

Software GUI for the EVK1060A Demonstration Kit

User Guide







Section 1

Configuring the EVK1060A

1.1 Introduction

The EVK1060A demonstration software is designed to show the implementation and function of the AT42QT1060 (QT1060) IC on the EVK1060A evaluation board.

New users are recommended to look through the Quickstart guide to familiarise themselves with the kit and software before reading this User Guide.

For detailed information regarding these products, including the latest datasheet and demonstration software, go to www.atmel.com.

1.2 Components Required

The following components are required:

- 1 x EVK1060A Evaluation Board
- 1 x 9206 USBPluginCard
- 1 x EVK1060A Demonstration Software
- 1 x Mini-USB Lead
- 1 x PC with USB Port

Refer to the *USBPluginCard for the EVK1060A User Guide* for information about connecting the EVK1060A evaluation board and the USBPluginCard.

1.3 Preparation

To prepare the EVK1060A for use, proceed as follows:

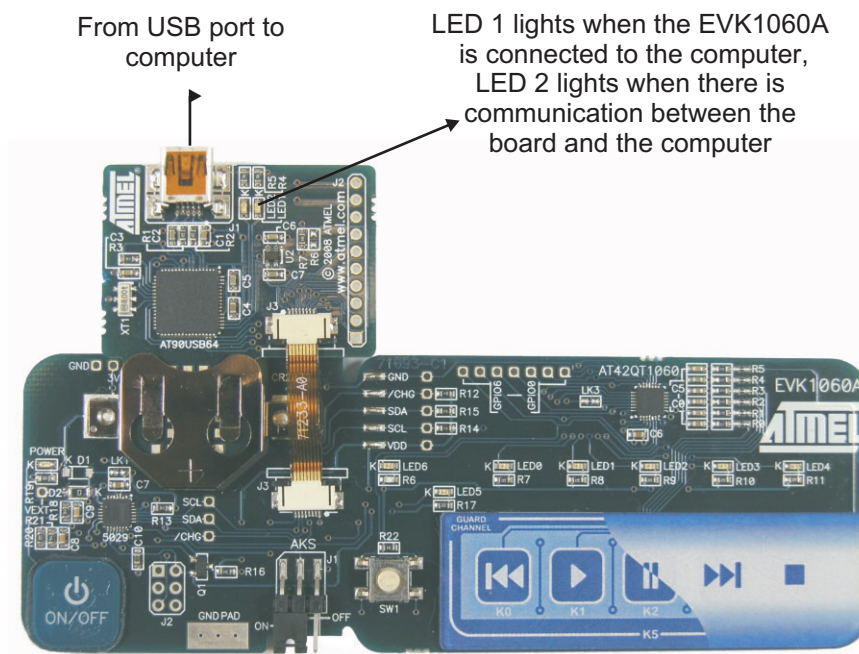
1. Connect the EVK1060A evaluation board and the USBPluginCard to form the EVK1060A assembly (refer to the *USBPluginCard for the EVK1060A User Guide*).
2. Using the mini-USB cable, connect the EVK1060A assembly to the computer. LED 1 and 2 on the top of the USBPluginCard light. LED 1 remains lit to indicate that there is power to the board (see [Figure 1-1 on page 1-2](#)). LED 2 goes out and relights when there is communication between the board and the computer.

The first time the assembly is connected to a PC, you may have to wait for Microsoft Windows® to install a driver for the USB interface.

3. Download the latest version of the EVK1060A demonstration software from www.atmel.com.

4. Double-click the exe file. Before the software GUI opens a message is shown “Please ensure all board modifications are completed”. This refers to when the EVK1060A is powered from the PC (and not the battery-operated standalone version) and the circuit must be configured to exclude power from the battery. Refer to the *USBPlugInCard for the EVK1060A User Guide* for details.
5. Once the software has been started initial settings (taken from a memory map built into the software) are sent to the EVK1060A.

