Features

- **High Accuracy**
  - ⇒ Heading within 0.5° or better
  - ⇒ Tilt within 0.2° or better
- **Wide Operating Range**
  - ⇒ ±42° Pitch and Roll
  - ⇒ ±80° Dip angle range
  - ⇒ Temperature -40° to 105°C
  - ⇒ Local Hard Iron to ±1.5 Gauss
- **Fast Response**
  - ⇒ 27.5 readings per second
  - ⇒ Wake from standby in 50 msec
- **Single Supply Operation**
  - ⇒ 6 to 45V unregulated DC or
  - ⇒ 5V regulated DC
- **Low Power**
  - ⇒ 25 mA operating
  - ⇒ 10 mA sample
  - ⇒ 2 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

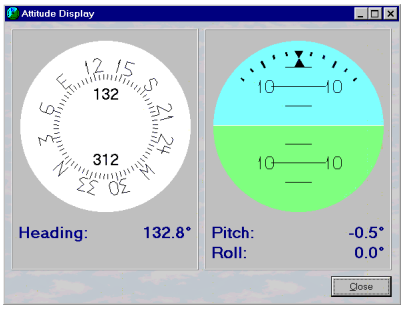
ECS eCompass Series

Strap down Electronic Compass

General Description

The ECS series represents the state-of-the-art in magnetic compassing. It 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 firmware and signal processing algorithms have been refined and improved over three prior generations of compasses to deliver the ultimate in performance from the available sensor data.

A key advantage of the ECS 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.



Attitude Display in PC Software

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

Jewell Instruments offers a development kit that includes the compass, cable, and software. The ECS is covered by a full one-year replacement warranty.

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	± 42°	
Update rate	27.5 per second	

Pitch and Roll Performance

Parameter	Value	Comments
Accuracy	± 0.3°	Factory calibrated
Repeatability	± 0.20°	No filter
Range	± 42°	
Settling time	0.5 sec	No damping

Electrical

Parameter	Value	Comments
Supply Current	*Below values are the same color*	
	25 mA operating	typical
	10 mA sample	typical
	2 mA standby	typical
Supply Voltage (V_{DD})	*Below values are the same color*	
	6 – 45 Vdc unregulated	4.9 Vdc min
	5.0 Vdc regulated	

Environmental

Parameter	Value	Comments
Operating Temp	-40° to 105 °C	
Storage Temperature	-50° to 150 °C	
Humidity	0 to 90%	Non-condensing

Mechanical

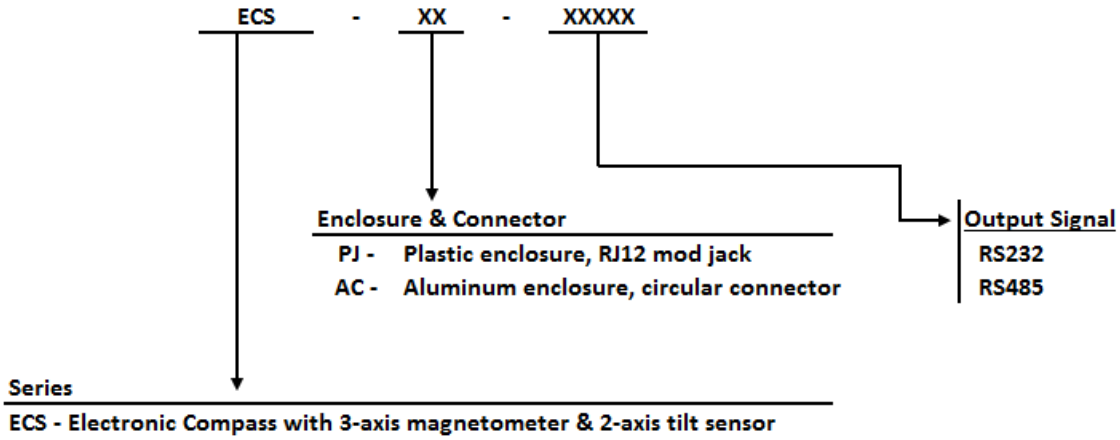
Enclosure Material	**Plastic Enclosure (P Option):** (ABS) Flame Retardant UL94 VO
	Aluminum Enclosure (A Option): Diecast Aluminum Alloy (Type 360.1)
PCB Size	1.8"W x 3.0"L x 0.6"H – H required for tilt sensor
PCB Mounting	4 #4 screws, 1.4" x 2.2" spacing
Weight	**Plastic Enclosure (P Option):** 3.2 oz. (90.7 grams)
	Aluminum Enclosure (A Option): 7.2 oz. (204.1 grams)
Connectors	8 pin, single-row, 0.1" friction header
	6 pin RJ12 modular jack

