ECV eCOMPASS SERIES

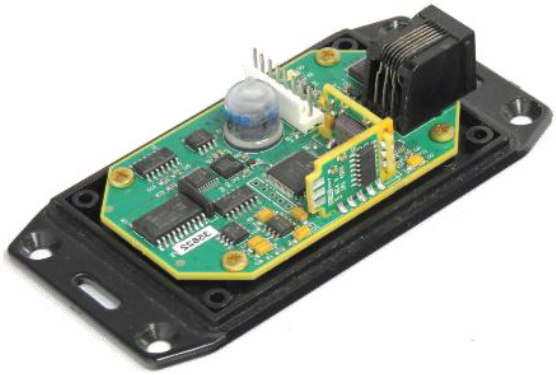
Jewell ECV eCompass represents the state of the art in magnetic compassing that delivers high accuracy for its small size, low-cost and low power.

The ECV eCompass Series provides stable azimuth, pitch, and roll measurements in dynamic conditions. The ECV's sensor suite consists of the following:

- 3-axis angular rate gyros
- 3-axis accelerometer
- 3-axis magnetometer
- 2-axis electrolytic tilt sensor

The advanced capabilities of the ECV are supported by updated eCompass PC software that simplifies engineering verification and integration tasks. The software provides the following functionality:

- Monitor and change compass settings
- Perform magnetic calibration
- Capture selected measurement data
- Maintain communication and setting logs



ADVANTAGES

- Exceptional dynamic performance
- High accuracy
- Precise factory calibration
- Wide Operating range
- RS232 & RS485 output available
- Fast response
- Low power

APPLICATIONS

- Unmanned vehicles
- Robotics
- Platform stabilization
- Excavation machinery
- And more

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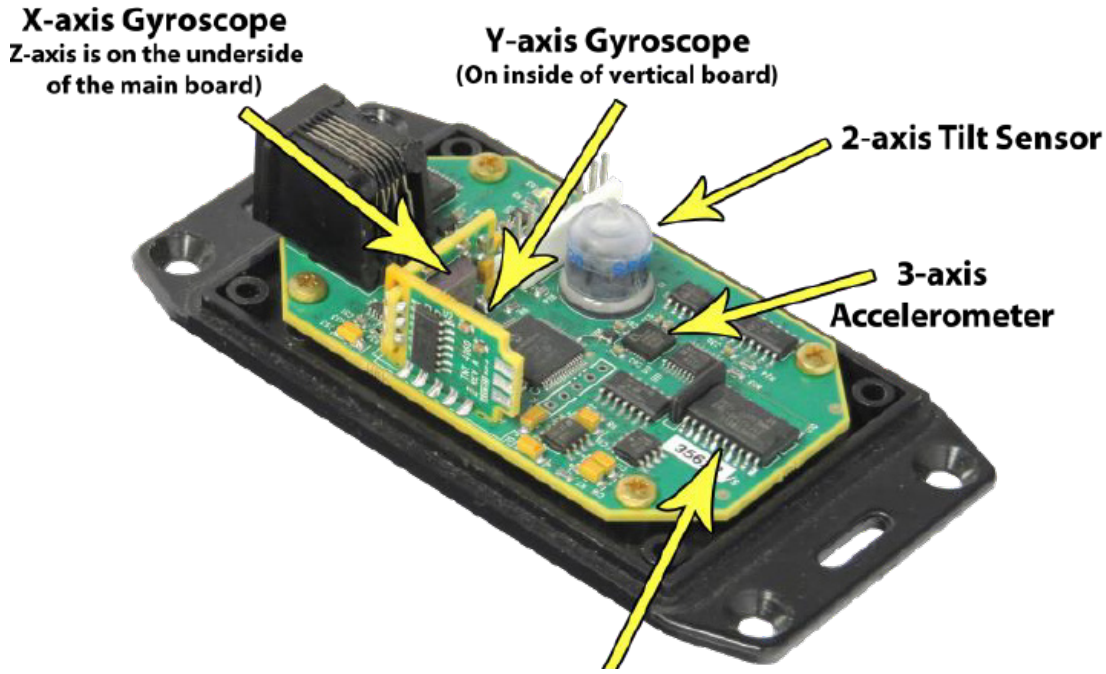
FEATURES