Figure 1-1. EVK1060A Assembly





Section 2

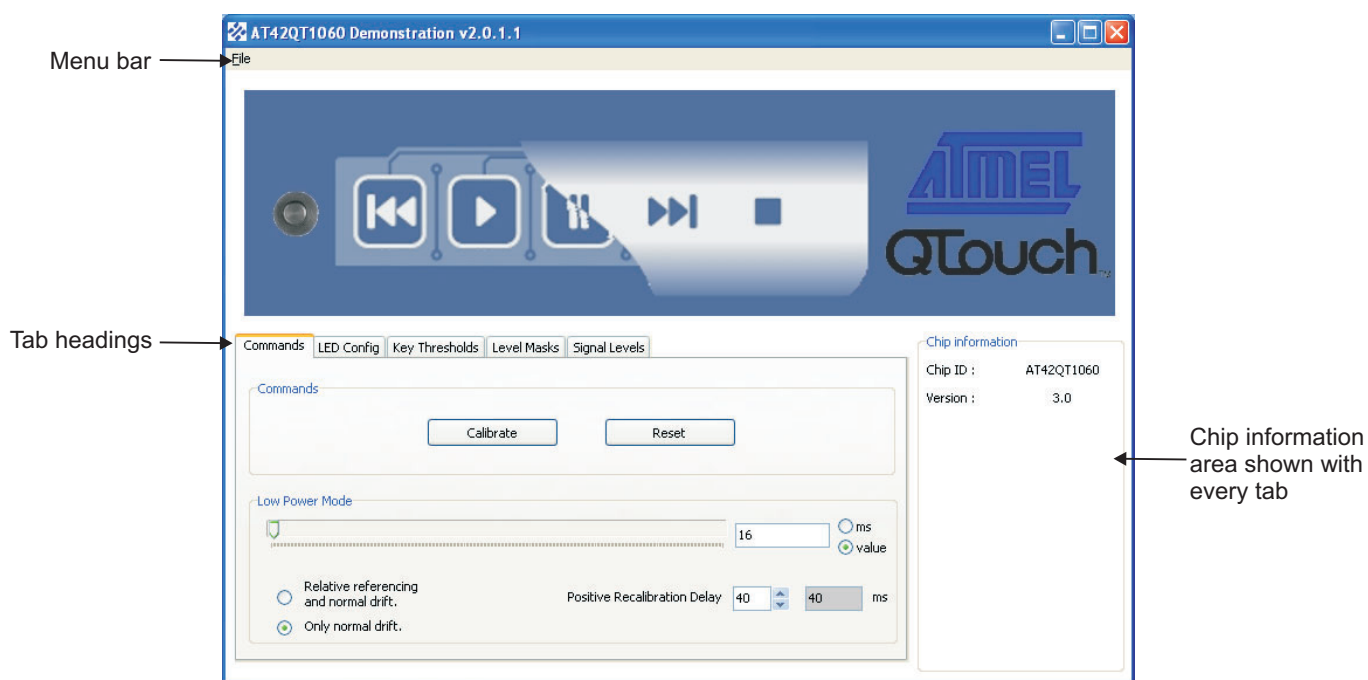
Using the Software GUI for the EVK1060A

2.1 Overview

2.1.1 EVK1060A Software GUI

The EVK1060A software consists of various options to configure the keys. These options are arranged in groups, displayed under various tab headings (see [Figure 2-1](#)).

Figure 2-1. Overview of EVK1060A Software GUI



2.1.2 Menu Bar

See [Figure 2-1](#) for the menu bar. The menu commands are identical for all of the tabbed dialog boxes.

- **File, Load Settings** – Opens a dialog box to load a preconfigured file.
- **File, Save Settings** – Opens a dialog box to save a file.

2.1.3 Changing and Saving Settings

Select a tab heading and change the settings as required (see [Section 2.2 on page 2-3](#) and later). All settings changed while the software is running are updated immediately to the QT1060 chip on the EVK1060A demonstration board.

See [Section 2.1.2](#) for how to save the customized settings to the PC and then reload them later.

