



IQS221 Evaluation Kit

IQS221EV02 (AZP075 PCB)



Evaluation Kit: User Manual

IQ Switch® - ProxSense® Series

IQS221 EV-Kit User Manual

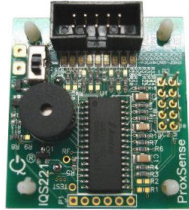
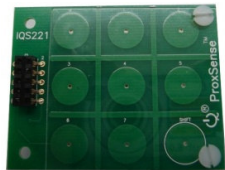
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1 Introduction

This user manual describes the IQS221 evaluation kit. The EV-kit is made in two parts, consisting of a mother board and keypad. It is developed to facilitate application engineers and development engineers in evaluating the IQS221 (9 channel) sensor with proximity and touch detection. LEDs are used to display the output of the device. The design of the EV-kit allows for flexibility, allowing the user to use the IQS221 in direct mode, streaming mode to a PC.

Evaluation Kit Contents:

1 x AZP075 Controller PCB:	
1 x Keypad PCB	
2 x CR2016 Battery (optional)	Optional CR2016 batteries included when EV02 is used as stand-alone kit

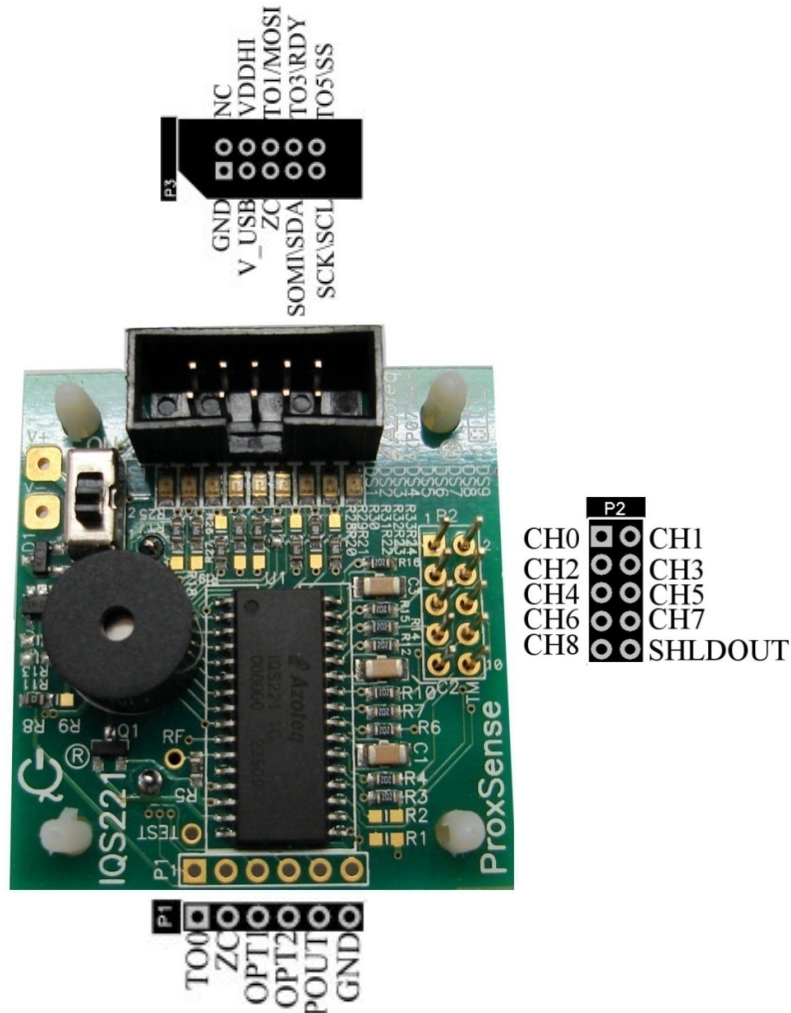
The keypad is easy removable from the IQS221 controller PCB. This makes the controller PCB a quick design tool when prototyping with the IQS221 9-channel capacitive sensing controller IC. The module is assembled with a SO-32 packaged device, and SO-32 samples are also included. These samples can be used for quick prototyping with any design. The IQS221 IC are also packaged in the very compact QFN5x5-32 package.