- **Static Accuracy**
  - Azimuth within 0.5° typical (0.1°resolution)
  - Pitch and roll within 0.2°
- **Dynamic Performance**
  - Gyro gimbal equations performed in firmware
  - Azimuth within 3° typical for rates < 150 °/sec
  - Pitch and roll within 1° typical for rates < 150 °/sec
- **Wide Operating Range**
  - Ambient temperature -40° to 105°C (-40° to 220°F)
  - ±300°/sec angular rate
  - Total magnetic field (earth + hard-iron) to ±1.5 Gauss
  - ±80° dip angle range
  - Total acceleration field to 1.5g (gravity = 1g)
  - ±90° electrolytic tilt sensor pitch & roll range (±180° optional)
- **Fast Response**
  - Up to 27.5 calibrated measurements per second
  - Wake from standby in 50 msec
- **Single Supply Operation**
  - 7 to 45V unregulated DC
  - Thermal overload and reverse polarity protection
- **Low Power**
  - 40 mA operating
  - 10 mA idle
  - 5 mA standby
- **Wide Selection of ASCII or Binary Output data**
  - Heading, pitch, and roll
  - Temperature, input voltage, and dip angle
  - Magnetometer X, Y, and Z
  - Total, horizontal, and vertical magnetic field strength
  - Raw and conditioned gyro data
- **Two independent serial channels**
  - Full-duplex RS-232 for the external RJ12
  - Either RS-232 or full-duplex RS-485 for the internal connector
- **In-System Configuration and Test**
  - Laptop can be connected while unit operates in situ
  - Perform hard and soft iron calibration
  - Monitor outputs and change userdefinable settings



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SPECIFICATIONS

Heading Performance

Parameter	Value	Conditions
Accuracy[1]	± 0.5° rms	Static, Tilt < 35° Dip < 60°
	± 3.0° rms	Dynamic, rate < 150°/sec
Repeatability	± 0.3°	Static, no filter
Response time	36 msec	Minimum, no filter
Dip Angle Range	± 80°	
Tilt Range	± 90° Pitch/± 180° Roll	
Update rate	27.5 measurements per second	

[1] May require calibration after installation to eliminate effect of local magnetic field

Pitch and Roll Performance

Parameter	Value	Conditions
Accuracy	± 0.3°	Factory calibrated
Repeatability	± 0.2°	No filter
Range	± 90° Pitch/± 180° Roll	(± 42°) electrolytic tilt only
Settling time	50 msec	Gyro enabled

Electrical

Parameter	Value	Conditions
Supply Voltage (V_{DD})	7 - 45Vdc unregulated	
Supply Current	40 mA operating	typical
	10 mA idle	
	05 mA standby	

Environmental

Parameter	Value	Conditions
Operating Temp	-40° to 105°C	-20°C with electrolytic tilt
Storage Temperature	-50° to 150°C	
Humidity	0 to 90%	Non-condensing
Shock	200g	Max horizontal (with electrolytic tilt)

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

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SPECIFICATIONS

Mechanical

Parameter	Value
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
PCB Mounting	4 #4 screws, 1.4" x 2.6" spacing
Connectors	8 pin, single-row, 0.1" friction header
	6 pin RJ12 modular jack
Weight	Plastic Enclosure (P Option): 3.2 oz. (90.7 grams)
	Aluminum Enclosure (A Option): 7.2 oz. (204.1 grams)

Interface

Parameter	Value
Signal type	RS-232 and RS-485
Baud rate	2400, 4800, 9600, 19200, or 38400 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

ECV - XX - XXXXX

Enclosure & Connector

PJ - Plastic enclosure, RJ12 mod jack

AC - Aluminum enclosure, circular connector

Output Signal

RS232

RS485

Series

ECV - Electronic Compass with 3-axis magnetometer, 3-axis gyroscope, 2-axis tilt sensor & 3-axis accelerometer

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

MODEL & PART NUMBERS:

Model Number	Part Number
ECV-P/J-RS232	02550403-ECV-001
ECV-P/J-RS485	02550403-ECV-004
ECV-A/C-RS232	02550403-ECV-002
ECV-A/C-RS485	02550403-ECV-003

