



# Evaluation Kit: User Manual

## IQ Switch® - ProxSense™ Series

### IQS127 EV-Kit User Manual

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## 1 Introduction

This user manual describes the IQS127 evaluation kit. The EV-kit is made in two parts, consisting of a mother board and separate plug-in boards. It is developed to facilitate application engineers and development engineers in evaluating the IQS127 capacitive proximity and touch

sensor. 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 IQS127 in direct mode, streaming mode to a PC, or use the small plug-in boards in an application circuit.

## 2 Motherboard

Figure 2.1 shows the top view of the EV-kit mother board. Its features include:

- Battery powered; or
- USB powered
- 15mm Diameter button
- Back-grid as Shield
- Back-grid as Ground
- Back-grid as Sense Plate
- Slide switch for programming or streaming selection (See Figure 2.3).

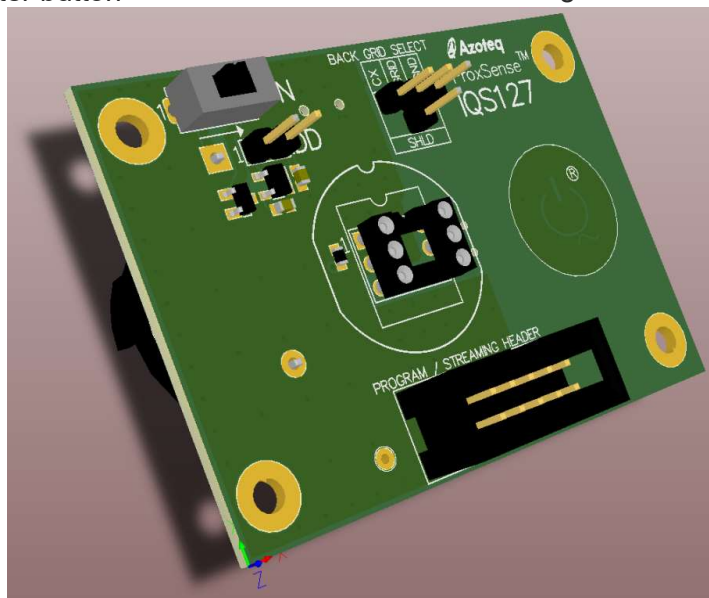
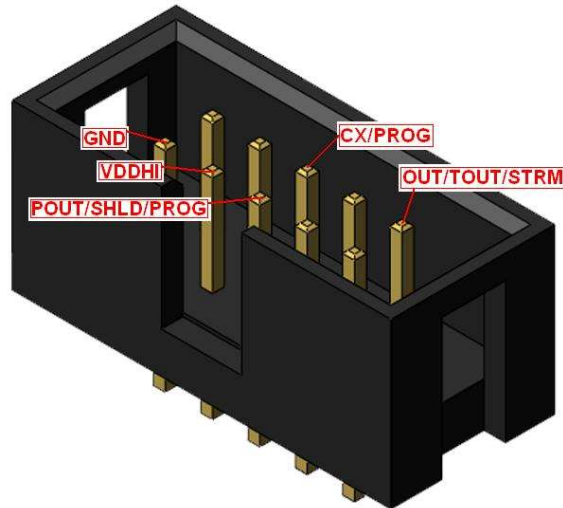


Figure 2.1 Top-View of EV-kit mother board.

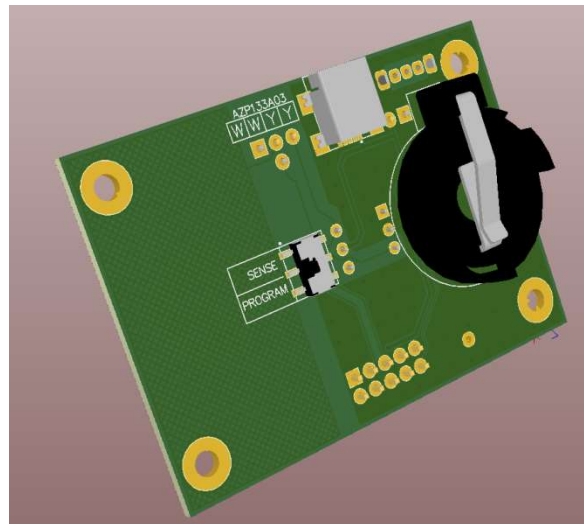


**Figure 2.2** Box header for Streaming/Programming.

The mother board includes a box header for programming and streaming the IQS127 devices through Azoteq configuration tools (CTxxx) to a PC, as well as two jumpers:

- W1 – for measuring current
- W2 – for back-grid selection

Figure 2.3 shows the bottom view of the mother board. The daughter boards are powered by two 3V coin cell batteries, in series, which is regulated on the mother board to 4.5V. A ground pin and mini USB connector is also available to connect and review the effect of introducing larger ground references.



