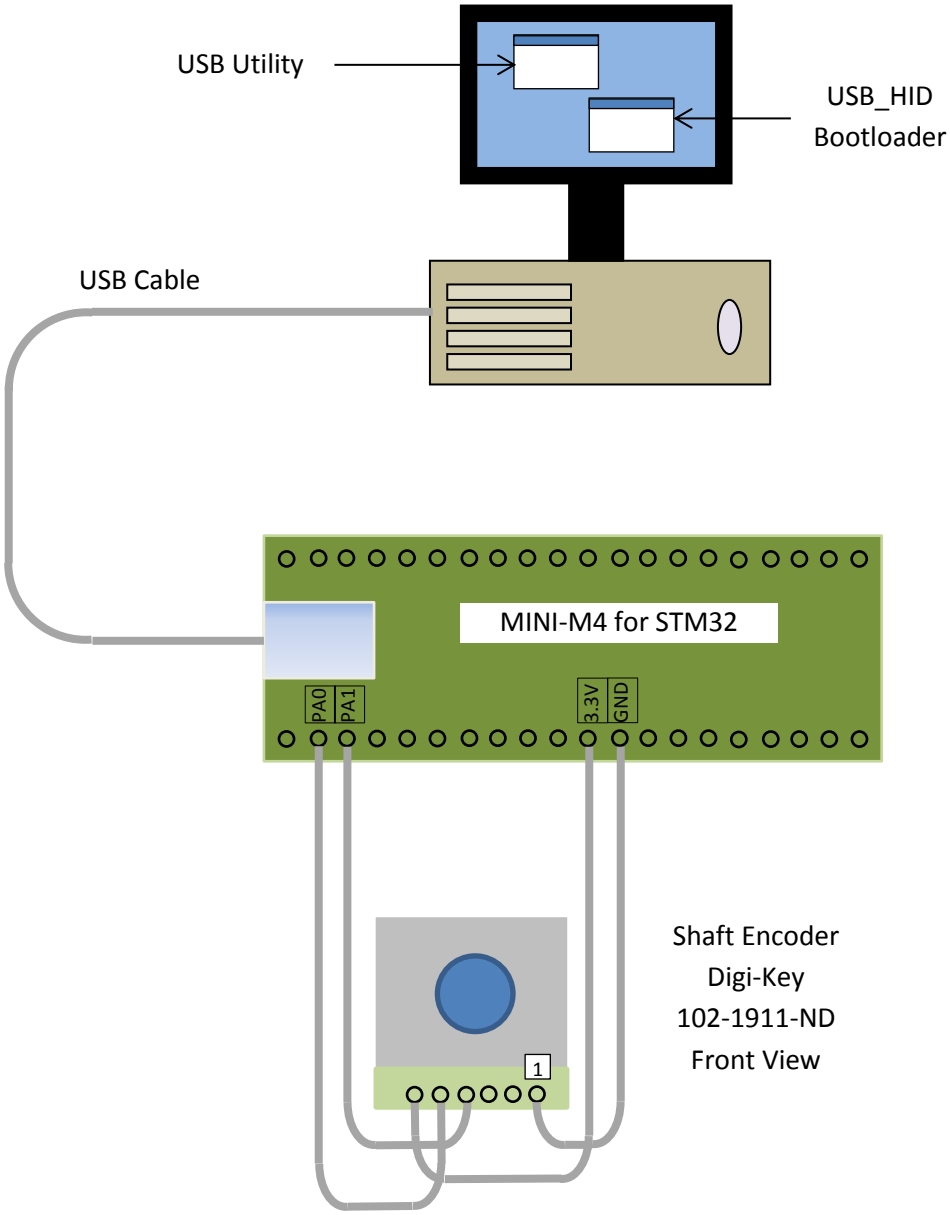
Hardware Hookup

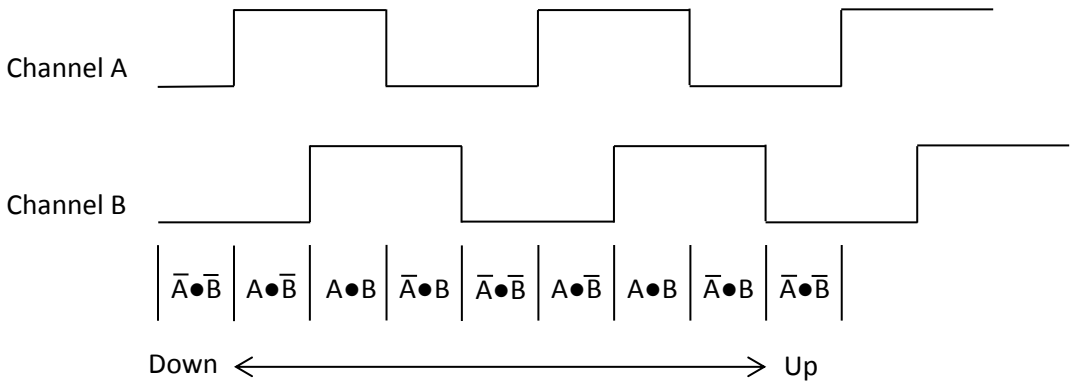


Although the shaft encoder shown is rated for 5V DC, it seems to work well on 3.3V DC. The connection pads on the shaft encoder are very small. It requires a skilful and