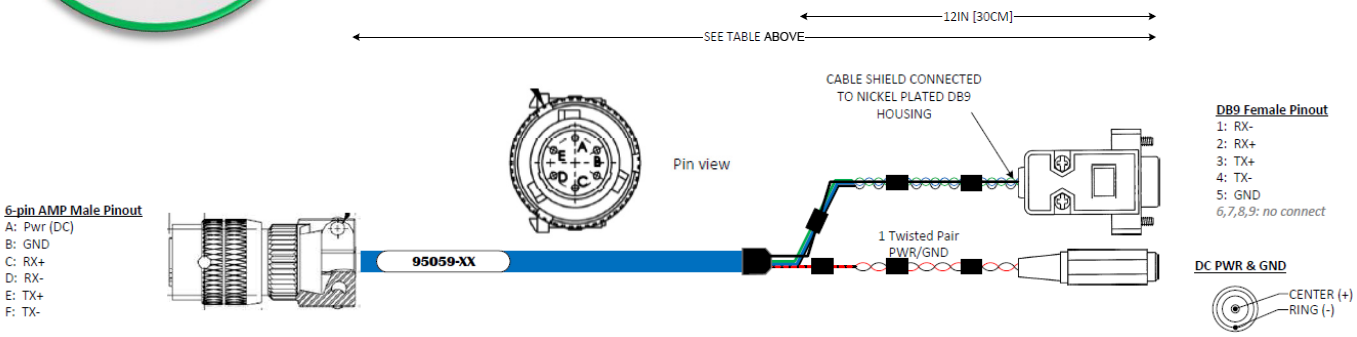
CABLE OPTIONS

Option 1: RS485 to DB9 & Power Cable

How to order:

PART NUMBER	CABLE LENGTH
95059-01	78.5 IN (~2m)

Note: Longer cable length available upon request

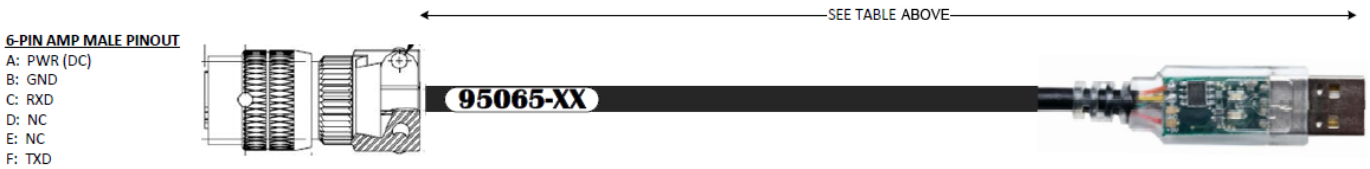


Option 2: RS232 to USB Cable

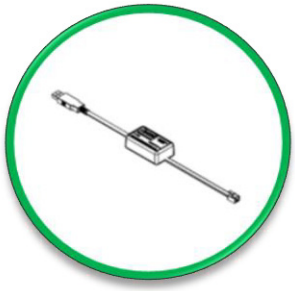
How to order:

PART NUMBER	CABLE LENGTH
95065-01	1.8m
95065-05	5m

Note: 5m is the max cable length for this option

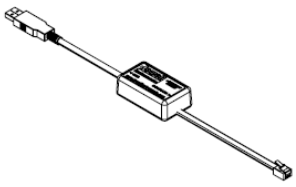


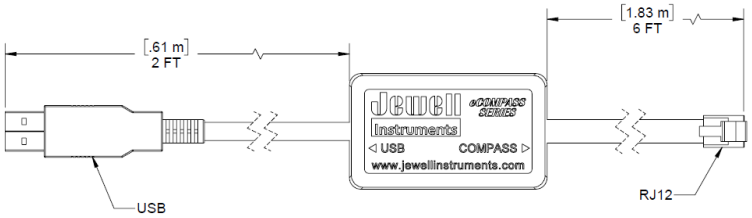
OTHER ACCESSORIES:



