

IEEE Standard for General Requirements for Cryptocurrency Exchanges

IEEE Consumer Electronics Society

Developed by the
Blockchain Standards Committee

IEEE Std 2140.1™-2020

IEEE Standard for General Requirements for Cryptocurrency Exchanges

Developed by the

Blockchain Standards Committee
of the
IEEE Consumer Electronics Society

Approved 24 September 2020

IEEE SA Standards Board

Abstract: Self-discipline and professional ethics of cryptocurrency exchange platforms, as well as relevance between them and to cryptocurrency wallets are covered in this standard. Exchange business logic, operational procedures, user authentication programs are also covered in this standard. In addition, a small but necessary technical category of requirements, including terminologies, basic architectural framework, key indicators, end-user interface specifications, in order to achieve the previously mentioned goals is covered in this standard.

Keywords: cryptocurrency, exchange, IEEE 2140.1, self-discipline, transaction

The Institute of Electrical and Electronics Engineers, Inc.
3 Park Avenue, New York, NY 10016-5997, USA

Copyright © 2020 by The Institute of Electrical and Electronics Engineers, Inc.
All rights reserved. Published 4 November 2020. Printed in the United States of America.

IEEE is a registered trademark in the U.S. Patent & Trademark Office, owned by The Institute of Electrical and Electronics Engineers, Incorporated.

PDF: ISBN 978-1-5044-7032-2 STD24395
Print: ISBN 978-1-5044-7033-9 STDPD24395

IEEE prohibits discrimination, harassment, and bullying.

For more information, visit <https://www.ieee.org/about/corporate/governance/p9-26.html>.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without the prior written permission of the publisher.

Important Notices and Disclaimers Concerning IEEE Standards Documents

IEEE Standards documents are made available for use subject to important notices and legal disclaimers. These notices and disclaimers, or a reference to this page (<https://standards.ieee.org/ipr/disclaimers.html>), appear in all standards and may be found under the heading “Important Notices and Disclaimers Concerning IEEE Standards Documents.”

Notice and Disclaimer of Liability Concerning the Use of IEEE Standards Documents

IEEE Standards documents are developed within the IEEE Societies and the Standards Coordinating Committees of the IEEE Standards Association (IEEE SA) Standards Board. IEEE develops its standards through an accredited consensus development process, which brings together volunteers representing varied viewpoints and interests to achieve the final product. IEEE Standards are documents developed by volunteers with scientific, academic, and industry-based expertise in technical working groups. Volunteers are not necessarily members of IEEE or IEEE SA, and participate without compensation from IEEE. While IEEE administers the process and establishes rules to promote fairness in the consensus development process, IEEE does not independently evaluate, test, or verify the accuracy of any of the information or the soundness of any judgments contained in its standards.

IEEE does not warrant or represent the accuracy or completeness of the material contained in its standards, and expressly disclaims all warranties (express, implied and statutory) not included in this or any other document relating to the standard, including, but not limited to, the warranties of: merchantability; fitness for a particular purpose; non-infringement; and quality, accuracy, effectiveness, currency, or completeness of material. In addition, IEEE disclaims any and all conditions relating to results and workmanlike effort. In addition, IEEE does not warrant or represent that the use of the material contained in its standards is free from patent infringement. IEEE Standards documents are supplied “AS IS” and “WITH ALL FAULTS.”

Use of an IEEE standard is wholly voluntary. The existence of an IEEE Standard does not imply that there are no other ways to produce, test, measure, purchase, market, or provide other goods and services related to the scope of the IEEE standard. Furthermore, the viewpoint expressed at the time a standard is approved and issued is subject to change brought about through developments in the state of the art and comments received from users of the standard.

In publishing and making its standards available, IEEE is not suggesting or rendering professional or other services for, or on behalf of, any person or entity, nor is IEEE undertaking to perform any duty owed by any other person or entity to another. Any person utilizing any IEEE Standards document, should rely upon his or her own independent judgment in the exercise of reasonable care in any given circumstances or, as appropriate, seek the advice of a competent professional in determining the appropriateness of a given IEEE standard.

IN NO EVENT SHALL IEEE BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO: THE NEED TO PROCURE SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE PUBLICATION, USE OF, OR RELIANCE UPON ANY STANDARD, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE AND REGARDLESS OF WHETHER SUCH DAMAGE WAS FORESEEABLE.

Translations

The IEEE consensus development process involves the review of documents in English only. In the event that an IEEE standard is translated, only the English version published by IEEE is the approved IEEE standard.

Official statements

A statement, written or oral, that is not processed in accordance with the IEEE SA Standards Board Operations Manual shall not be considered or inferred to be the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that the presenter's views should be considered the personal views of that individual rather than the formal position of IEEE, IEEE SA, the Standards Committee, or the Working Group.