Interface

Signal type	RS232 or RS485
Baud rate	2400, 4800, 9600, 19200, 38400 or 57600 bps
Character Format	8 data, no parity, 1 stop
Input Buffer Size	110 characters
Output Buffer Size	110 characters
Output Format	NMEA 0183 and binary
Output Data Rate	1 to 1650 sentences per minute
Operating Modes	Continuous or sample
Angle Units	Degrees, mils, radians, 16-bit integer

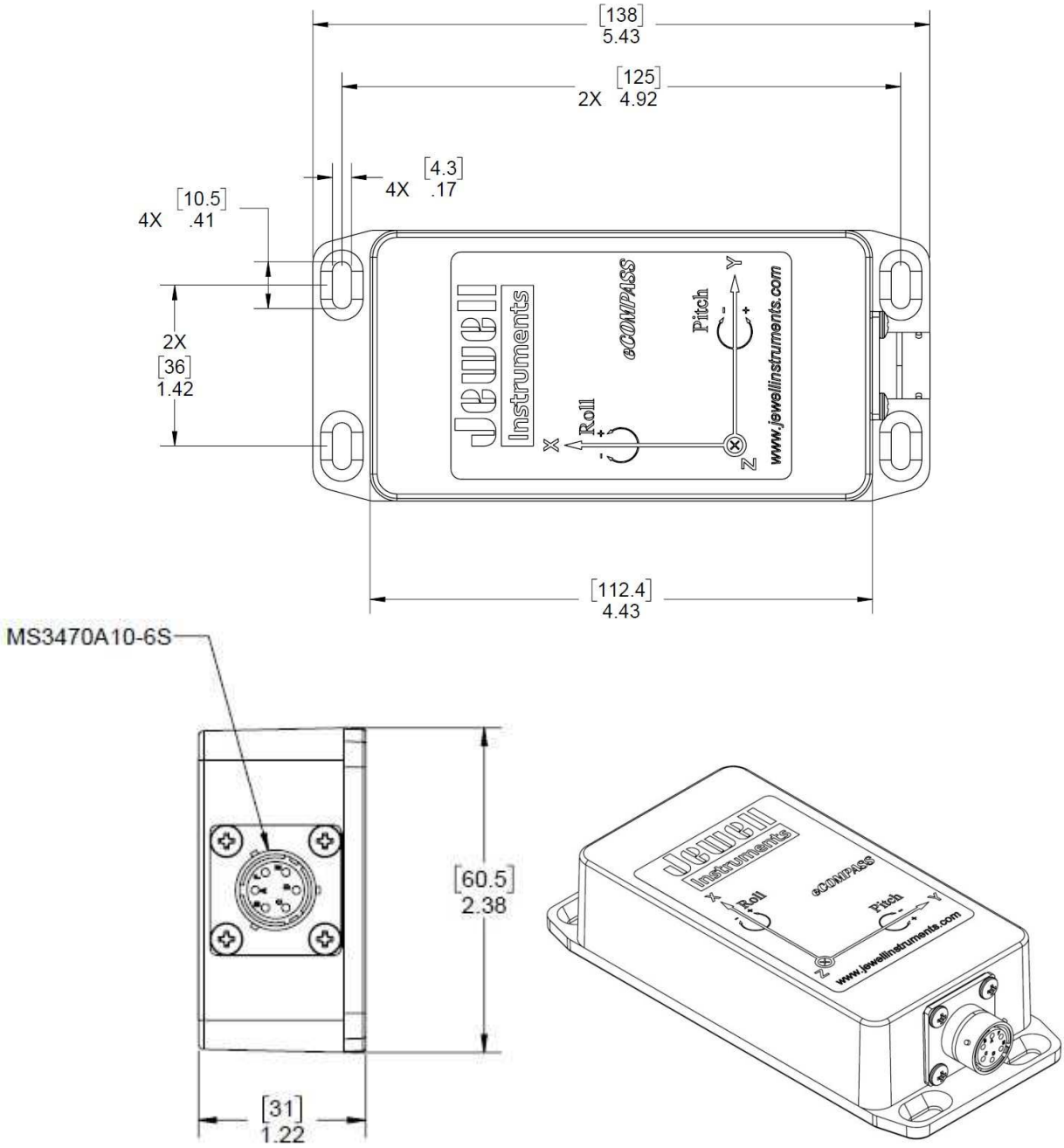
***Specifications subject to change without notice on account of continued product development**

