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Cards and security devices for personal identification — ISO UAS licence and drone or UAS security module —

Part 1: Physical characteristics and basic data sets for UAS licence

Cartes et dispositifs de sécurité pour l'identification des personnes — Permis ISO et module d'identité de drone pour les drones (véhicules ultralégers ou systèmes d'aéronefs sans équipage à bord) —

Partie 1: Caractéristiques physiques et jeu de données de base pour les permis de systèmes d'aéronefs sans équipage à bord

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Foreword

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The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of document should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives or www.iec.ch/members_experts/refdocs).

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A list of all parts in the ISO/IEC 22460 series can be found on the ISO and IEC websites.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html and www.iec.ch/national-committees.

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Introduction

0.1 General

This document specifies requirements for a drone or uncrewed aircraft system (UAS) remote pilot licence (DrL). Its purpose is to facilitate the issuance of a single document that fulfils the functions of both a domestic drone or UAS remote pilot licence (DDrL) and an international drone or UAS remote pilot licence (IDrL). Authorities issuing DDrLs that do not adhere to these standards can benefit from incorporating elements of this document for their domestic licensing procedures. These issuing authorities can define the scope and function of DDrL as well as the requirements of drone licence and the drone/UAS Security Module (DSM).

The concept of a pilotless aircraft was initially introduced in the 1929 Protocol, and amended at the Paris Convention on October 13, 1919. A formal definition was outlined in Article 8 of the International Convention on Civil Aviation (ICAO Doc 7300) signed in Chicago on December 7, 1944, and subsequently amended by the ICAO General Assembly in 1947. According to ICAO 10019:2015, Item 2.2.1, the remotely-piloted aircraft system (RPAS) categorizes aircraft without pilots as uncrewed aircraft, while remotely controlled aircraft are classified as remote-controlled aircraft[19].

The RPAS encompasses both operation and personal licensing aspects:

— RPAS operation**:** This involves the certification, oversight, human performance aspects, RPAS operators and safety management of RPAS.

— Pilot Certification**:** The pilots and the other members of the operating crew of every aircraft engaged in international navigation possess certificates of competency and licences issued or validated by the State in which the aircraft is registered.

— Personal licensing: This area covers the licensing requirements for remote pilots and air traffic controllers, as well as any medical prerequisites.

The ISO/IEC 22460 series utilizes licence IDs for drones or UAS remote pilots. The uncrewed aircraft (UA), which is remotely operated or controlled without onboard personnel, is designed to be controlled by a remote pilot, ensuring cybersecurity and integrity by storing the eID/RID according to ISO 23629-8. This includes pilot information within a drone or UAS security module container in accordance with the ISO 7816 series.

To prevent cyberattacks attempting to remotely identify the eID/RID of the UA during flight by UAS traffic management (UTM) or related entities, cryptographic measures and integrity protection are employed to safeguard access rights to the elementary file within the DSM in accordance with the ISO 7816 series.

Furthermore, this document aims to achieve the interoperability of eID/RID recorded in the DSM with integrity once the remote pilot of the UA has obtained flight permission for both local and international operations.

0.2 Similarities and differences between a driver’s licence and a drone or UAS Licence (UAL)

There exist both similarities and differences between a driver's licence and a drone or UAS licence.

a) Operation Method: An automobile is operated by a driver within the vehicle, whereas a drone or a UAS is remotely operated or controlled by a remote pilot uncrewed aircraft system.

b) Registration and Insurance Requirements: Both an automobile and a drone or a UAS are registered with the relevant agencies, and it is mandatory to obtain injury and property insurance. This is necessary because both types of vehicles bear responsibility for accidents in the event of an accident.

c) Recognition of Certificates and Licences: Certificates of airworthiness and competency, and licences issued or validated by the contracting state in which the aircraft is registered, can be acknowledged as valid by other contracting states, provided they meet or exceed the minimum standards established under the Convention.

d) Licensing exemptions: Motorcycles (e.g. those with engine capacities of 50cc or less) can be driven without a licence. Similarly, ultra-light toy-level drones (e.g. those weighing 250 g or less, 0.9 kg or less

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under ISO 21895 maximum take-off grade I, II, or EASA LUC / open category subcategory A1, A2, A3) can be remotely piloted with a certificate. To obtain the remote pilot certificate, the remote pilot acquires the necessary knowledge. The preregistered drone owned by the certificate holder can only be flown in permitted flight areas before sunset.

e) Vehicle Registration Cards and Cybersecurity Measures: Dutch Automobile Registration Card (DA12EN) is utilized to record the vehicle identification number and automobile registration information on the IC card EF according to the ISO 7816 series at the time of release. This helps prevent cyberattacks by incorporating public key information. In addition, DSM performs UAS eID/RID and security functions similar to the mobile phone subscriber identification module.

