CapSense_CSD_P4 Tuner Design example project

1.20

Features

- Sensing elements: 5 segment Linear Slider
- Tuner GUI scan results visualization
- Tuning parameters using Tuner GUI
- Visual indication of Slider touch position with Tri-color LED

General Description

This example project demonstrates the CapSense CSD component configured with Linear Slider. The Tuner GUI displays the scanning results.

Development kit configuration

The project requires configuration settings changes in order to run on the KIT, different from CY8CKIT-042.

A full description of the supported development KITs, along with more example programs and ordering information, can be found at the following links:

- CY8CKIT-042 - http://www.cypress.com/go/cy8ckit-042
- CY8CKIT-040 - http://www.cypress.com/go/cy8ckit-040
- CY8CKIT-042-BLE - http://www.cypress.com/go/cy8ckit-042-ble

In order to switch from the CY8CKIT-042 to the CY8CKIT-040/CY8CKIT-042-BLE KITs the following steps should be performed:

1. Select the appropriate device with a Device Selector called from the project's context menu:
    - CY8C4245AXI-483 for CY8CKIT-042 KIT
    - CY8C4014LQI-422 for CY8CKIT-040 KIT
    - CY8C4247LQI-BL483 for CY8CKIT-042-BLE
2. In the case of migration to the CY8CKIT-040 KIT, the LED_2 pin should be removed from the project schematic. Double click on the LED_2, select Built-in tab, set CY_REMOVE parameter to True.
3. Change assignment of the pin components to physical pins. In the Workspace Explorer window, double-click the project's design-wide resource file and assign the pins for CapSense_CSD and RGB LED accordingly to Table 1.

Table 1. Pin assignment of CapSense_CSD_P4_Design project

Pin Name	Development Kit		
	CY8CKIT-042	CY8CKIT-042-BLE	CY8CKIT-040
\Capsense_CSD:Cmod\	P4[2]	P4[0]	P0[4]
\Capsense_CSD:Sns[0]\	P1[1]	P2[1]	P1[4]
\Capsense_CSD:Sns[1]\	P1[2]	P2[2]	P1[5]
\Capsense_CSD:Sns[2]\	P1[3]	P2[3]	P1[6]
\Capsense_CSD:Sns[3]\	P1[4]	P2[4]	P1[0]
\Capsense_CSD:Sns[4]\	P1[5]	P2[5]	P1[7]
LED_1	P0[2]	P3[6]	P1[1]
LED_2	P0[3]	P3[7]	-
\SCB:scl\	P3[0]	P3[5]	P1[2]
\SCB:sda\	P3[1]	P3[4]	P1[3]

Project configuration

The example project consists of the CapSense CSD component and SCB component in the EzI2C mode. The top design schematic is shown in **Figure 1**.