How to Order



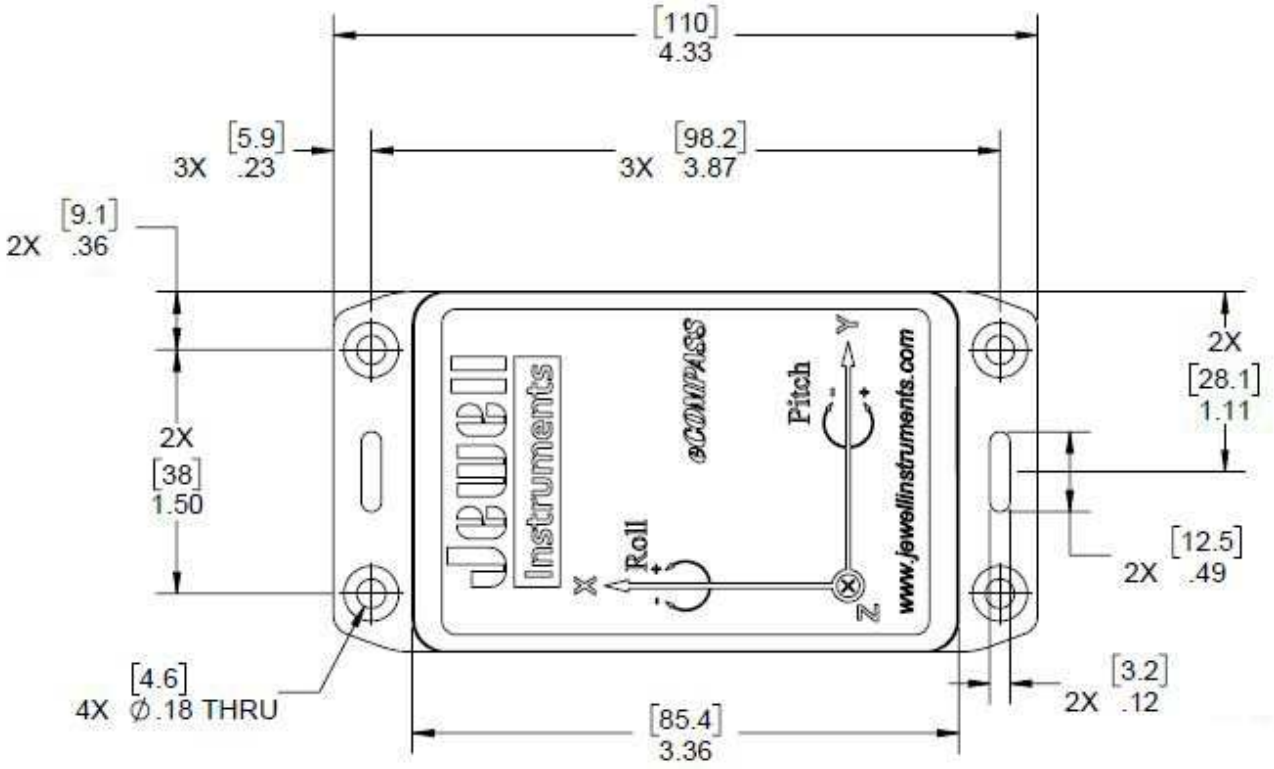
Example:
ECS-PJ-RS232
ECS Electronic Compass with 3-axis magnetometer & 2-axis tilt sensor, plastic enclosure, RJ12 mod jack & RS232 output signal

