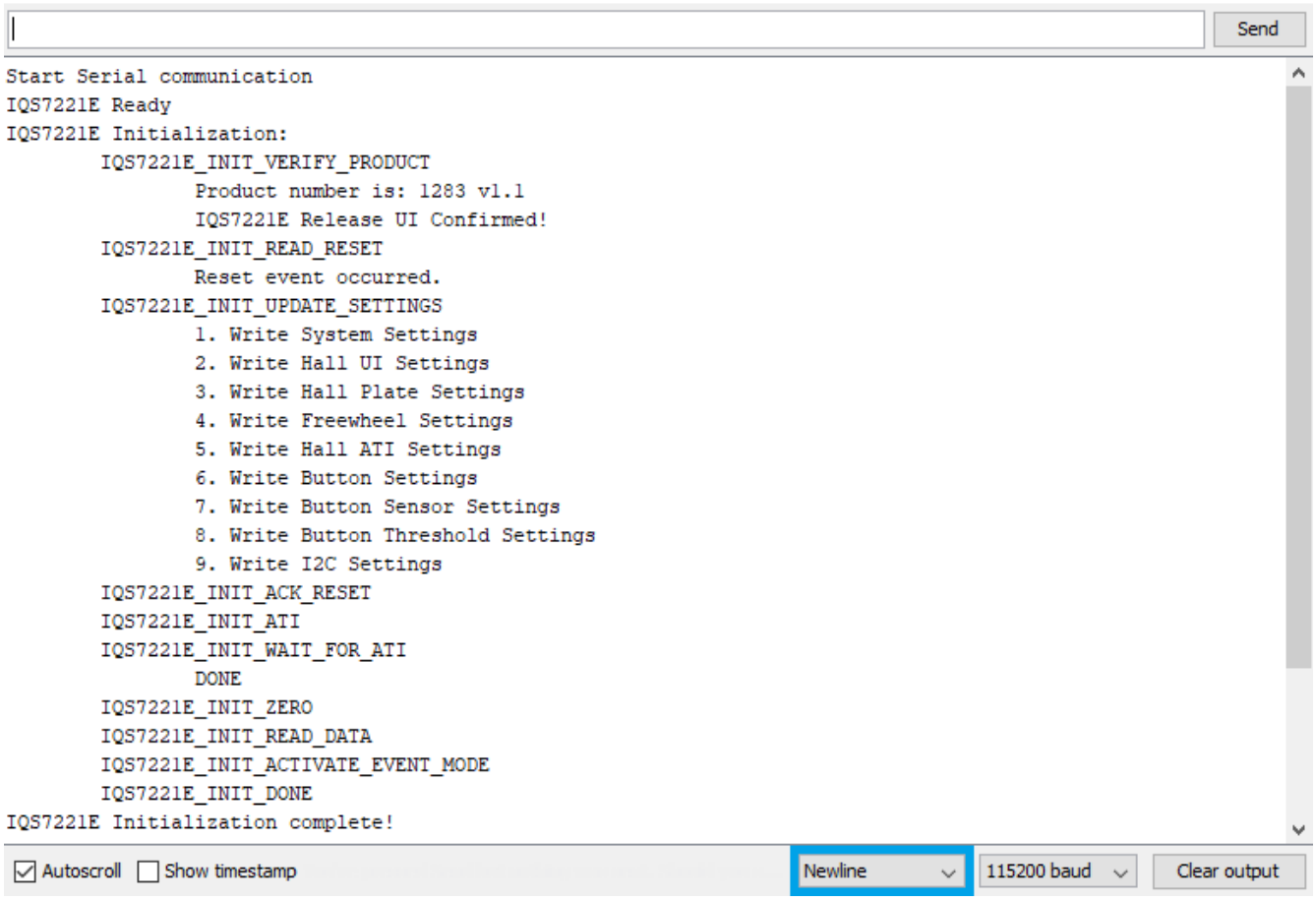
Serial Communication and Interface

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 IQS7221E 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.



© 2023 Azoteq (Pty) Ltd
All rights reserved