
**Unmanned aircraft systems —
Part 2:
UAS components**

Aéronefs sans pilote —

Partie 2: Composants des UAS

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 21384-2:2021

<https://standards.iteh.ai/catalog/standards/iso/00617390-7ecb-4579-9502-2c7f22b035ce/iso-21384-2-2021>



iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

ISO 21384-2:2021

<https://standards.iteh.ai/catalog/standards/iso/00617390-7ecb-4579-9502-2c7f22b035ce/iso-21384-2-2021>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

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	vii
Introduction	viii
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Abbreviated terms	2
5 General design requirements for UAS	4
5.1 General	4
5.2 Function and reliability	4
5.2.1 Design	4
5.2.2 Components	5
5.3 Maintainability and supportability	5
5.3.1 Design	5
5.3.2 Documentation	5
5.3.3 Support	6
5.4 Fatigue durability	6
5.5 Aircraft identification features	6
5.6 Transportation, storage and packaging	6
6 Aircraft structures	7
6.1 Overview	7
6.2 Damage tolerance assessment	7
6.3 UA construction	7
6.4 Moving parts	8
6.5 Attached parts	8
7 Propulsion	8
7.1 Propulsion risk management	8
7.2 Engines and motors	8
7.2.1 General requirements	8
7.2.2 Mounting and installation	8
7.2.3 Combustion engines	9
7.2.4 Electric motors	9
7.2.5 Electronic speed controller (ESC) requirements	9
7.3 Thrust mechanisms	9
7.3.1 Propellers and rotors	9
7.3.2 Turbine and fans	10
8 Electrical systems	10
8.1 General	10
8.2 Electrical safety	10
8.3 Airborne electrical systems	10
8.4 Ground electrical systems	10
8.4.1 UAS electrical components on the ground	10
8.4.2 RPS power system	11
8.4.3 Labelling	11
9 Energy sources	11
9.1 Batteries	11
9.1.1 General	11
9.1.2 Protective measures	11
9.1.3 Precautions	11
9.2 Combustible fuels	11
9.3 Fuel cells	12
9.3.1 General requirements	12

	9.3.2	General safety requirements	12
	9.3.3	Protective measures	12
10		Equipment	12
	10.1	Avionic equipment (general)	12
	10.2	Flight control system (FCS)	13
	10.2.1	General requirement	13
	10.2.2	Flight control hardware	13
	10.2.3	Flight control software	14
	10.2.4	Course accuracy	14
	10.2.5	Airspeed	14
	10.3	Flight control actuators	15
	10.4	Diagnostics	15
	10.5	Navigation systems	15
	10.5.1	General	15
	10.5.2	Global Navigation Satellite System (GNSS) receiver	15
	10.5.3	Real time kinematic (RTK) augmentation	15
	10.5.4	Inertial measurement unit (IMU)	16
	10.5.5	Magnetic compass	16
	10.6	Attitude sensors	16
	10.6.1	Altimeter	16
	10.6.2	Airspeed sensor	16
	10.6.3	Optical sensor	17
	10.7	Hardware and software redundancy	17
	10.8	Failure modes	17
11		C2 Link	18
	11.1	Performance and design	18
	11.2	Antenna module design	18
	11.3	Operations	18
	11.4	Monitoring	19
	11.5	Protocol	19
	11.6	Data features	19
	11.6.1	General	19
	11.6.2	UA status data	19
	11.6.3	Delay requirements	19
	11.7	Reliability requirements	19
	11.8	Security requirements	20
12		Remote pilot station	20
	12.1	General	20
	12.2	Features	20
	12.2.1	General	20
	12.2.2	Data monitoring systems requirements	20
	12.3	Design requirements	20
	12.3.1	System	20
	12.3.2	Structure	21
	12.3.3	Human factors engineering and ergonomics design	21
	12.4	Functional requirements	21
	12.4.1	Mission planning	21
	12.4.2	Data link control	21
	12.4.3	Flight Control Commands	21
	12.5	Displays	22
	12.5.1	Instrumentation	22
	12.5.2	Readability	22
	12.5.3	Accuracy	22
	12.5.4	Warnings, cautions, and advisories	22
	12.5.5	Display/interface failures	22
	12.5.6	Track and parameter display	23
	12.5.7	C2 Link status display	23

	12.5.8 Telemetry parameter record.....	23
12.6	Performance requirements.....	23
	12.6.1 Environmental adaptability.....	23
	12.6.2 Reliability.....	24
12.7	Safety.....	24
12.8	Collision avoidance (CA) systems.....	24
13	Payload.....	24
13.1	General requirements.....	24
13.2	Safety marking.....	25
13.3	Wiring design.....	25
13.4	Payload power supply.....	25
13.5	Storage requirement.....	25
14	Airworthiness.....	25
14.1	Documentation.....	25
	14.1.1 Instructions.....	25
	14.1.2 Manuals and handbooks.....	25
	14.1.3 Procedural changes.....	26
14.2	Composition of an operator's manual.....	26
	14.2.1 Technical specifications.....	26
	14.2.2 Flight performance.....	26
	14.2.3 Aircraft weights.....	26
	14.2.4 Flight control accuracy.....	26
	14.2.5 Dimensions.....	27
	14.2.6 Atmospheric and other environments adaptability.....	27
14.3	Electromagnetic compatibility considerations.....	27
14.4	Noise.....	27
14.5	Built-in test and monitoring.....	27
14.6	System safety program.....	28
	14.6.1 Selection of design materials.....	28
	14.6.2 Properties and processes.....	28
	14.6.3 Mass properties.....	28
	14.6.4 Corrosion.....	29
	14.6.5 Material limitations.....	29
	14.6.6 Fire hazards.....	29
	14.6.7 Equipment separation.....	29
15	UAS software.....	29
15.1	Software architecture and design.....	29
15.2	Safety.....	30
15.3	Security.....	30
15.4	Software compliance.....	30
15.5	Software development life cycle.....	30
16	Other considerations.....	30
16.1	Ground equipment.....	30
16.2	Multi vehicle control.....	31
16.3	Jamming and spoofing.....	31
17	Automation.....	31
17.1	General.....	31
17.2	Software development lifecycle.....	31
17.3	Remote pilot intervention.....	32
17.4	System data collection.....	32
17.5	Automation risk assessment.....	32
17.6	Automation system architecture.....	32
	Annex A (informative) Software risk management.....	33
	Annex B (informative) Electromagnetic environmental effects (E3).....	36

iTeh Standards
(<https://standards.itih.ai>)
Document Preview

[ISO 21384-2:2021](https://standards.itih.ai/catalog/standards/iso/00617390-7ecb-4579-9502-2c7f22b035ce/iso-21384-2-2021)

<https://standards.itih.ai/catalog/standards/iso/00617390-7ecb-4579-9502-2c7f22b035ce/iso-21384-2-2021>