delicate soldering technique to connect the wires. A flat cable is recommended.

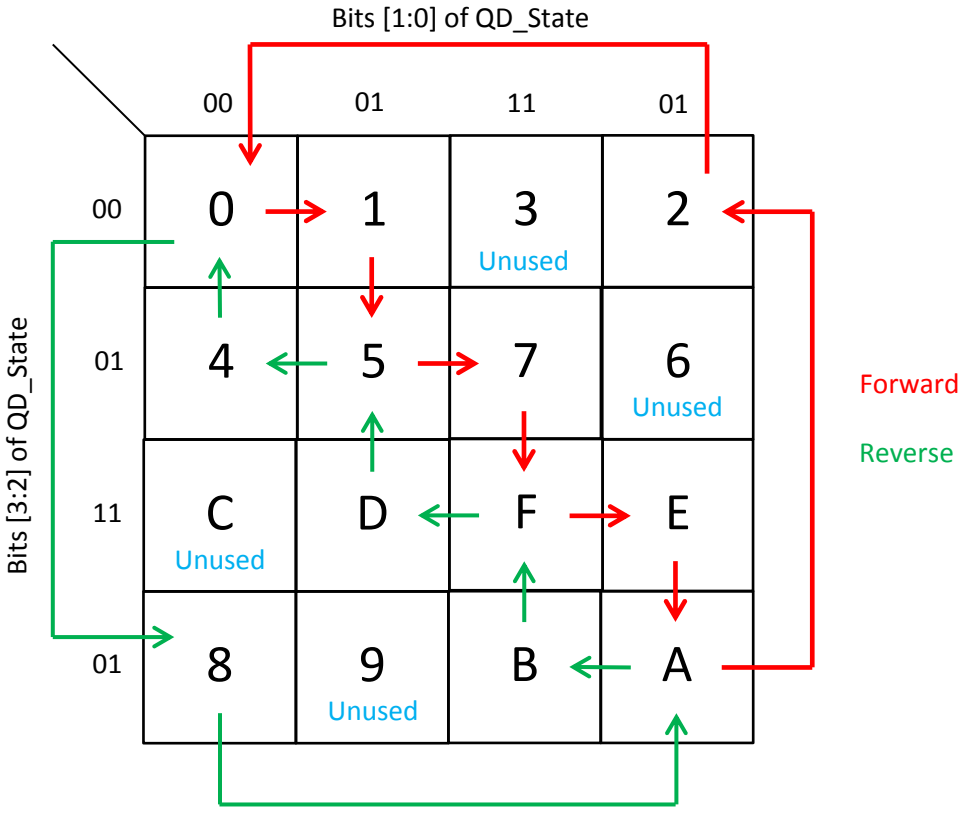
Many other shaft encoders are available and can be used. Some are designed for higher rotational rates, others are designed for higher precision.

