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## *Revolution<sup>tm</sup> 2X*

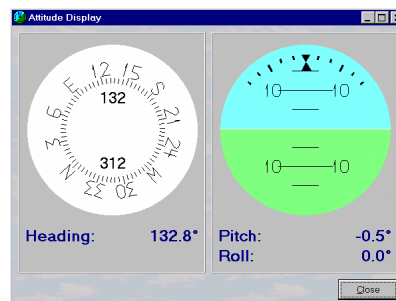
### Strapdown Electronic Compass

#### General Description

The Revolution 2X combines a precision 3-axis solid-state magnetometer and a rugged 2-axis electrolytic tilt sensor to provide accurate heading and tilt measurements over a wide range of environmental conditions. The 2X is similar to True North's original Revolution compass but **with double the speed**. The measurement cycle rate is 27.5 Hz, as opposed to 13.75 for the standard Revolution. The device is fully compatible with existing Revolution software.

A key advantage of the Revolution 2X is its quick-connect, external serial interface. While the compass is in-place, and without disconnecting system wiring, a serial cable or available USB cable can be temporarily connected via the RJ12-style modular receptacle. This allows easy access during installation for calibration and tuning. It also provides a valuable diagnostic port and can be used for an auxiliary read-out when needed. In situations where a fixed installation is not desirable, the RJ12 connection can be used exclusively.

Among the host of user definable parameters is the selection of NMEA output data



**Attitude Display in PC Software**

and update rate; operating mode as continuous or query-only; and angle data in degrees, mils, radians, or 16-bit integer (65536 counts per revolution). Compensation for both hard and soft iron influences is built-in.

True North offers a development kit that includes the compass, cable, and software. The Revolution is covered by a full one-year replacement warranty.



#### Features

- ◆ **High Accuracy**
  - ⇒ Heading within 0.5° or better
  - ⇒ Tilt within 0.2° or better
- ◆ **Wide Operating Range**
  - ⇒ ±40° Pitch and Roll
  - ⇒ ±80° Dip angle range
  - ⇒ Temperature -20° to 70°C
  - ⇒ Local Hard Iron to ±1 Gauss
- ◆ **Fast Response**
  - ⇒ 28 readings per second
  - ⇒ Wake from standby in 75 msec
- ◆ **Single Supply Operation**
  - ⇒ 6 to 30V unregulated DC or
  - ⇒ 5V regulated DC
- ◆ **Low Power**
  - ⇒ 20 mA operating
  - ⇒ 5 mA sample
  - ⇒ 1 mA standby
- ◆ **Wide Selection of Output data**
  - ⇒ Heading, pitch, and roll
  - ⇒ Magnetometer X, Y, and Z
  - ⇒ Dip angle
  - ⇒ Total, horizontal, and vertical magnetic field strength
  - ⇒ Horizontal X and Y magnetic field strength
- ◆ **Choice of Interface**
  - ⇒ Full-duplex RS-232
  - ⇒ Full-duplex RS-485
- ◆ **In-System Configuration and Test**
  - ⇒ PC or laptop can be connected while unit operates in-situ
  - ⇒ Perform hard and soft iron calibration
  - ⇒ Monitor outputs and change user-definable settings

## Specifications

### Heading Performance

Parameter	Value	Comments
Accuracy	± 0.5° rms	Typical, Tilt < 35° Dip < 60°
Repeatability	± 0.3°	No filter
Response time	36 msec	Minimum, no filter
Dip Angle Range	± 80°	
Tilt Range	± 40°	
Update rate	28 per second	

### Pitch and Roll Performance

Parameter	Value	Comments
Accuracy	± 0.2°	Factory calibrated
Repeatability	± 0.15°	No filter
Range	± 40°	
Settling time	0.5 sec	No damping

### Electrical

Parameter	Value	Comments
Supply Current	20 mA operating 5 mA sample 1 mA standby	typical typical typical
Supply Voltage (V <sub>DD</sub> )	6 – 30 Vdc unregulated 5.0 Vdc regulated	4.9 Vdc min

### Environmental

Parameter	Value	Comments
Operating Temp	-20 to 70 °C	
Storage Temperature	-40 to 125 °C	PC Board, not ABS encl.
Humidity	0 to 90%	Non-condensing

### Mechanical

Parameter	Value	Comments
Box	Hammond Mfg1591MFL	ABS
PCB Size	1.6"W x 3.0"L x 0.6"H	H required for tilt sensor
PCB Mounting	4 #4 screws, 1.4" x 2.2" spacing	
Weight	3 oz. in box	
Connectors	8 pin, single-row, 0.1" friction header 6 pin RJ12 modular receptacle	

### Interface

Parameter	Value
Signal type	RS232 or RS485
Baud rate	2400, 4800, 9600, 19200, or 38400 bps
Character Format	8 data, no parity, 1 stop
Input Buffer Size	90 characters
Output Buffer Size	110 characters
Output Format	NMEA 0183
Output Data Rate	1 to 2400 sentences per minute
Operating Modes	Continuous or sample
Angle Units	Degrees, mils, radians, 16-bit integer