

Matchbox Demo User Manual

Intelligent Proximity Sensing

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Matchbox Demo Manual

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1. Demo Kit Contents

Sensor demo
with Micro USB
jack



Battery pack with
Micro USB
connector



USB cable



3 x AAA
batteries



2. Getting Started

Use the battery pack or USB cable to power the demo.

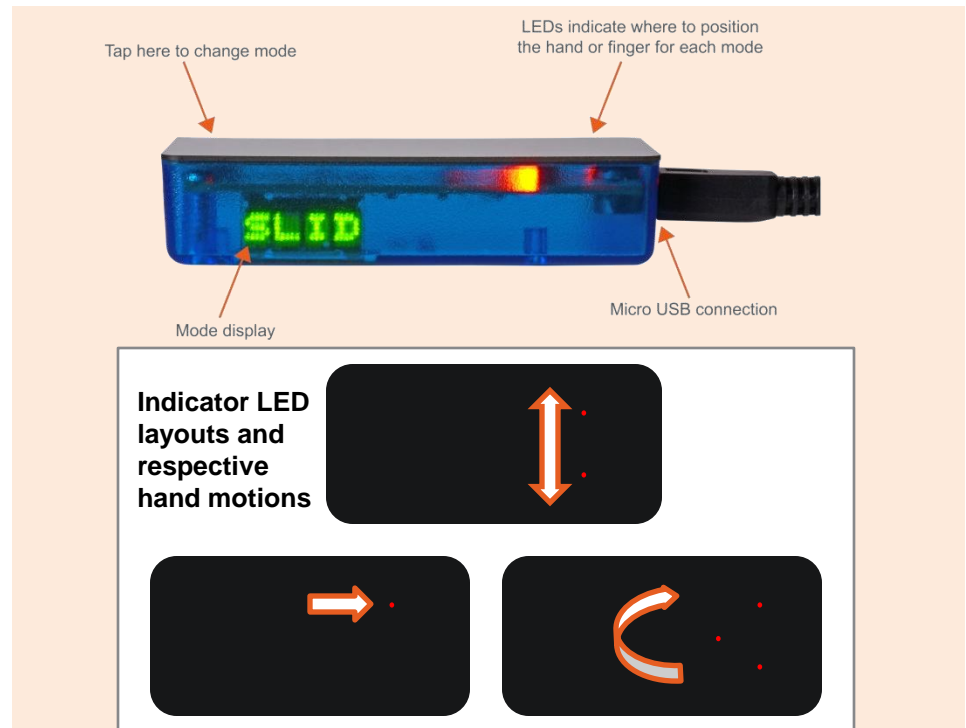
1a. Battery Pack

- Insert AAA batteries in the battery pack
- Connect the battery pack to the demo
- Switch on battery pack

1b. USB Cable

- Connect the USB cable to demo and a computer
- See *4. Software Installation* and *5. Graphical User Interface*

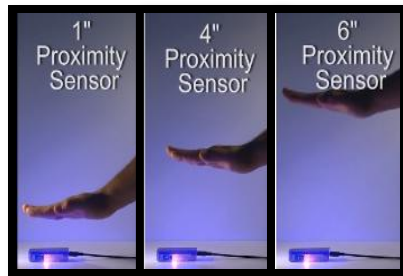
2. Operating the demo



3. Modes

Proximity sensing (1", 4" & 6")

Place hand over indicator LED at respective distance for on. Remove hand for off.



Slide

Slide finger across the two indicator LEDs for on. Slide finger across in the opposite direction for off.



Rotary

Rotate finger counter clockwise around the three indicator LEDs to increase brightness. Rotate finger clockwise to reduce brightness.



Touch

Tap indicator LED to turn on/off. Hold finger down to increase/decrease brightness.



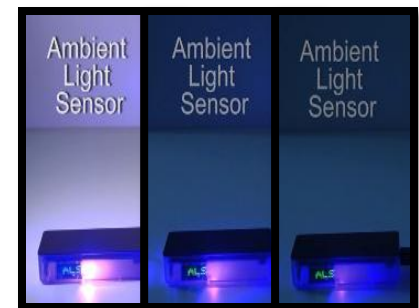
Wave

Wave hand left- right- left once for on. Wave a second time for off.



