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IQS316EV01 Evaluation Kit User Manual
IQ Switch® - ProxSense® Series

1   Introduction

This user guide describes the operation of the IQS316EV01 Evaluation Kit. The EV-Kit consists of three IQS316 controller boards. A controller board is interfaced to any personal computer with the Azoteq Configuration Tool (CT120/200), and the

IQS316 Graphical User Interface (GUI). The purpose of the IQS316 EV-Kit is to help application and development engineers in evaluating the IQS316 proximity and touch sensor.
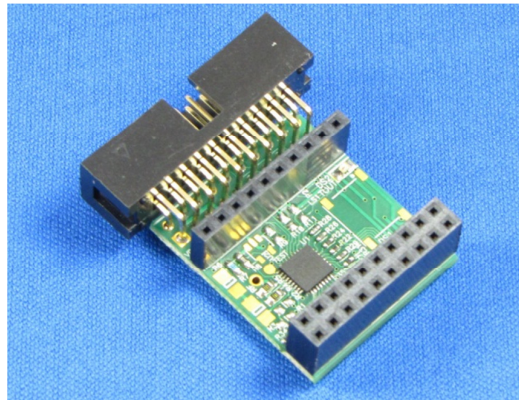
2   IQS316 Controller Board

Figure 2.1   Top view of IQS316 EV-Kit controller board

3   Using the Software GUI

Download and install the IQS316 Software GUI available at:
http://www.azoteq.com/products/download.php?downloadid=241

Plug in the ribbon cable provided into the CT120/200 Configuration Tool, and into the controller board

Plug the desired sense antennae into the controller board

After opening the GUI, "IQS316 Demo", select the communication type

"SPI" or "I²C" as indicated in Figure 3.1, depending on the mode that the IQS316 Controller module is configured in (default SPI).

See **Figure 3.1**

Figure 3.1   Start-up Screen for the IQS316 Demo GUI

3.2 Raw Data mode

The general purpose operation of the IQS316 software GUI is in Raw Data mode.

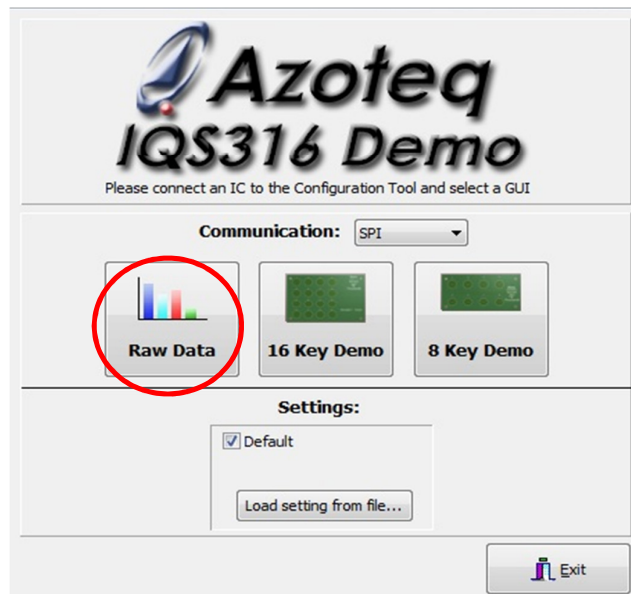To enter the Raw Data mode, click on "Raw Data" on the IQS316 Demo GUI start-up screen, as indicated in Figure 3.2.

