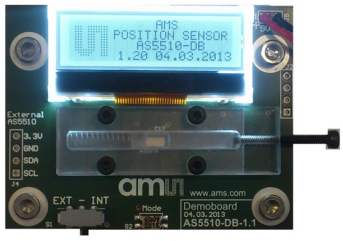
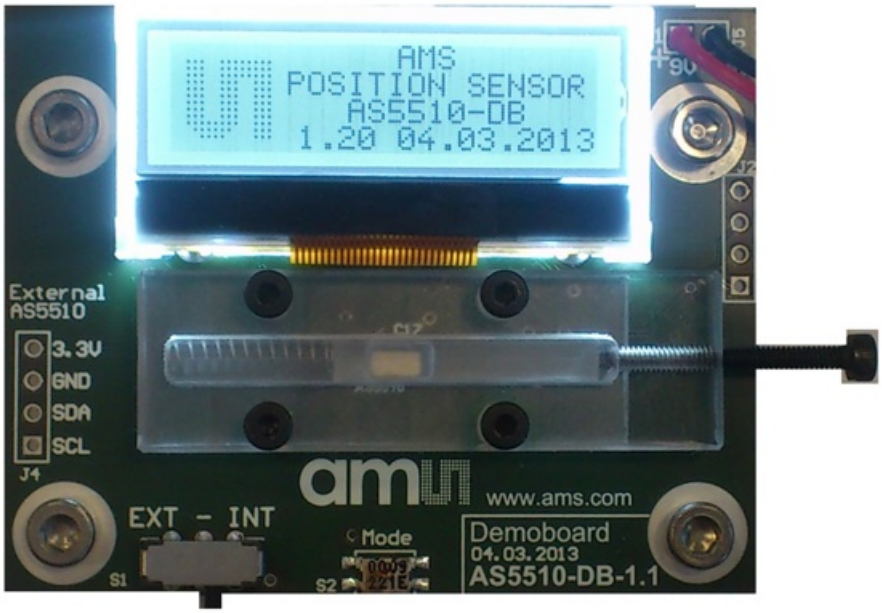


ams AS5510 10-bit Linear Incremental Position Sensor User Manual

Product Document
AS5510 10-bit Linear Incremental Position Sensor



User Manual – AS5510 Demo Kit
AS5510
10-bit Linear Incremental Position Sensor with Digital Angle output

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3 Operating the Demo board
4 Hardware Indicators and Connectors
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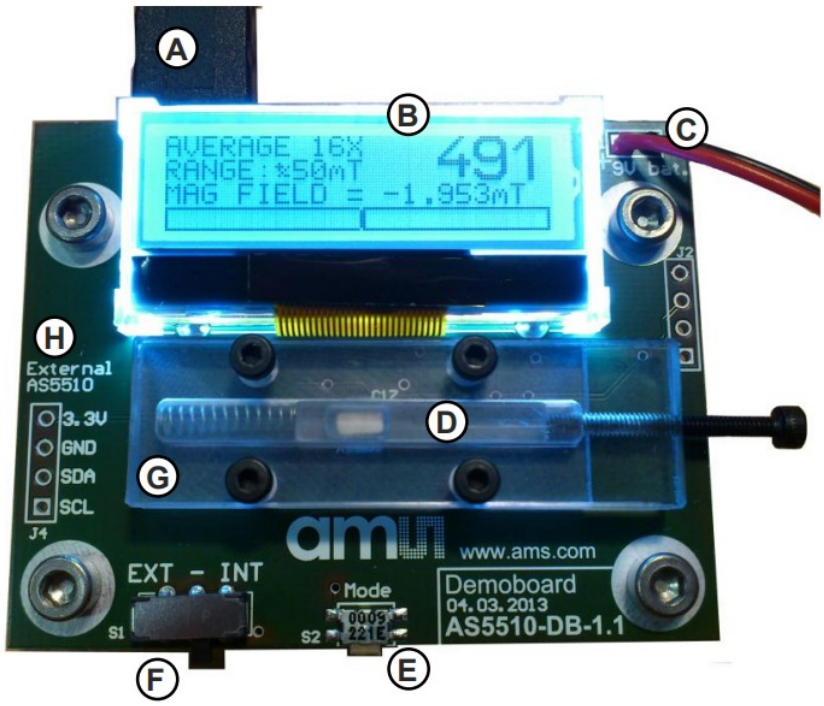
General Description

The AS5510 is a linear Hall sensor with 10 bit resolution and I²C interface. It can measure absolute position of lateral movement of a simple 2-pole magnet.
Depending on the magnet size, a lateral stroke of 0.5~2mm can be measured with air gaps around 1.0mm. To conserve power, the AS5510 may be switched to a power down state when it is not used.
It is available in a WLCSP package and qualified for an ambient temperature range from -30°C to +85°C.