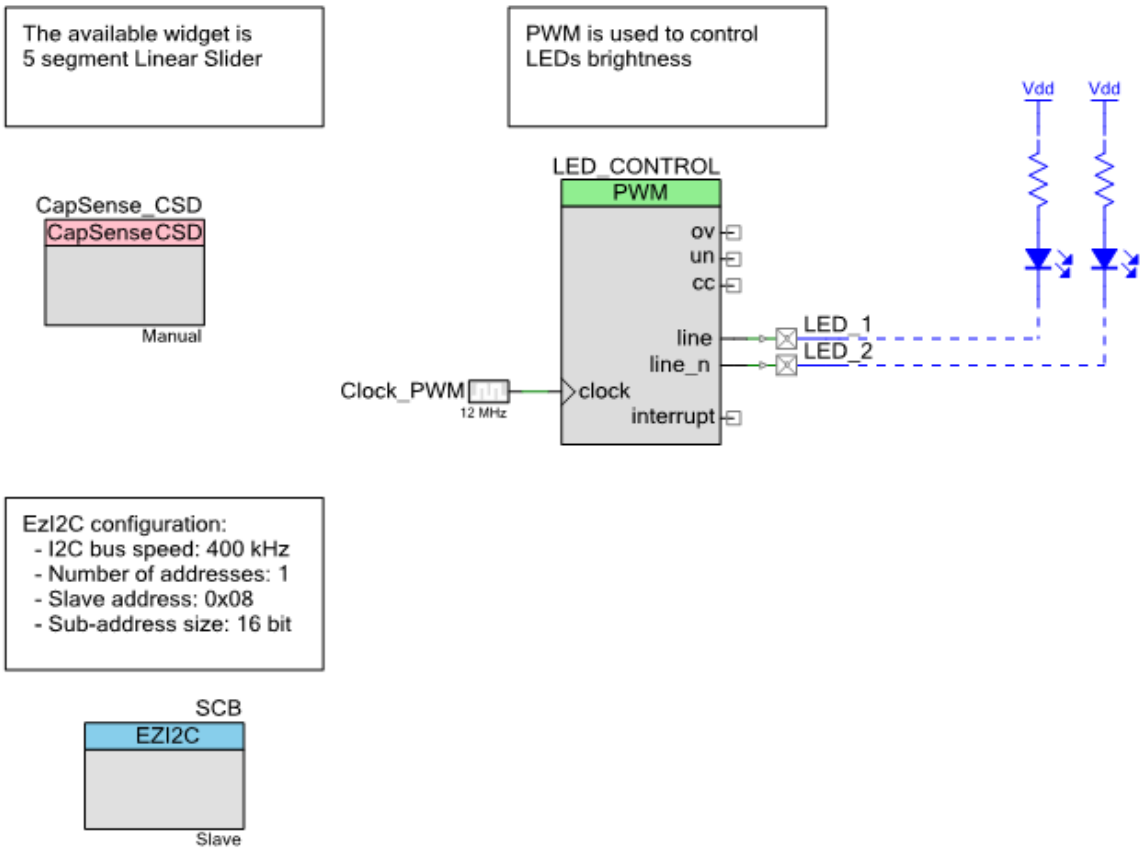


Figure 1. Top design schematic

The PWMs is configured to drive two LEDs from the Tri-color LED.