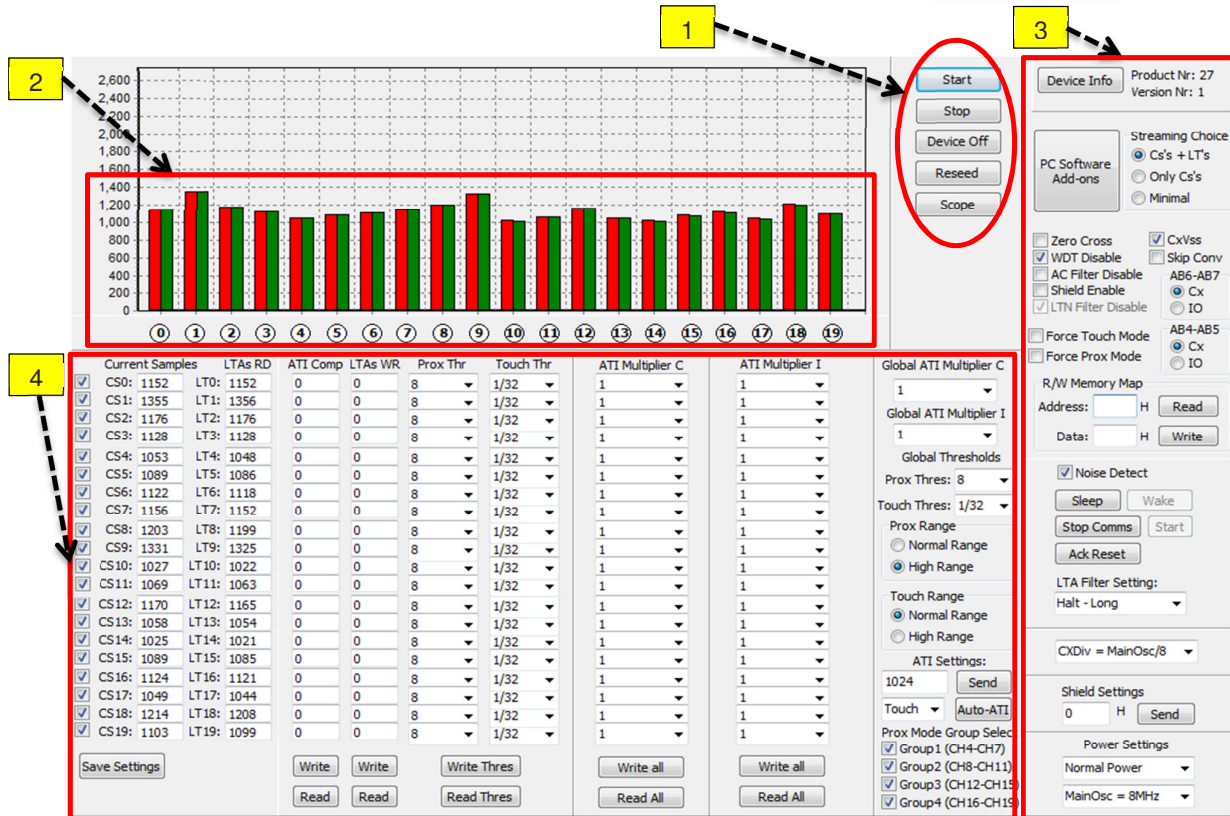**Figure 3.2   Start-up Screen for the IQS316 Demo GUI**

Figure 3.3   IQS316 GUI Screen

See Figure 3.3 for following of descriptions.

(1) Main GUI start/stop controls. Click on "Start" to start streaming data. Click on "Stop" to stop streaming data. Click on "Device Off" to stop streaming data and to cut power to the controller board. To reseed the LTA filter click on "Reseed". To view channel streaming data with respect to time click on "Scope".

(2) Channel data is displayed as bar graphs. The red bar indicates current samples (CS). The green bar indicates the Long Term Average (LTA). Channel 0 to 3 represents the four proximity channels. Channel 4 to 19 indicate the 16 touch channels.

(3) In this section the behavior of the IQS316 IC can be adjusted. Oscillator frequency and the LTA filter mode along with active shield settings can be modified. To view the device number, click on "Device Info". To set custom touch thresholds click on "PC Software add-ons". Under "Streaming Choice", the amount of data that is streamed to the GUI can be selected as desired. The various check boxes, "R/W Memory Map", "Sleep", "Stop Comms" and "Ack Reset" enable additional functions such as Zero Crossing synchronization, please see the IQS316 datasheet for details describing each option.

(4) This section enables the user to configure the Prox and Touch channels individually or globally. The current samples (CS) and LTA filter values of each channel are displayed under "Current samples" and "LTAs RD", respectively. The check boxes on the left hand side can be used to enable or disable channels as desired. ATI multiplier

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and ATI compensation settings can be modified by reading and adjusting the values as necessary, or by utilizing the "Auto-ATI" function for automatic ATI selection for Prox as well as Touch, under "ATI Settings:".

3.2.1 Example (See Figure 3.4 and Figure 3.5):

(i) To change the touch threshold on individual channels, click on "Read Thres". This will display the current settings. Change the threshold setting of the channel in question by selecting the desired value from the drop down box, and click on "Write Thres" as indicated in Figure 3.4.

(ii) To change the base value of current samples that the Auto-ATI algorithm tunes the touch channels to, enter a new value under "ATI Settings:" (500 in the example). Under "ATI Settings:" click on "Send". Whenever "Auto-ATI" is clicked on, the algorithm will retune the current samples to the selected base value. Lower base values: More stable, faster response times. Higher base values: More sensitive.