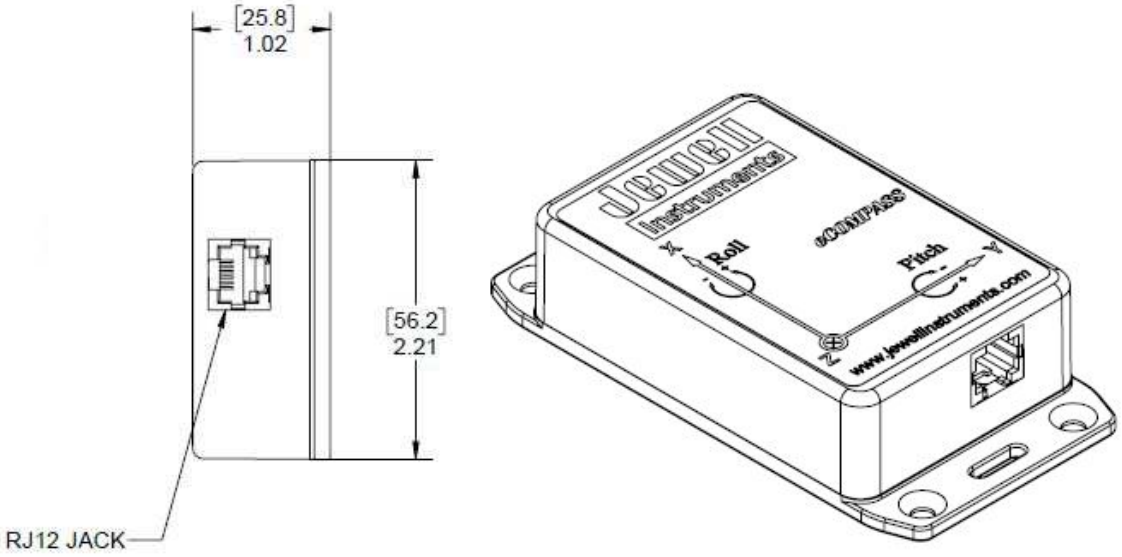
Dimensions of Aluminum Enclosure



Dimensions in mm [in]

Dimensions of Plastic Enclosure





Dimensions: in [mm]