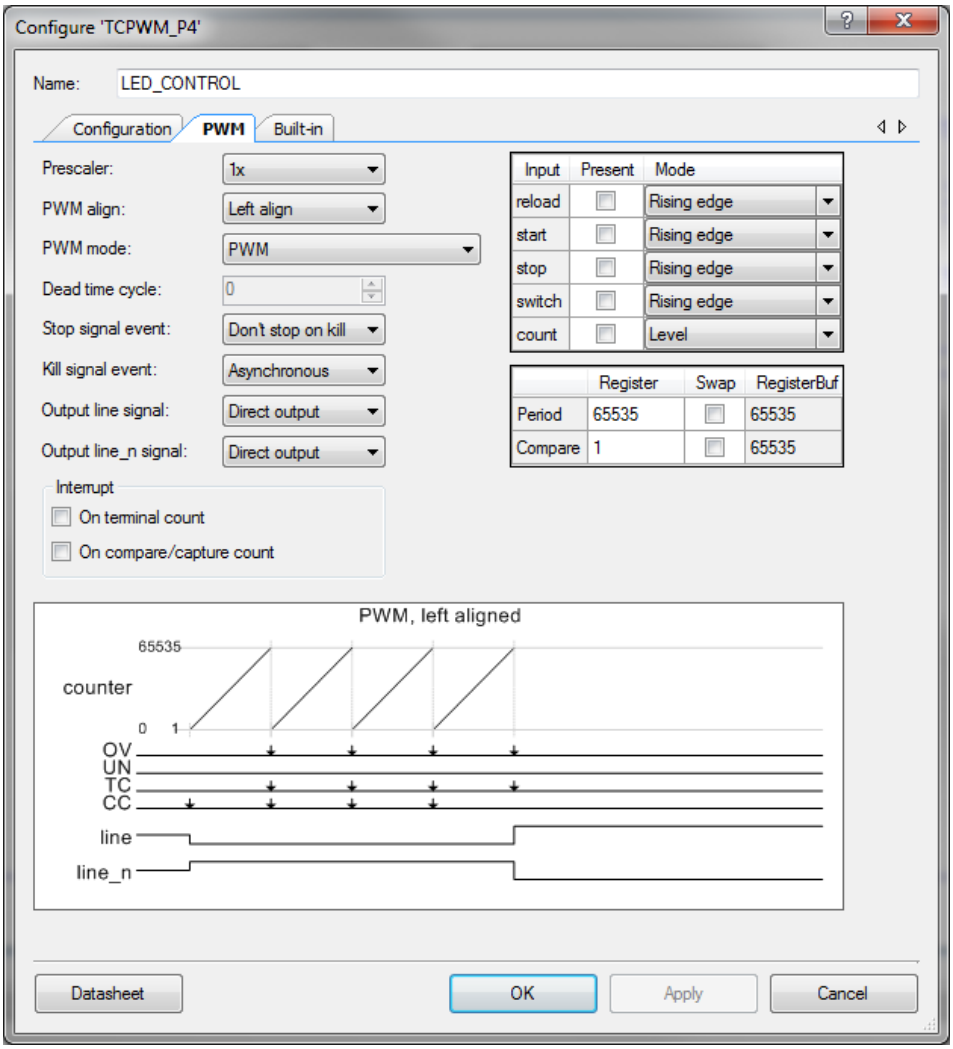


Figure 2. PWMs configuration.

The CapSense_CSD component is configured with the Tuning method Manual with run-time tuning for 1 Linear Slider.