Ambient Light Sensor

Ambient light will increase brightness. The reduction of ambient light will decrease brightness.



4. Software Installation

Go to: <http://ledlight.osram-os.com/matchboxdemo>

5. Graphical User Interface

Top Level Application Using Events

File Edit Operate Tools Window Help

Calibration:
Screen input
Write to board
Store to EEPROM

Write to Board

Store to EEPROM

Read EEPROM

Register Functions

Run Mode: Screen values

Save Settings: c:\data\Settings.xls

Load Settings: c:\data\Settings.xls

Customer: Preset Values default hidden:
Store to EEPROM
Read EEPROM
Write to board

Application Mode: 1 inch Prox.

ALS Mode: Triggered all data

Ambient Light Sensor

ALS lower Thresh.: 10 ALS upper Thresh.: 20 ALS Reading: 37

Data Retrieval: Start Run

Save Data:

Writes to Board first

Abort Run

Display Data:

Exit / Exit after Run

Proximity Sensor Channels

LED 3 LED 2 LED 1

Prox Mode: Triggered all data

Current Sample: 467

Sample Limit: 50000

Create new Files:

File Path ALS: c:\data\ALS.xls

File Path Prox 1: c:\data\Prox1.xls

File Path Prox 2: c:\data\Prox2.xls

File Path Prox 3: c:\data\Prox3.xls

Average short dist.: 10 x

Short Dist. Prox. Slide Lamp

LED 1 current: 50 mA

LED 2 current: 50 mA

LED 3 current: 50 mA

Prox 1 Thresh.: 30 Prox 1 Reading: 9

Prox 2 Thresh.: 30 Prox 2 Reading: 0

Prox 3 Thresh.: 30 Prox 3 Reading: 0

Long Dist. Prox. Rotary Wave

Average long dist.: 30 x

Average wave: 5 x

Prox Thresh. I.d.: 50 LED current I.d.: 200 mA

Prox Integration I. d.: 1500 us

Measurement

OSRAM
Opto Semiconductors

Part ID: 97

V-06-2013

ALS:

PS1:

PS2:

PS3:

5. Graphical User Interface

Top Level Application Using Events

File Edit Operate Tools Window Help

Calibration:
Screen input
Write to board
Store to EEPROM

Write to Board

Store to EEPROM

Read EEPROM

Save Settings

Load Settings

Customer:
Preset Values default hidden:
Store to EEPROM
Read EEPROM
Write to board

Register Functions

Run Mode: Screen values

Save Settings: c:\data\Settings.xls

Load Settings: c:\data\Settings.xls

Application Mode: 1 inch Prox.

ALS Mode: Triggered all data

Ambient Light Sensor

ALS lower Thresh.: 10

ALS upper Thresh.: 20

ALS Reading: 37

LED 3

LED 2

LED 1

Prox Mode: Triggered all data

Proximity Sensor Channels

Average short dist.: 10 x

Short Dist. Prox. Slide Lamp

Long Dist. Prox. Rotary Wave

Average long dist.: 30 x

Average wave: 5 x

LED 1 current: 50 mA

LED 2 current: 50 mA

LED 3 current: 50 mA

Prox 1 Thresh.: 30

Prox 1 Reading: 9

Prox 2 Thresh.: 30

Prox 2 Reading: 0

Prox 3 Thresh.: 30

Prox 3 Reading: 0

Prox Thresh. I.d.: 50

LED current I.d.: 200 mA

Prox Integration I. d.: 1500 us

Data Retrieval: Start Run

Save Data: [Toggle]

Writes to Board first: Abort Run

Display Data: [Toggle]

Exit / Exit after Run: [Toggle]

Current Sample: 467

Sample Limit: 50000

Create new Files: [Toggle]