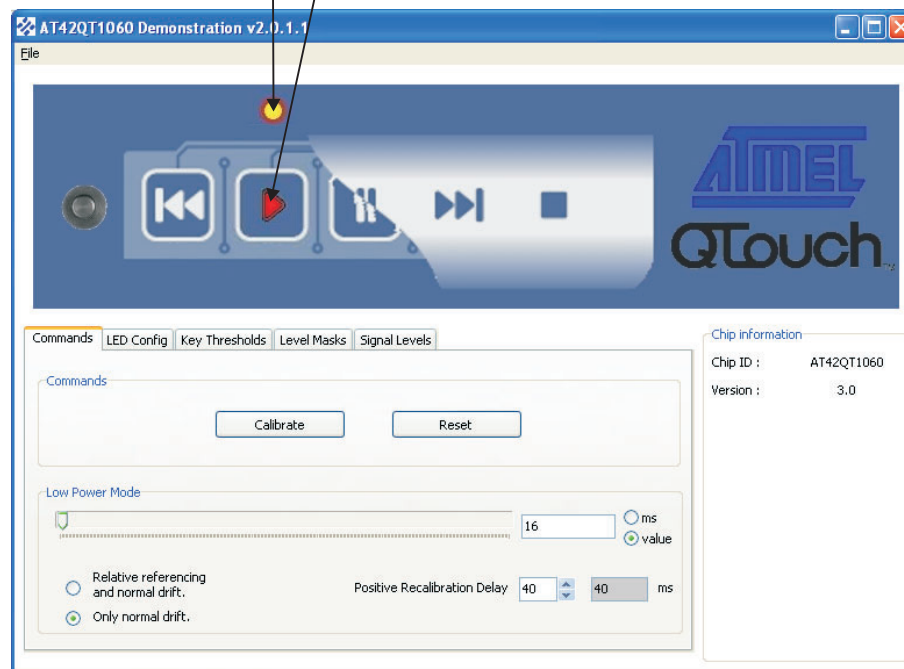
If the EVK1060A board is unplugged or the software is reset, the user-defined settings disappear and all settings revert to EVK1060A software defaults.

2.1.4 Detecting Touch

When a key is touched on the EVK1060A demonstration board the corresponding response is displayed on the software (see [Figure 2-2](#)).

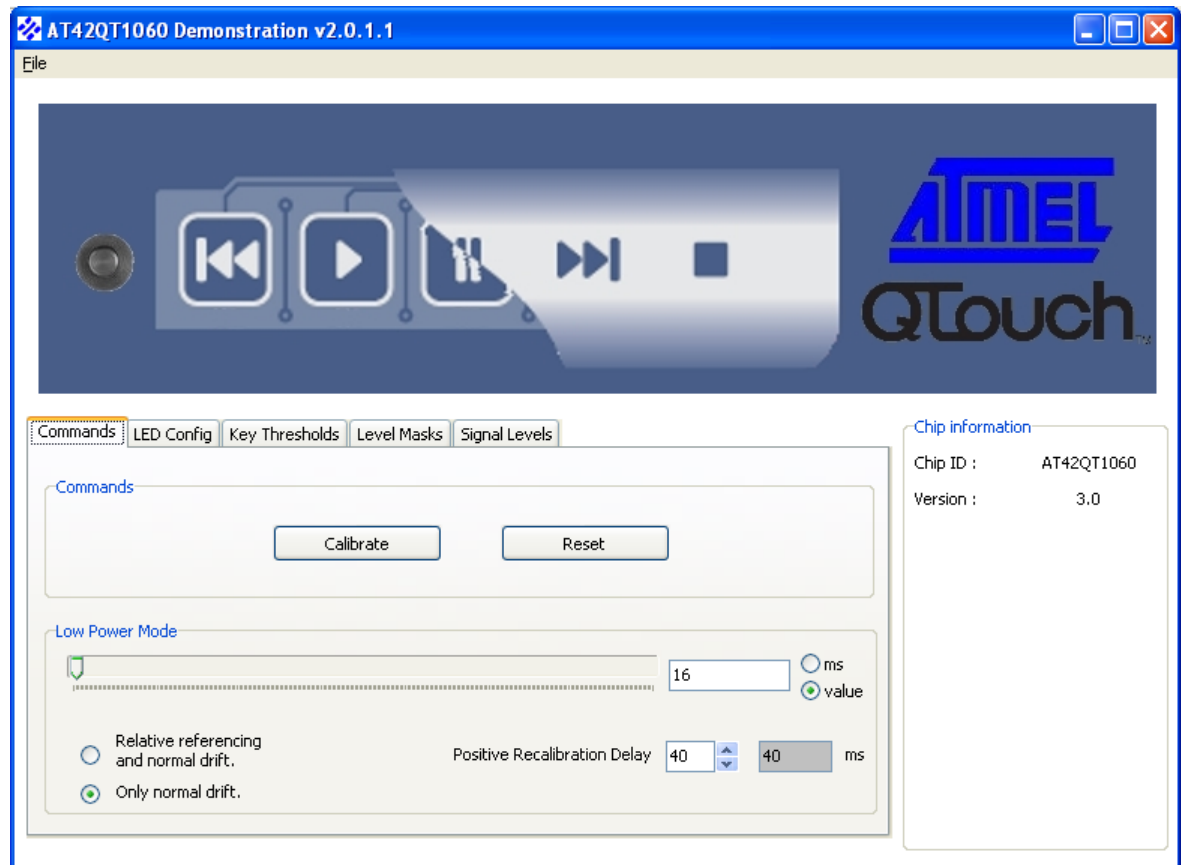
Figure 2-2. Keys – Touched and Untouched

