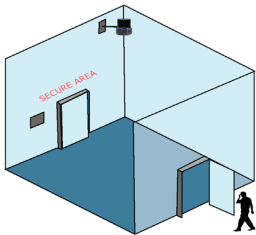# Quanergy's 3D LiDAR-based Mantrap Tailgating Solution

Quanergy's Mantrap tailgating solution addresses a key problem of tailgating, which occurs when an unauthorized person gains access to a sensitive area by essentially tagging along with or following someone who is authorized. Tailgating is a significant and all-too-common issue that is sometimes done without the authorized person knowing; in other cases, the authorized person is in on it. And not only is it a huge physical security risk, it's also a cybersecurity risk because an unauthorized person could then gain access to data centers and other protected networks.
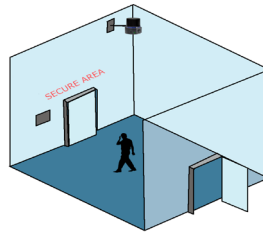
Environments such as airports, data centers, and distribution centers, that require restricted/authorized access to secure areas can benefit significantly from Quanergy's Mantrap solution.

Quanergy's Mantrap solution, which consists of MQ-8 LiDAR sensors and QORTEX DTC™ perception software, can detect tailgating through secure portals with far higher accuracy than proprietary optical imaging systems. The solution sees everything in 3D, unlike camera-based systems that only see in 2D. It offers the coverage, granularity, and accuracy that's needed to provide a hyper accurate people count which is the most critical component of the entire solution.
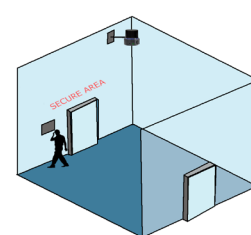
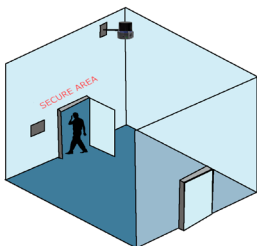## Typical Mantrap Workflow

Phase 1: Access to unsecured area is open, access to secured area is restricted, person begins entering mantrap
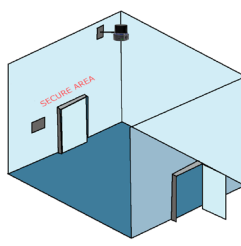

Phase 2: Access to unsecured area remains open, access to secured area remains restricted, person enters mantrap

Phase 3: Person swipes badge, access to unsecured area is restricted, access to secured area remains restricted, Quanergy's Mantrap solution does a count to ensure that there is only 1 person in the mantrap

Phase 4: If the count is 1, access to secured area is open, person enters secure area, access to unsecure area remains restricted

Phase 5: Person has entered the secure area, access to secured area is restricted, Quanergy's Mantrap solution does a count to ensure that there are no people in the mantrap, access to unsecured area is open

QPN 96-00121

The Pitfalls of Existing Mantrap Setups

A mantrap or vestibule typically consists of a small room with two doors – one connected to the unsecured area and the second connected to the secured area. Gaining access from either side requires using some sort of a credential/identification validation, which is usually swiped against an access control reader, and in some cases, there are also cameras set up as a secondary source of situational awareness.

Access control systems like this are at the heart of most security systems, but there's one way to easily bypass one of these systems: holding the door open. All access systems, regardless of the underlying technology, are vulnerable to this problem.

Tailgating, which occurs when an unauthorized person gains access to a sensitive area by essentially tagging along with or following someone who is authorized, is a significant and all-too-common issue.

One of the major problems in today's mantraps is that they rely on visual sensors such as cameras or T-DAR systems for counting people. These solutions are inaccurate, unreliable, very sensitive to lighting or environmental changes, and most importantly, easily defeatable by malicious actors due their line of sight based counting mechanism which results in very low accuracy in terms of reliable people counting.

Benefits of Quanergy's Mantrap Tailgating Solutiion

Quanergy's Mantrap solution can detect tailgating through secure portals with far higher accuracy than proprietary optical imaging systems. The solution sees everything in 3D, unlike camera-based systems that only see in 2D. It offers the coverage, granularity, and accuracy that's needed to provide a hyper accurate people count which is the most critical component of the entire solution.