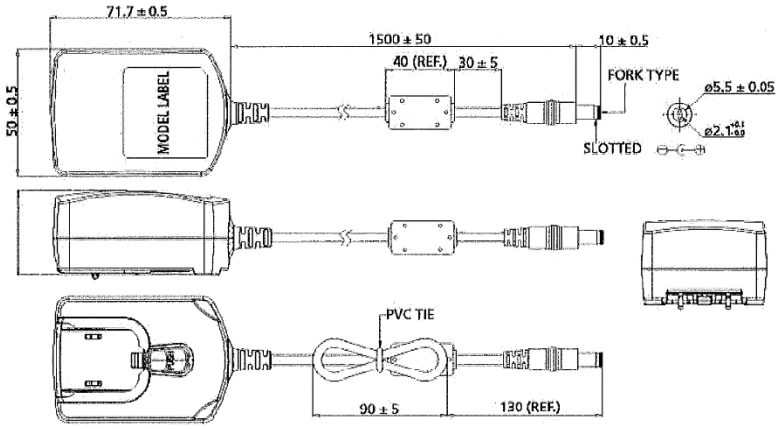
USB to RJ12 Cable
Part Number 879882

RJ12 CONNECTOR	
PIN	FUNCTION
1	GND (JUMP TO PIN 6)
2	PWR
3	TX
4	RX
5	GND
6	100K (JUMP TO PIN 1)





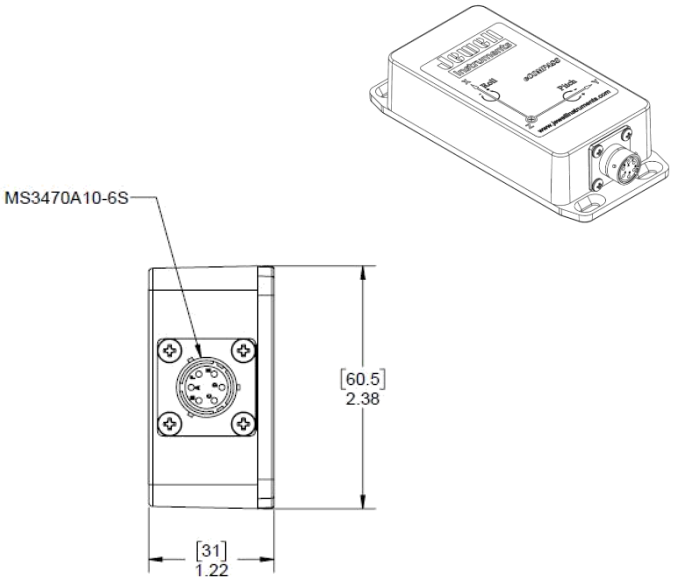
110-240Vac to 12VdcTransforme
Part Number 00254-02

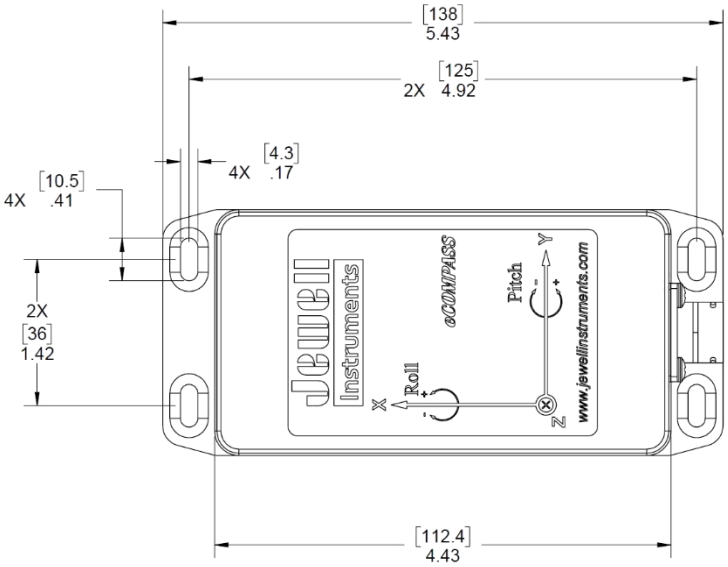


USB toRS232/RS485 Converter
Part Number F849284

Dimensions: 5 x 4 x 2.5 in

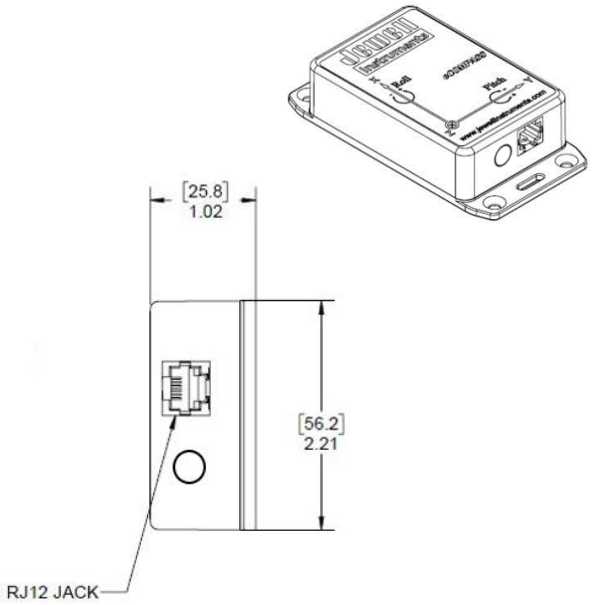
OUTLINE DRAWINGS (ALUMINUM ENCLOSURE)