Comments on standards

Comments for revision of IEEE Standards documents are welcome from any interested party, regardless of membership affiliation with IEEE or IEEE SA. However, **IEEE does not provide interpretations, consulting information, or advice pertaining to IEEE Standards documents.**

Suggestions for changes in documents should be in the form of a proposed change of text, together with appropriate supporting comments. Since IEEE standards represent a consensus of concerned interests, it is important that any responses to comments and questions also receive the concurrence of a balance of interests. For this reason, IEEE and the members of its Societies and Standards Coordinating Committees are not able to provide an instant response to comments, or questions except in those cases where the matter has previously been addressed. For the same reason, IEEE does not respond to interpretation requests. Any person who would like to participate in evaluating comments or in revisions to an IEEE standard is welcome to join the relevant IEEE working group. You can indicate interest in a working group using the Interests tab in the Manage Profile and Interests area of the [IEEE SA myProject system](#). An IEEE Account is needed to access the application.

Comments on standards should be submitted using the [Contact Us](#) form.

Laws and regulations

Users of IEEE Standards documents should consult all applicable laws and regulations. Compliance with the provisions of any IEEE Standards document does not constitute compliance to any applicable regulatory requirements. Implementers of the standard are responsible for observing or referring to the applicable regulatory requirements. IEEE does not, by the publication of its standards, intend to urge action that is not in compliance with applicable laws, and these documents may not be construed as doing so.

Data privacy

Users of IEEE Standards documents should evaluate the standards for considerations of data privacy and data ownership in the context of assessing and using the standards in compliance with applicable laws and regulations.

Copyrights

IEEE draft and approved standards are copyrighted by IEEE under US and international copyright laws. They are made available by IEEE and are adopted for a wide variety of both public and private uses. These include both use, by reference, in laws and regulations, and use in private self-regulation, standardization, and the promotion of engineering practices and methods. By making these documents available for use and adoption by public authorities and private users, IEEE does not waive any rights in copyright to the documents.

Photocopies

Subject to payment of the appropriate licensing fees, IEEE will grant users a limited, non-exclusive license to photocopy portions of any individual standard for company or organizational internal use or individual, non-commercial use only. To arrange for payment of licensing fees, please contact Copyright Clearance Center, Customer Service, 222 Rosewood Drive, Danvers, MA 01923 USA; +1 978 750 8400; <https://www.copyright.com/>. Permission to photocopy portions of any individual standard for educational classroom use can also be obtained through the Copyright Clearance Center.

Updating of IEEE Standards documents

Users of IEEE Standards documents should be aware that these documents may be superseded at any time by the issuance of new editions or may be amended from time to time through the issuance of amendments, corrigenda, or errata. An official IEEE document at any point in time consists of the current edition of the document together with any amendments, corrigenda, or errata then in effect.

Every IEEE standard is subjected to review at least every 10 years. When a document is more than 10 years old and has not undergone a revision process, it is reasonable to conclude that its contents, although still of some value, do not wholly reflect the present state of the art. Users are cautioned to check to determine that they have the latest edition of any IEEE standard.

In order to determine whether a given document is the current edition and whether it has been amended through the issuance of amendments, corrigenda, or errata, visit [IEEE Xplore](#) or [contact IEEE](#). For more information about the IEEE SA or IEEE's standards development process, visit the IEEE SA Website.

Errata

Errata, if any, for all IEEE standards can be accessed on the [IEEE SA Website](#). Search for standard number and year of approval to access the web page of the published standard. Errata links are located under the Additional Resources Details section. Errata are also available in [IEEE Xplore](#). Users are encouraged to periodically check for errata.

Patents

IEEE Standards are developed in compliance with the [IEEE SA Patent Policy](#).

Attention is called to the possibility that implementation of this standard may require use of subject matter covered by patent rights. By publication of this standard, no position is taken by the IEEE with respect to the existence or validity of any patent rights in connection therewith. If a patent holder or patent applicant has filed a statement of assurance via an Accepted Letter of Assurance, then the statement is listed on the IEEE SA Website at <https://standards.ieee.org/about/sasb/patcom/patents.html>. Letters of Assurance may indicate whether the Submitter is willing or unwilling to grant licenses under patent rights without compensation or under reasonable rates, with reasonable terms and conditions that are demonstrably free of any unfair discrimination to applicants desiring to obtain such licenses.

Essential Patent Claims may exist for which a Letter of Assurance has not been received. The IEEE is not responsible for identifying Essential Patent Claims for which a license may be required, for conducting inquiries into the legal validity or scope of Patents Claims, or determining whether any licensing terms or conditions provided in connection with submission of a Letter of Assurance, if any, or in any licensing agreements are reasonable or non-discriminatory. Users of this standard are expressly advised that determination of the validity of any patent rights, and the risk of infringement of such rights, is entirely their own responsibility. Further information may be obtained from the IEEE Standards Association.