**Figure 2.3** Bottom view of mother board.



### 3 Square Daughter Board

Figure 3.1 shows the top view of the square daughter board. Its features include:

- Prox LED
- Touch LED
- Small PCB layout, 10.7mm x 10.7mm

- Three possible assemblies:
  - ❖ Dual mode (D)
  - ❖ Shield mode (S)
  - ❖ Streaming mode (STRM)
    - Indicated by ink marking on PCB



**Figure 3.1 Top view of square daughter board. When looking from the top, IC and PCB pins are mapped one-to-one.**

Figure 3.2 shows the bottom view of the square daughter board. Descriptions of the components are given in Table 3.1. The square daughter board can be wired into applications, by connecting VDDHI (pin 5),

GND (pin 2) and a sense plate (pin 6) from the application to the square daughter board. This allows the IQS127 to be tested in existing applications.



Table 3.1 Square daughter board component descriptions.

| Component          | Use  | Typical Value           |
|--------------------|--|-------------------------|
| C1,C3 <sup>1</sup> | Power Supply decoupling capacitor          | 1uF, 100pF <sup>1</sup> |
| C2,C4 <sup>1</sup> | Internal regulator decoupling capacitor    | 1uF, 100pF <sup>1</sup> |
| R1 & R2            | LED current limiting resistor              | 2k                      |
| R3                 | CX series resistor (Added ESD protection)  | 2k                      |
| R4                 | Shield Pull-up resistor (only for IQS127S) | 10k                     |

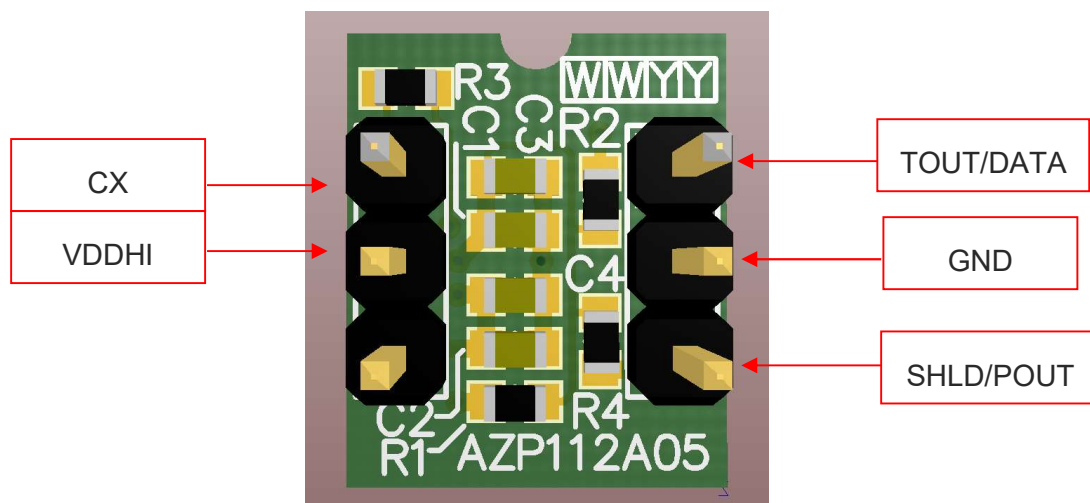


Figure 3.2 Bottom view of square daughter board.