Pin Outs

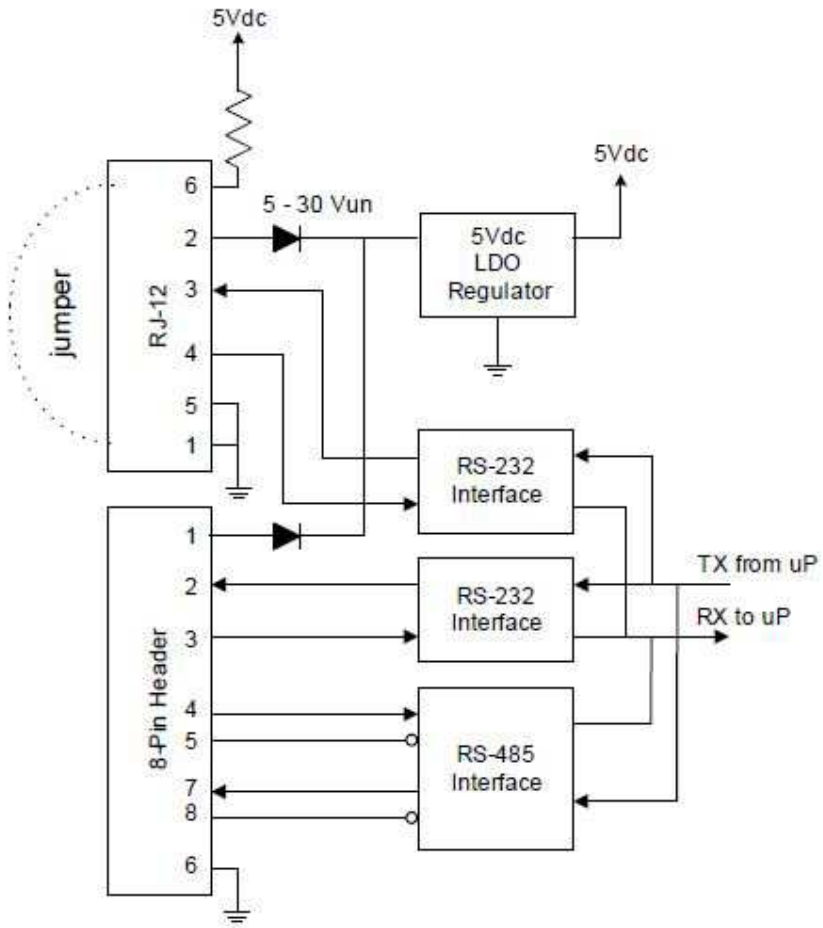
Circular Connector

J1 RJ-12 Jack Pin Out	
Pin 1	Ground
Pin 2	Power
Pin 3	TX
Pin 4	RX
Pin 5	Ground
Pin 6	100K

Mod Jack

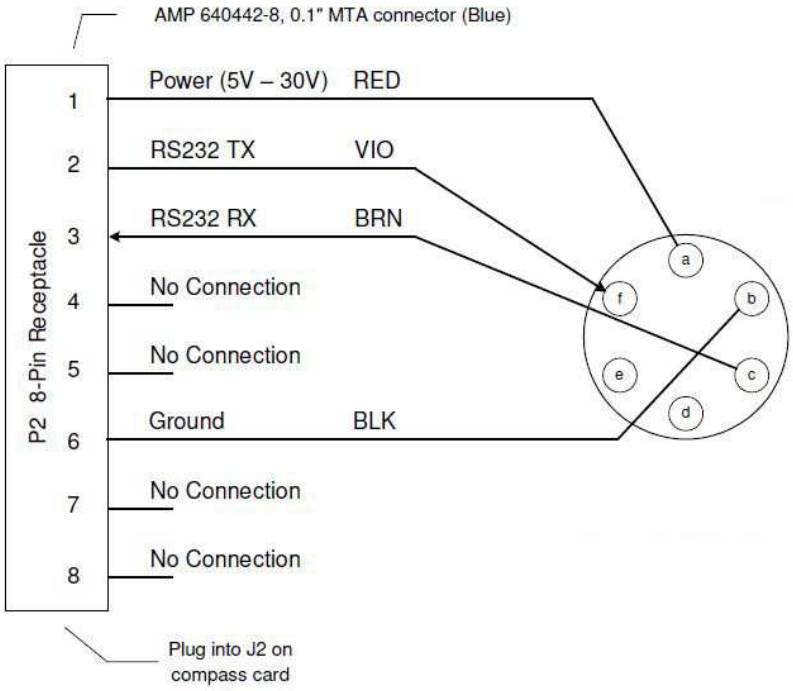
J2 8-Pin Header Pin Out	
Pin 1	Power
Pin 2	RS232 TX Out
Pin 3	RS232 RX In
Pin 4	RS485 RX+
Pin 5	RS485 RX-
Pin 6	Ground
Pin 7	RS485 TX+
Pin 1	RS485 TX-

Interface Block Diagram



Wiring Drawings

RS-232



RS-485