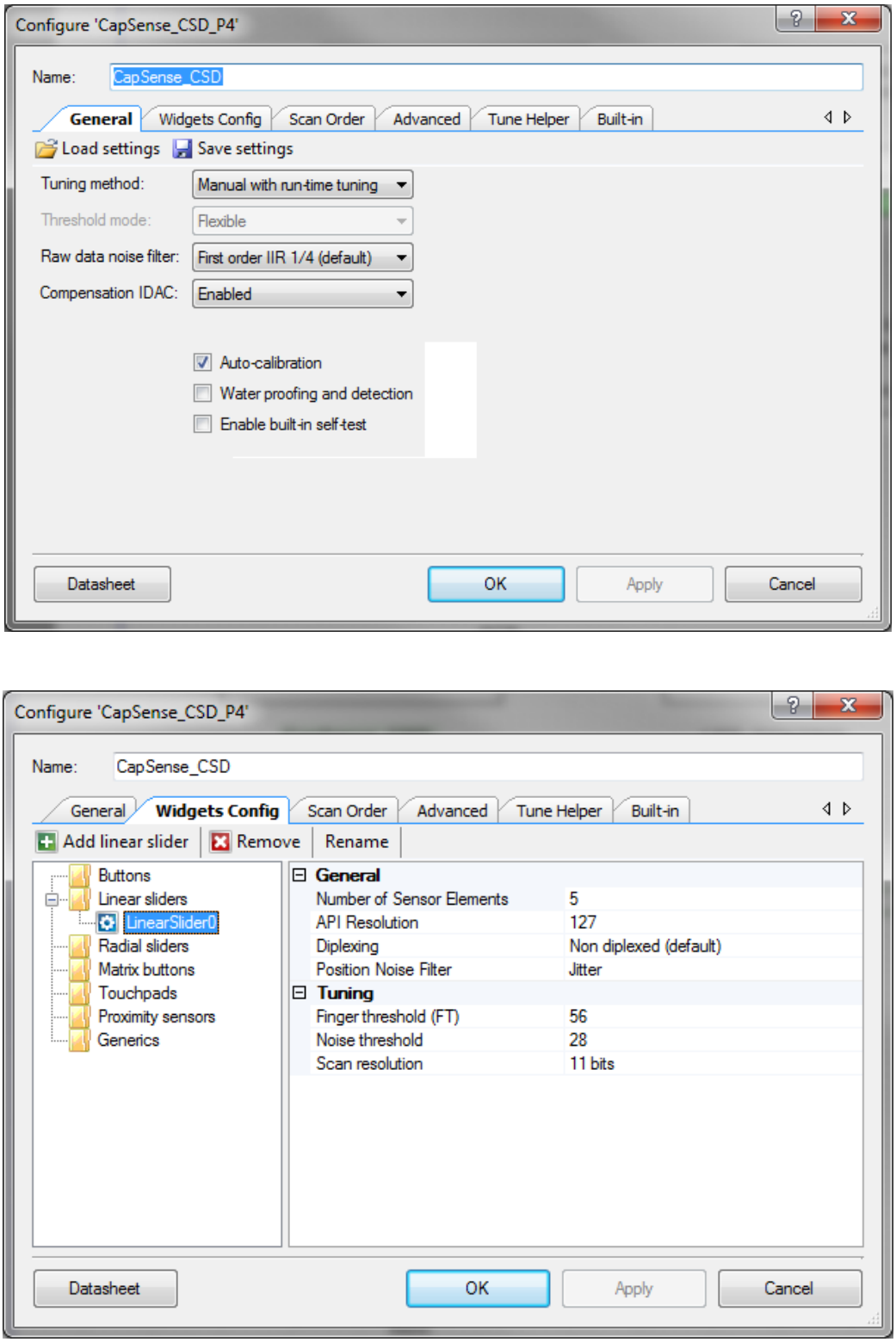


Figure 3. CapSense_CSD Widget Config Tab

The SCB component is configured: Mode: **EzI2C**, **I2C bus speed**: 400 kHz, **Number of addresses**: 1, **Slave address**: 0x08, **Sub-address size**: 16 bit.

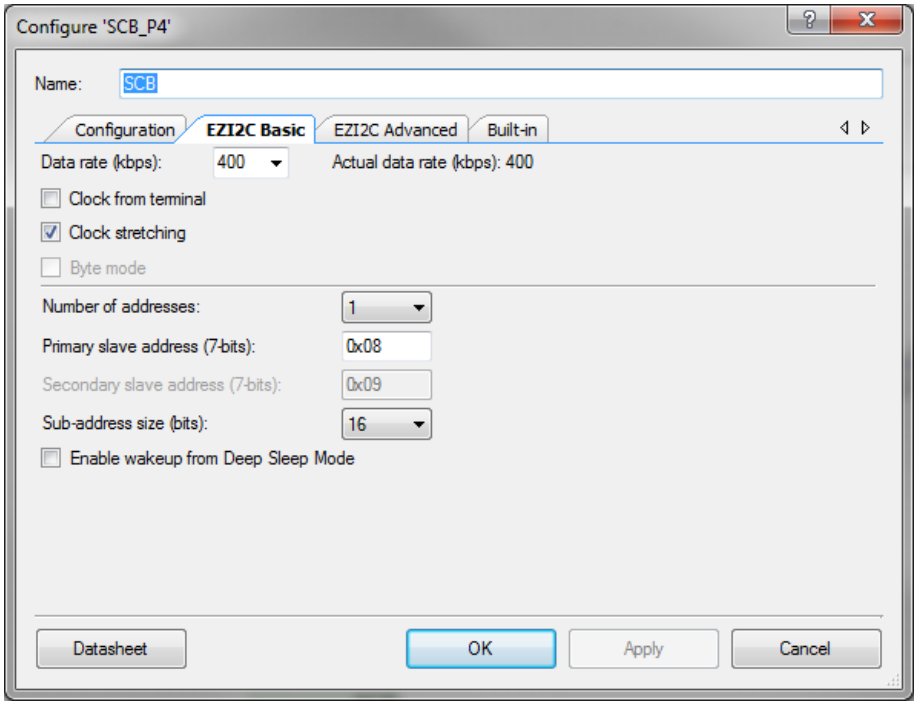
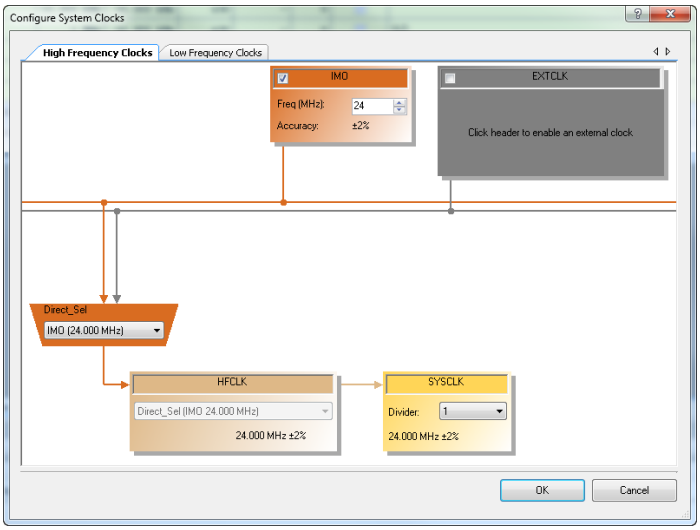