Here's a scenario: Let's say you have a data center employee who is authorized to be at the data center site and has all of the credentials they need. They approach the mantrap, from the unsecured area to the secured one, and swipe their badge against the card reader, which is tied to the access control platform. As soon as the system accepts the badge and they enter, that will trigger the outside door to close.

If you've implemented Quanergy's Mantrap solution in your access control system, the solution will do a "count," determine if there's just one person in the mantrap or vestibule, and then it will trigger the opening of the door to the secured area. After the employee exits into the secured area, the secured door closes again, and the solution does another count to ensure there's no one left in the vestibule before the next person can then approach the outside door.

If there were two people counted in that mantrap, the secured door would not open because Quanergy's solution would detect both people. This isn't the case with less-accurate systems.

Leveraging Existing Investments

Physical security investments often don't come cheap, so many organizations are reluctant to do any kind of rip-and-replace process unless absolutely necessary. Quanergy's solutions complete existing access control systems rather than replacing them. Quanergy's LiDAR-enabled Mantrap solution is platform independent and relies on a Moxa switch to communicate with the access control systems, thus it seamlessly integrates with most access control solutions that can communicate with a Moxa switch. Organizations that need higher security with broader coverage and no blind spots can use Quanergy's solution to complement what they already have in place.

Quanergy's 3D LiDAR-based Security Solutions

Quanergy's mantrap tailgating solution is built upon an end to end software and hardware portfolio offering that consists of the QORTEX DTC perception software as well as MQ-8 3D LiDAR sensors. QORTEX DTC stands for Detect, Track, Classify and it provides 3D perception and volumetric sensing to enable reliable, real-time people and vehicle tracking in a variety of industries including smart cities, smart spaces, critical infrastructure, and much more.

The MQ-8 Series LiDAR sensor features a smart beam structure that delivers up to 70m continuous tracking range (140m diameter), enabling up to 15,000 square meters of coverage with a single sensor. The MQ-8 sensor, paired with the QORTEX DTC software, provides a higher classification accuracy compared to traditional LiDAR systems. In addition, the beam pattern provides 360° scanning with flat mounting to maximize coverage and reduce installation time and costs.

Quanergy's 3D LiDAR Security platform provides a modular, scalable, and advanced perception platform to enable real-time analysis for detection, tracking, and classification. With Quanergy's smart LiDAR solutions, businesses can now leverage real-time, advanced 3D insights to transform their operations in a variety of industries including smart cities, smart spaces, critical infrastructure, and much more.

Quanergy 3D LiDAR sensors, such as the MQ-8, create a rich and dense point cloud of any given space. When coupled with the QORTEX DTC™ (Detect, Track, Classify), the brains of Quanergy's Security Flow Management Solution platform, it enables reliable and real-time tracking of

- People
- Vehicles & vehicle sub classifications
- Unknownclassified objects

QORTEX DTC generates rich data that includes

- Location
- Direction
- Speed
- Object Classification
- Type of objects detected

Features and Benefits of Quanergy's Security Solutions

98% Detection Accuracy

QORTEX DTC™ accurately detects the number and direction of people, entering in and out of the common areas. This can be also used to detect tailgaters and increase the safety of environments. QORTEX DTC™ accuracy is significantly higher than a camera-based system.

Protected Privacy

The LiDAR solution does not capture (PII) Personal identifiable information; therefore, it guarantees the anonymity of people and poses zero PII risk.

Reliability & Scalability

Works in all lighting and atmospheric conditions which enables security systems to effectively operate 24/7.

Rich 3D, Real-Time Data

Provides accurate centimeter-level information about the number of objects, spatial location, direction, and speed as well as the distance between people.

Key Markets

- Airports
- Data Centers
- Distribution Centers

Product Codes

PRODUCT CODE	DESCRIPTION
QRTXDTC-MTRAP-PPTL	Qortex DTC add-on license for the Mantrap Tailgating Solution, perpetual
QRTXDTC-MTRAP-1YR	Qortex DTC add-on license for the Mantrap Tailgating Solution, annual