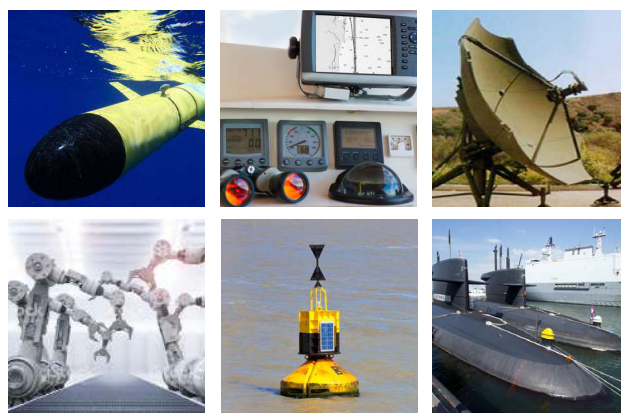# Jewell Instruments

MAKING SENSE OUT OF MOTION

ECS eCOMPASS SERIES

Strap-Down Electronic Compass

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.

FEATURES:

- High Accuracy
- Wide Operating Range
- Fast Response - 27.5 Readings per Second
- Single Supply Operation
- Low Power
- Wide Selection of Output Data
    - Heading, Pitch, & Roll
    - Magnetometer X, Y, and Z
    - Dip angle
    - Total, horizontal, and vertical magnetic field strength
    - Raw and conditioned gyro data
- In-System Configuration and Test

APPLICATIONS:

- Unmanned vehicles
- Robotics
- Weather buoys
- Antenna positioning
- Marine navigation

PERFORMANCE SPECIFICATIONS

HEADING PERFORMANCE

ACCURACY (rms)	±0.5° typical: Tilt <35°, Dip <60°
REPEATABILITY	±0.3°, static, no filter
RESPONSE TIME	36 msec minimum, no filter
DIP ANGLE RANGE	±80°
TILT RANGE	±42°
UPDATE RATE	27.5 per second

PITCH & ROLL PERFORMANCE

ACCURACY	±0.3°, factory calibrated
REPEATABILITY	±0.2°, no filter
RANGE (°)	±42°
SETTLING TIME	0.5 seconds, no damping

ELECTRICAL

SUPPLY CURRENT	25mA operating, typical
	10mA sample, typical
	2mA standby, typical
SUPPLY VOLTAGE	6-45 VDC unregulated (4.9 VDC min)
	5.0 VDC regulated

ENVIRONMENTAL

OPERATING TEMP. RANGE	-40° to +105°C
STORAGE TEMP. RANGE	-50° to +150°C
HUMIDITY	0 to 90% non-condensing

INTERFACE

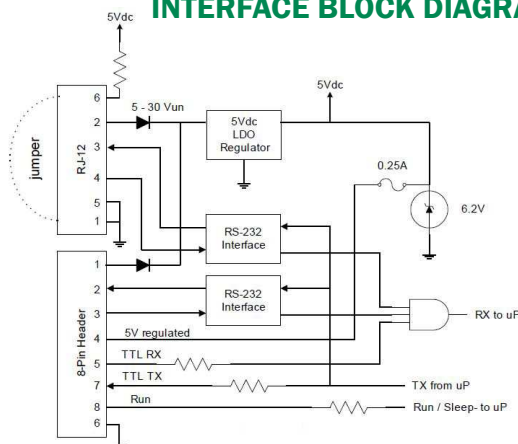|	
SIGNAL TYPE	RS232 or RS485
BAUD RATE	2400, 4800, 9600, 19200, 38400, or 57600 bps
CHARACTER FORMAT	8 data, no parity, 1 stop
INPUT BUFFER SIZE	110 characters
OUTPUT BUFFER SIZE	110 characters
OUTPUT FORMAT	NMEA 0183 and binary
OUTPUT DATA RATE	1 to 1650 sentences/min
OPERATING MODES	Continuous or sample
ANGLE UNITS	Degrees, mils, radians, 16-bit integer