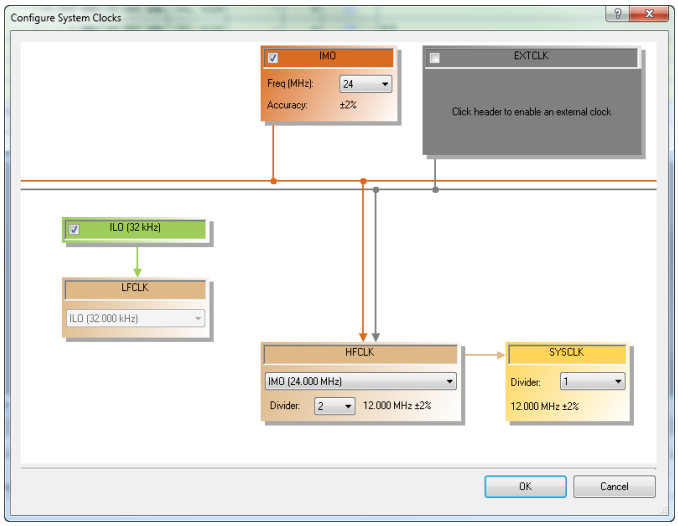
Figure 4. EzI2C Basic Configuration Tab

The clock system configuration is shown in Figure 5.

PSoC 4100/4200



PSoC4000



PSoC 4100/P4200-BL

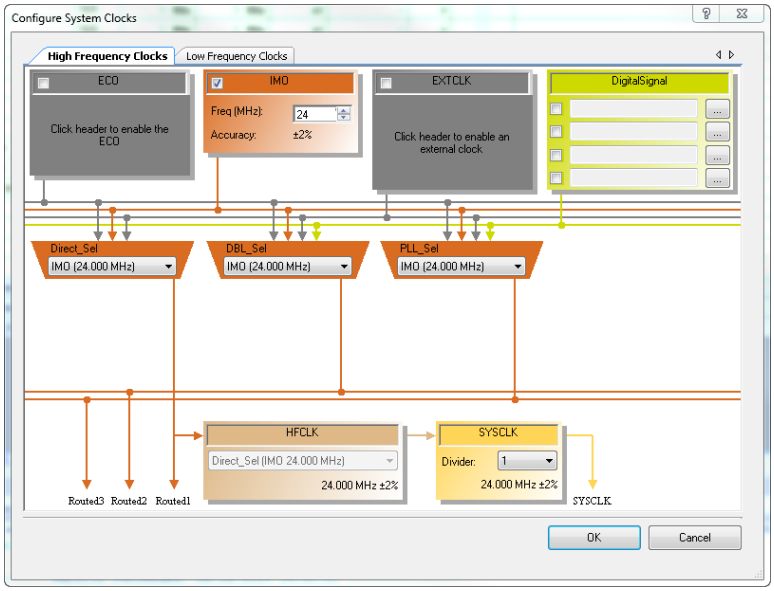


Figure 5. “Configure System Clocks” window

Start project step-by-step

Build the design and program the PSoC device

Refer to PSoC Creator Help if needed.

Launch Tuner GUI

Right-click and select **Launch Tuner** from the CapSense_CSD instance context menu.

