



ProxSense® IQS213 GUI User Guide

IQ Switch® - ProxSense® Series - SwipeSwitch™

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1 Introduction

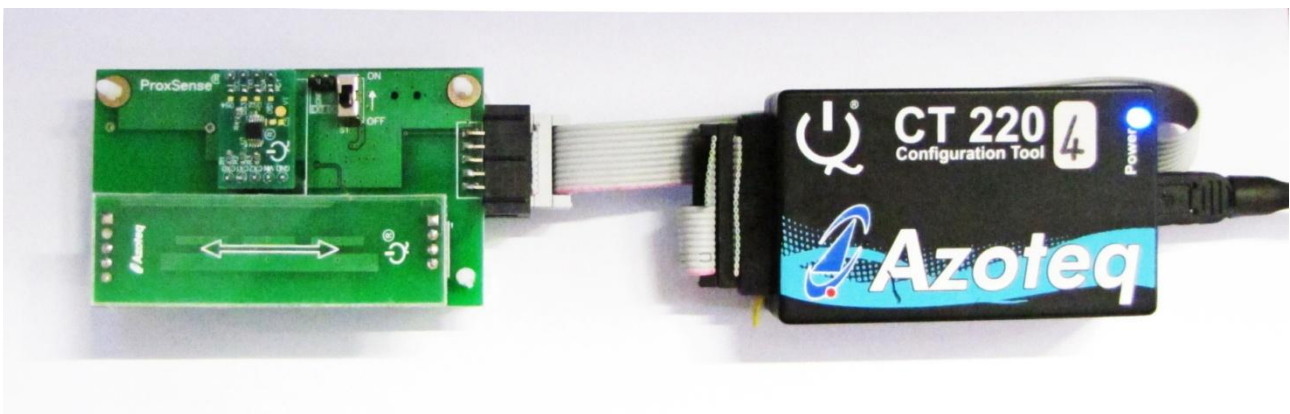
This user guide describes the basic operation of the **IQS213** Graphical User Interface (GUI) software from Azoteq. The GUI provides a platform for rapid prototyping by enabling application and development engineers to visualise the real time data stream from the **IQS213** Proximity, Touch and Swipe Sensor.

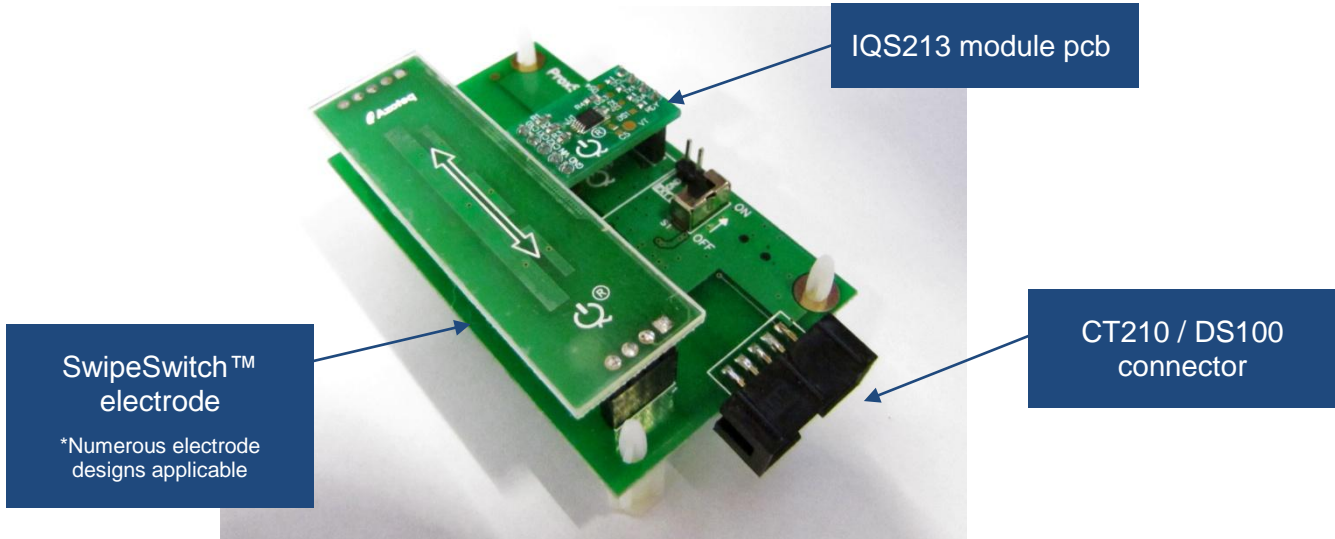
2 Setup

The **IQS213** GUI Software can be downloaded from the “Software and Tools” section on the Azoteq website: www.azoteq.com

