

Guide

DJI Dock: Features, Applications & Case Studies

Explore the versatile DJI Dock with our comprehensive guide covering its cutting-edge features, real-world applications, and insightful case studies. Uncover the potential of this innovative drone docking station for various industries and use cases.



Introduction

Drones have rapidly transitioned from being just recreational toys to becoming essential tools across various industries. Their versatility and range of applications have made them crucial in everything from search and rescue missions to agriculture. In recent years, advancements in drone technology have made drone operations safer and more efficient for pilots.

During the NestGen'23 keynote, **Freda Peng, DJI Global Solutions Engineering Director**, emphasized the importance of drone autonomy and its potential to revolutionize industries such as delivery and search and rescue. In this blog post, we will delve deeper into the exciting advancements made by DJI and how they are transforming the way we live and work.

Freda Peng

*Global Solutions
Engineering Director,
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Powered by **FlytNow**

The DJI Dock

As the first drone-in-a-box solution offered by DJI, the introduction of DJI Dock has been a game changer for the industry and a significant step towards achieving true autonomy in drone operations. Companies looking to establish or expand their drone programs can reduce the learning curve by using the DJI Dock, which allows them to perform fully automated drone operations remotely.



One of the key features of the DJI Dock is its ability to operate unattended outdoors for extended periods. To accomplish this, DJI engineers implemented a variety of waterproof and dustproof designs that were rigorously tested to achieve the IP55 protection rating. Furthermore, the DJI Dock was subjected to reliability tests to ensure its ability to withstand extreme environmental conditions.



DJI plans to start dock shipment to international markets in Q2 2023. This move is expected to further boost the popularity of the DJI Dock and improve the overall efficiency of drone operations worldwide.

Top Features of DJI Dock

Automated Drone Deployment

DJI Dock enables automated drone deployment, significantly reducing human intervention and allowing for more efficient use of resources.

- **Scheduled Ops:** Users can pre-program flight schedules and routes, ensuring that drones are deployed at the right time and place for maximum efficiency.
- **Incident Response:** DJI Dock's automated deployment allows drones to respond rapidly to emergency situations, minimizing response time and maximizing the effectiveness of rescue and recovery efforts.

Drone Charging and Maintenance

DJI Dock offers an integrated charging and maintenance solution to keep drones operational and minimize downtime.

- **Fast Charging:** DJI Dock features fast charging capabilities, ensuring that drones are charged quickly and ready for their next mission.
- **Automatic Maintenance Checks:** The system performs automatic maintenance checks, detecting potential issues and ensuring that drones are in optimal condition for flight.

Data Collection and Analysis

DJI Dock is equipped with advanced data collection and analysis features that enable organizations to make informed decisions based on real-time information and AI-based insights.

- **Real-Time Monitoring:** DJI Dock allows for real-time monitoring of drone operations, providing users with live data and video feeds to ensure missions are executed efficiently and effectively.

- **AI-Based Insights:** The system leverages artificial intelligence (AI) to analyze data collected during drone flights, offering valuable insights that can help organizations make data-driven decisions and optimize their operations.

Scalability and Integration

DJI Dock is designed to be adaptable and flexible, allowing organizations to scale their drone operations and integrate the system with existing infrastructure and workflows.

- **Adaptable for Various Applications:** The DJI Dock can be customized to accommodate a wide range of applications, such as emergency response, infrastructure inspection, agriculture, and environmental monitoring.
- **Integration with Existing Systems:** The solution can be seamlessly integrated with existing systems and workflows, enabling organizations to maximize the benefits of drone technology without disrupting their current operations.



SUCCESSFUL CASE STUDIES OF AUTOMATION IN THE ENERGY INDUSTRY

Determining ROI of the DJI Dock for Solar Inspections

Drones are increasingly being used in the solar sector to aid in every stage of a plant's life cycle, from planning to maintenance. They can assist in topographic surveys during planning, monitor construction progress, conduct commissioning inspections, and perform routine asset inspections for operations & maintenance.

Thermal sensors on drones can detect issues such as hotspots in cells, panels, or strings, while AI can improve the layout of solar fields by considering factors such as transmission lines, shadows from vegetation, and landscape slope. Here is one more case study on BVLOS Inspections of Solar Farms Using Modular Drone Docks in Japan



Introducing autonomy into the equation instantly elevates the entire operation. With the DJI Dock, operators can now double their efficiency and speed in no-time. DJI uses the following scenarios to demonstrate the cost savings of using DJI Dock in the solar industry:

Scenario 1: No Inspections at all

Doing no inspections at all could result in reduced power generation, which could end up costing up to 140K USD per year. This is because undetected faults or damages could cause equipment failure or even safety hazards.