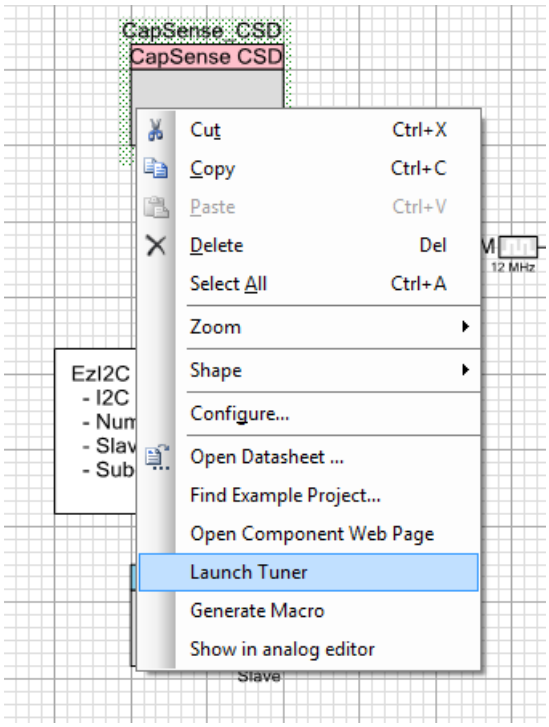


Figure 6. CapSense CSD instance context menu

The Tuner GUI application opens. The linear slider widget is shown.