2.1 General Setup

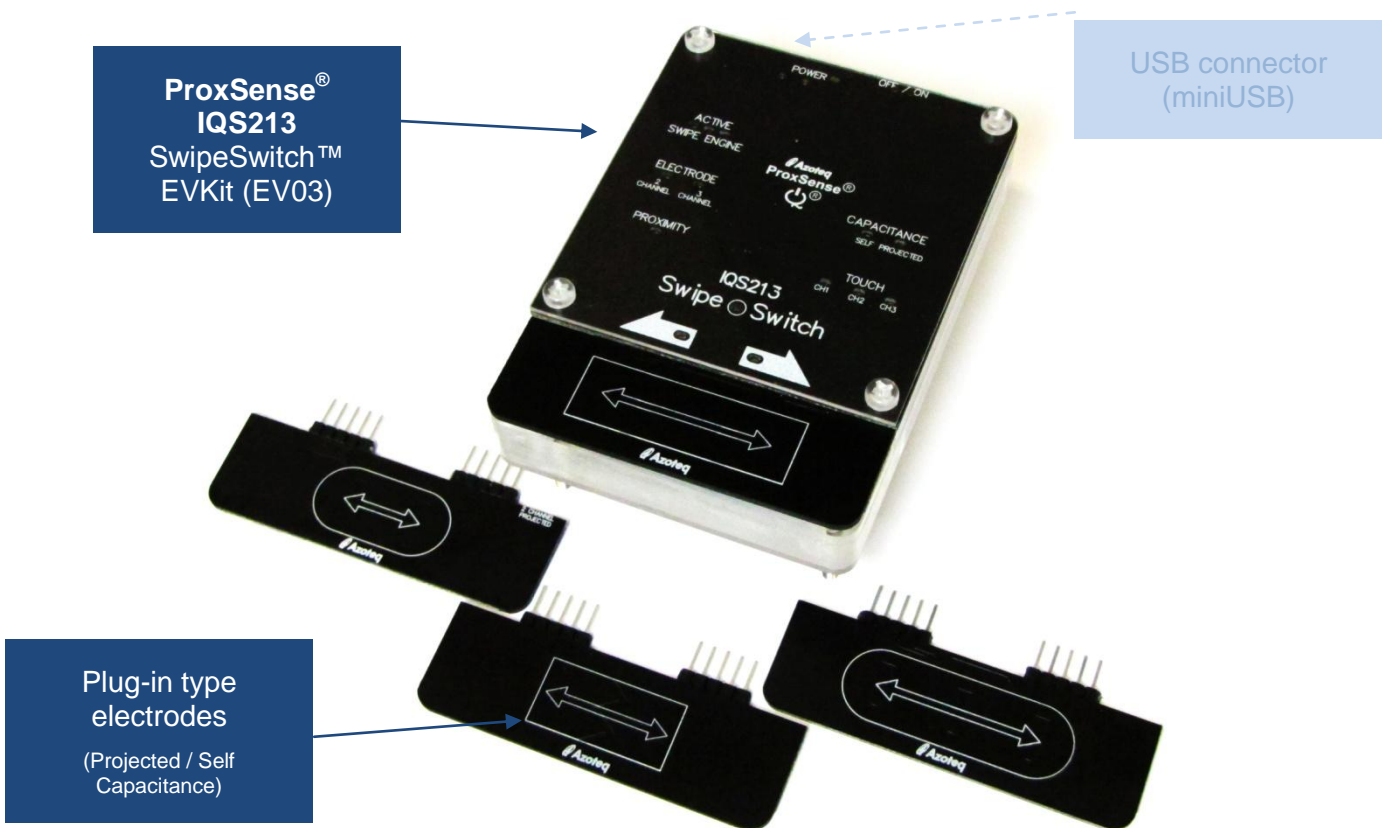
- ☞ Ensure that the **IQS213** has the I²C debug bit programmed, to enable data streaming. The programming of OTP (One Time Programmable) options can be accomplished with the Azoteq USBProg.exe software and CT210 (or later) USB dongle.
- ☞ Connect the GND, VDDHI, RDY, SDA and SCL lines on an **IQS213** IC or prototype pcb to the Azoteq CT210 (Configuration Tool) or DS100 (DataStreamer) USB dongle.
- ☞ Note: Pull-Up resistors (typ. 10kΩ) may be required on I²C communication lines.
- ☞ Run the **IQS213** Software GUI.





