

INTERNATIONAL STANDARD

ISO 21384-3

Second edition
2023-10

Unmanned aircraft systems — Part 3: Operational procedures

Aéronefs sans pilote —

Partie 3: Modes opératoires





COPYRIGHT PROTECTED DOCUMENT

© ISO 2023

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword.....	v
Introduction.....	vi
1 Scope.....	1
2 Normative references.....	1
3 Terms and definitions.....	1
4 Abbreviated terms.....	4
5 Safety and security.....	5
5.1 General.....	5
5.2 Safety.....	5
5.2.1 Safety policy.....	5
5.2.2 Requirements for operators conducting UAS operations in VLOS or EVLOS.....	6
5.2.3 Additional requirements for operators conducting UAS operations in BVLOS at VLL.....	7
5.2.4 Additional requirements for operators conducting UAS operations in controlled airspace, above VLL and under IFR and for C2CSP.....	7
5.2.5 Tasks of the COMO.....	8
5.2.6 Tasks of the SAFO.....	8
5.3 Security.....	9
5.3.1 Requirements for operators conducting UAS operations in VLOS or EVLOS.....	9
5.3.2 Additional requirements for operators conducting UAS operations in BVLOS at VLL.....	10
5.3.3 Additional requirements for operators conducting UAS operations in controlled airspace, above VLL and under IFR and for C2CSP.....	10
5.3.4 Tasks of the SECO.....	11
6 Data protection — Operator requirements.....	12
7 Operator.....	12
7.1 Documentation.....	12
7.1.1 Documents held by the UAS operator.....	12
7.1.2 Documents to be available at the point of operations.....	13
7.2 Insurance.....	14
8 Airspace.....	14
8.1 Compliance with airspace regulations.....	14
8.2 Airspace information.....	14
8.3 Operations above 500 ft (150 m).....	14
8.4 Special zones at very high flight levels (FL) 600.....	14
8.5 Facility and equipment and requirements.....	14
8.6 Registration.....	14
8.7 UA identification.....	14
8.8 Compatibility.....	15
9 Operations.....	15
9.1 Flight operations.....	15
9.2 Operational plan — Flight planning.....	15
9.3 Flight preparation.....	16
9.3.1 Pre-flight inspections.....	16
9.3.2 Communication planning.....	17
9.4 In flight operations.....	17
9.4.1 Responsibilities of the remote pilot in command (RPIC).....	17
9.4.2 Operational limitations.....	18
9.4.3 Transfer of functions and responsibilities.....	18
9.4.4 Multiple UA operation.....	19
9.4.5 Autonomous operations.....	20

9.4.6	Communication and airborne functions for UTM.....	20
9.4.7	Operations at night.....	20
9.4.8	Surface/ground operations.....	20
9.4.9	Journey log.....	21
9.4.10	Abnormal and contingency procedures.....	21
9.5	External services.....	21
9.5.1	UAS functions interacting with UTM.....	21
9.5.2	Oversight of contracted service providers.....	21
9.5.3	C2 communication service provider (C2CSP).....	22
9.6	Personnel qualification and management.....	26
9.6.1	General.....	26
9.6.2	Competence.....	26
9.6.3	Currency.....	27
9.6.4	Qualification and training.....	28
10	Maintenance.....	28
10.1	General.....	28
10.2	Hardware updates.....	29
10.3	Software updates.....	29
10.4	Service release.....	29
10.5	Configuration management.....	29
11	Conflict management.....	30
11.1	General.....	30
11.2	Separation provision and collision avoidance.....	30
11.3	Operational procedure.....	30
	Annex A (normative) Privacy etiquette.....	36
	Annex B (informative) External services.....	37
	Bibliography.....	38

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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 ISO 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 20, *Aircraft and space vehicles*, Subcommittee SC 16, *Unmanned aircraft systems*.

This second edition cancels and replaces the first edition (ISO 21384-3:2019), which has been technically revised.

The main changes are as follows:

- [Clause 2](#): addition of normative references;
- [Clause 3](#): addition of several terms and definitions;
- [5.1](#): addition of applicable management systems and equipment requirements;
- [5.2](#): major restructuring of the subclause, addition of requirements for operators under different preconditions and specified tasks for different personnel to be conducted;
- [9.1](#): designation of a remote pilot in control added;
- [9.4](#): addition of requirements for handovers of functions and responsibilities, precautions for the operation of multiple UA by one remote pilot, communication and airborne functions for UTM;
- [9.5](#): addition of new subclauses on organizational, operational and technical requirements for external service regarding UTM and C2CSP;
- [Clause 11](#): new clause on conflict management including operational charts and descriptions.

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.

Introduction

This document outlines requirements for unmanned aircraft (UA) operational procedures which, when applied together with any other current and future standard on unmanned aircraft systems (UAS), form a robust UA safety and quality standard. This document applies to all commercial UAS regardless of size, categorization, application or location and represents the international best practice for the safe operation of all commercial UAS. This document is structured in a way to provide a logical pathway from core principles to specific requirements.

Unmanned aircraft systems —

Part 3: Operational procedures

1 Scope

This document specifies the requirements for safe commercial unmanned aircraft system (UAS) operations, including the external safety-critical service providing command and control (C2) link.

2 Normative references

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 12100, *Safety of machinery — General principles for design — Risk assessment and risk reduction*

ISO 21384-4, *Unmanned aircraft systems — Part 4: Vocabulary*

ISO 23629-12:2022, *UAS traffic management (UTM) — Part 12: Requirements for UTM service providers*

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

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21384-4 and the following apply.

ISO and IEC maintain terminological 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/>

3.1

C2 Link communications service provider

C2CSP

entity which provides a portion of or all of the *C2 Link* (3.4) service for operation of an UAS

Note 1 to entry: The definition is adapted from Reference [16].

3.2

designated operational coverage

DOC

volume where the *C2 Link QoSD* (3.9) meets the *C2 Link* (3.4) specified performances and supports the corresponding intended UAS operations

Note 1 to entry: The definition is adapted from Reference [16].

3.3

collision avoidance

third layer of conflict management which activates when the separation mode has been compromised

Note 1 to entry: The definition is adapted from Reference [17].