

The Problem with Warehouse Drones

A 5 Year assessment of this once promising cycle counting approach

Automated cycle counting in the warehouse needs to account for inventory stored from the floor to the highest bays. Historically, reaching the highest bays entails warehouses using forklift platforms to lift workers to the highest shelves to scan or document inventory status. While OSHA regulations (ANSI/ITSDF B56.1) allow for this sort of practice, these platforms need to be designed in accordance with strict standards. This cycle counting practice is both dangerous and slow, contributing to poor and incomplete inventory counts. This is why warehouse drones were first introduced in the mid-2010s to help expedite and improve the inventory cycle counting process.

Vimaan was one of the very first solution providers to offer warehouse drones for the purpose of inventory cycle counting. StorTRACK Air from Vimaan is an aerial inventory robotic drone designed to fly around our customer warehouses and scan inventory providing real-time data on inventory levels, status, conditions, and locations. In fact, Vimaan has likely flown more inventory scanning missions from 2018-2022 than any other solution provider in North America. Based on these missions (and working closely with some of the largest 3PLs in the industry) it has become clear that drones are not the cycle counting panacea the industry was hoping for. Below is a sample of the issues and feedback collected from the field regarding drones in the warehouse:

- **Constant Prep-work and Precautions** – In order for a drone to complete a safe and error-free scan of an aisle, all obstacles need to be removed. This includes obstacles on the ground AND in the shelves. Rotating blades push down on air to maintain their lift. IT IS VERY COMMON for drones to become disabled due to foreign objects like shrink wrap, paper, tape, and other debris getting stuck in rotors.
- **Battery Life** – One of the primary challenges of warehouse drones is their limited battery life and flight time. No matter the drone or manufacturer, drones can only fly for limited amounts of time before they need to be recharged (and eventually replaced). Warehouse drone solution providers are very upfront about their battery shelf life, no company admits to a charge that can support flight times longer than 20 minutes.



- **Shortened Mission Times** – A 20-minute battery charge does not equate to 20-minute cycle count missions. If the drone is programmed to return to its launch pad for re-charging, it needs enough battery life to adequately return. This means the drones need to always stay close by the stations or cut their missions short by up to 50% so they can return home. This means a 20-minute cycle count mission is typically shortened to 10-12 minutes and then it's time to recharge or change the battery packs.
- **Regular Operational Support Needed** – Most major drone providers describe their vehicles as autonomous or self-flying. This is a common way to describe these missions but it's misleading. All warehouse drones require some monitoring by warehouse associates, solution provider employees, or sometimes both. This labor needs to be on hand to change battery packs, transfer data, clear flight paths, and even monitor drones to ensure uptime and collision avoidance. This also typically requires special warehouse training.
- **Small Field of View** – In an effort to keep drones light, there is a limited amount of equipment weight that can be installed on the vehicle. That's one of the reasons batteries are so small and the reason why they typically will only include a single camera. While this reduces the weight it also reduces the drone's Field Of View (FOV). The smaller the FOV, the longer the time required to scan your inventory, especially when the bins are filled with multiple labels that need scanning. Small FOV combined with short battery lives equates to limited amounts of your inventory being scanned in a single flight.
- **“Noisy”, “Distracting”, “Dangerous”, and “Inconvenient”** – are just 4 different words used by warehouse associates when working alongside drones. These flights typically result in aisle or warehouse section closures and can lead to challenging communications between workers.
- **Inherently Inefficient** – the limited space and weight allowance on a drone can only support limited cameras or barcode readers, which allows for only one item to be scanned at a time, which is inherently inefficient. So if a warehouse wants to do a physical inventory scan of the entire warehouse in a weekend, it is not supported.

Up until 2023, Vimaan exclusively deployed drones to capture inventory data from shelves. Having flown more missions and conducted more inventory location scans than any other drone solution provider in North America, the knowledge we have amassed has enabled the Vimaan team to become domain matter experts on the solution. Instead of remaining with this problematic solution Vimaan pivoted in May 2023 and introduced StorTRACK - a safer, faster and more reliable alternative to drones. StorTRACK is a durable computer vision frame that is easily lifted and manoeuvred by existing MHE to provide the most complete automated cycle count solution available.

For more information visit: www.vimaan.ai/stortrack.



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