2.2 IQS213 EVKIT (EV03)

- ⌚ Connect the **IQS213** EV03 EVKIT to a computer using a suitable USB cable (with the ON/OFF switch in the OFF position, which disconnects the battery power).
- ⌚ Run the **IQS213** Software GUI.
- ⌚ The **IQS213** EV03 kit does not require the use of an Azoteq USB dongle to interface with the **IQS213** GUI, since the EV03 kit has been designed to be USB compatible.





3 GUI Operation

- ❏ The **IQS213** GUI display is illustrated in Figure 3.1. The “Hints and Tips” Pop-up window in the centre of the screen contains important information relevant to the GUI software and IC, please take the time to read though all of the information. The scroll buttons can be used to flip through the hints and tips and are marked in Figure 3.1
- ❏ After closing the Hints & Tips window in the centre of the screen, data streaming can be started by clicking on the “Start” button, also indicated in Figure 3.1

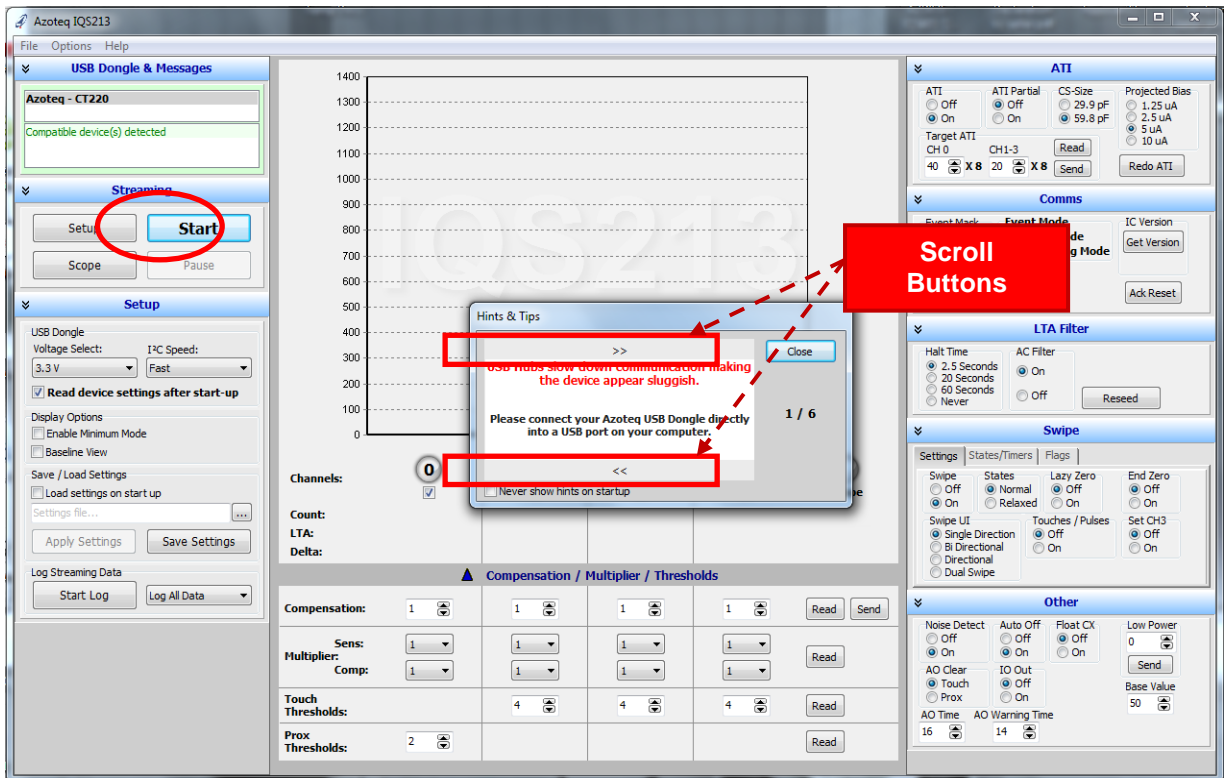


Figure 3.1 IQS213 GUI Startup Screen

- ❏ After clicking the “Start” Button, the “Electrode Configuration” pop-up window will appear, as shown in Figure 3.2. Please select the appropriate electrode configuration that match the electrode design connected to your **IQS213** device. The four available options are for 2- or 3-Channel, Self- or Projected capacitive electrode configurations.
- ❏ Upon selecting the desired electrode configuration, the GUI will automatically setup the device and start to stream the **IQS213** data.

