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OTAC DRONE SOLUTIONS

swidch

DRONE Solutions

Remoted Controlled Mobility

The Drone industry is rapidly developing and impacting our daily lives in numerous and innovative ways. However, with this innovation comes the potential negative impact of security breaches and exploitation from external rogue sources.

Challenges

As it stands, there are the 3 main challenges that the drone industry and/or drone market is facing today.

Security: Hijacking

Drone communications with remote controllers are often encrypted, but the encrypted codes are often the same (i.e. static), which makes it a preferred and easy target for hijacking. In military drones, extra hardware, CMVP (Cryptographic Module Validation Program) is installed in drones to validate the security level in communications. Small commercial drones on the other hand often rely on the existing encrypted communication methods which are relatively easy to hijack.

Safety: Identification

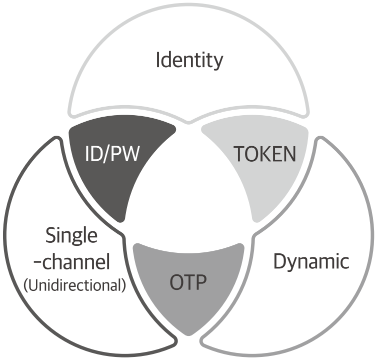
Drones are small, fast, and relatively difficult to detect in comparison to a flying jet. When multiple aircrafts, both manned and unmanned, are flying, each device needs to identify and communicate with each other to guarantee safety and mission success. This is why there is need for an identification system for drones and its operators. The economic cost of an unidentified drone near an airport is 500,000 euros for every 30 mins an airport is stopped from operating.

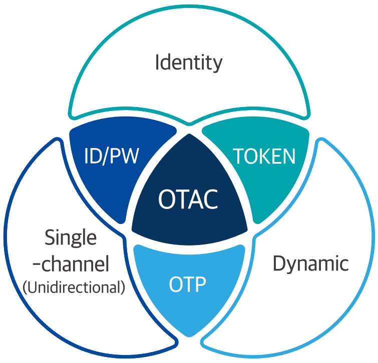
Regulation: Compliance

Remote ID is a new regulation introduced by the FAA and it is the "ability of a drone in flight to provide identification and location information that can be received by other parties", such as law enforcement. To comply with this upcoming regulation, drone manufacturers are having to implement a solution to embed identification capabilities on drones in accordance with the standards given by the FAA. The drone pilots/operators must also register themselves with the FAA before they can legally fly the drones.

Why OTAC?

swIDch's OTAC technology provides all the advantages of the three most commonly used authentication systems: ID and password, RSA hardware and software for generating authentication codes, and tokenisation. The functions provided by the individual systems are all combined in OTAC, ensuring a more efficient and effective authentication process.





Limitations of Existing Authentication Methods

- Vulnerable to leakage/exposure by Static value
- User authentication is impossible with OTP only
- Communication required between User and server (Pull & Push)

One-way Unique Identification Authentication Code

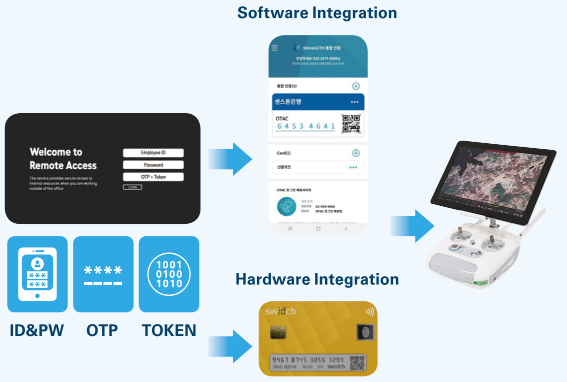
- No need to communicate with Server
- Real-Time changes every time for Secure authentication
- Non-reusable One-Time Authentication

Solutions

swIDch upgrades Drone solutions by preventing the use of static information and providing single-channelled dynamic codes to eliminate external threats. OTAC technology, which can be applied to both the software and hardware, maintains and enhances the robust security environment level required for Drone manufacturers and system operators.

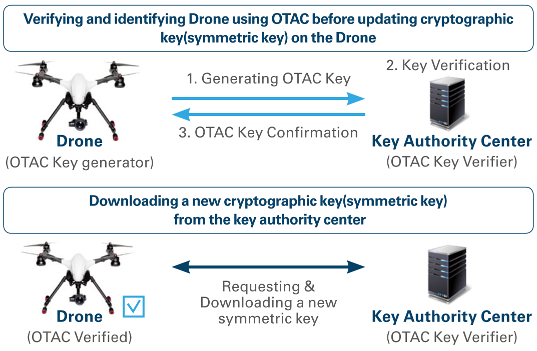
OTAC Pilot Access Management

OTAC allows the registered, licensed pilots to securely access their drone remote system with the highest level of security together with convenience. The pilot uses swIDch's mobile app to authenticate themselves, and to generate OTAC which is used to securely access the drone control system.