PIN OUTS

RJ-12 JACK

1	GROUND
2	POWER
3	TX
4	RX
5	GROUND
6	100K

8-PIN HEADER

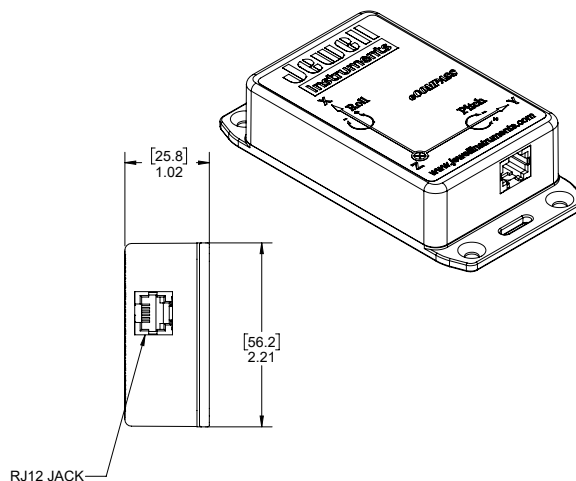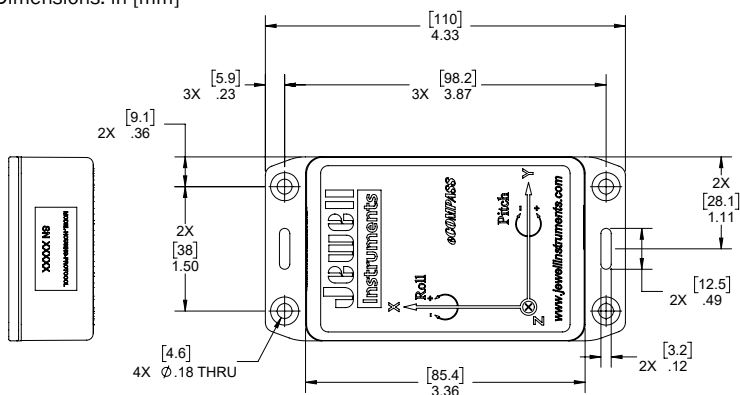|	
1	UNREGULATED PWR
2	RS232 TX OUT
3	RS232 RX IN
4	REGULATED PWR
5	TTL RX IN
6	GROUND
7	TTL TX OUT
8	TTL RUN/SLEEP IN

INTERFACE BLOCK DIAGRAM

PRODUCT SPECIFICATIONS

MECHANICAL

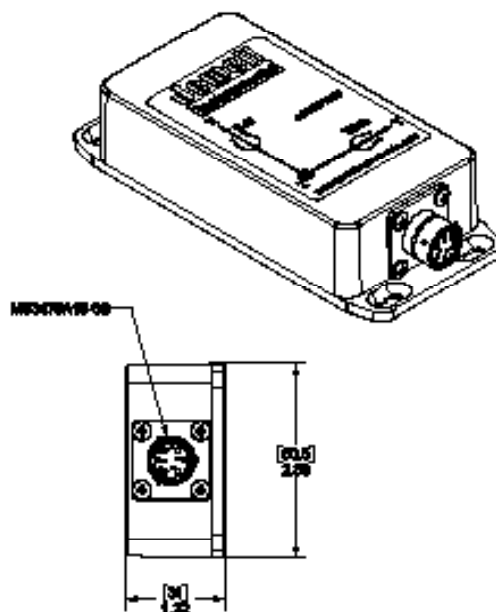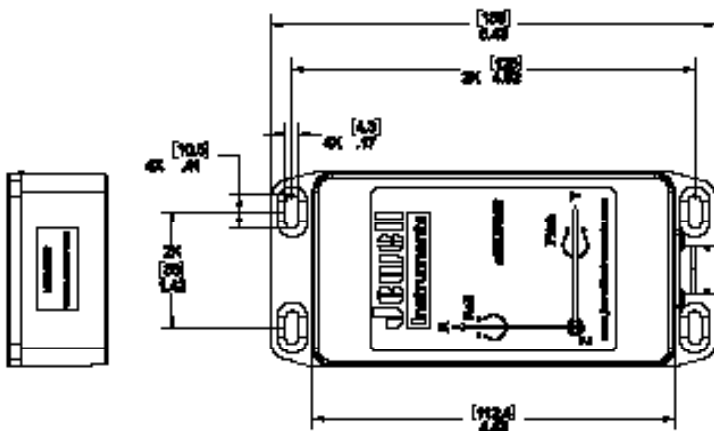| MECHANICAL	PLASTIC ENCLOSURE	ALUMINUM ENCLOSURE
ENCLOSURE DETAILS	(ABS) Flame Retardant UL94 VO	Diecast Aluminum Alloy (Type 360.1)
PCB SIZE	1.6"W x 3.0"L x 0.6" (H required for tilt sensor)	
PCB MOUNTING	4 #4 screws, 1.4" x 2.2" spacing	
WEIGHT	3.2 oz. (90.7 g)	7.2 oz. (204.1 g)
CONNECTOR	6 pin RJ12 modular jack	