File Path ALS: c:\data\ALS.xls

File Path Prox 1: c:\data\Prox1.xls

File Path Prox 2: c:\data\Prox2.xls

File Path Prox 3: c:\data\Prox3.xls

PS Output

ALS Output

Measurement

OSRAM Opto Semiconductors

V-06-2013

Part ID: 97

ALS: [Status]

PS1: [Status]

PS2: [Status]

PS3: [Status]

Proximity sensor parameters:

- Active LED indicator
- Display mode:
 - shows all events
 - shows events above threshold only

5. Graphical User Interface

The screenshot shows the 'Top Level Application Using Events' GUI. Key sections include:

- Calibration:** Buttons for 'Screen input', 'Write to board', and 'Store to EEPROM'.
- Settings:** 'Save Settings' and 'Load Settings' buttons with file paths (e.g., 'c:\data\Settings.xls').
- Customer:** 'Preset Values default hidden' and 'Store to EEPROM', 'Read EEPROM', 'Write to board'.
- Application Mode:** Set to '1 inch Prox.'.
- ALS Mode:** Set to 'Triggered all data'. Parameters: ALS lower Thresh. (10), ALS upper Thresh. (20), ALS Reading (37).
- Proximity Sensor Channels:** 'Prox Mode' set to 'Triggered all data'. Includes controls for LED 1, 2, 3 current and thresholds.
- Data Retrieval:** 'Start Run', 'Abort Run', 'Save Data', 'Display Data', 'Exit / Exit after Run' buttons.
- Current Sample:** 467. Sample Limit: 50000.
- File Paths:** ALS (c:\data\ALS.xls), Prox 1 (c:\data\Prox1.xls), Prox 2 (c:\data\Prox2.xls), Prox 3 (c:\data\Prox3.xls).
- Graph:** 'Measurement' plot showing PS Output (left axis, 0-25) and ALS Output (right axis, 0-535) over time (38977-39177).
- OSRAM Opto Semiconductors:** Logo and Part ID 97.

Ambient light sensor parameters:

- ALS lower threshold
- ALS upper threshold
- Actual ALS readings in counts
- Display mode:
 - shows all events
 - shows events above upper or below lower threshold only

5. Graphical User Interface

Top Level Application Using Events

File Edit Operate Tools Window Help

Register Functions

Run Mode Screen values

Calibration:
Screen input
Write to board
Store to EEPROM

Save Settings
c:\data\Settings.xls

Load Settings
c:\data\Settings.xls

Write to Board

Store to EEPROM

Read EEPROM

LED 3
LED 2
LED 1

Average short dist. 10 x

Short Dist. Prox. Slide Lamp

Long Dist. Prox. Rotary Wave

Average long dist. 30 x

Average wave 5 x

LED 1 current 50 mA

LED 2 current 50 mA

LED 3 current 50 mA

Prox 1 Thresh. 30

Prox 2 Thresh. 30

Prox 3 Thresh. 30

Prox 1 Reading 9

Prox 2 Reading 0

Prox 3 Reading 0

Prox Thresh. I.d. 50

LED current I.d. 200 mA

Prox Integration I. d. 1500 us

Data Retrieval

Start Run

Writes to Board first

Abort Run

Exit / Exit after Run

Save Data

Display Data

Current Sample 467

Sample Limit 50000

Create new Files

File Path ALS c:\data\ALS.xls

File Path Prox 1 c:\data\Prox1.xls

File Path Prox 2 c:\data\Prox2.xls

File Path Prox 3 c:\data\Prox3.xls

- Counter of measurements
- Counter limit
- Save data: Active / non active
- Display data: Active / non active
- Data saved in shown excel files
- Data in new file or appended
- Display of measured prox and ALS values

PS Output

ALS Output

Measurement

OSRAM Opto Semiconductors

V-06-2013

Part ID 97

ALS

PS1

PS2

PS3

5. Graphical User Interface

Top Level Application Using Events

File Edit Operate Tools Window Help

Register Functions

Run Mode: Screen values

Save Settings: c:\data\Settings.xls

Load Settings: c:\data\Settings.xls

Customer: Preset Values default hidden: Store to EEPROM Read EEPROM Write to board

Application Mode: 1 inch Prox.