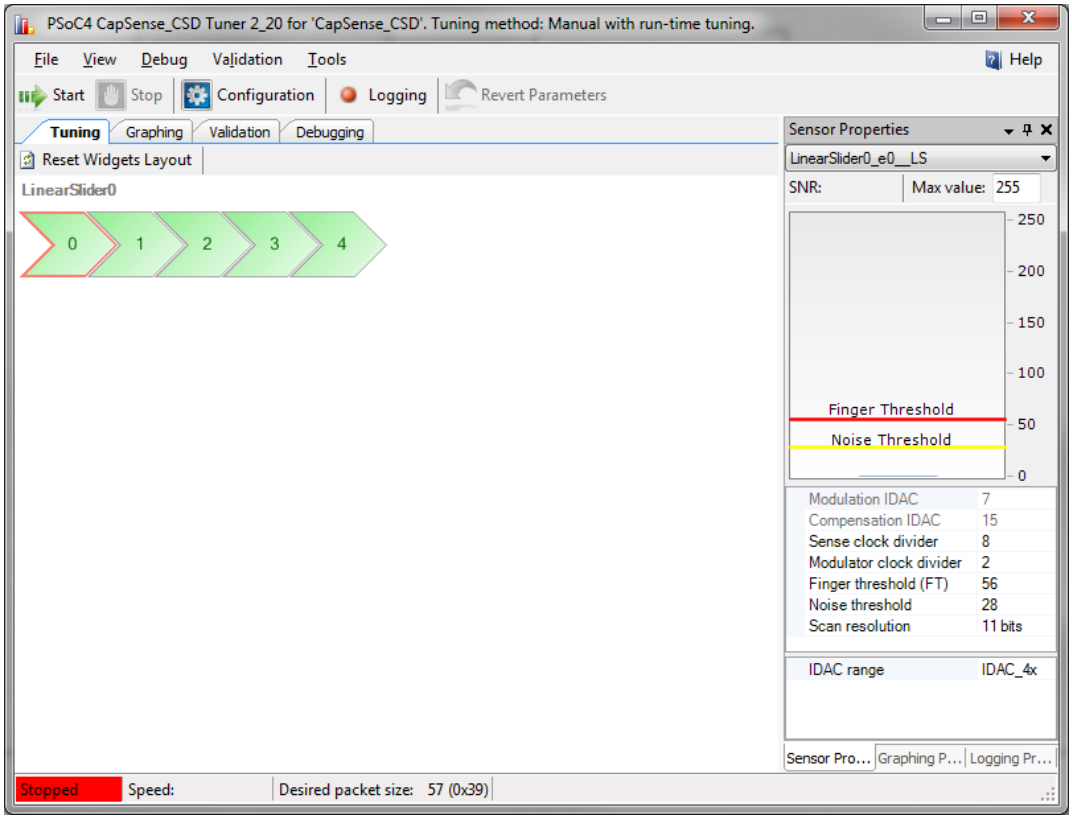


Figure 7. Tuner main window

Configure communication parameters

1. Click Configuration to open the Tuner Communication dialog.

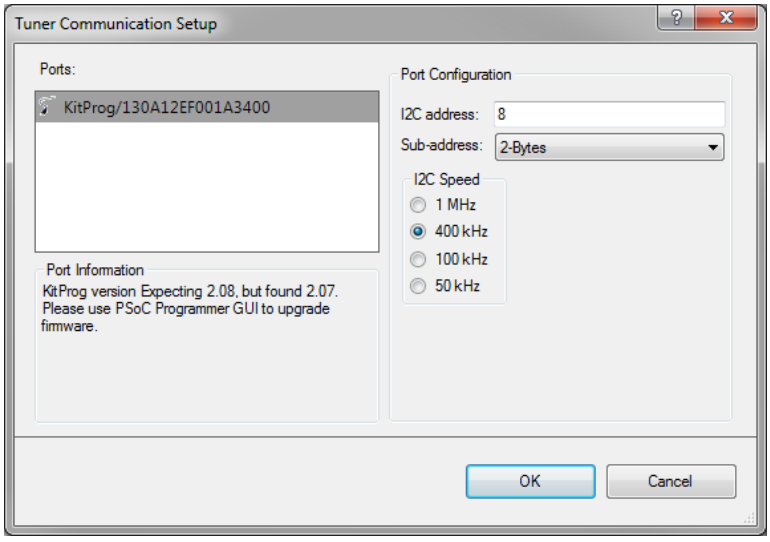


Figure 8. Tuner communication setup dialog

2. Set the communication parameters.

Important: These properties must be identical to EzI2C component: **I2C Bus Speed**, **I2C Address**, **Sub-address.**

Start tuning

Click **Start** on the Tuning GUI. The scanning results will be shown for all the sensing elements.

Expected results

The scanning results are showing for all the sensing elements.