DIMENSIONS OF PLASTIC ENCLOSURE
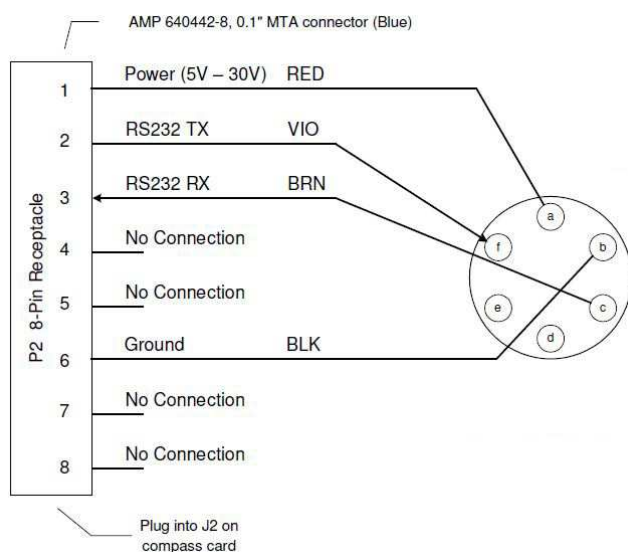
Dimensions: in [mm]
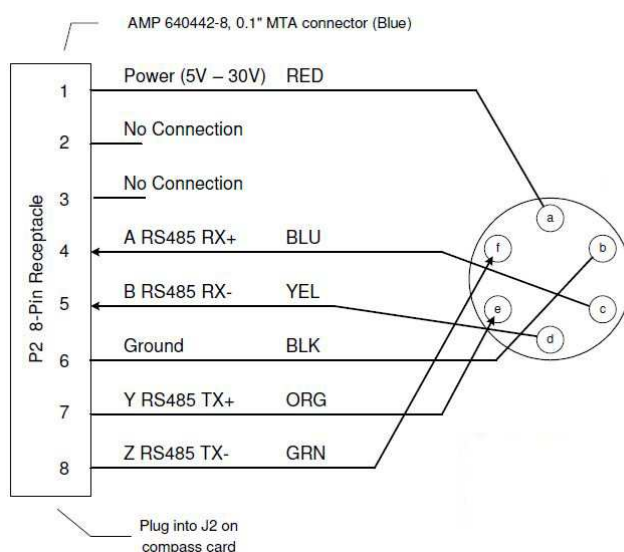

DIMENSIONS OF ALUMINUM ENCLOSURE

Dimensions: in [mm]

PRODUCT SPECIFICATIONS

RS-232 WIRING

AMP 640442-8, 0.1" MTA connector (Blue)

P2 8-Pin Receptacle

Pin	Signal	Color
1	Power (5V – 30V)	RED
2	RS232 TX	VIO
3	RS232 RX	BRN
4	No Connection	
5	No Connection	
6	Ground	BLK
7	No Connection	
8	No Connection	

Plug into J2 on compass card

RS-485 WIRING

AMP 640442-8, 0.1" MTA connector (Blue)

P2 8-Pin Receptacle

Pin	Signal	Color
1	Power (5V – 30V)	RED
2	No Connection	
3	No Connection	
4	A RS485 RX+	BLU
5	B RS485 RX-	YEL
6	Ground	BLK
7	Y RS485 TX+	ORG
8	Z RS485 TX-	GRN

Plug into J2 on compass card

ORDERING INFORMATION

RoHS Version	ENCLOSURE	MODEL #	PART #
RS232	PLASTIC	ECS-P/J-RS232-ROHS	02550403-ECS-001
	ALUMINUM	ECS-A/C-RS232-ROHS	02550403-ECS-002
RS485	ALUMINUM	ECS-A/C-RS485-ROHS	02550403-ECS-003

Jewell Instruments

ISO **9001** CERTIFIED