When a key is pressed on the EVK1060A the corresponding key and LED on the software light



2.2 Commands Tab

Figure 2-3. Commands Tab



2.2.1 Commands

■ Calibrate

Click **Calibrate** to recalibrate all enabled keys.

■ Reset

Click **Reset** to reset the EVK1060A to its default settings. All user-defined settings are lost unless previously saved (see [Section 2.1.2 on page 2-1](#)).

2.2.2 Low Power Mode

■ Low Power Mode

Drag the **Low Power mode** slider to the desired setting to set the sleep time between bursts. Higher values cause more sleep time (lower power consumption but slower response times). Values are 0 = Sleep, 1 = 16 ms to 255 = 4080 ms, incremented in 16 ms periods.

When the low power mode = 0 there is an ultra-low power mode where no measurements are carried out (Sleep Mode).

When the low power mode = 255 the device operates in Free-run mode where the device continuously performs measurements one after another, resulting in the fastest response time but the highest power consumption.

■ **Relative Referencing/Normal Drift**

Click the required option, **Relative referencing and normal drift** or **Only normal drift**. Relative referencing compensates for fast signal drifts that are common to all keys. This mode is suitable if the keys are placed close to each other and have closely matched burst lengths. Normal drifting is also carried out but at a slower rate compared to the relative referencing drift rate.

■ **Positive Recalibration Delay**

Click the **Positive Recalibration Delay** arrows to select a value. Recalibration of a key is usually required to restore that key's function if a prolonged detection is produced due to an object's unintentional contact. The delay before recalibration occurs is determined by the PRD.