Board Description

The AS5510 demo board is a complete linear encoder system with built-in microcontroller, USB interface, graphical LCD display, incremental indicators, incremental counter serial communication and PWM output LED.
The board is USB powered or externally supplied with a 9V battery for standalone operation.

Figure 1:
AS5510-DK Demo Kit



A) USB plug for power supply

B) Display

C) 9V Battery Connector

D) Slider with bipolar magnet

E) Mode Switch (S1)

F) Encoder Selection (SW1)

G) Slider guide

H) External sensor connector

Operating the Demo board

The AS5510 demo board can be powered in several ways:

- Supplied by a 9V battery

  Connect a 9V battery to the battery connector on the top right side of the board.

  No other connection is required.
- Supplied by the USB port

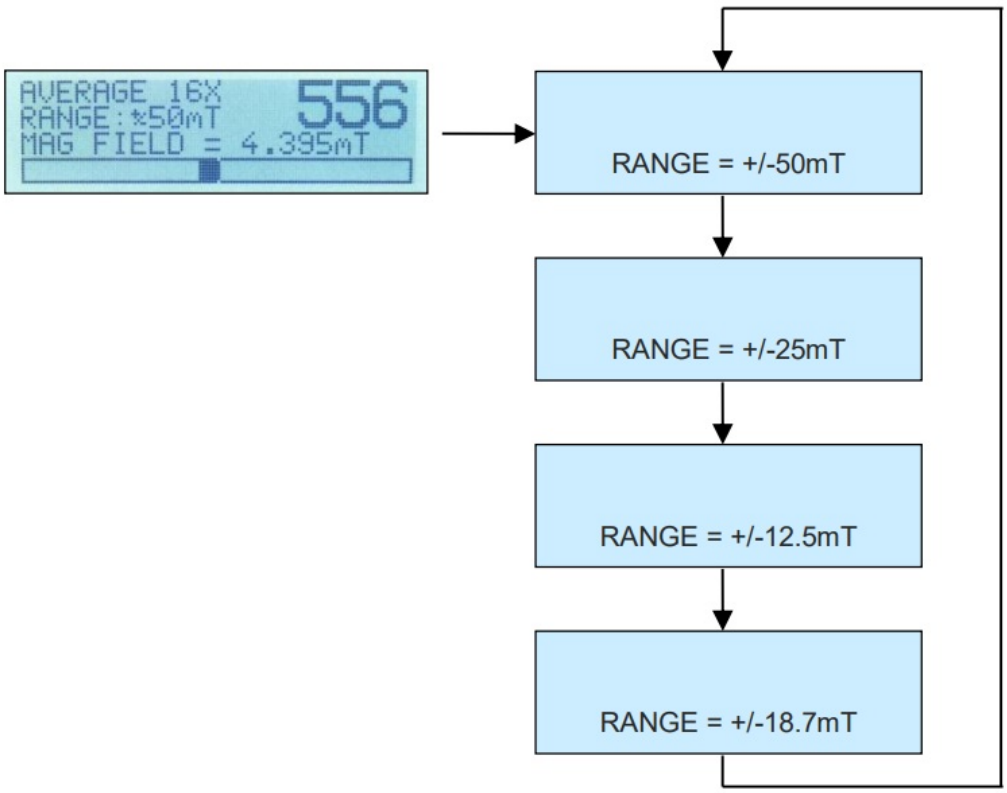
  Connect the demo board to a PC using a USB/USB cable (included in demo board shipment). The board is supplied by the 5V supply of the USB port. No other connection is required.

Turn the screw on the right side to move precisely the magnet left and right.