Scenario 2: Manual Inspections

Getting a service team to walk around the site and do manual inspections could cost around 120K USD per year. Moreover, manual inspections can be time-consuming, labor-intensive, and prone to human error.

Scenario 3: Automated Drone-in-a-Box based Inspections

DJI Dock hardware and deployment, plus a 3rd-party operations & analysis software, would cost around 45K USD. While this may seem like a significant investment, it can provide long-term benefits in terms of increased efficiency, accuracy, and safety.

The solar inspection system developed by third party software developers such as SNEGrid enables processing drone imagery with AI analysis to create accurate reports. This not only saves time and effort but also enables predictive maintenance and optimized performance.

DJI Dock can inspect the solar power plants for a minimum of 12 times per year, and even more if needed. This means that the system can provide regular and timely feedback on the status of the solar PV system, allowing for proactive measures to be taken. Drone autonomy can be a part of the IOT network and create a synergy with other smart devices.

For example, the data collected by drones can be integrated with weather forecasts, energy demand forecasts, and other relevant information to optimize the overall energy management system.

This would enable real-time monitoring and control of the solar PV system, as well as seamless communication among different components.



Power Grid Inspections with DJI Dock

In Jilin, a city in northeastern China, powerline inspection crews from Jilin National Grid are responsible for restoring power after snowstorms. However, with a winter that lasts six months and temperatures plummeting to -20 degrees Celsius, the crews are susceptible to frostbite and snow blindness, which poses significant risks to their safety and effectiveness.



The DJI Dock (powered by FlytNow) offers fully automated drone operations, allowing companies to schedule and plan activities without requiring physical presence at the worksite. This has made inspections more efficient, accurate, and safe, while also reducing labor costs. Furthermore, the data collected by the drones can be integrated with weather and energy demand forecasts to optimize energy management systems.

The successful implementation of the DJI Dock in Jilin demonstrates the potential for drone autonomy to revolutionize power grid inspection and maintenance. Companies can leverage the DJI Dock to prevent equipment malfunction, increase efficiency, and save on labor costs while keeping their workers out of harm's way.

To address these challenges, the DJI Dock has been deployed to conduct inspections that are too hazardous for human workers. With just a few clicks, an operator at the operations and maintenance center, located 60 kilometers away from the Dock, can remotely select a Dock device and conduct immediate inspections of substations and connecting lines.



DJI'S COLLABORATION WITH FLYTNOW SOFTWARE SOLUTION

DJI has been working closely with other third-party software solutions, including FlytNow to enable drone operators to easily automate their drone operations. FlytNow is a cloud-based software that allows users to remotely control their DJI drones and automate their drone operations. The solution is designed to be customizable and scalable, making it suitable for use in a wide range of industries, including inspection, surveillance, operations & maintenance.

The key benefits of using a software such as FlytNow includes:

Designed for BVLOS ops

FlytNow's uniqueness lies in the fact that the software has been designed with long-range Beyond-Visual-Line-of-Sight (BVLOS) operations in mind.

BVLOS-approved

Numerous customers and partners have received waivers to conduct beyond-visual-line-of-sight (BVLOS) drone operations with FlytNow. This approval has been granted by various regulatory bodies, such as the FAA, EASA, JCAB, CAAM, and GCAA. For instance, afterFIT in Japan received approval for automated drone operations, including night-time flights. Read more: <https://dronedj.com/2022/05/27/bvlos-drones-night/>

Integrations for BVLOS enablement

FlytNow offers comprehensive software and hardware integrations to facilitate large scale BVLOS operations. These integrations include:

- Detect and Avoid (DAA) technology like Casia-G, which can detect cooperative and non-cooperative aircraft in your operational environment,
- ADS-B technology like PingUSB, which provides real-time aircraft status updates,

- **UTM systems** such as Altitude Angel and Involi to enhance airspace awareness,
- **Connectivity (5G/LTE) technology** like Elsie Halo for uninterrupted communication for remote operations,
- **Parachute Recovery systems** like AVSS-PRS and DRS for safe landings during emergencies, among others.