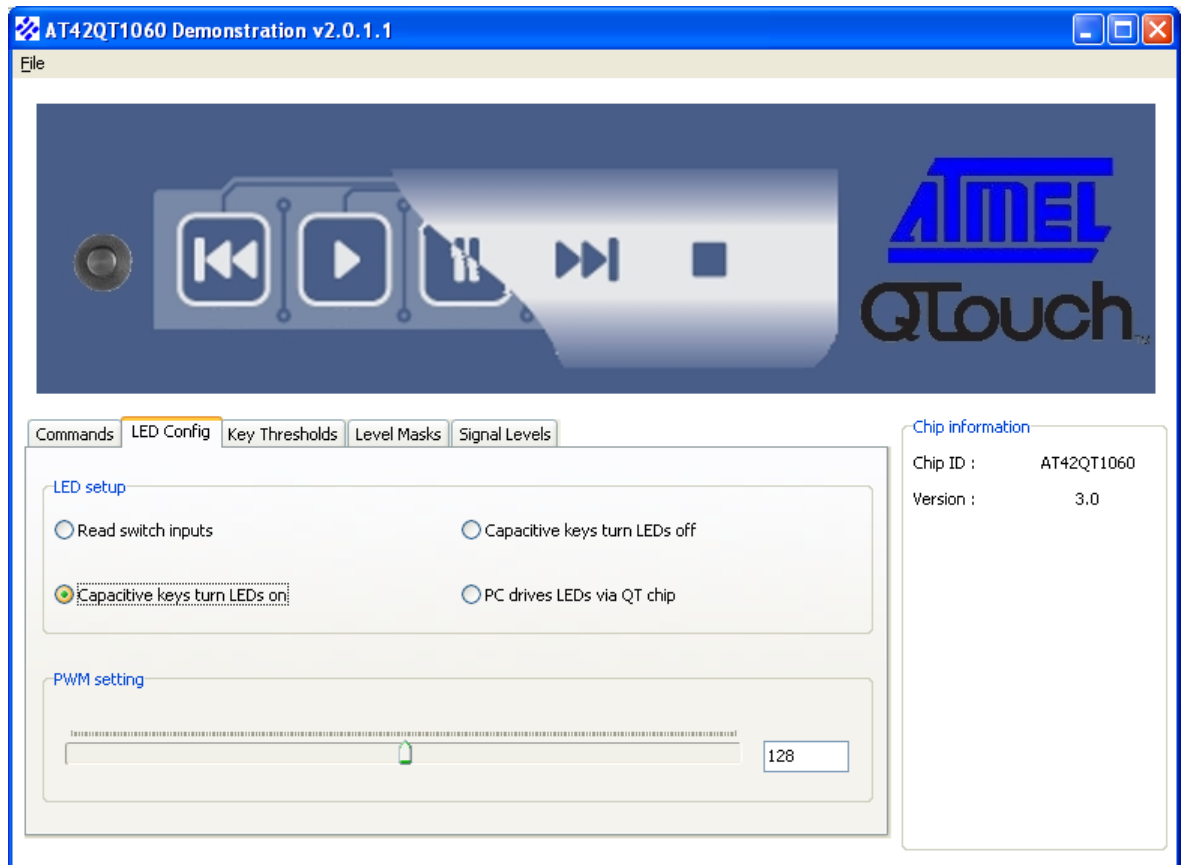
The PRD duration is equal to the LP mode cycle time (in milliseconds) multiplied by the PRD value. The result, in milliseconds, is shown in the box adjoining the PRD value.

PRD values are 0 – 255.

2.3 LED Config Tab

This tab controls how the LEDs work and their brightness.

Figure 2-4. LED Config Tab



2.3.1 LED Setup

■ Read switch inputs

Click **Read switch inputs** to select this option; it turns all the GPIOs into inputs.

■ Capacitive keys turn LEDs on

Click **Capacitive keys turn LEDs on** to select this option; all the LEDs are initially turned off. When a key is pressed the LED lights for that particular key.

■ Capacitive keys turn LEDs off

Click **Capacitive keys turn LEDs off** to select this option; all the LEDs are initially lit. When a key is pressed the LED turns off for that particular key.

■ PC drives LEDs via QT chip

Click **PC drives LEDs via QT chip** to select this option; all the LEDs are initially lit on the board and the software. When a key is pressed the LED on the board remains on but the software LED turns off for that particular key.