(iii) To make one or more channels more sensitive, the ATI compensation parameter can be adjusted as follows (See Figure 3.5). Under "ATI Comp" click on "Read" to display the current compensation values. Enter a new value between 0 and 63 for the channel that is to be adjusted, and click on "Write". A higher compensation value will yield higher current samples, and thus will make the channel more sensitive.
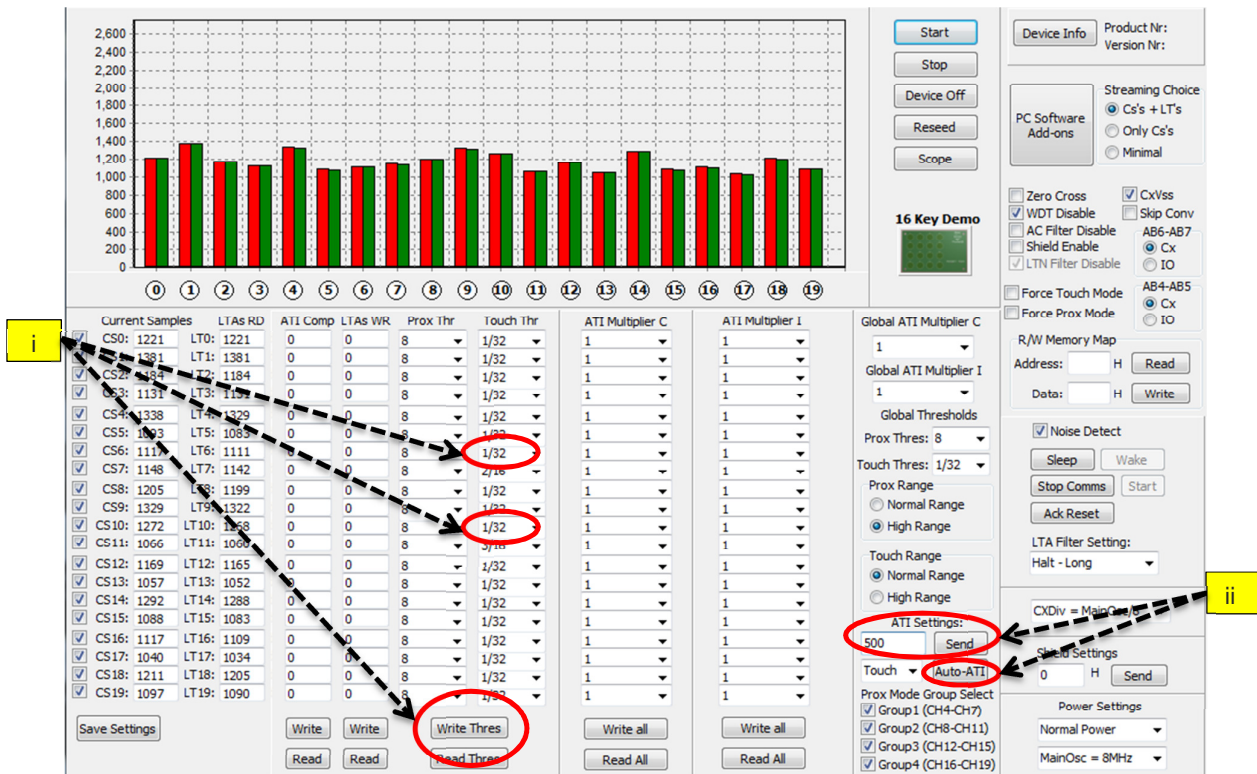