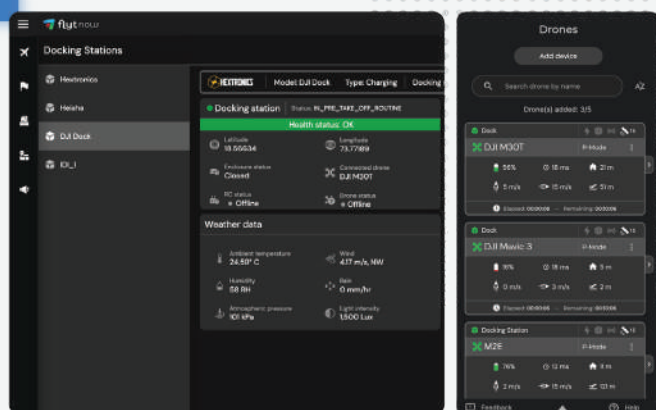


Built for Enterprise Users

FlytNow is backed by advanced collaboration workflows and enterprise-grade security and scalability. Here's how:

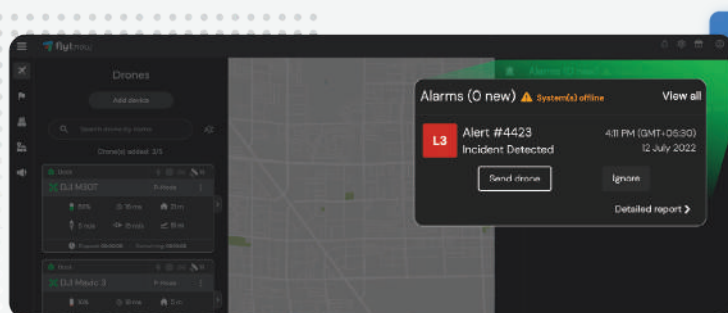
Scalable

FlytNow is a scalable software solution for remote drone operations. It can manage one or multiple drones, as well as one or many docking stations. Its hosting infrastructure and enterprise-grade capabilities ensure uninterrupted drone operations at any scale.



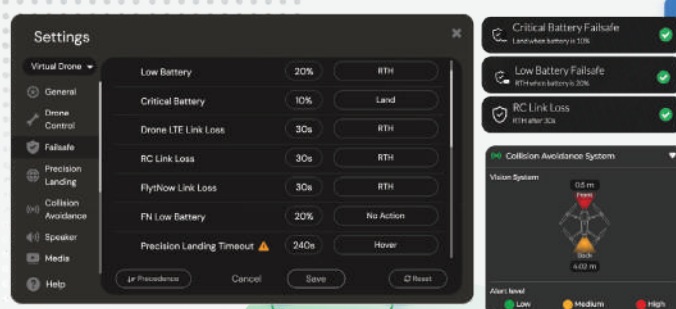
Existing Workflow Integrations

With FlytNow, enterprises can easily integrate their existing security solutions, such as VMS or alarm systems, for a seamless experience. For example, to ensure the clearance of pipeline ROW, third-party alarms that detect mechanical digging or heavy machinery over the pipeline can be integrated with FlytNow. When an intrusion alert is triggered, FlytNow autonomously dispatches a drone to the geolocation of the alert. The drone relays a live HD video feed back to the command center, allowing operators to quickly inspect the asset and respond to the incident.



Ensures Operational Safety & Reliability

Operational safety and reliability are crucial for successful autonomous solutions. FlytNow offers numerous checks to detect issues in real-time and activate necessary fail-safes. Its workflows can be configured to make safer decisions by using data and events from multiple layers. For instance, users can set weather failsafes to trigger a "return to home" action, with a dynamically computed route based on UTM data that avoids no-fly zones. In case the drone can't land at the docking station, it would be automatically rerouted to a safe alternate location.



FlytNow's architecture addresses several challenges with remote and automated operations, including splitting operational context between edge and cloud systems to enable safe and reliable operations despite sporadic network connectivity.

Secure to its Core

In FlytNow, security is not an afterthought. The software platform is secured by token-based authentication and end-to-end encryption to ensure safe access and use. Designed to comply with industry standards, the platform ensures high availability with 24/7 monitoring and automated incident response systems.

With a reliable hosting infrastructure and functionalities such as access control, SSO sign-in and DDoS protection, FlytNow enables you to conduct your drone operations with a peace of mind.

Architected to be Hardware-Agnostic

FlytNow is designed to support a wide range of hardware, such as

- drones including DJI and other custom-built drones on PX4/Ardupilot,
- over 16 docking stations such as the DJI dock, Heisha Nest Series, Hextronics, IDIPLOYER Nexus, Omnidock, DBOX, Aerieport among others,
- Payloads such as thermal cameras, loudspeakers, spotlights, parachute systems among others,

Want to see
FlytNow in action?

Schedule a demo ↗