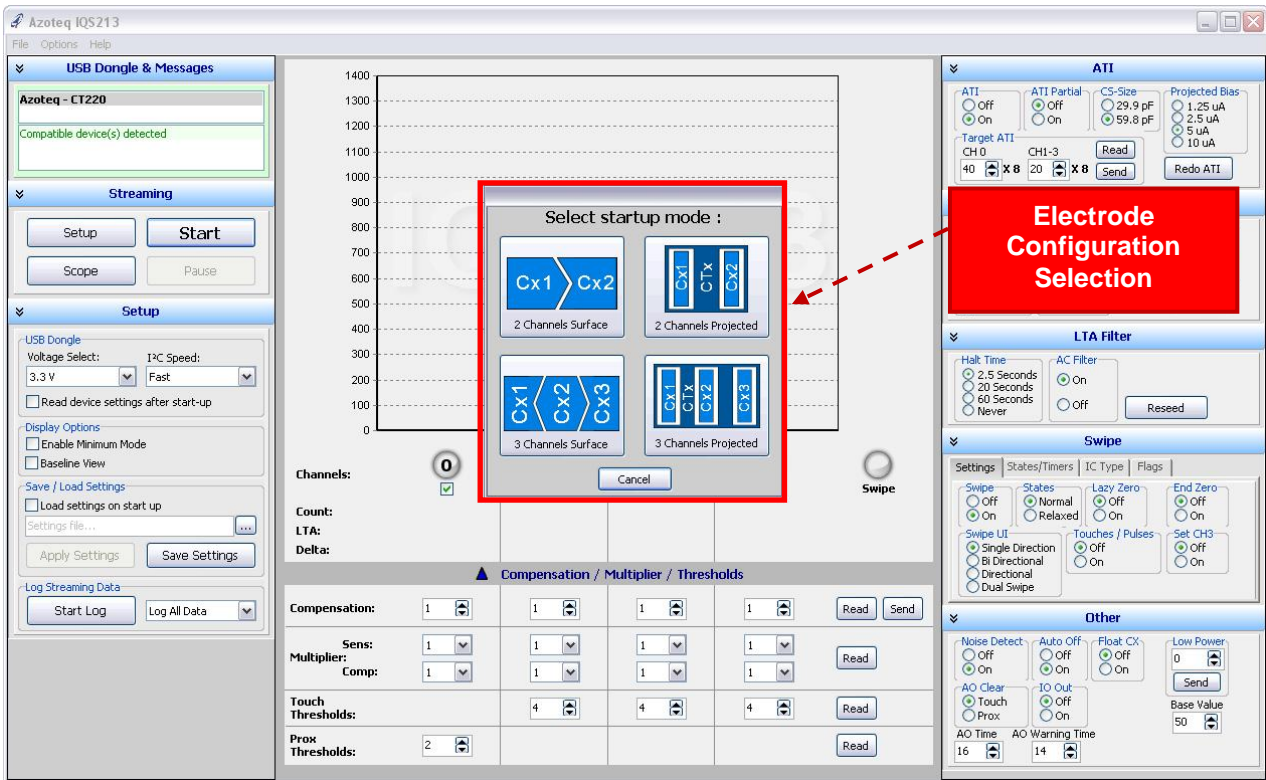


Figure 3.2 IQS213 Electrode Configuration Selection Pop-up window

After data streaming has commenced, the display will appear as illustrated in Figure 3.3. The channel data is indicated by bar graphs in the centre of the GUI:

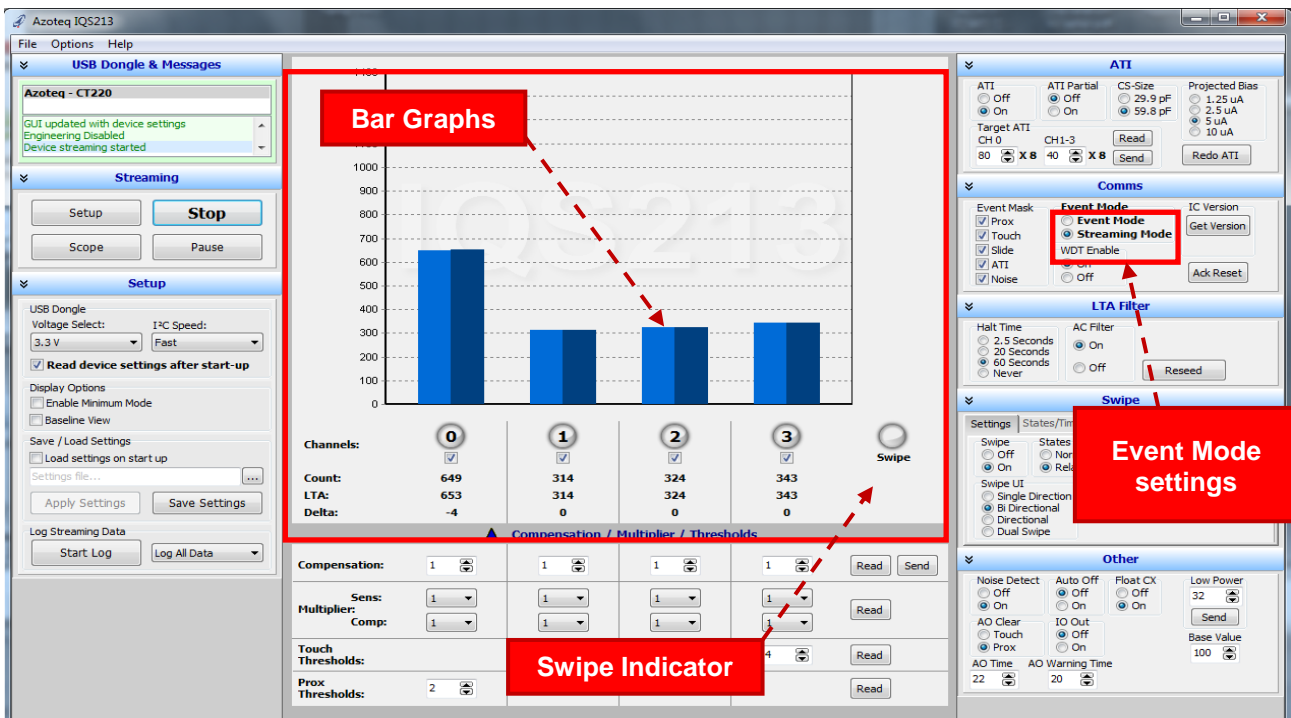


Figure 3.3 IQS213 Data streaming started



- ❏ Please note that the GUI automatically disables the “Event-Mode” streaming option by setting the IQS213 device to provide continuous data streaming. This provides a fluent and continuous stream of data for prototyping and visualisation. Event-Mode I²C (Event-driven / interrupt driven) communication is the **default** interface on all IQS213 devices. Therefore, with the IQS213 IC configured in Event Mode, communication will only occur when the IC registers an event, such as proximity, touch and swipe detection events. Please see the IQS213 datasheet for further information regarding Event Mode operation.
- ❏ When a user performs a swipe action, a swipe event is registered, and the swipe indicator will light up. The indicator will be toggled once another swipe event is detected.
- ❏ Channel 0 (CH0) is used as a proximity (PROX) only channel. This channel is realized by charging all active channel electrodes simultaneously to deliver a distributed proximity channel. During Low Power (LP) modes, only CH0 is active – upon detection of a PROX event on CH0, the IC will zoom to Normal Power (NP) for fast touch / swipe detection.
- ❏ The proximity and touch detection levels (thresholds), as well as the overall sensitivity can be adjusted individually for each channel, in the “Compensation / Multiplier / Thresholds” section of the GUI, as illustrated in Figure 3.4.