Software

Shaft Encoder Input

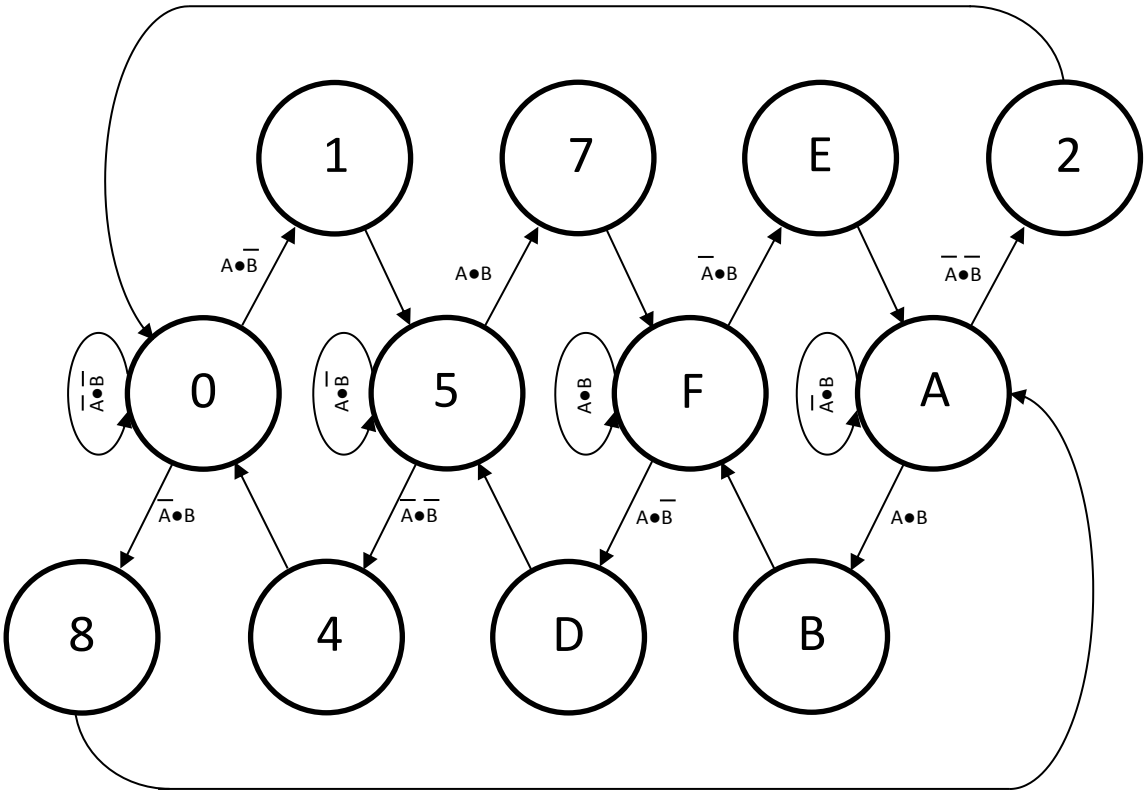


State Machine Sequence for Forward and Reverse Shaft Encoder Direction



When moving from state to state as shown above on the Karnaugh map (at right angles), only one bit of QD_State changes. This is not so important in the software version, but if implemented in hardware, it will eliminate glitches when decoding the various states.

State Diagram



Usage

Shaft encoders can replace many electromechanical devices, such as potentiometers, variable capacitors, etc. The cost is much higher when you add up the shaft encoder, MPU, and output device. However, sometime the cost is not the primary driver but aesthetics and human factors may have a bearing in the selection. They can be used to measure angular and linear distances, angular and linear velocity, and many other physical phenomena limited only by imagination.

If a shaft encoder is not available, you can simulate it by sending commands “c” and “d” on the USB port by means of the included Delphi software or by using HID Terminal.