UAS Aeromagnetic Survey System

Three-hour endurance VTOL fixed-wing UAS
Miniature rubidium optical pump magnetometer

CW-15M is the industry’s first VTOL fixed-wing UAV based miniature Rubidium Optical Pump Aeromagnetic Survey System, it combines VTOL fixed-wing UAV and Atomic Rubidium Magnetometer / Vector Fluxgate Magnetometer / Aeromagnetic technology, deliver the most convenient and efficient high-resolution / sensitivity magnetic data acquisition measurement, which can be widely applied in mining exploration, utility location, archaeology and regional geology etc.

**CW-15 series UAV platform from China JOUAV**
- Hybrid configuration of fixed wing and quadrotor, vertical takeoff and landing, no runway required;
- Hierarchical layout of forward motor and payload module, minimize motor magnetic effect to magnetometer;
- Featuring long endurance (up to 3 hours) and control range (≥30km);
- RTK and PPK for high accuracy positioning;
- Fully autonomously flight controlled through professional autopilot system from JOUAV;
- Easy to operate by 1~2 technicians in one team, quick assembly / disassembly within 5 mins;
- One UAV platform for multiple application with simply change the payload module.
Specifications of CW-15 UAV platform

<table>
<thead>
<tr>
<th>Feature</th>
<th>Specification</th>
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<tbody>
<tr>
<td>Wingspan:</td>
<td>3.6m</td>
</tr>
<tr>
<td>Fuselage:</td>
<td>1.7m</td>
</tr>
<tr>
<td>Max payload:</td>
<td>2.5kg</td>
</tr>
<tr>
<td>MOTOW:</td>
<td>16kg</td>
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<tr>
<td>Case Dimensions:</td>
<td>1.37m x 0.5m x 0.6m</td>
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<tr>
<td>Power:</td>
<td>LiPo battery</td>
</tr>
<tr>
<td>Operational Temperature:</td>
<td>-20 - 50°C</td>
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<tr>
<td>Flight Endurance (Hover):</td>
<td>15min</td>
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<tr>
<td>Flight Endurance (Fixed wing):</td>
<td>2 - 3h</td>
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<tr>
<td>Cruise Speed:</td>
<td>16 ~ 30 m/s (TAS)</td>
</tr>
<tr>
<td>Ceiling Altitude:</td>
<td>5000m</td>
</tr>
<tr>
<td>Max Crosswind:</td>
<td>12m/s</td>
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<tr>
<td>Radio data link frequency:</td>
<td>902 - 928MHz</td>
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<tr>
<td>Radio data link range:</td>
<td>≥30km</td>
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Aeromagnetic Survey Sensor from Canada Geodrones

- Miniature rubidium optical pump magnetometer, high sensitivity and resolution;
- Software calibrated fluxgate magnetometer correction technology;
- 18-parameter compensation algorithm, specially designed for fixed-wing UAV platform;
- Real-time or post-flight aeromagnetic correction as options;
- 700g of total system weight, portable and integratable friendly.

Specifications of rubidium optical pump magnetometer

- Field Sensitivity: <1pT/√Hz in 0.1-100 Hz band
- Deadzone: single equatorial plane, ± 7 deg
- Heading error: below 3nT (uncompensated)
- Dynamic Range: 1000nT to 100000nT
- Slew rate: 10000nT/s
- Max gradient: 1000nT/cm
- Operating temperature range: -30 - 50°C
- Max data rate: 400 samples/s sensor output directly, 10 samples/s for surveying system
- Calibration: None required
- Sensor dimension: 10mm x 19 mm x 47mm
- Sensor weight: 30g
- Control unit dimension: 100mm x 40mm x 25mm
- Control unit weight: 170g

Specifications of fluxgate magnetometer

- Fluxgate axis: 3 (Right hand XYZ coordinate)
- Measuring range: ±100nT
- Frequency domain noise: ≤10pT/√Hz at 1Hz
- Preparing time: 15 mins
- Offset error: In the zero field ±10nT
- Scale error: DC: ±0.5%
- Temperature offset error: 1nT/°C
- Orthogonality error: Inter-axial error less than 1°
- Sensor dimension: 80mm x 55mm x 35mm
- Sensor weight: 70g