Application Note
SPECTROTILT™ *RS232 Communication Protoco*

The **SPECTROTILT™** *RS232 Electronic Inclinometer* (p/nis SSY0185-VDS and SSY0185-HDS) output is transmitted on a single wire in a RS232 format. The driver is a CMOS 0 to +5VDC. The output is high (+5VDC) when the unit is not transmitting.   The unit sends data as soon as the power is applied to it. Two bytes, MSByte and LSByte, are continuously transmitted at 15ms intervals. B7 identifies the most significant byte (MSB) and the less significant byte (LSB). The output data is an average of 3 readings from the A/D converter. The output range is 0 to 1023 (512 is zero). The scale is adjusted to 0.137 degrees per count.

Data format:
The MSByte is sent first.
9600baud rate
1 start bit
1 stop bit
Parity Even
Start,b0,b1,b2,b3,b4,b5,b6,b7,Stop

MSByte:
B7 is 1: To indicate that this is the most significant byte.
B6 is even parity: All the bits are included when the parity is calculated.
B5-B4: reserved
B3-B0: Is the output from the A/D converter

B7	B6	B5	B4	B3	B2	B1	B0
1	Parity	Reserved	Reserved	D9	D8	D7	D6

Parity is even (for instance: data = 1X000001 transmitted 10000001).

LSByte:
B7 is 0: To indicate that this is the less significant byte
B6 is even parity: All the bits are included when the parity is calculated
B5-B0: Is the output from the A/D converter

B7	B6	B5	B4	B3	B2	B1	B0
0	Parity	D5	D4	D3	D2	D1	D0

Examples:

Byte 1001 0110 and 0101 0101
A/D converter   → Hex 195   → Dec   405 → -14.65

Byte 1101 1110 and 0011 0011
AD converter   → Hex 3B3   → Dec   947 → 59.595

Connections:
Red wire: +7VDC to +14VDC (unregulated)
White wire: Data output,   0 to +5VDC (serial stream
Black wire: Ground