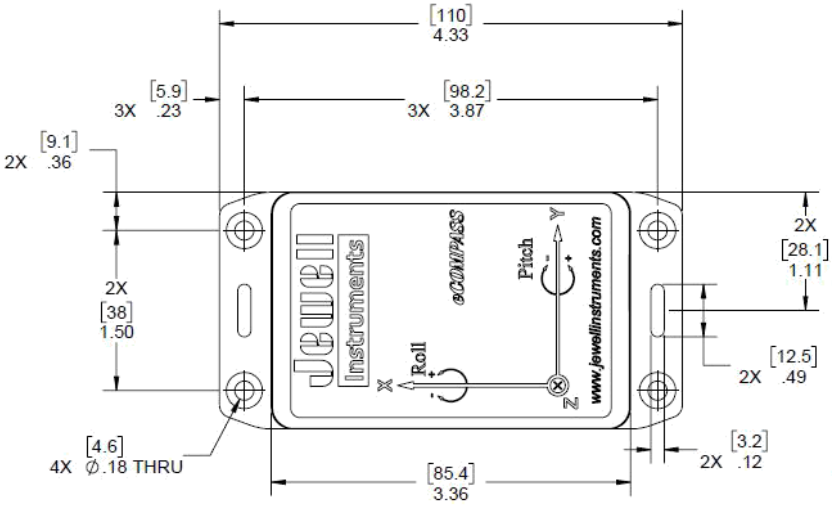




Dimensions in IN [mm]

OUTLINE DRAWINGS (PLASTIC ENCLOSURE)





Dimensions in IN [mm]

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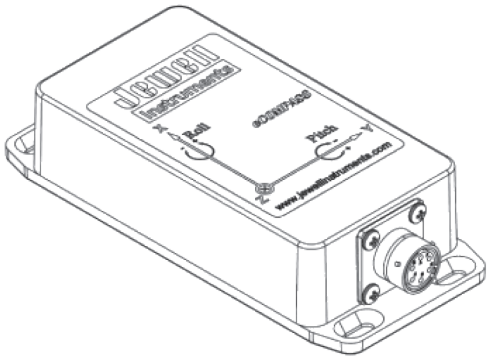
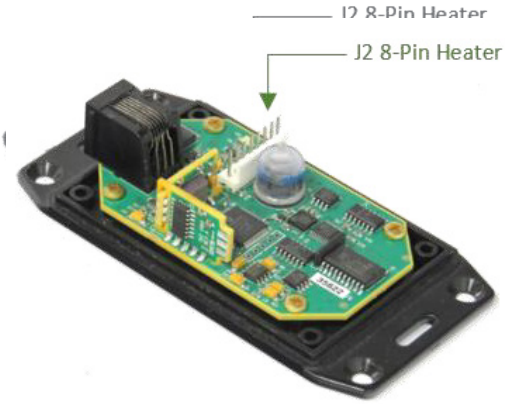
PIN OUT (ALUMINUM ENCLOSURE)

Circular Connector	RS232	RS485
Pin A	Power (7-45 Vdc)	
Pin B	Ground	
Pin C	RX	RX+
Pin D	-	RX-
Pin E	-	TX+
Pin F	TX	TX-



PIN OUT (PLASTIC ENCLOSURE):

RJ12 Mod Jack	Function
Pin 1	GND (Jump to Pin 6)
Pin 2	Power
Pin 3	TX
Pin 4	RX
Pin 5	GND
Pin 6	100K (Jump to Pin 1)



J2 8-PIN Heater (RS485)		Wire
Pin 1	Power	Red
Pin 2	RS232 TX Out	Violet
Pin 3	RS232 RX In	Brown
Pin 4	RS485 RX+	Blue
Pin 5	RS485 RX-	Yellow
Pin 6	Ground	Black
Pin 7	RS485 TX+	Orange
Pin 8	RS485 TX-	Green