2.3.2 PWM Setting

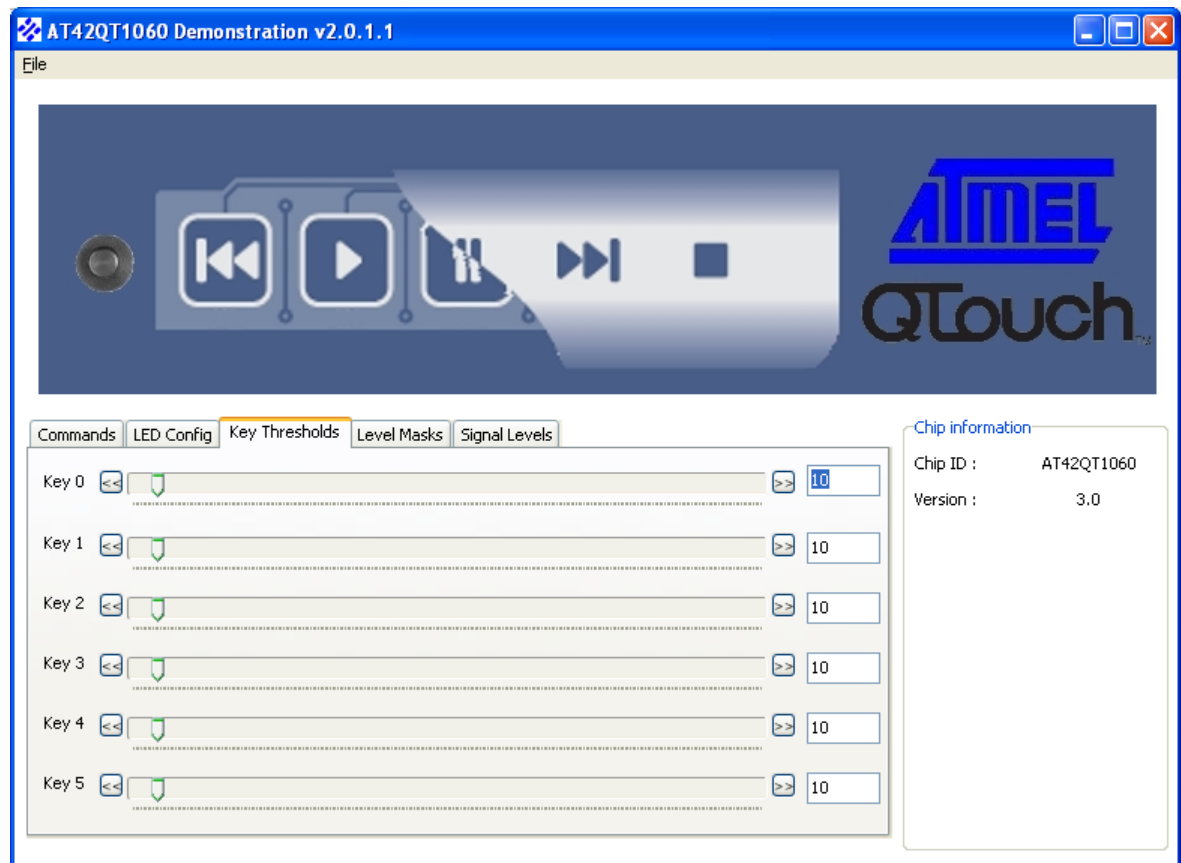
Drag the **PWM Setting** slider to the desired setting for the PWM level – this is shown in an adjoining box. This value (0 – 255) sets the duty cycle for PWM enabled LEDs and also their brightness.

Note: This option only works when **PC drives LEDs via QT chip** is selected.

2.4 Key Thresholds Tab

This tab sets the negative threshold (NTHR) level for each key.

Figure 2-5. Key Thresholds Tab



2.4.1 Key 0 – Key 5

Drag the **Key Thresholds** slider to the desired setting for the negative threshold (NTHR) level for each key. The threshold is used to determine key touch when crossed by a negative-going signal swing after having been filtered by the detection integrator. Larger absolute values of threshold desensitize keys since the signal must travel farther in order to cross the threshold level. Conversely, lower thresholds make keys more sensitive.

Alternatively, click the arrows at either end of the slider to increment or decrement the values.