<sup>1</sup> Used for added RF immunity in extreme environments (GSM band)

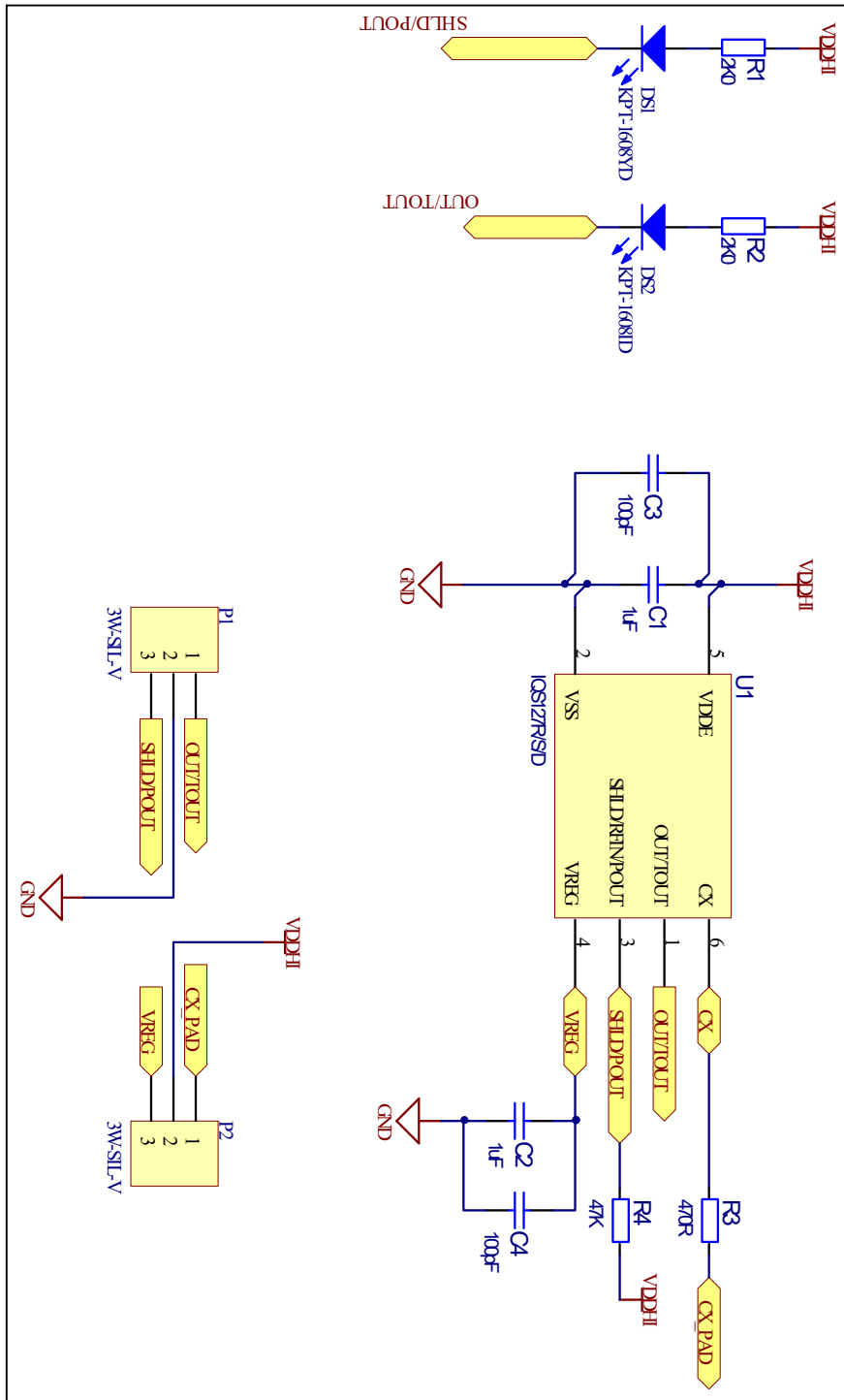


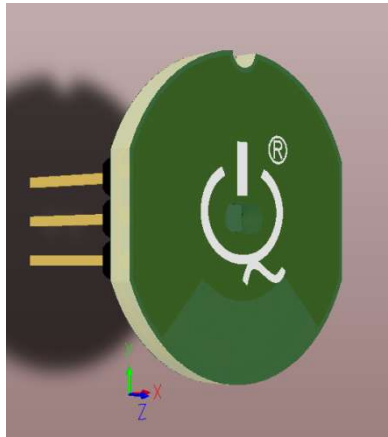
Figure 3.3 Schematic diagram of square daughter board.