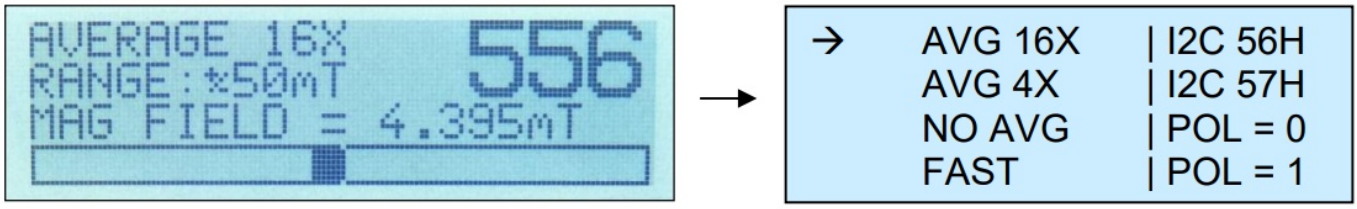
Hardware Indicators and Connectors

Display Description
The LCD display shows the realtime absolute magnetic field strength measured by the AS5510:
Moving the slider from right to left will increase the absolute value until 4095 (19 99µm) with 0.488µm steps, then returns to zero.
Figure 2:
AS5510-DK Display in standalone mode

A) Filtering / Sampling mode
B) Magnetic Input Range
C) Magnetic Field in mT
D) Magnetic Field (0~1023)
E) Magnetic field barograph
Mode Switch S1
The Mode Switch S1 allows changing the parameters of the AS5510 and of the demo board itself.
Depending on how long you keep S1 pressed, you will enter the Quick menu or the Configuration menu.
Quick Menu
The Quick Menu changes the sensitivity setting of the AS5510.
Figure 3:
AS5510-DK Display Quick Menu



From the main screen, press S1 shortly (<1s).
The current Range and sensitivity setting will appear. At that moment, press S1 shortly again to toggle the 4 sensitivity settings of the AS5510.
When the desired sensitivity is chosen, wait 2 seconds, and the demo board will display the main screen back with the new sensitivity setting.
Adjust the sensitivity depending on the peak of the magnetic field present on the AS5510.
The optimum sensitivity using the 4x2x1 magnet on this demo board is +/25mT.
Figure 4:
AS5510-DK Configuration menu



From the main screen, **press and hold S1 during 2 seconds.**
The configuration menu will appear.
By pressing S1 shortly, the next item is chosen.
To validate the pointed item, press and hold S1 during 2 seconds.

- AVG 16X

  Does an average of 16 consecutive values of the 10-bit output. This is used to reduce the jitter of the magnetic field value. The AS5510 is configured in Slow Mode (12.5kHz ADC sampling frequency).
- AVG 4X

  Does an average of 4 consecutive values of the 10-bit output. This is used to reduce the jitter of the magnetic field value. The AS5510 is configured in Slow Mode (12.5kHz ADC sampling frequency).
- No AVG

  Direct read of the 10-bit output. The AS5510 is configured in Slow Mode (12.5kHz ADC sampling frequency).
- FAST

Direct read of the 10-bit output. The AS5510 is configured in Fast Mode (50kHz ADC sampling frequency).

- I2C 56H

  The demo board communicates with the I²C address 56h. This is the default address.

  The on-board AS5510 must be used with this address only.

- I2C 57H

  The demo board communicates with the I²C address 57h. This address can be used for an external AS5510 connected on J4, and S1 configured on EXT. This address

- POL = 0

  Selects the default magnet polarity

- POL = 1

  Selects the inverted magnet polarity

Encoder Selection Switch
The switch SW1 selects the encoder which communicates with the microcontroller through the I²C bus.

1. INT (Bottom position, default): Onboard AS5510
2. EXT (Top Position): External AS5510 connected on J4.

The signals of the I²C interface (SCL, SDA) and the power supply (3.3V, GND) of an external AS5510 can be connected directly to J4. In this configuration, all the data from the external AS5510 are displayed on the LCD display.