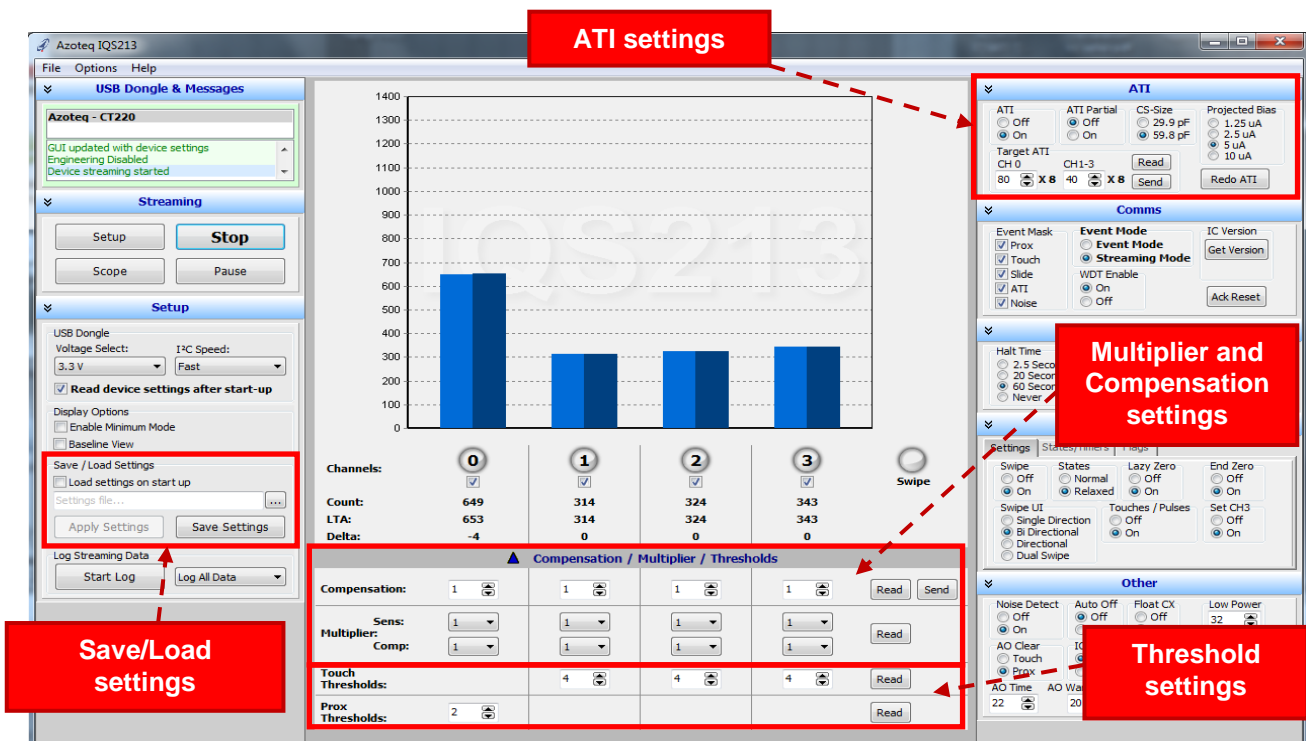


Figure 3.4 IQS213 GUI Settings

- ❏ The threshold settings will adjust the proximity and touch detection levels, whereas the Multiplier and Compensation settings will adjust the counts, and thus the overall sensitivity of the device. By default the ATI algorithm will adjust these values to the optimum settings to reach a target count of approximately 640 counts for the proximity channel, and 320 for the touch channels. ATI can be turned off and the settings selected manually. The ATI



settings can be found in the ATI section of the software GUI, as illustrated in the upper right corner of Figure 3.4.

- ❏ After the appropriate adjustments have been made to the IC, the settings can be saved to a file for future use, by making use of the Save/Load function as displayed in the left hand side of Figure 3.4. This enables settings to be loaded from the file, instead of re-adjusting all settings from scratch.
- ❏ Proximity, Touch and Swipe detection events are indicated in the GUI, by the channel light underneath the corresponding bar graph, as well as the Swipe Indicator light. A blue light indicates proximity detection, a red light indicates touch detection and the Swipe indicator swipe detection, as illustrated in Figure 3.5.