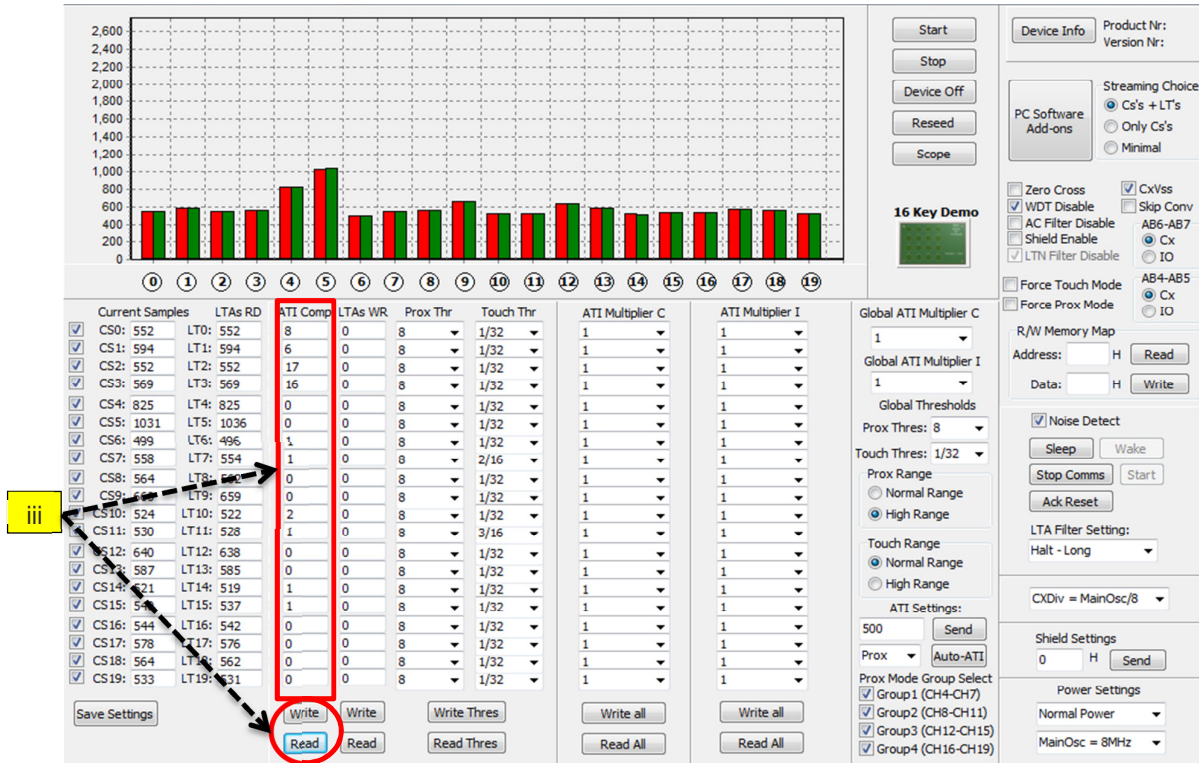**Figure 3.4   Adjusting individual channel thresholds**

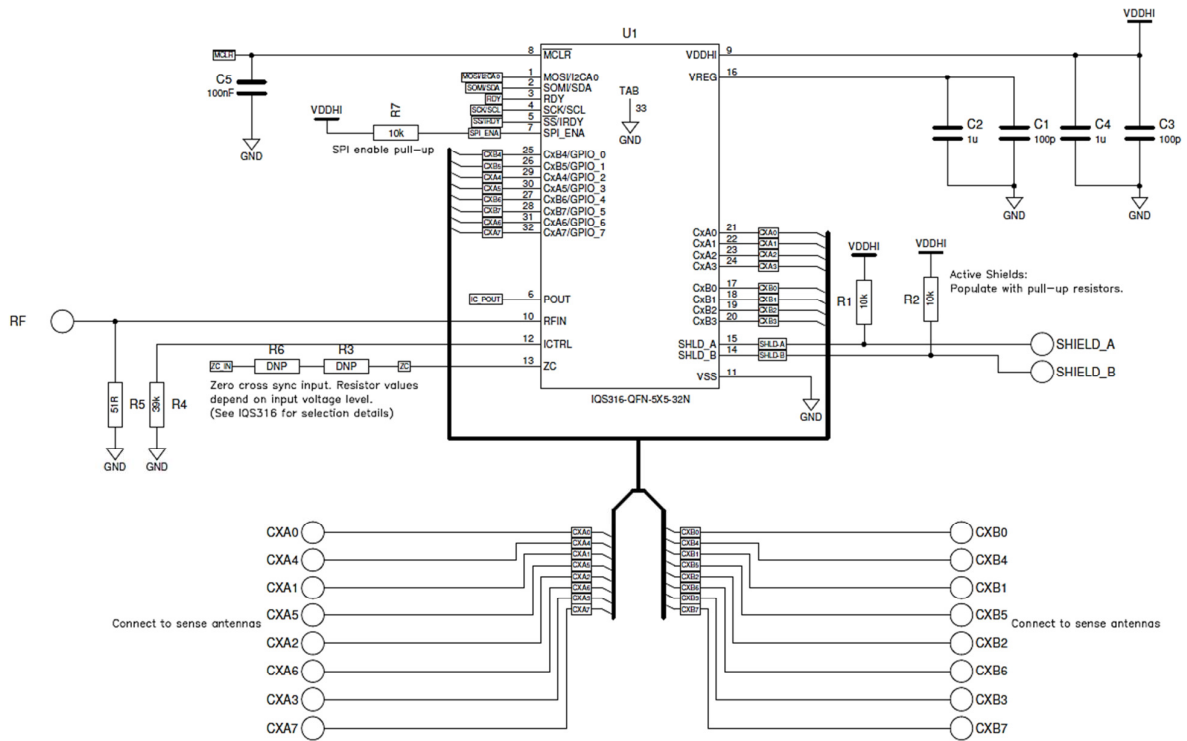**Figure 3.5   Adjusting channel sensitivity ATI compensation**