## 4 Round Daughter Board

Figure 4.1 shows the top view of the round daughter board. Its features include:

- Bi-colour Prox and Touch LED
- Button on board
- Backlighting through the button
- Two possible assemblies:
  - ❖ Dual Mode
  - ❖ Streaming Mode



**Figure 4.1 Top view of round daughter board.**

Figure 4.2 shows the bottom view of the round daughter board. Component descriptions are given in Table 4.1. The round daughter board makes it extremely easy to wire the IQS127 into existing applications for testing. It needs only VDDHI (pin 5) and GND (pin 2), as it has a

button and output LEDs mounted on the PCB already. To program the round daughter board through the mother board, R3 (2k) should be moved to R4 footprint. R4 should also be placed instead of R3, to connect larger/different sense plates to the IQS127 (pin 6).

**Table 4.1 Component descriptions for round daughter board.**

| Component          | Use  | Typical Value           |
|--------------------|--|-------------------------|
| C1,C3 <sup>2</sup> | Power Supply decoupling capacitor            | 1uF, 100pF <sup>2</sup> |
| C2,C4 <sup>2</sup> | Internal regulator decoupling capacitor      | 1uF, 100pF <sup>2</sup> |
| R1 & R2            | LED current limiting resistor                | 2k                      |
| R3 or R4           | CX selection resistor (Added ESD protection) | 2k                      |
| DS1                | Bi-colour LED                                | N/A                     |

<sup>2</sup> Used for added RF immunity in extreme environments (GSM band)

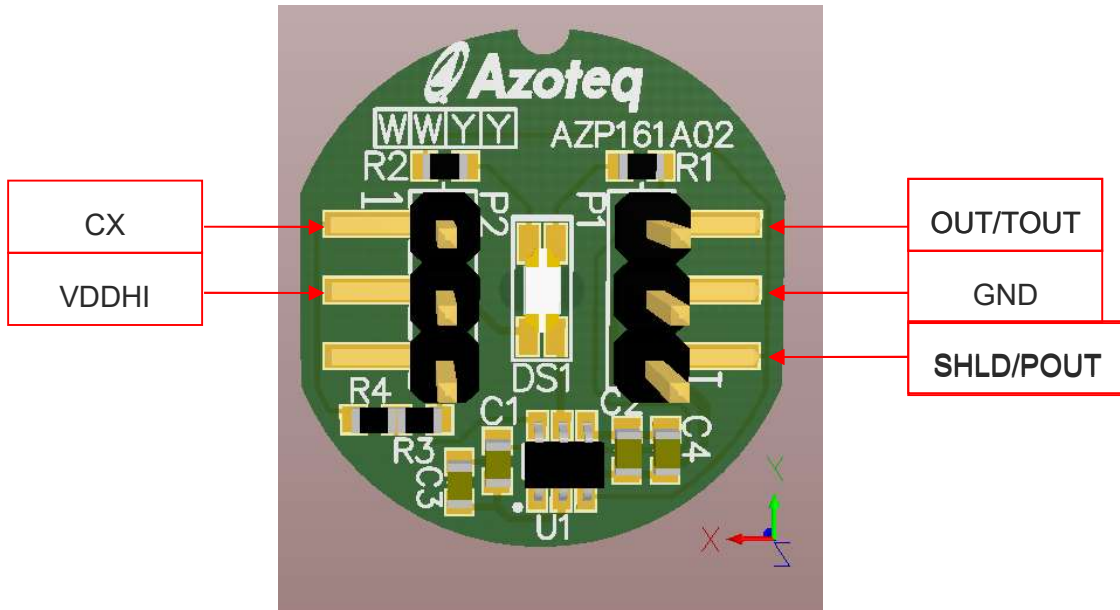


Figure 4.2 Bottom view of round daughter board.