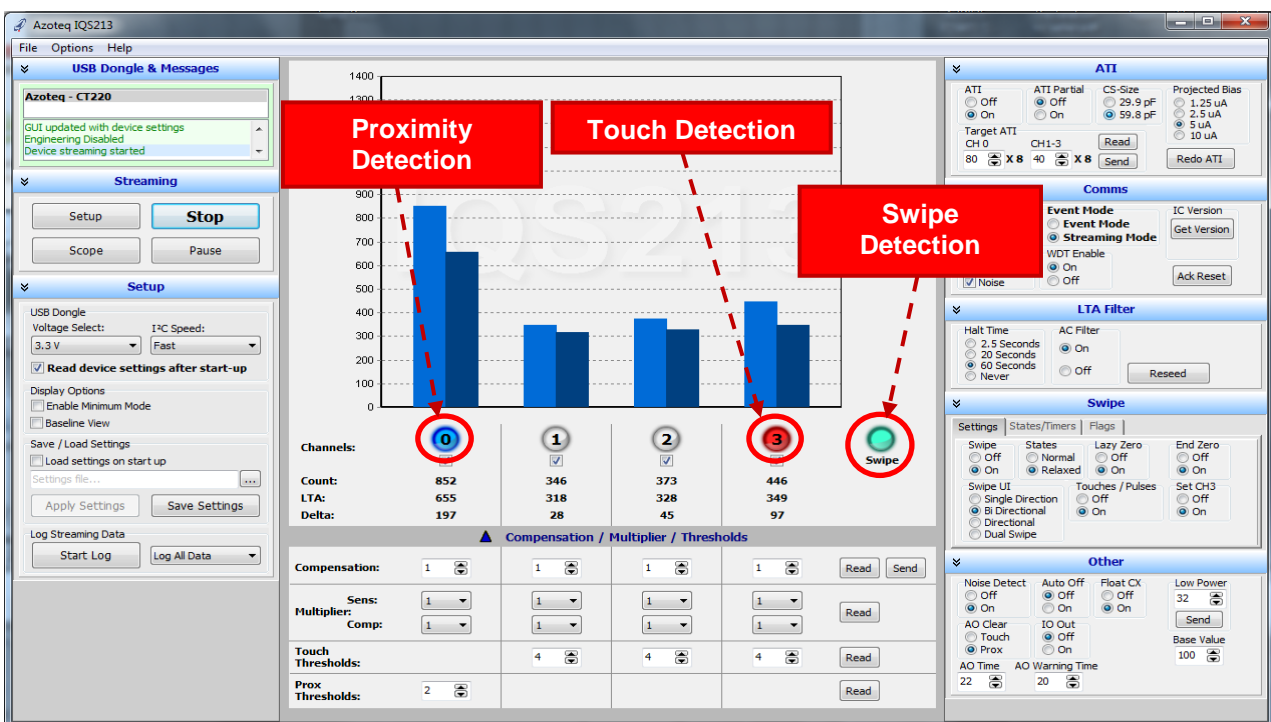


Figure 3.5 Proximity, Touch and Swipe indications

- ❏ The user can also select the desired **IQS213** IC type from the “IC Type” tab in the GUI, as shown in Figure 3.6. This will configure the **IQS213** IC to operate as either a SwipeSwitch™ or normal touch and proximity detection device. Please refer to the **IQS213** datasheet for IC type configurations.
- ❏ Hint: For first-time users of **IQS213** SwipeSwitch™ related devices, it is recommended to select the “**zz1 x2x zz3**” IC type option, if using a 3-channel swipe electrode configuration (see Figure 3.6). Selecting this IC type, together with the “Zero State” = On function, will provide the most flexible swipe detection capability.

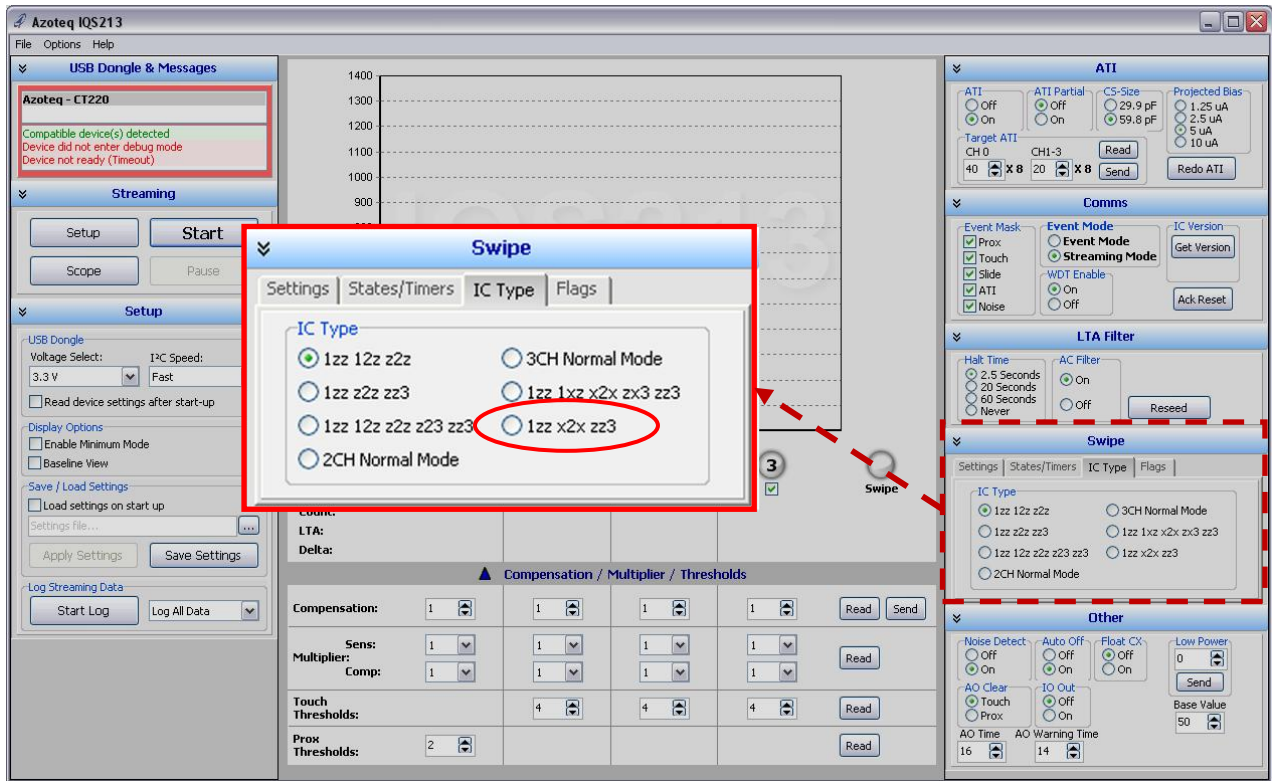


Figure 3.6 IQS213 IC Type Selection

To visualise detailed changes in data with respect to time (discrete samples), the “Scope View” can be enabled by clicking on the “Scope” button, as illustrated in Figure 3.7.