Demo board block diagram, schematics and layout

Figure 5:
AS5510-DK Demo board block diagram

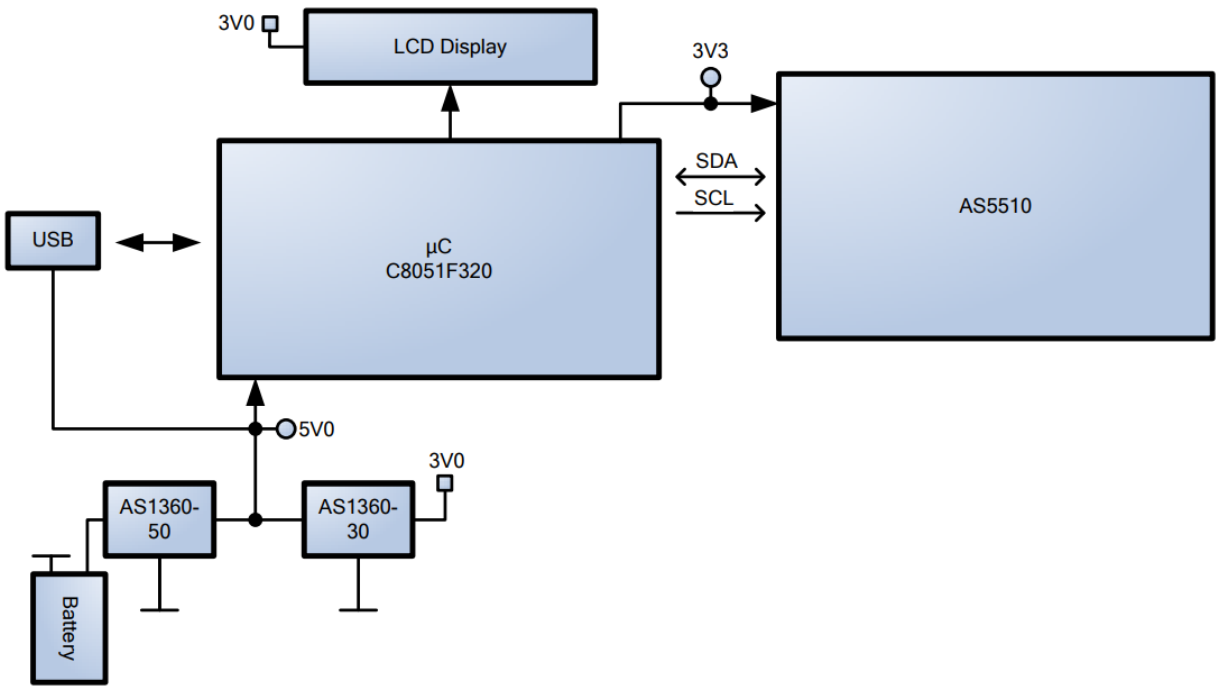


Figure 6:
AS5510-DK Demo board schematic

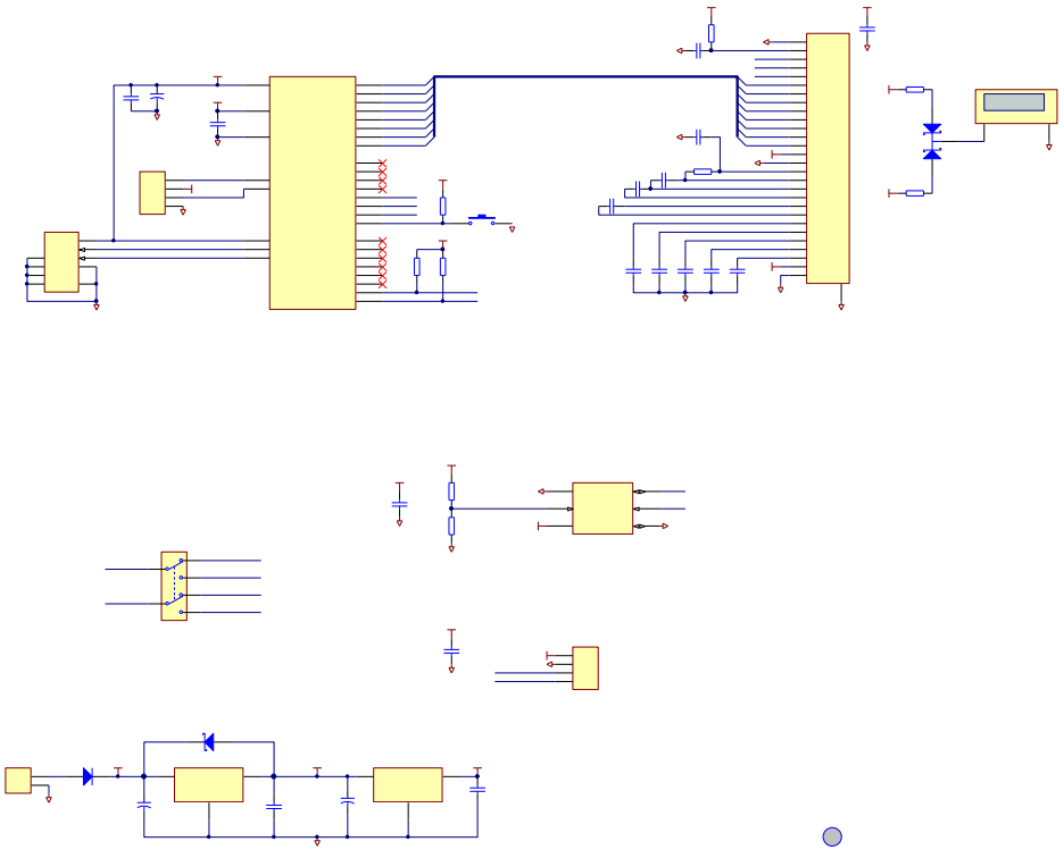
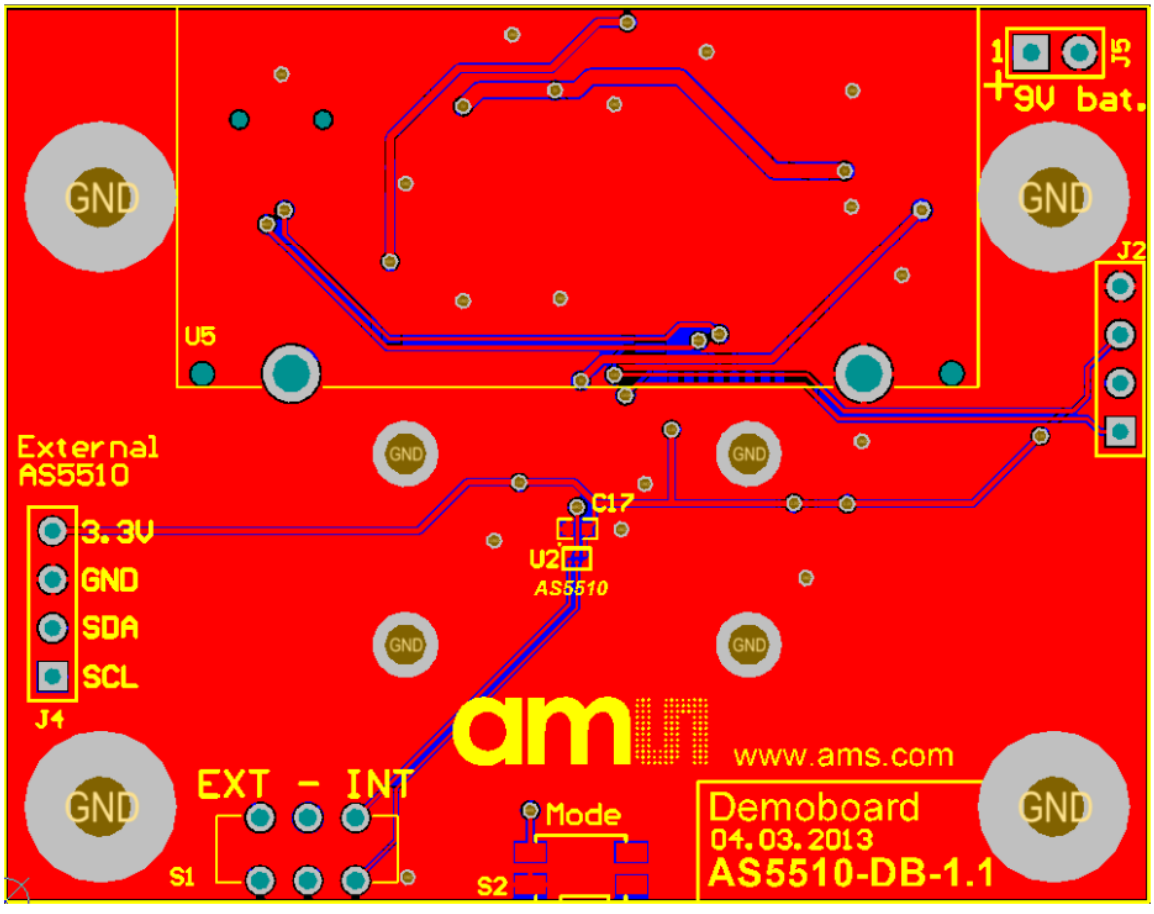


Figure 7:
AS5510-DK Demo board PCB layout



Ordering Information

Table 1:
Ordering Information

Ordering Code	Description	comments
AS5510-DB	DemoKit for AS5510 Linear Position Sensor	

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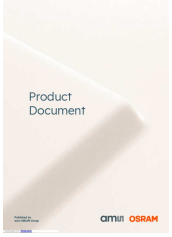	ams AS5510 10-bit Linear Incremental Position Sensor [pdf] User Manual AS5510, 10-bit Linear Incremental Position Sensor with Digital Angle output, AS5510 10-bit Linear Incremental Position Sensor with Digital Angle Output, AS5510 10-bit Linear Incremental Position Sensor, Linear Incremental Position Sensor, Incremental Position Sensor, Position Sensor, Sensor

References

- Sensor Solutions | ams
- Contact us | ams OSRAM

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