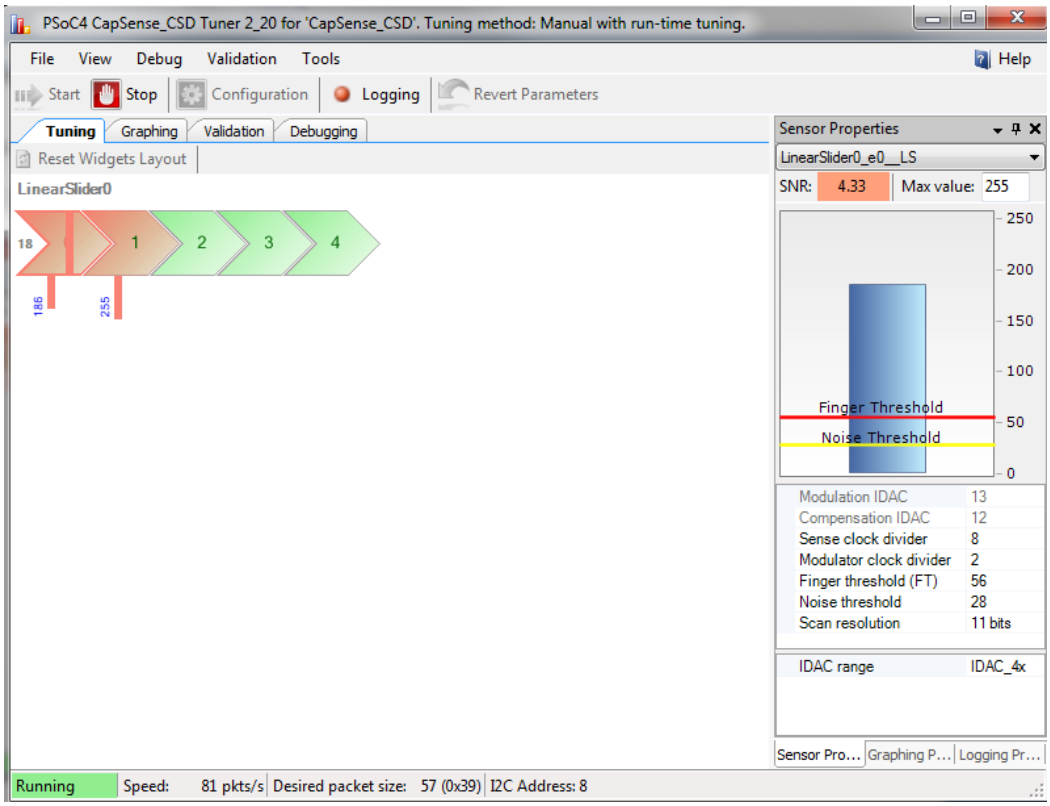


Figure 9. Scanning results

Use Graphing Tab to display detail information for scanning results of the selected sensors.

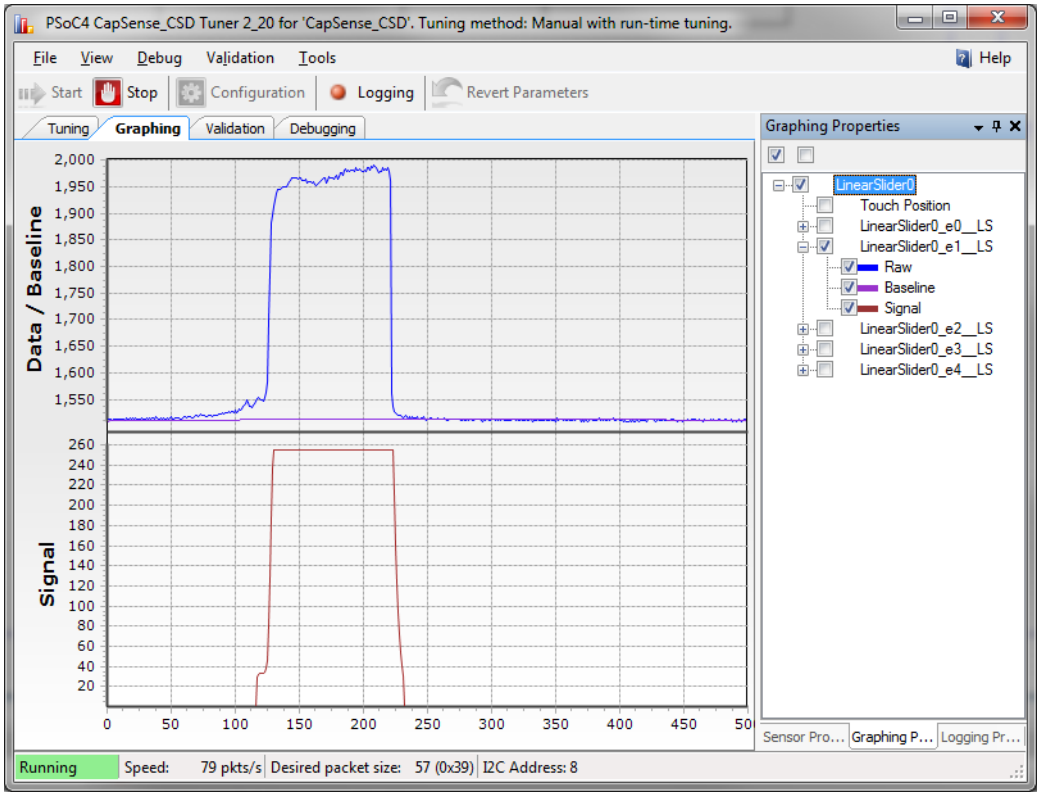


Figure 10. Graphing

On the CY8CKIT-042/CY8CKIT-042-BLE KITs Slider a touch position changes the LED color moving up and vice versa in the downward direction.
On the CY8CKIT-040 Slider a touch position changes the LED brightness from low to high if moving up and vice versa in the downward direction.