2.5 Level Masks Tab

This tab sets the mask level for each individual GPIO line. Where there is a clash then precedence 1 overrides precedence 2 which overrides precedence 3 and so on.

Figure 2-6. Level Masks Tab



2.5.1 I/O Mask (Precedence 1)

A one (1) in any bit position of this mask sets the corresponding line to an output. If a bit is 0, the line is an input and the function of the PWM, detect and active state masks will not matter for this line. The level of the input lines is reflected in the input Status register. Changes to the logic levels on the inputs cause the $\overline{\text{CHG}}$ line to be asserted.

2.5.2 Detection Mask (Precedence 2)

These bits control which GPIOs that are configured as outputs will be controlled by their corresponding capacitive key. A one (1) means the output “n” generates an active output when key “n” is detecting a touch. A zero (0) means that the output is controlled by the output buffer.

2.5.3 Key Mask

These bits control whether a change in the corresponding bit in the detection status register generates a transition on the $\overline{\text{CHG}}$ line. A 1 allows the status bit to cause a $\overline{\text{CHG}}$ request, a 0 stops the corresponding bit from causing a $\overline{\text{CHG}}$ request.

2.5.4 PWM Mask (Precedence 3)

These bits control which GPIOs that are configured as outputs will output a PWM signal. A 1 means the output will generate a PWM signal, a 0 means the output will generate a logic level. The active level of the output (both logical and PWM) is determined by the Active level mask.

2.5.5 Active Level Mask (Precedence 4)

These bits control the active logic level for the GPIOs that are configured as outputs. A 1 means the output generates an active high output, a 0 means that the output is active low.

2.5.6 AKS Mask

These bits control which keys are included in the Adjacent Key Suppression (AKS) group. A 1 means the corresponding key is included in the AKS group and may only go into detect when it has the largest signal change of any key in the group. A 0 means that it is excluded and can go into detect whenever its threshold is passed.

2.5.7 User Output Buffer (Precedence 5)

These bits control the output level for the GPIOs that are configured as outputs. A 1 means the output generates an active output, a 0 means that the output is inactive.