2 Motherboard

The figure below shows the top view of the EV-kit motherboard. Its features include:

- ☐ Battery powered; or
- ☐ External power supply powered
- ☐ Modular design: Connect the supplied keypad into the main board, or wire the main board into a prototype for rapid prototyping Back-grid as Shield
- ☐ LEDs indicate proximity AND contact to the buttons (7 touch LEDs)
- ☐ Can be used in one of 2 modes:
 - Direct mode using onboard LEDs: Battery powered and output on LED's
 - Data Streaming Mode: Visualization and control from a PC GUI (requires Azoteq Configuration Tool CT, or Azoteq Data Streamer DS)
- ☐ Buzzer
- ☐ Test pads for the driven shield, zero cross and analog measurement of key parameters
- ☐ OTP bits can be programmed on the kit (requires CTxxx)

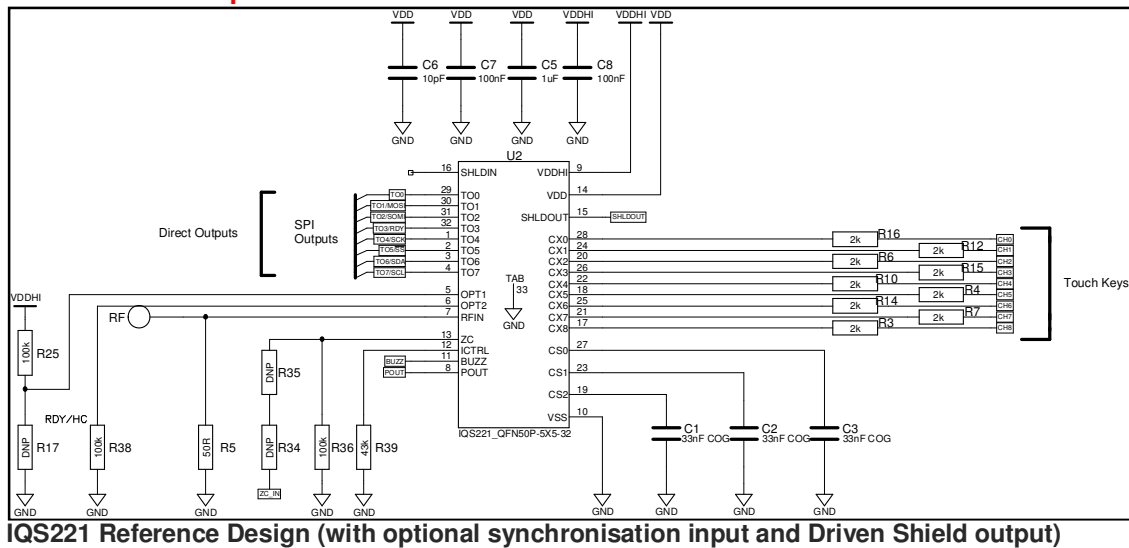


3 Operation

1. Ensure Keypad is connected to EV02 controller PCB
2. **Standalone Mode:** Connect V^+ and V^- to supply voltage (3.0V – 5.5V) or flip switch to ON position if optional battery kit is supplied. (**Note:** Remove battery before connecting to PSU)

Debug Mode: Module can be connected to VisualProxSense on the SPI header to evaluate the real-time working of the IQS technology (see Appnote for further details: “AZD006 – VisualProxSense Overview verx.xx.pdf”).