OTAC CMVP key management

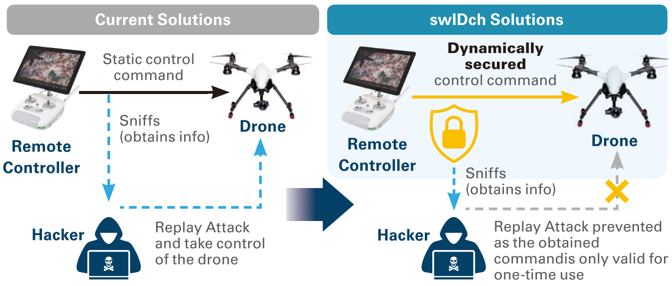
OTAC can also be used to secure and authenticate encryption CMVP communication modules. OTAC is generated locally from the hardware encryption modules which is verified and authenticated from the central server, allowing for the generation, and downloading of the new random secure master key to the operating drones, Over-The-Air.


Verifying and identifying Drone using OTAC before updating cryptographic key(symmetric key) on the Drone

Downloading a new cryptographic key(symmetric key) from the key authority center

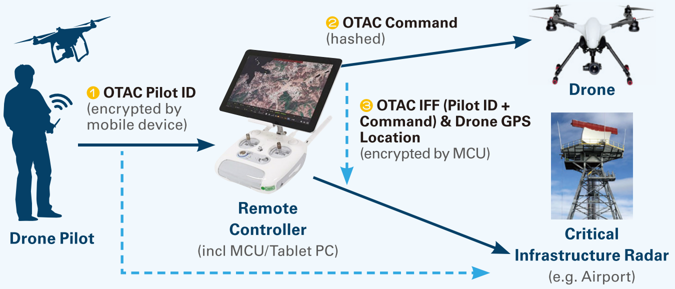
OTAC Command

Once the pilot securely accesses the control system via OTAC Pilot ID, the pilot can have full confidence in the security level of the command communication with the drone. Thanks to swIDch command, every single command generated from the remote controller will be in a 'one-time, dynamic' form.


Current Solutions
Static control command
Remote Controller
Drone
Sniffs (obtains info)
Hacker
Replay Attack and take control of the drone
swIDch Solutions
Dynamically secured control command
Remote Controller
Drone
Sniffs (obtains info)
Hacker
Replay Attack prevented as the obtained commandis only valid for one-time use

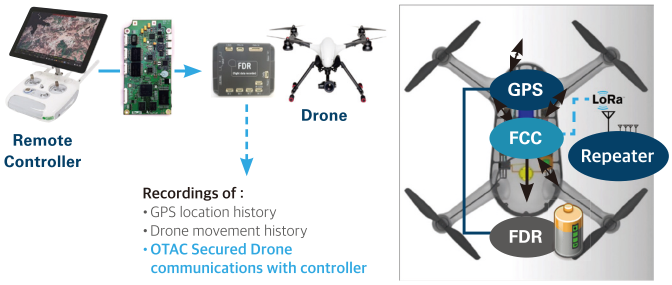
IFF(Identification of Friend or Foe)

swIDch combines the unique information from the Pilot OTAC and OTAC command as a chained protocol to generate a unique IFF code. In commercial use It can be used to identify if the flying drone is a legitimate and registered drone and pilot, and in military use the information can be secured in order to identify and distinguish the friendly and enemy drones.


1 OTAC Pilot ID (encrypted by mobile device)
2 OTAC Command (hashed)
3 OTAC IFF (Pilot ID + Command) & Drone GPS Location (encrypted by MCU)
Drone Pilot
Remote Controller (incl MCU/Tablet PC)
Drone
Critical Infrastructure Radar (e.g. Airport)

OTAC FDR

swIDch combines the unique information from the Pilot OTAC and OTAC command as a chained protocol to generate a unique IFF code. This is used to identify and verify the flying objects in the airspace. The information can be both public and secured, meaning that in commercial use cases, it can be used to identify if the flying drone is a legitimate and registered drone and pilot. In military use, the information can be secured in order to identify and distinguish the friendly and enemy drones.



Recordings of :
- GPS location history
- Drone movement history
- OTAC Secured Drone communications with controller

swidch

Next Generation Authentication Security Lab swidch

swIDch is willing to be your Authentication Security Lab

We provide the highest quality authentication security service.
Enquire now.

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