



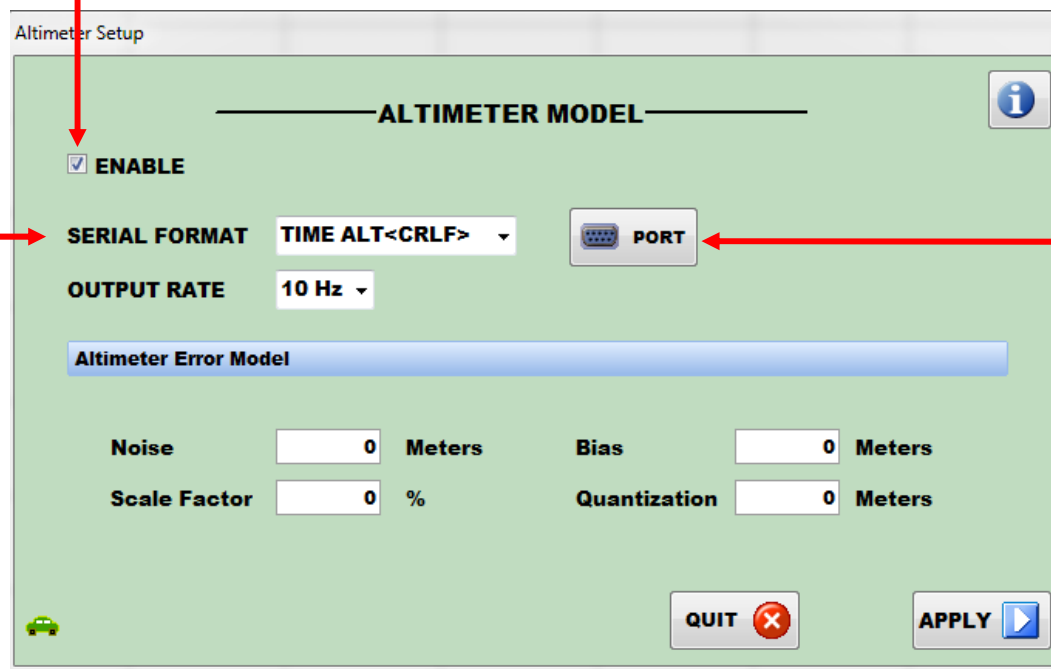
## ALTIMETER MODEL

TAPESTRY constructs and outputs simulated Barometric-Altitude (height above WGS84 Geod). Baro-Altitude is used for two purposes within Tapestry. Firstly, Baro-Altitude can be output as a standalone sensor via COM1 or COM4. The second use is for support of the Vertical channel within the Inertial Navigation Sensor (INS) simulated as an ICD-GPS-059 CADC input. When used to support the INS model, no Serial Data output is required.

There are four modeled effects:

- Bias.
- Scale Factor.
- Uncorrelated Noise.
- Quantization.

Check this to enable this model.  
Otherwise, Baro Altitude is set  
equal to true Altitude.



The Altimeter Setup dialog box is titled "Altimeter Setup" and contains the following elements:

- ENABLE:** A checked checkbox.
- SERIAL FORMAT:** A dropdown menu set to "TIME ALT<CRLF>".
- OUTPUT RATE:** A dropdown menu set to "10 Hz".
- PORT:** A button with a serial port icon.
- Altimeter Error Model:** A section header for the error model parameters.
- Noise:** A text input field set to "0" followed by "Meters".
- Scale Factor:** A text input field set to "0" followed by "%".
- Bias:** A text input field set to "0" followed by "Meters".
- Quantization:** A text input field set to "0" followed by "Meters".
- Buttons:** "QUIT" (with a red X icon) and "APPLY" (with a blue play icon).

Use this button to  
assign output to  
COM1.

### Select Format

- INS Model Support (data used internally)
- RMS
- Time Tagged Baro-Altitude followed by carriage return <CR> and line feed <LF>
- Baro-Altitude followed by carriage return <CR> and line feed <LF>



## MODEL IMPLEMENTATION

$$H_{\text{BARO}} = H_{\text{TRUE}} + \text{Bias} + \text{SF} ( H_{\text{TRUE}} ) + \text{Noise}$$

If you enter a non-zero Quantization, it is implemented as follows:

$$H_Q = [ ( H_{\text{BARO}} ) / \text{Quantization} + 0.5 ]$$

$$H_{\text{BARO}} = ( H_Q ) \text{Quantization}$$

## FORMAT DESCRIPTIONS

- a) RMS format. This format constructs altitude and transmits it via assigned RS232 port in the following byte-wise format ;

```
unsigned char AltBytes[18];
```

```
AltBytes[0] = 'R'
```

```
AltBytes[1] = 'M'
```

```
AltBytes[2] = 'S'
```

```
AltBytes[3] = ' '
```

```
sprintf( &AltBytes[4], "%+06ld", (long) Baro-Altitude (feet)
```

```
AltBytes[10] = 'T'
```

```
AltBytes[11] = '-'
```

```
AltBytes[12] = '9'
```

```
AltBytes[13] = '9'
```

```
AltBytes[14] = checksum_byte[0]
```

```
AltBytes[15] = checksum_byte[1]
```

```
AltBytes[16] = 0x0d (carriage return)
```

```
AltBytes[17] = '/0'
```

- b) Time tagged <CRLF> format. This format constructs and outputs Baro-Altitude in the following serial format;

```
sprintf( &AltBytes[0], &AltBytes[9], "%8.1lf, %+6ld%c%c", (double) GpsTime ,  
(long) Altitude , 0x0d, 0x0a)
```

- c) <CRLF> format. This format constructs and outputs baro-altitude in the following serial format;

```
sprintf( &AltBytes[0], "%+6ld%c%c", (long) Altitude , 0x0d, 0x0a)
```