DNP = Do Not Populate

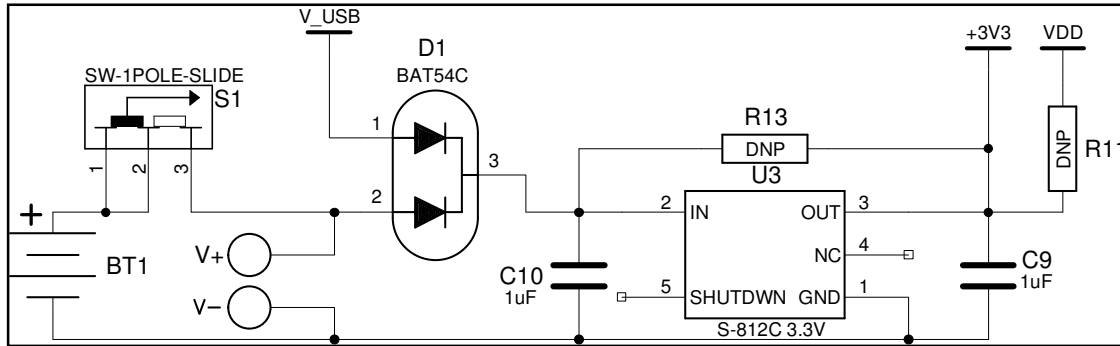




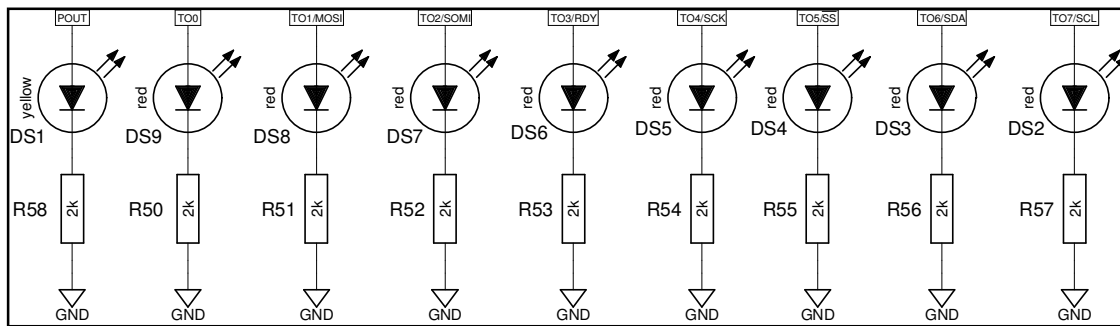
Optional:

Synchronisation Input: The IQS221 can be synchronised with an external MCU or High Voltage (50Hz) AC through the populating the correct resistors to the ZC pin.

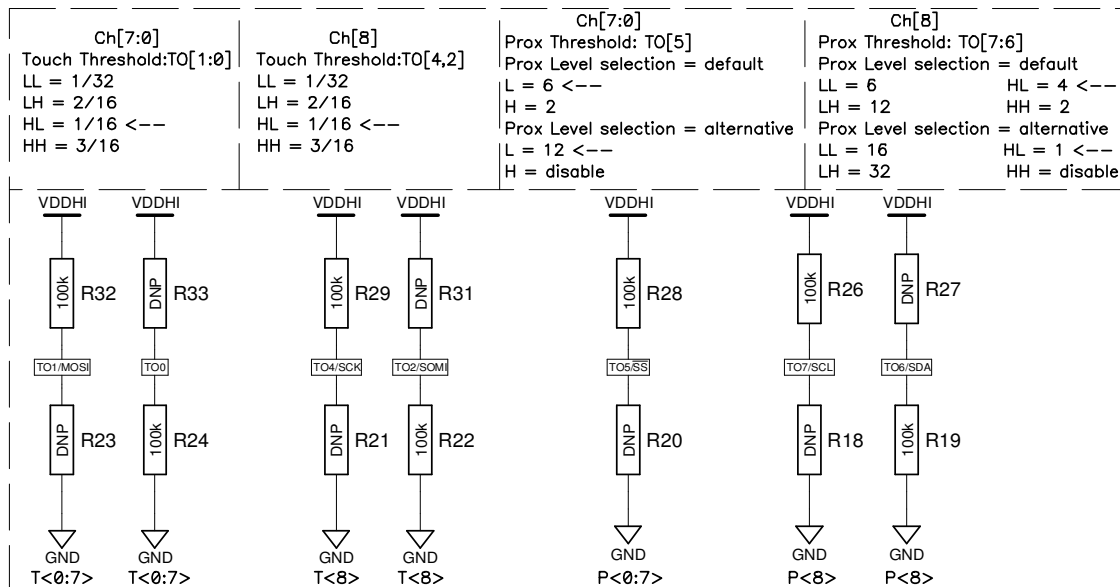
Driven Shield Output: One channel of the IQS221 (CX8 for this design) can be shielded if it is needed to locate the proximity sensor in a remote location.