Data Retrieval: Start Run, Abort Run, Exit / Exit after Run

Save Data: [Toggle]

Display Data: [Toggle]

Current Sample: 467

Sample Limit: 50000

Create new Files: [Toggle]

File Path ALS: c:\data\ALS.xls

File Path Prox 1: c:\data\Prox1.xls

File Path Prox 2: c:\data\Prox2.xls

File Path Prox 3: c:\data\Prox3.xls

ALS Mode: Triggered all data

Ambient Light Sensor

ALS lower Thresh.: 10

ALS upper Thresh.: 20

ALS Reading: 37

LED 3, LED 2, LED 1

Prox Mode: Triggered all data

Proximity Sensor Channels

Average short dist.: 10 x

Short Dist. Prox. Slide Lamp

Long Dist. Prox. Rotary Wave

Average long dist.: 30 x

Average wave: 5 x

LED 1 current: 50 mA

LED 2 current: 50 mA

LED 3 current: 50 mA

Prox 1 Thresh.: 30

Prox 2 Thresh.: 30

Prox 3 Thresh.: 30

Prox 1 Reading: 9

Prox 2 Reading: 0

Prox 3 Reading: 0

Prox Thresh. I.d.: 50

LED current I.d.: 200 mA

Prox Integration I. d.: 1500 us

PS Output vs Measurement graph

OSRAM Opto Semiconductors

V-06-2013

Part ID 97

ALS, PS1, PS2, PS3 status

Run Mode:

- Preset: Takes values stored on demo board
- Screen Values: Takes values from GUI

Settings:

- Saves GUI values in excel file
- Reads GUI values from excel file

5. Graphical User Interface

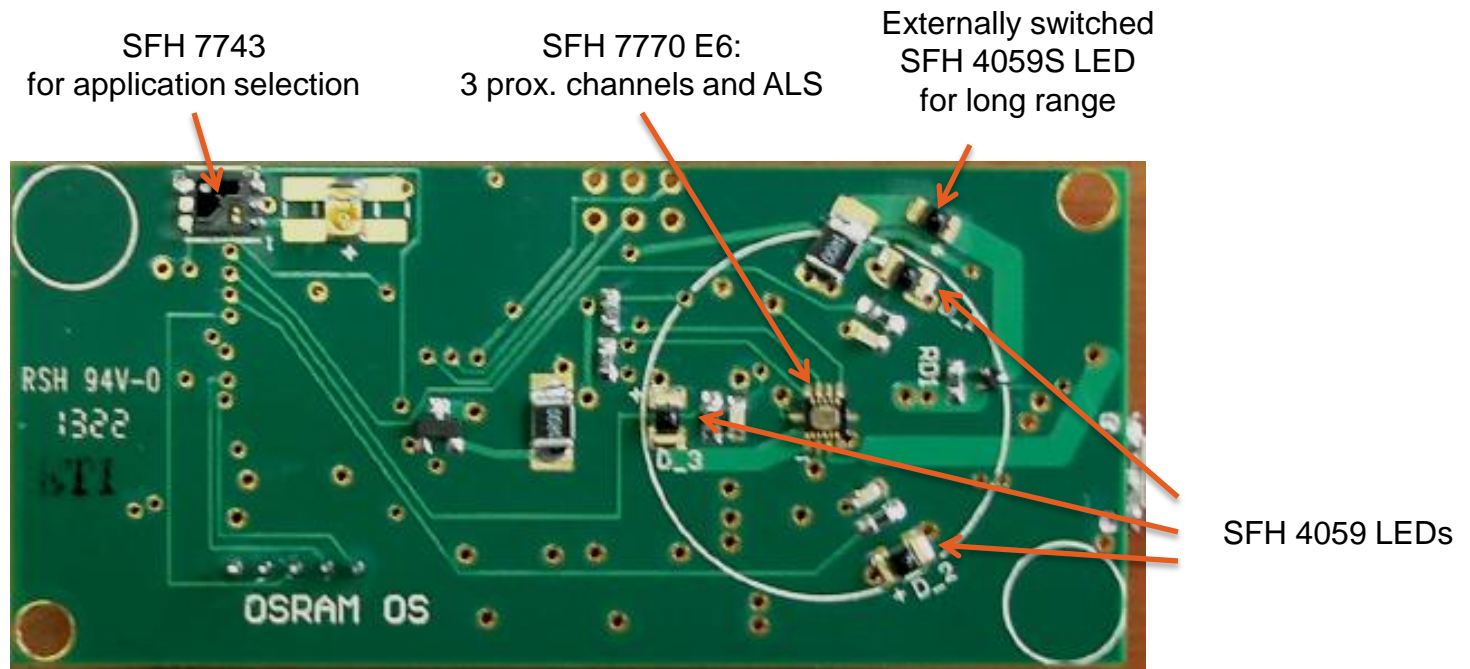
The screenshot shows the 'Top Level Application Using Events' GUI. The interface is divided into several sections:

- Calibration:** Includes buttons for 'Screen input', 'Write to board', and 'Store to EEPROM'. There are also 'Write to Board', 'Store to EEPROM', and 'Read EEPROM' buttons.
- Register Functions:** Contains 'Save Settings' and 'Load Settings' buttons, each with a file path input field set to 'c:\data\Settings.xls'. There is also a 'Customer: Preset Values default hidden: Store to EEPROM Read EEPROM Write to board' section.
- Run Mode:** A dropdown menu currently set to 'Screen values'.
- Application Mode:** A dropdown menu currently set to '1 inch Prox.', which is circled in red.
- ALS Mode:** A dropdown menu set to 'Triggered all data'. Below it are 'ALS lower Thresh.' (10), 'ALS upper Thresh.' (20), and 'ALS Reading' (37).
- Proximity Sensor Channels:** Includes 'LED 3', 'LED 2', and 'LED 1' indicators. The 'Prox Mode' dropdown is set to 'Triggered all data'.
- Average short dist.:** A dropdown menu set to '10 x'. Below it are 'Short Dist. Prox. Slide Lamp' and 'LED 1 current' (50 mA).
- Long Dist. Prox.:** A dropdown menu set to '30 x'. Below it are 'Long Dist. Prox. Rotary Wave', 'Average long dist. Average wave' (5 x), 'Prox Thresh. I.d.' (50), and 'LED current I.d.' (200 mA).
- Prox 1 Reading:** A text field showing '9'. Below it are 'Prox 1 Thresh.' (30) and 'Prox 2 Reading' (0).
- Prox 2 Reading:** A text field showing '0'. Below it are 'Prox 2 Thresh.' (30) and 'Prox 3 Reading' (0).
- Prox 3 Reading:** A text field showing '0'. Below it are 'Prox 3 Thresh.' (30) and 'Prox Integration I. d.' (1500 us).
- Data Retrieval:** Includes 'Start Run', 'Abort Run', and 'Exit / Exit after Run' buttons. There are also 'Save Data' and 'Display Data' toggle switches.
- Current Sample:** A text field showing '467'. Below it are 'Sample Limit' (50000) and 'Create new Files' toggle switch.
- File Path ALS:** A list of file paths: 'c:\data\ALS.xls', 'c:\data\Prox1.xls', 'c:\data\Prox2.xls', and 'c:\data\Prox3.xls'.
- Graph:** A line graph showing 'PS Output' (left y-axis, 0-25) and 'ALS Output' (right y-axis, 0-535) over time. The x-axis is labeled 'Measurement' with values 38977 and 39177.
- OSRAM Opto Semiconductors:** Logo and 'Part ID 97'.
- ALS Status:** A small grid showing the status of ALS, PS1, PS2, and PS3.

