

AgriDock Compatibility Kit

Installation & Configuration Guide

Version 1.0

Extend your drone capabilities with universal compatibility adapters

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1. Overview & Compatibility

The AgriDock Compatibility Kit allows AgriDock Station to work seamlessly with third-party agricultural drones and aircraft. This universal adapter system provides automated battery swapping, payload management, and mission planning for any compatible drone platform.

Supported Drone Platforms

Manufacturer	Model	Compatibility Level
DJI	Matrice 300 RTK	Full ✓
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Freefly	Astro	Full ✓
PrecisionHawk	Lancaster	Partial*
Aeryon	SkyRanger	Partial*

* Partial compatibility requires custom payload attachment (sold separately)

What the Kit Enables

- **Automated Battery Management:** Hot-swap batteries automatically between missions
- **Payload Integration:** Mount sprayers, sensors, and cameras via dock
- **Weather Protection:** Environmental enclosure shields aircraft during charging
- **Mission Continuity:** Dock-to-dock mission planning for extended coverage
- **Data Management:** Automatic data sync and backup between flights

2. What's Included

Main Components

- **Universal Drone Adapter Plate:** Quick-release mechanism (aluminum alloy)
- **Battery Interface Module:** Universal voltage conversion (12V, 24V, 48V)
- **Payload Connector Hub:** USB-C and RS-232 serial connections
- **Mounting Brackets:** Adjustable clamps for drones 1-5 kg
- **Cable Harness Set:** 6 pre-configured connection cables
- **Installation Hardware:** Fasteners, alignment guides, seal strips
- **Configuration Software:** USB drive with AgriDock Compatibility Manager
- **Documentation:** This manual plus technical reference guide

Optional Accessories

- Custom payload brackets for specific sensors
- Extended battery conversion module
- Weather enclosure upgrade kit
- RF frequency converter (for legacy aircraft)

3. Installation Guide

⚠ Before You Start

Disconnect all power sources and remove batteries from both the drone and AgriDock Station before beginning installation. Installation should take 45-90 minutes depending on drone model.

Step-by-Step Installation

- 1 Prepare the drone:** Remove props, clean body, and identify mounting points. Refer to your drone's manual for weight distribution information.
- 2 Position adapter plate:** Center the universal adapter plate on drone's underside. Mark mounting holes using the included alignment guide.
- 3 Drill/attach mounting points:** Create fastener holes (2mm diameter for most platforms). Use included brackets to secure plate with provided hardware.
- 4 Connect battery interface:** Locate drone's battery connector and connect the universal voltage module. Ensure polarity is correct (red = +, black = -).
- 5 Attach payload hub:** Mount payload connector hub to drone body (near battery compartment). Secure all cable harnesses with provided clips.
- 6 Install alignment beacon:** Place magnetic alignment beacon on drone top for precise docking. This helps AgriDock Station locate the aircraft.
- 7 Test all connections:** Reconnect battery (without propellers) and test all connectors with compatibility software.

Weight & Balance Considerations

Important: The compatibility kit adds 1.2-1.8 kg depending on configuration. Verify your drone's maximum payload capacity. Mounting position should be at center of gravity or slightly forward (max 5cm offset).

4. Configuration & Testing

Software Configuration

1. Insert provided USB drive into computer
2. Run AgriDock Compatibility Manager application
3. Select your drone model from the dropdown menu
4. Follow the configuration wizard (typically 5-10 minutes)
5. System will auto-detect voltage requirements and set parameters

Initial Testing Checklist

- Battery charging through dock interface (test with 10% charge)
- Payload power delivery (verify all connector outputs with voltmeter)
- Data communication (test USB sync at minimum 1 Mbps)
- Alignment beacon detection (should appear on dock display)
- Manual dock positioning (test alignment without power)

Pre-Flight Test Flights

Before fully committing to dock operations, perform 3-5 manual test flights with the adapter kit installed. Monitor for:

- Weight balance (any unusual flight behavior)
- Connector stability during flight vibration
- Cable routing (no interference with propellers or sensors)
- Communication latency (should be <50ms)

5. System Integration

AgriDock Station Setup

Once your drone is equipped with the compatibility kit, update AgriDock Station software to latest version. The dock will automatically detect the new drone type upon first approach.

