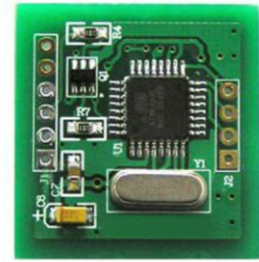


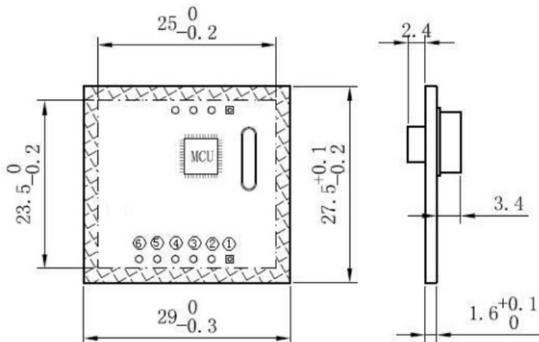


Description

The LCP-45 is a low cost dual axis inclinometer sensor with a $\pm 45^\circ$ measuring range, a resolution of 0.1° and an accuracy of $\pm 0.5^\circ$. It uses a full duplex RS232 interface for bidirectional communication. It can be programmed (via RS232) to give ASCII or Hex output and with different filter frequencies. It can also switch between absolute or relative measurement mode, and re-calibrate the absolute zero point. All of the settings are stored even after power down. Details of the RS232 connection can be found below.



Wiring Information



Pin Number	Function	Pin numbers for PC Connection with DB9 serial port
1	+5V dc	NC
2	GND	Pin 5
3	Rx (RS232)	Pin 3
4	Tx (RS232)	Pin 2
5	Rx (TTL)	NC
6	Tx (TTL)	NC

RS232 Interface

- Baud Rate : 9600 bps
 - Parity : None
 - Start Bit : 1
 - Data Bits : 8
 - Stop Bits : 1
- The full duplex RS232 interface allows commands can be sent to and data received from the device simultaneously. The output by default transmits the angle data continuously in ASCII format at 9600bps. Using the commands below these defaults can be changed, and the settings are stored even after the device is powered off. The commands are case sensitive and should be exactly as detailed below.

Command	Function	Response
*n	Continuous output (Default)	Continuous angle data (HEX or ASCII format)
*P	Switches to single output and transmits single output	Single angle data (HEX or ASCII format)
*4800B	Switches baud rate to 4800	baud4800
*9600B	Switches baud rate to 9600 (Default)	baud9600
*1920B	Switches baud rate to 19200	baud19200
*AS	ASCII output format (Default)	asii
*HE	HEX output format	hex
&Z	Set current position as zero output	set zero
FILT**	Sets the output frequency response in Hz, ** options are 01, 03, 05, 07, 10, 14(default)	setfilt** (where ** is the frequency response)

ASCII Output Format (Default) : (16 Bytes)

Byte No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Byte Count	1		5				1	1	1			5			1	1
O/P	X	+	1	3	.	5	SP	SP	Y	-	0	7	.	4	CR	LF

HEX Output Format : (5 Bytes)

When the data is transmitted in HEX format, a total of 5 bytes are sent. Bytes 1 and 2 hold the X axis data, bytes 3 and 4 hold the Y axis and byte 5 is always 0x0A to signify the end of the message. The two byte angle data is broken down as detailed in the table below. Bits 13 (MSB) to bit 0 contain the angle value. The value stored in these bits is 10 times the actual angle. Bit 14 is the sign bit, '1' = -ve and '0' = +ve. Bit 15 signifies whether the data word relates to the X or Y axis, '1' = X axis value, '0' = Y axis value.

Byte No.	1	2	3	4	5
Byte Count	2		2		1
O/P	X angle data		Y angle data		End

Bit No.	15	14	13.....0
Bit Count	1	1	14
O/P	X or Y axis data	Sign (1 = -ve, 0 = +ve)	Angle value (need to divide this value by 10 to get the actual angle)