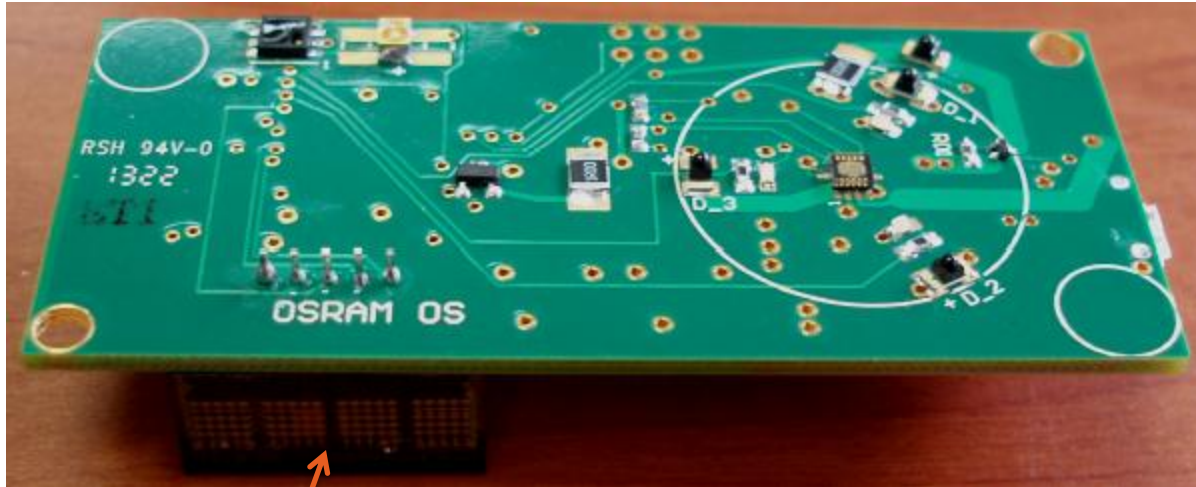
Application Mode:

- 1 inch Prox.
- 4 inch Prox.
- 6 inch Prox.
- Slide
- Rotary
- Touch function
- Wave detection
- ALS

6. PCB: Top view

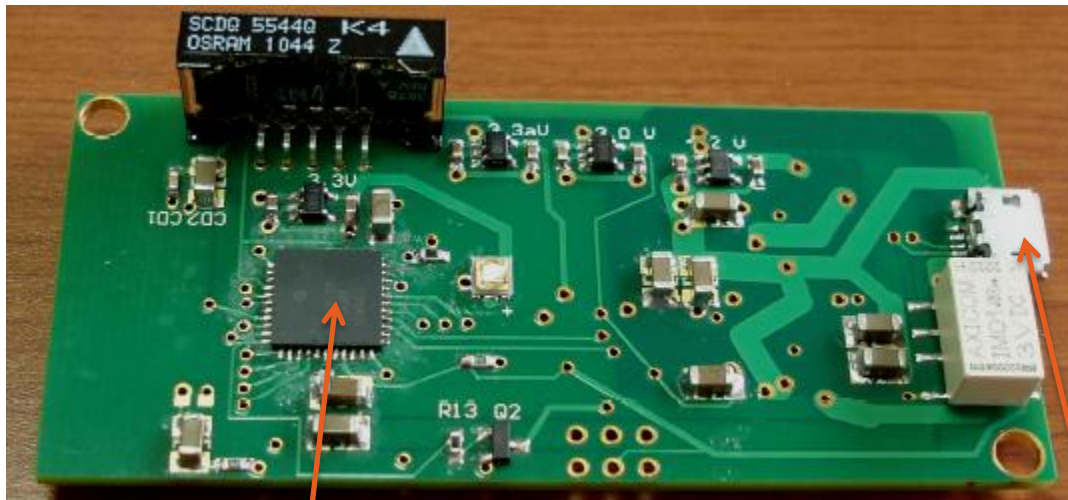


6. PCB: Side view



Display SCDQ 5544 Q
for application mode display

6. PCB: Bottom view



Microcontroller Microchip
PIC18F46J50
for I²C and USB communication

USB Micro connector

Thank You.