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4   Reference design

Figure 4.1   IQS316 reference design

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5 PCB Design

5.1 Controller Board PCB Design
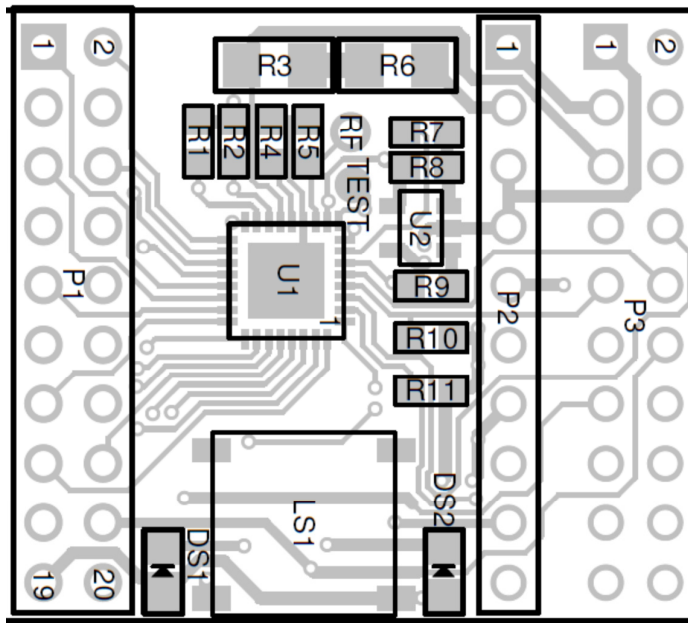

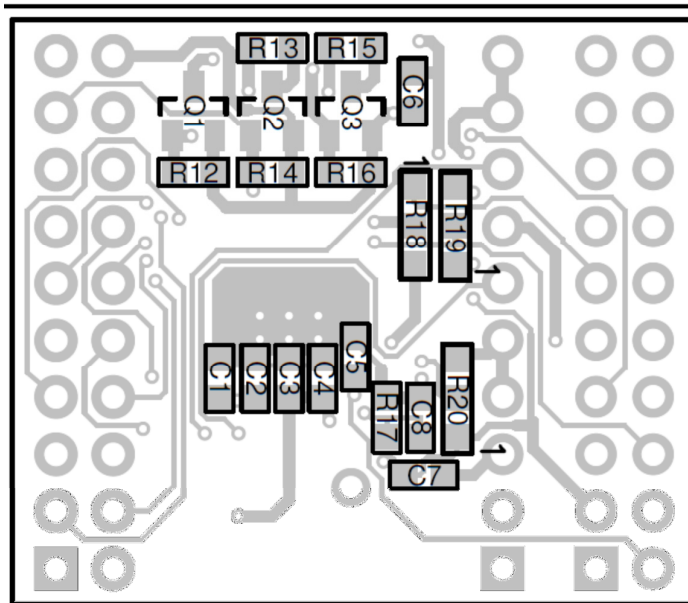**Figure 5.1   Top layer component placement**

Figure 5.2   Bottom layer component placement

The following patents relate to the device or usage of the device: US 6,249,089 B1, US 6,621,225 B2, US 6,650,066 B2, US 6,952,084 B2, US 6,984,900 B1, US 7,084,526 B2, US 7,084,531 B2, US 7,119,459 B2, US 7,265,494 B2, US 7,291,940 B2, US 7,329,970 B2, US 7,336,037 B2, US 7,443,101 B2, US 7,466,040 B2, US 7,498,749 B2, US 7,528,508 B2, US 7,755,219 B2, US 7,772,781, US 7,781,980 B2, US 7,915,765 B2, EP 1 120 018 B1, EP 1 206 168 B1, EP 1 308 913 B1, EP 1 530 178 B1, ZL 99 8 14357.X, AUS 761094

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