Docking Procedure for Adapted Drones

- 1 Approach dock:** Pilot the drone to within 50m of the dock. Switch to automatic approach mode (if available).
- 2 Alignment detection:** Dock's cameras will locate the magnetic alignment beacon on your drone.
- 3 Precision approach:** Dock guides aircraft to exact position using RTK GPS ($\pm 2\text{cm}$ accuracy).
- 4 Connector engagement:** Aircraft descends into dock, and all payload connectors engage automatically.
- 5 System verification:** Dock performs health check on all connections before charging begins.
- 6 Automated service:** Battery swapped, payload recharged, aircraft cleaned, ready for next mission.

Mission Planning Software

The AgriDock mobile app integrates compatibility kit features. Plan missions with automatic dock stops, specify payload requirements per mission, and track multi-flight coverage in real-time.

6. Maintenance

Monthly Maintenance

- Inspect all electrical connectors for corrosion (clean gently with isopropyl alcohol if needed)
- Check fasteners and brackets are tight (use torque wrench if available)
- Verify alignment beacon is securely attached and not damaged
- Test all connector seals for flexibility (should not crack when bent)

Quarterly Deep Clean

- Disconnect all cables and remove adapter plate from drone
- Clean all connectors with compressed air (not water)
- Inspect cable harnesses for damage or wear
- Reapply conformal coating to all exposed contacts if exposed to harsh conditions
- Reinstall and re-test connectivity

Replacement Parts

Expected service life for compatibility kit components:

- **Cable harnesses:** 18-24 months with regular use
- **Connectors:** 3-4 years (approximately 5,000 mate/unmate cycles)
- **Alignment beacon:** 2-3 years (magnetic degradation)
- **Adapter plate:** Permanent (aluminum, corrosion resistant)

7. Troubleshooting

Dock Won't Recognize Drone

Solution: Verify alignment beacon is attached and visible. Check that drone is within 100m of dock. Restart dock's computer system. Update compatibility software to latest version.

Battery Not Charging in Dock

Solution: Inspect battery interface connectors for dirt or corrosion. Test voltage output from dock (should show 24V on voltmeter). Try different battery if available. Check cable harness for damage.

Poor Data Sync After Docking

Solution: Verify USB cable is firmly seated on both ends. Check file system of drone's storage device for corruption. Update USB drivers on dock computer. Perform manual file transfer if automatic sync fails.

Drone Drifts During Approach

Solution: Calibrate drone's compass using manufacturer's procedure. Verify RTK GPS is receiving corrections. Check that alignment beacon has not shifted position. Perform dock camera alignment calibration.

Adapter Plate Causes Weight Imbalance

Solution: Reposition mounting brackets 2-3cm forward or aft to match aircraft center of gravity. Add small counterweight on opposite side if needed. Re-test with manual flights at low altitude.

Payload Not Receiving Power

Solution: Test payload power connector with 5V test device. Verify correct voltage is selected in compatibility software. Check that payload power limit hasn't been exceeded (max 2A total).

8. Technical Specifications

Electrical Specifications

Specification	Value
Input Voltage Range	10-60V DC
Supported Battery Types	LiPo, LiFe, Li-ion
Maximum Charging Current	20A (dock limited)
Output Voltages	5V, 12V, 24V, 48V
Payload Power Limit	2A maximum (all ports combined)

Physical Specifications

Component	Dimensions	Weight
Adapter Plate	400mm × 300mm × 12mm	0.8 kg
Battery Interface Module	80mm × 60mm × 40mm	0.3 kg
Payload Connector Hub	120mm × 80mm × 50mm	0.4 kg
Complete Kit (assembled)	Varies by drone	1.2-1.8 kg

Communication Protocols

- **Data Interface:** USB 2.0 (480 Mbps), USB-C 3.0 (5 Gbps)

- **Serial Port:** RS-232, 9,600-115,200 baud (configurable)
- **Wireless:** Optional WiFi module (802.11ac 5GHz)
- **Alignment Beacon:** RF identification at 125 kHz

Environmental Specifications

Specification	Range
Operating Temperature	-20°C to +60°C
Storage Temperature	-30°C to +70°C
Humidity (Operating)	5-95% RH (non-condensing)
Ingress Protection	IP54 (dust and splash resistant)

For technical support: compatibility@agridock.com | Phone: +1 (555) 123-4567

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