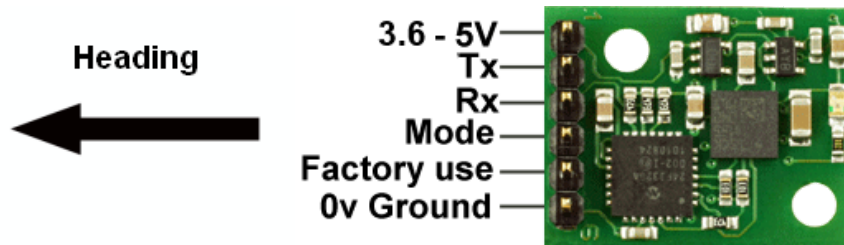


# CMPS10 - Tilt Compensated Compass Module

## Serial mode

### Connections



To use the serial mode of operation the mode pin must be connected to ground.

### Communication settings

The Serial mode operates over a link with a default baud rate of 9600 bps (no parity, 2 stop bits) and 3.3v-5v signal levels. This is not RS232. Do not connect RS232 to the module, the high RS232 voltages will irreversibly damage the module.

### Commands

Below is a table describing commands that can be sent to the CMPS10 and the data it will respond with.

#### Commands for Serial

Command	Name	Bytes returned	Returned data description
0x11	GET VERSION	1	Software version
0x12	GET ANGLE 8 BIT	1	Angle as a single byte 0-255
0x13	GET ANGLE 16 BIT	2	Angle as two bytes, high byte first 0-3600
0x14	GET PITCH	1	Pitch angle +/- 0-85°
0x15	GET ROLL	1	Roll angle +/- 0-85°
0x21	GET MAG RAW	6	Raw magnetic data, 16 bit signed: X high, X low, Y high, Y low, Z high, Z low
0x22	GET ACCEL RAW	6	Raw accelerometer data, 16 bit signed: X high, X low, Y high, Y low, Z high, Z low
0x23	GET ALL	4	angle high, angle low (0-3600), pitch (+/- 0-85), roll (+/- 0-85)
0x31	CALIBRATE EN1	1	returns ok (0x55)
0x45	CALIBRATE EN2	1	returns ok (0x55)
0x5A	CALIBRATE EN3	1	returns ok (0x55)
0x5E	CALIBRATE	1	returns ok (0x55)
0x6A	RESTORE 1	1	returns ok (0x55)
0x7C	RESTORE 2	1	returns ok (0x55)
0x81	RESTORE 3	1	returns ok (0x55)
0xA0	BAUD 19200	1	returns ok (0x55)
0xA1	BAUD 38400	1	returns ok (0x55)

### Calibration the CMPS10

I would recommend evaluating the CMPS10 performance first before implementing this function. Its purpose is to remove offsets caused by constant magnetic sources around the CMPS10. First of all you need to determine North and align the CMPS10 with it, then write a sequence of 3 commands in the correct order with a small delay between bytes, 100ms will be more than adequate. The sequence to enter calibration mode is 0x31,0x45,0x5A, then calibrate the first point by sending 0x5E to the command register, this should also light the LED. The Compass should then be rotated 90° and 0x5E sent to the command register again, repeat for two further 90° rotations and the calibration completes and the LED turns off. Please make sure that the CMPS10 is not located near to ferrous objects as this will distort the magnetic field and induce errors in the reading.

### Restore of factory calibration of the CMPS10

To perform a restore of the factory calibration write a sequence of 3 commands in the correct order with a small delay between bytes, 100ms will be more than adequate. The sequence is 0x6A,0x7C,0x81.

### Changing the baud rate

While the CMPS10 operates at a default serial bus baud rate of 9600 you may wish to change this. There are two other baud rates that can be used, for 19200 just send 0xA0 or alternatively for 38400 send 0xA1. Please note that the CMPS10 will always default to its 9600kbps rate after power cycling and after setting a new baud rate the ok response (0x55) will be sent at the newly selected speed.