

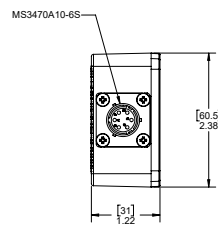
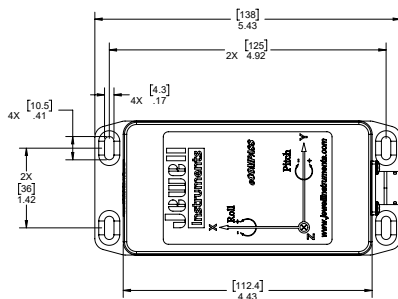
ECV-IMU

Inertial Measurement Unit

The Jewell ECV-IMU Series offers high accuracy in a small package. This low-cost, low power device provides stable azimuth, pitch, and roll measurements in dynamic conditions. This sensor consists of the following: 3-axis angular rate gyros, 3-axis accelerometer, 3-axis magnetometer and 2-axis electrolytic tilt sensor.

FEATURES:

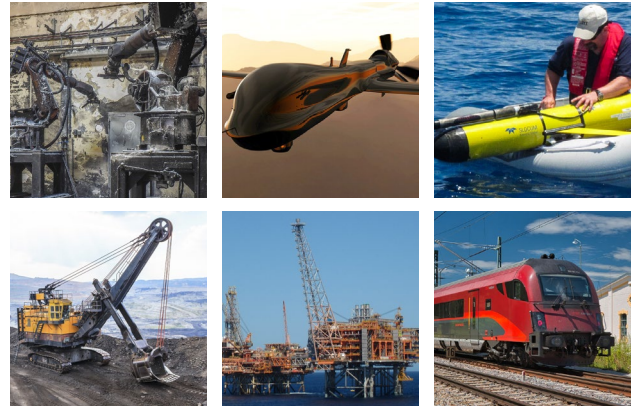
- Exceptional dynamic performance
- High accuracy
- Precise factory calibration
- Wide operating range
- RS-485 output
- Fast response
- Low power



Dimensions: in [mm]

PIN OUT:

A	POWER (7V-45V)	D	Rx-
B	GROUND	E	Tx+
C	Rx+	F	Tx-



APPLICATIONS:

- Unmanned vehicles
- Robotics
- Platform stabilization
- Excavation machinery
- Rail



PERFORMANCE SPECIFICATIONS: ECV-IMU

PERFORMANCE

SENSOR	3-axis Accelerometer	3-axis Gyro	3-axis Magnetometer
INPUT RANGE	±2g	±250°/sec	±2G
IN-RUN BIAS STABILITY		<0.2°/sec	
NOISE DENSITY	<45 µg/√Hz	<0.005°/sec/√Hz	<29nV/√Hz
AXIS MISALIGNMENT	2%		±3% FS
RESOLUTION	<0.06 mg	<0.01°/sec	<27µG
BANDWIDTH	>30 Hz		

ELECTRICAL

SUPPLY VOLTAGE	+7.0 Vdc to +45 Vdc	
ELECTRICAL ISOLATION	1500 Vrms	
POWER CONSUMPTION	Standby	5mA
	Idle	15mA
	Operating	40mA

BUILT-IN TESTS

TEMPERATURE SENSOR	Yes	
DIGITAL OUTPUT INTERFACE	RS-485 (Continuous streaming)	
ICD (BASIC FIELDS REPORTED)	Acceleration (X, Y, & Z axis)	Rate Angular Speed (X, Y, & Z axis)
	50 Hz sampling speed	Compass Direction (X, Y, & Z axis)

(See Data Packet on pg. 3)

MECHANICAL

WEIGHT	7.1 oz (201.4 g)
DIMENSIONS	5.43" (138mm) x 2.38" (60.5mm) x 1.22" (31mm)
HOUSING & BASE MATERIAL	Anodized and Alodine Aluminum
CONNECTOR	6 Pos Circular Female Connector

PERFORMANCE SPECIFICATIONS: ECV-IMU

ENVIRONMENTAL

OPERATING TEMPERATURE	-40 °C to +70 °C
STORAGE TEMPERATURE	-55 °C to +85 °C
INGRESS PROTECTION	IP67
FLAMABILITY	UL94 V-0
FIRE PROTECTION	EN 45545 Hazard Level 3 (HL3)
ALTITUDE	0 to 2500m above sea level
ROHS COMPLIANT	Yes