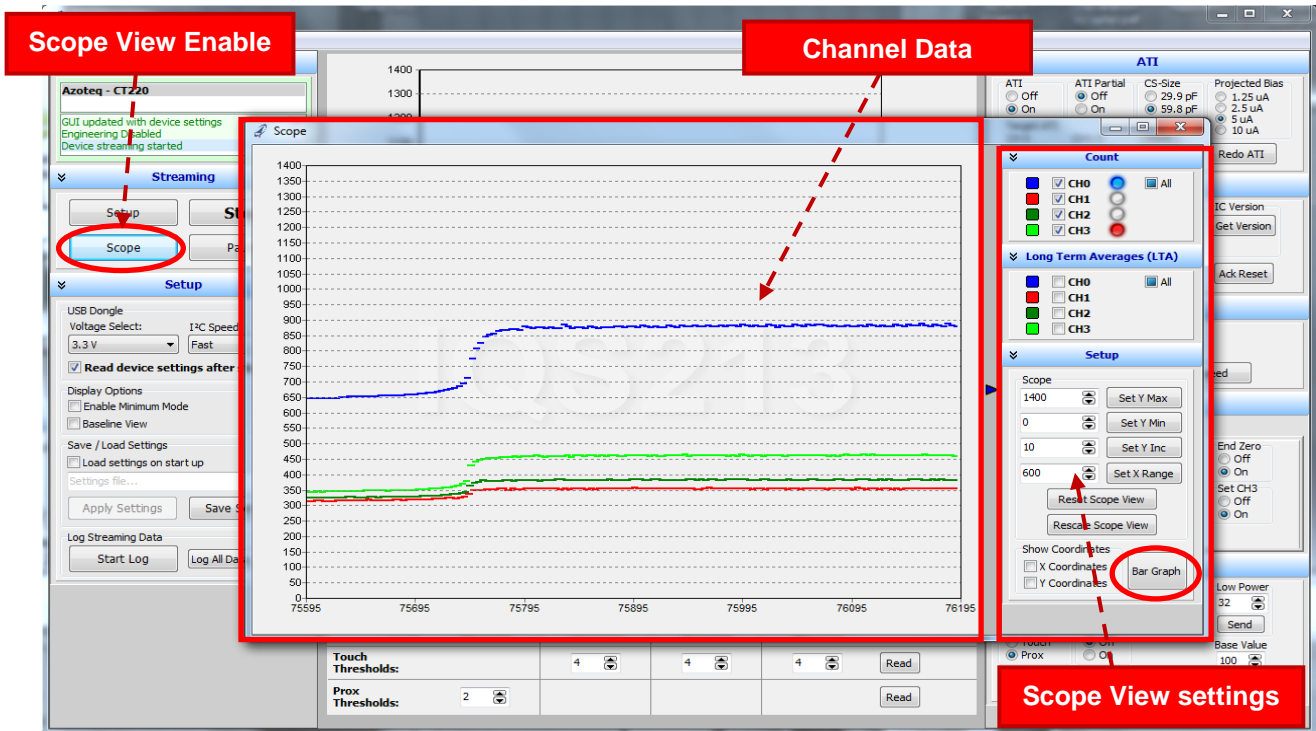


Figure 3.7 IQS213 GUI - Scope View



- ☞ Each channel's visibility and colour can be adjusted along with the scale of the scope view, in the scope view settings section, on the right hand side of the scope view window.
- ☞ To return to the Bar graph view, simply close out of the scope view window. This can be done by clicking on the X in the upper right hand corner of the window, or by clicking the "Bar Graph" button in the lower right hand corner of scope view settings section of the scope view window.

For I²C-related data streaming information, please refer to the **IQS213** datasheet for device memory register descriptions and application note: "**AZD066: IQS213 Communication Interface Guideline**", available at: www.azoteq.com.

For further enquiries regarding the **IQS213**, please contact your local distributor or submit enquiries to Azoteq at: ProxSenseSupport@azoteq.com

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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