Application Note

SA40111 – *Ultra-Dual Signal Conditioner Communication Protocol (RS232)*

This Application Note details the communication protocol for the **SA40111** *Ultra-Dual Signal Conditioner*. Please see the Product Data Sheet for general specifications and input/output connections.

Communication Protocol

Baudrate 19200
Data width ....8 bits
Parity ....….none
Flow control ....none
Stop bit ....……1

Commands

Commands can be sent in either lower or upper case.

a: Sleep mode ....save 40% of power, send any character to exit sleep mode
b: DAC input .....…….cycle DAC input between EEPROM and sensors
c: X axis ....……..…read X axis, see m for format
d: Y axis ....……...read Y axis, see m for format
e: Temperature ...…....read temp in 10s of degree C (i.e. 28.4 deg C = 284)
f: Both axis ....……read X and Y axis
g: Correction ....……turn on/off linearity correction and offset
h: Write address ....write DDD at address AAA, address & data are in decimal format
i: Read address ....…read address AAA, address & data are in decimal format
j: ....…………..….reserved
k: Start/Stop loop ..….loop last channel/channels (k will stop the loop)
l: Reset memory ....reset memory; to use, memory location 9 must be enabled, returns D if disabled, G if updated or E if error
m: Output format …….cycle output format from ADC counts to angle in degrees
n: ………….…………reserved
p: Update pots………..update X and Y gain pots with content of memory locations 187 and 188
s:………….…………..reserved
r: ………….…………..reserved
t: ………….…………..reserved
u: ………….…………..reserved
v : Software version…show current firmware version
x: CPU reset ....… reset/restart the CPU, it is required when the temp. correction is modified

Note: All other inputs will result in return of the characters sent and carriage return, line feed. All outputs from the module are terminated with carriage return, line feed.

EEPROM configuration

Note: Offsets in two.s complement, values should be within +/- 10,000

00 = Reserved
01 = Offset low byte X axis
02 = Offset high byte X axis
03 = Offset low byte Y axis
04 = Offset high byte Y axis
05 = Spare
06 = Spare

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(cont'd)

07 = Scale Factor low (used when the m command is issued) (ADC counts ÷ Scale factor)
08 = Scale Factor high (used when the m command is issued)
09 = Config 1

        bit 0-3 If 0 then power is 3 volts if 5 then power is 5 volts
        bit 4   If set the memory initialization is locked
        bit 5   If set when the unit starts the correction will be on
        bit 6   If set when the unit starts it will send the angle in degrees
        bit 7   If set use memory 183-184 for DAC X and 185-186 for DAC Y

11 = Reserved
12 = Reserved
13 = Start linearization look up table
124 = End look up table
125 = Start temperature correction, first word is slope, second word is offset, slope normalized to 4096

	ch0		ch1	
125	Cold	Slope		
127	Cold	Offset		
129	Hot	Slope		
131	Hot	Offset		
133			Cold	Slope
135			Cold	Offset
137			Hot	Slope
139			Hot	Offset

169 = End temperature correction table
170-180 = Spares for customer
182 = Config 2

        bit 0 Enable DAC
        bit 1 Enable temperature correction
        bit 2 Turn on the output temperature in binary
        bit 3 Setup dual axis sensor needs reset after change

183 = DAC X low byte
184 = DAC X high byte
185 = DAC Y low byte
186 = DAC Y high byte
187 = Pot X
188 = Pot Y
189 = Serial number low byte
190 = Serial number high byte
191-198 = Reserved
199 = Low byte scale factor Y
200 = High byte scale factor Y
201 = Setup gain for X and Y axis X b0 -> b3 Y b4 -> b7

b7/b3	b6/b2	b5/b1	b4/b0	
0	0	0	0	gain 1
0	0	0	1	gain 2
0	0	1	0	gain 4
0	0	1	1	gain 8

202 = Temperature offset low byte (works only for Deg C)
203 = Temperature offset high byte

All the outputs from the module are terminated with LF and CR