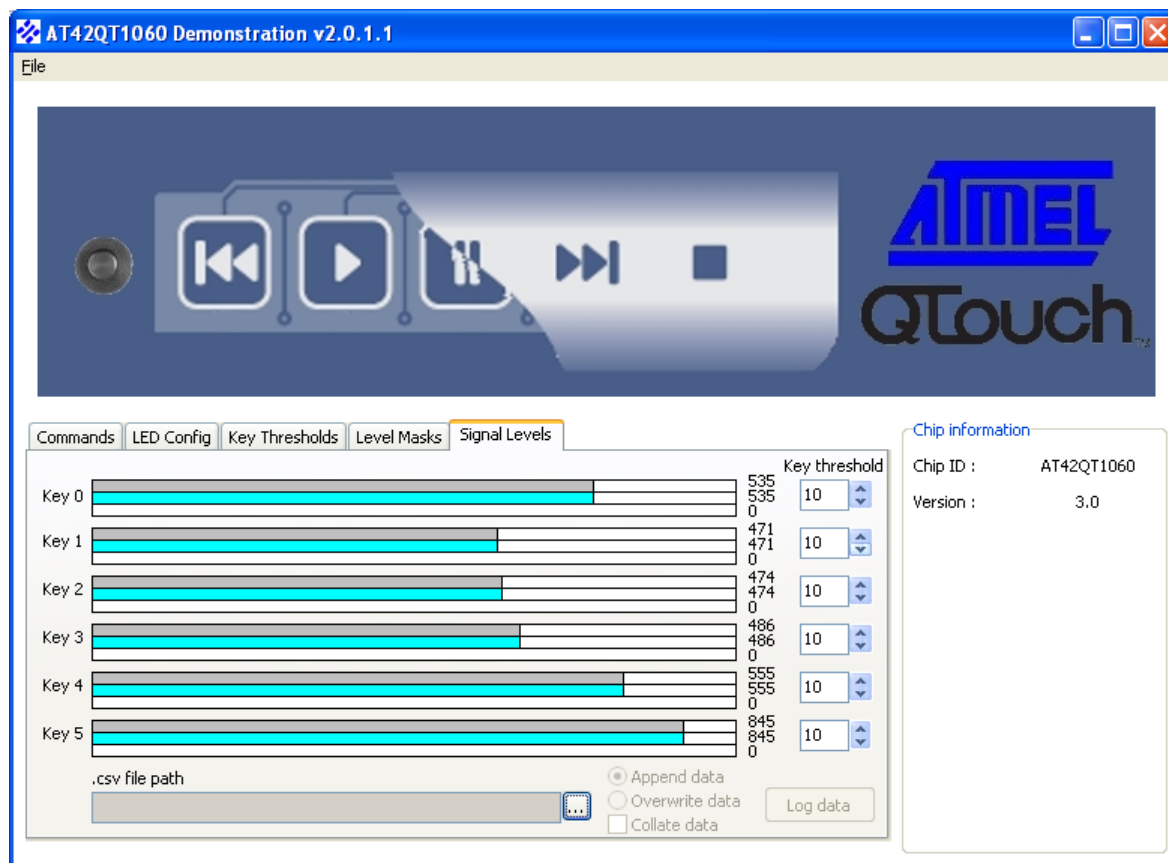
2.5.8 PWM Setting

This setting operates in the same way as [Section 2.3.2 on page 2-6](#).

2.6 Signal Levels Tab

This tab shows the the signal level, reference and delta for each key (see [Figure 2-7](#)).

Figure 2-7. Signal Levels Tab



2.6.1 Key 0 – Key 5

The signal and reference levels are shown for keys 0 – 5 in a bar graph format. Signal level, reference and delta information, in numerical format, is also shown for every key.

2.6.2 Key Threshold

This setting operates in the same way as [Section 2.3.2 on page 2-6](#),

2.6.3 Log Data

The values displayed for key 0 – key 5 on the **Signal Levels** tab can be stored. Click **.csv file path** to open a dialog box to specify where to store the file. The log_data.csv file is automatically created in the same folder that the demonstration software is run from or the user can define a different folder.

Click **Append data** or **Overwrite data**. Click **Collate data**.

Click **Log data**. This creates a datalog in comma-separated values (.csv) file format, logging all signal data in approximately 0.5s intervals.

Click **Stop log** to stop recording the data.

To review the data, open Windows Explorer, select the file and open it.



Associated Documents

- User Guide – *USBPluginCard for the EVK1060A Demonstration Kit*
- Datasheet – *AT42QT1060, QTouch™ 6-channel Sensor IC*

Revision History

Revision No.	History
Revision A – July 2009	• Initial version for EVK1060A (71093-C1)



Headquarters

Atmel Corporation
2325 Orchard Parkway
San Jose, CA 95131
USA
Tel: 1(408) 441-0311
Fax: 1(408) 487-2600

International

Atmel Asia
Unit 01-05 & 16, 19/F
BEA Tower, Millennium City 5
418 Kwun Tong Road
Kwun Tong
Kowloon
Hong Kong
Tel: (852) 2245-6100
Fax: (852) 2722-1369

Atmel Europe
Le Krebs
8, Rue Jean-Pierre Timbaud
BP 309
78054 Saint-Quentin-en-
Yvelines Cedex
France
Tel: (33) 1-30-60-70-00
Fax: (33) 1-30-60-71-11

Atmel Japan
9F, Tonetsu Shinkawa Bldg.
1-24-8 Shinkawa
Chuo-ku, Tokyo 104-0033
Japan
Tel: (81) 3-3523-3551
Fax: (81) 3-3523-7581

Touch Technology Division

1 Mitchell Point
Ensign Way
Hamble
Southampton
Hampshire SO31 4RF
United Kingdom
Tel: (44) 23-8056-5600
Fax: (44) 23-8045-3939

Product Contact

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