0.3 Harmonization and Interoperability

All human-readable drone or UALs issued in each country, including those currently in use, include the following:

— sufficient information to enable identification of the licence holder;

— security features that make counterfeiting difficult;

— security features that make alteration resistant.

With the increasing global freedom of movement and the growing population and market of the drone or UAS, along with the expanding application of these systems, there is a pressing need to mitigate drone or UAS collisions and accidents. Consequently, drone or UAL systems impose additional requirements with the advent and need for machine-assisted storage, retrieval, reading and verification technologies for the facilitation of data protection and secure communication.

To achieve maximum global harmonization and interoperability of UTM and ATM, standards in this sector are imperative. These standards provide common platforms for visual human-readable evidence as well as for machine-assisted storage, retrieval, reading and verification through the utilization of data storage technologies incorporated into the drone licence UAS document.

The design approach for the ISO drone or UAS remote pilot and remote crew licence, in accordance with ISO ID-1 size card standards, aims to establish a secure drone or UAS remote pilot and remote crew licence not only for domestic purposes but also international compatibility. This licence facilitates both human verification and machine readability.

While existing domestic drone or UAS remote pilot and remote crew licences may not be recognized or valid for use in other countries, an ISO drone or UAS remote pilot and remote crew licence would hold validity for use in any country.

The basic design principles for the document include:

— establishment of a minimum mandatory data element set;

— adoption of a standardized layout for easy recognition;

— implementation of minimum security requirements for both human and machine verification;

— provision for interoperability of the machine-readable content, subject to the discretion of national or regional drone or UAS-related authorities:

— flexibility to include supplementary optional data elements to fulfil specific national or regional requirements beyond the minimum mandatory data element set;

— permission for additional physical security features as determined by national or regional authorities to facilitate international procurements;

— incorporation of machine-readable technologies, such as integrated circuits with contacts according to the ISO 7816 series and contactless integrated circuit technology according to the ISO 14443 series, at the discretion of national or regional authorities;

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— accommodation of current and future technologies (including mobile, biometrics, cryptography and data compression) as determined by national or regional authorities.

This design for the drone or UAS remote pilot and remote crew licence results in a document that:

— incorporates security features to deter counterfeiting and alteration;

— enables authorities to authenticate the document's validity;

— integrates personal data into a secure ID-1 size medium;

— enhances the reliability of licence holder identification;

— allows for the integration of machine-readable technologies;

— facilitates information exchange and mutual recognition among drone or UAS-related authorities.

Issuing authorities can introduce additional functions to an IDrL, provided these functions do not conflict with the primary purpose of the drone or UAS remote pilot and remote crew licence and do not compromise the requirements outlined in this document

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Cards and security devices for personal identification — ISO UAS licence and drone or UAS security module —

Part 1:
Physical characteristics and basic data sets for UAS licence

1 Scope

This document establishes requirements and recommendations for the design format and data content of a drone or UAS remote pilot and remote crew licence, encompassing both visual human-readable features and machine-readable technologies. By establishing a common basis, this document aims to standardize drone or UAS remote pilot and remote crew licence without impeding the efforts of individual national or regional drone or UAS-related authorities.

NOTE Not all jurisdictions require drone or UAS remote pilot and remote crew licences.

2 Normative reference(s)

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/IEC 7810, *Identification cards — Physical characteristics*

ISO/IEC 7816 (all parts), *Identification cards — Integrated circuit cards*

ISO/IEC 18013-1:2018, *Information technology — Personal identification — ISO-compliant driving licence — Part 1: Physical characteristics and basic data set*

ISO/IEC 19794-5:2011, *Information technology — Biometric data interchange formats — Part 5: Face image data*

ISO 21895:2020, *Categorization and classification of civil unmanned aircraft systems*

ISO/IEC 22460-2, *Cards and security devices for personal identification — ISO UAS license and drone/UAS security module — Part 2: Drone/UAS security module*

ISO 23629-8, *UAS traffic management (UTM) — Part 8: Remote identification*

ISO 23665, *Unmanned aircraft systems — Training for personnel involved in UAS operations*

ISO/IEC 39794-5:2019, *Information technology — Extensible biometric data interchange formats — Part 5: Face image data*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

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