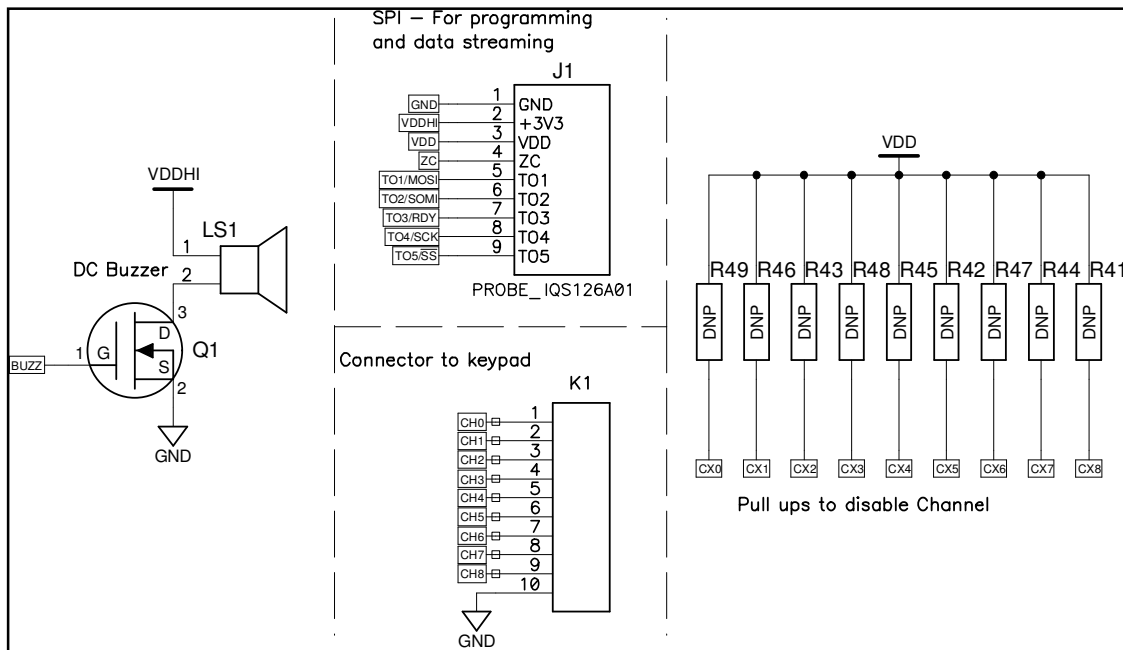
Optional: Regulator stage (with reverse voltage protection)



Optional: LEDs to indicate active outputs



Optional: External selections for prototyping



Optional: Buzzer, SPI Header, Keypad Header, Resistors to disable channels

Note:

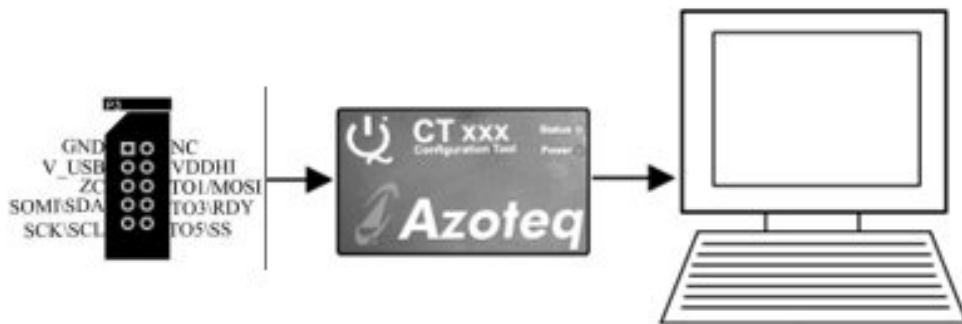
- Additional hardware not necessary for general designs with IQS221:
 - Reverse voltage protection diode.
 - 3.3V_{DC} regulator (User can input up to 18V_{DC} with regulator).
 - External selection resistors for sensitivity prototyping purposes.
 - Buzzer and related control hardware.
 - Synchronising (ZC) input.
 - Active driven shield output.
 - Option to disable individual channels with resistors.
- R[9:1] populated for additional ESD protection.
- Sensitivity fine-tuning:
 - Increase CS capacitors will increase module sensitivity.
 - Decrease CS capacitor will decrease module sensitivity.
- Default configuration (OTP bits):
 - DIR-A. (Key 7 will not respond with a LED, as there are only 8 TO LEDs populated)
 - Normal power mode.
 - LED will switch off if proximity occur for 15sec or more, and no touches are detected (environmental filter – see datasheet for additional options).
 - RF filter enabled.
 - Shield disabled.
- User can select custom options for IQS221 OTP bits with “PartNumberGenerator” which can be found on www.azoteq.com under downloads section.
- Keypad header can be used to connect controller PCB to custom product.
- Connecting the IQS221 EV02 module to a good ground connection will significantly increase proximity detection distance.



4 Programming & Streaming

The EV-Kit is by default in standalone mode. However, for some applications it is useful to evaluate the raw data of the IQS221.

- ☐ Connect the EV-kit to a PC through a CT200.
- ☐ Streaming can now be done through VisualProxSense.



Connect CT200 to PC (use 10 pin ribbon cable to EV-Kit).

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