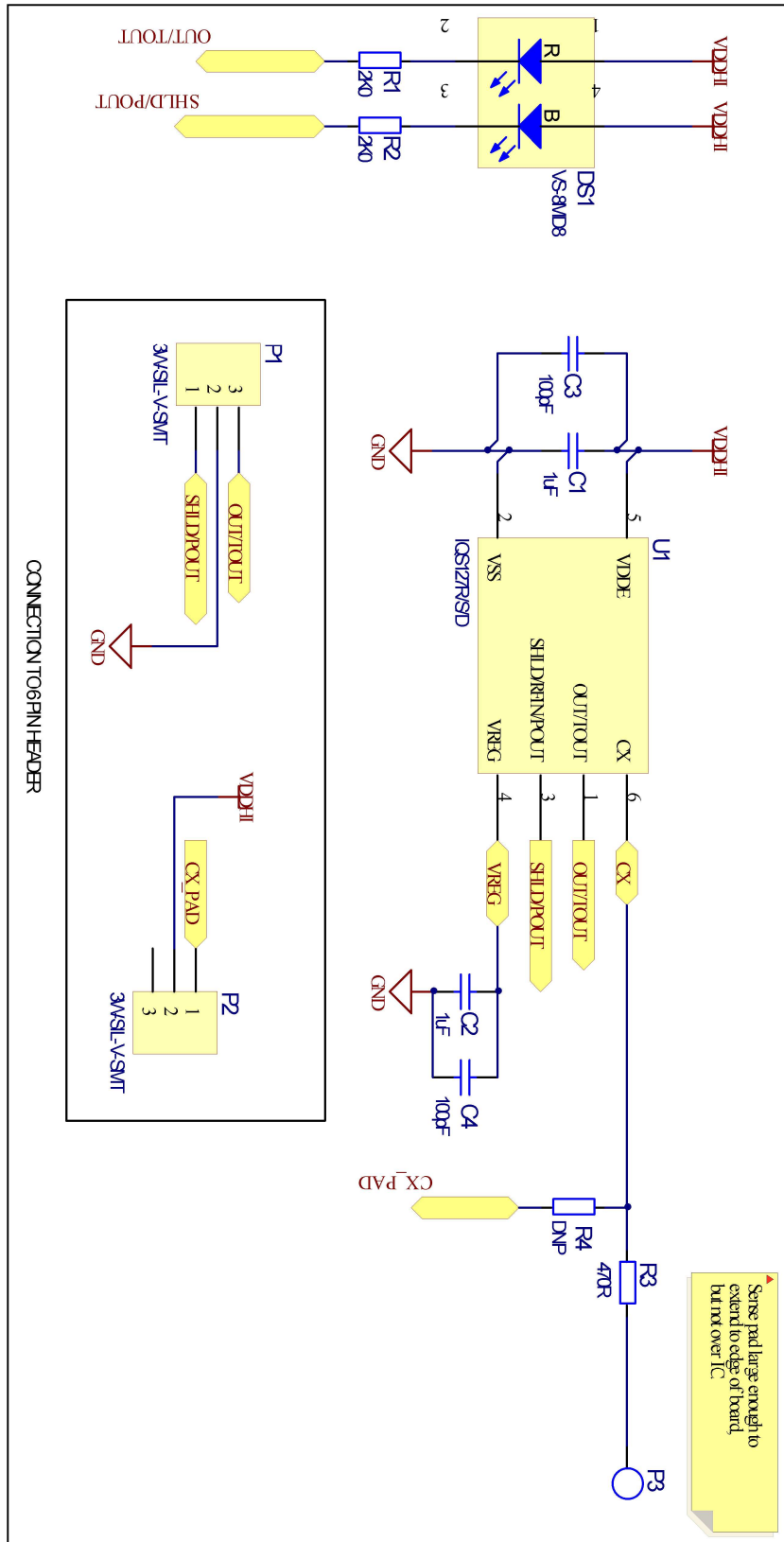


Figure 4.3 Schematic diagram round daughter board.





## 5 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 IQS127. To be able to use this feature, the IQS127 needs to be in streaming mode.

The daughter boards can be programmed through the mother board. Begin by:

- Inserting the daughter board. (Remember to move R3 to R4)
- Move slide switch S2 to programming. See Figure 5.1

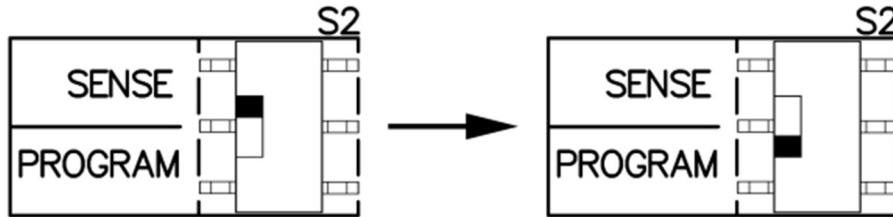


Figure 5.1 Programming switch S2.

- Connect the EV-kit to a PC through a CT200.



Figure 5.2 Connect CT200 to PC (use 10 pin ribbon cable to EV-Kit).

- Burn the IQS127 into streaming mode, by using USBProg.exe (available on the website: [www.azoteq.com](http://www.azoteq.com)).
- Move S2 back to SENSE after programming. (And R3 back to R4 for the round daughter board)
- Streaming can now be done through VisualProxSense.



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