RELIABILITY

MILSTD 217 GM @ +25 °C	147,200 hours
MILSTD 217 GM @ +45 °C	76,300 hours

DATA PACKET

WORD INDEX	TRANSPORT LAYER NAME	NAME	DESCRIPTION	VALUE
1	Header	NA	Packet header	0x55AA
2	Length	NA	Packet length in bytes (from header to CS)	30
3	Data 1	Cmd	Command	0x0212
4	Data 2	Cnte	Packet counter	0-65535
5	Data 3	AccX	Accelerometer X-axis	0-65535
6	Data 4	AccY	Accelerometer Y-axis	0-65535
7	Data 5	AccZ	Accelerometer Z-axis	0-65535
8	Data 6	MagX	Magnetometer X-axis	0-65535
9	Data 7	MagY	Magnetometer Y-axis	0-65535
10	Data 8	MagZ	Magnetometer Z-axis	0-65535
11	Data 9	GyroX	Gyroscope X-axis	0-65535
12	Data 10	GyroY	Gyroscope Y-axis	0-65535
13	Data 11	GyroZ	Gyroscope Z-axis	0-65535
14	Data 12	Temp	Temperature	0-65535
15	CS	NA	Checksum (Sum from header to Data 12)	0-65535

Acc = acceleration signed fixed point 0.0625 = 1g

Mag = magnetic North signed fixed point 0.0625 = 0.5 Gauss

Gyro = angular speed signed fixed point $\pi/5760 = 1\text{dps}$

Temp = temperature signed fixed point $T^{\circ}\text{C} = 96.4 * \text{Temp} + 33$



MATING CONNECTOR AND CABLE ASSEMBLIES

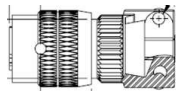
RS-485 TO DB9 & POWER CABLE

PART #	LENGTH
95059-01	78.5 in (~2m)

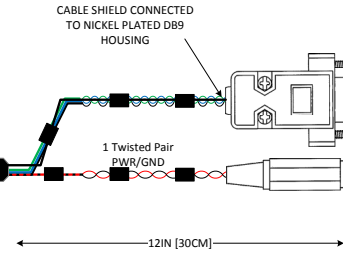
NOTE: Longer cable length available upon request

6-pin AMP Male Pinout

- A: Pwr (DC)
- B: GND
- C: RX+
- D: RX-
- E: TX+
- F: TX-



Pin view



DB9 Female Pinout

- 1: RX-
- 2: RX+
- 3: TX+
- 4: TX-
- 5: GND
- 6,7,8,9: no connect

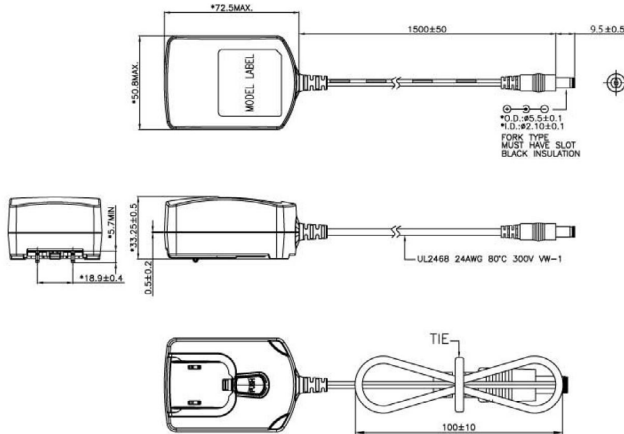
DC PWR & GND



5.5MM O.D. X 2.1MM

OTHER ACCESSORIES

110-240VAC TO 12VDC TRANSFORMER



PART # 00254-02

USB TO RS-485 CONVERTER

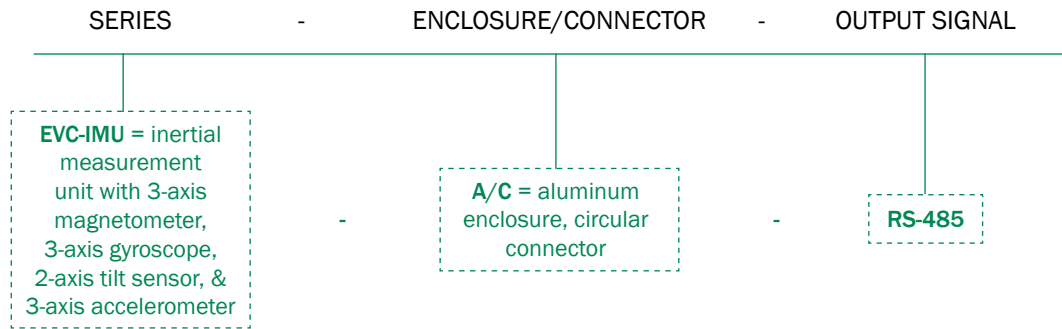


DIMENSIONS:
5 x 4 x 2.5 in

PART # F849284



ORDERING INFORMATION



EXAMPLE: ECV-IMU-A/C-RS485

850 Perimeter Road Manchester, NH 03103 USA

SENSORS: 800.227.5955
www.jewellinstruments.com | sensors@jewellinstruments.com

IMU485
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