

## Using the SEI Absolute Encoders Package of A2, A2T, A4, HBA2, HBA4, HD25A with the AD2-B SEI to RS232 Interface

This manual describes how to interface the AD2-B interface connected to an A2 (Non contacting optical rotary position sensor from US-Digital) for azimuth and an A2T (single axis digital gravity angle sensor from US-Digital) for elevation. It has not been tested with any of the other devices mentioned above although they may well work. Users should check the technical information for themselves and make the judgement call. The website for information is: <http://www.usdigital.com>

The Azimuth and Elevation information from the SEI interface comes into the shack unit through the one port. I have chosen the port allocated to the elevation. The azimuth port is unused. Each encoder is queried in turn using 9600 baud ASCII. The shack unit reads the information coming in from the encoders and calculates the azimuth and elevation readings. The azimuth encoder reads from 0-360 degrees with accuracy to 0.1 degree. The elevation sensor reads from minus 180 degrees, through to 0 degrees and then through to positive 180 degrees. In reality the range -10 to + 90 is the useful readout also with an accuracy of 0.1 degree.

***The second MAX232 must be installed for the SEI encoder system to work as the AD2-B requires full RS232 levels. See the main manual for details.***

Some rewiring of J3 and the associated DB9 are required. This wiring will prevent the use of an analogue or any other serial encoder option on the elevation socket. It is specific to the SEI interface. To interface with the cable supplied with the AD2-B you will need to change the Elevation DB9 socket to a DB9 Plug or use a gender bender. Note that DB9 plugs and DB9 sockets are mirror image wired so look at the pin numbers not the pin positions when wiring to the diagram below.

Note that the handshake line (CTS) from the SEI system is not used. Instead the software waits for the command echo and then reads the encoder data. The read mode times out if no data comes in resulting in a reading of 0 degrees on the LCD.

Function	J3 pin no.	Direction	SEI DB9	Function
12 volt line	1		NC	
Handshake	2	>	NC	
9600 in	3	<	2	Data from SEI
9600 out	4	>	3	
+5V	5		NC	
Gnd	6		5	Gnd

Note this wiring diagram applies only for SEI interface use

Notes regarding menu items when using the SEI system

(1) The following menu items are inactive in SEI mode:

- Items 10, 11 (spread)
- Items 12, 13 (azimuth and elevation offset)
- Items 25, 26 (10/12 bit operation)
- Items 27 (averaging)
- Items 28, 29 (addition and subtraction of offsets)

(2) Set menu item 33 to “SEI active **On**”

- (3) Set menu item "Az/El mode" to 15 even though the Azimuth port is unused. This is necessary to set some internal flags.
- (4) Set other menu items as required.

**For information:**

The software sends a character 17 to the elevation encoder on port 1 of the SEI device. The encoder echoes back the command and sends the elevation information as Highbyte first and Lowbyte second.

Next, the software sends a character 16 to the azimuth encoder on port 0 of the SEI device. The encoder echoes back the command and sends the azimuth information as High byte first and Lowbyte second.

**Sample settings**

Here are the settings VK3UM uses with his SEI system. Many important menu items for an SEI encoder system are not shown. Not all of these are critical but these settings may help you get the system going. The encoders are set for 3600.

- 8 Ser/Ser
- 9 Delay=2 (or what you want)
- 10 AZ spread 360.00
- 11 EL spread=360.00
- 12 AZ offset=0
- 13 EL offset=0
- 14 AZ hyst=10
- 15 EL hyst=10
- 16 AZ highstop=255
- 17 AZ lowstop=255
- 18 EL highstop=90
- 19 EL lowstop=-2
- 20 Ht ASL=60.00 (or what you want)
- 21 Long=-117.74 (or what you want)
- 22 Lat=33.63 (or what you want)
- 23 Park AZ=2.00
- 24 Park EL=90.00
- 25 AZ 12 bit
- 26 EL 12 bit
- 27 Incline Cal=135 (not used)
- 28 Ave STATIC=15
- 29 Ave MOVE=1
- 30 Sub AZ offset
- 31 Add EL offset
- 32 VGA OFF
- 33 Time OFF
- 34 CTS +5V
- 35 In=SEI
- 36 Refrac OFF
- 37 Relay ModeB
- 38 Dop=1296
- 39 RunOnAZ=0.00

- 40 RunOnEL=0.00
- 41 Park=OFF
- 42 Check ON (later versions of software)