IMPORTANT NOTICE

IEEE Standards do not guarantee or ensure safety, security, health, or environmental protection, or ensure against interference with or from other devices or networks. IEEE Standards development activities consider research and information presented to the standards development group in developing any safety recommendations. Other information about safety practices, changes in technology or technology implementation, or impact by peripheral systems also may be pertinent to safety considerations during implementation of the standard. Implementers and users of IEEE Standards documents are responsible for determining and complying with all appropriate safety, security, environmental, health, and interference protection practices and all applicable laws and regulations.

Participants

At the time this IEEE standard was completed, the Cryptocurrency Exchange Working Group had the following membership:

Daozhuang Lin, *Chair*
Ning Hu, *Vice Chair*
Wenqi Zhao, *Secretary*

OxSenses Corporation	China National Electric Apparatus	Ontology Foundation Ltd.
Anhubao Corporation	Research Institute Co., Ltd.	PetroChina Planning and
Bitconch Blockchain Technology	Hangzhou Qulian Technology Co.,	Engineering Institute
Co., Ltd.	Ltd.	Xiaomi Communications Co., Ltd.
Chaincomp Technologies Co., Ltd.	Huochain Technology	Zhejiang University
	Matrix Tech Pte. Ltd.	

The Working Group gratefully acknowledges the contributions of the following participants. Without their assistance and dedication, this standard would not have been completed.

Liang Cai	Yong Liu	Anlv Tan
Xiaofeng Chen	Chuan Lu	Wei Tang
Zhiying Chen	Tianyuan Ma	Yiming Weng
Hui Ding	Xianping Mao	Xing Yang
Haobo Lai	Fanwei Meng	Yu Yuan
Huafeng Lei		Weiwei Zhuang

The following members of the entity Standards Association balloting group voted on this standard. Balloters may have voted for approval, disapproval, or abstention.

OxSenses Corporation	Easy-Visible SkyTree Technology	Institute of Digital Economy
Anhubao Corporation	(Beijing) Co., Ltd.	Industry, ICT, CAS
Chaincomp Technologies Co., Ltd.	Hangzhou Qulian Technology Co.,	Matrix Tech Pte.Ltd
China National Electric Apparatus	Ltd.	Ontology Foundation Ltd
Research Institute Co., Ltd.	Huobi Research	Zhejiang University
	Institute of Computing Technology,	
	Chinese Academy of Sciences	

When the IEEE SA Standards Board approved this standard on 24 September 2020, it had the following membership:

Gary Hoffman, *Chair*
Jon Walter Rosdahl, *Vice Chair*
John Kulick, *Past Chair*
Konstantinos Karachalios, *Secretary*

Ted Burse	David J. Law	Mehmet Ulema
Doug Edwards	Howard Li	Lei Wang
J.Travis Griffith	Dong Liu	Sha Wei
Grace Gu	Kevin Lu	Philip B. Winston
Guido R. Hiertz	Paul Nikolich	Daidi Zhong
Joseph L. Koepfinger*	Damir Novosel	Jingyi Zhou
	Dorothy Stanley	

*Member Emeritus

Introduction

This introduction is not part of IEEE Std 2140.1–2020, IEEE Standard for General Requirements for Cryptocurrency Exchanges.

This standard involves multiple aspects, including self-discipline and professional ethics of cryptocurrency exchange platforms, the exchanges' business logic and necessary technical requirements.

Contents

1. Overview	10
1.1 Scope	10
1.2 Purpose	10
1.3 Word usage	10
2. Definitions, acronyms, and abbreviations	11
2.1 Definitions	11
2.2 Acronyms and abbreviations	11
3. Cryptocurrency exchanges self-discipline and professional ethics	12
3.1 Compliance and order	12
3.2 Independence and objectivity	12
3.3 Integrity and responsibility	12
3.4 Professional degree	13
3.5 Market reputation	13
4. Cryptocurrency exchanges business model	13
4.1 Business logic	13
4.2 Operational procedures	13
4.3 User authentication	14
5. Cryptocurrency exchanges technical framework	14
5.1 The infrastructure	14
5.2 Key indicators	15
5.3 User terminal specifications	15
Annex A (informative) An example of a centralized cryptocurrency exchange infrastructure	16

IEEE Standard for General Requirements for Cryptocurrency Exchanges

1. Overview

1.1 Scope

This standard involves multiple aspects, including self-discipline and professional ethics of cryptocurrency exchange platforms, as well as relevance between them and cryptocurrency wallets. This standard also describes the exchanges' business logic, operational procedures, and user authentication programs. In addition, this standard provides a small but necessary number of technical requirements, including terminologies, basic architectural framework, key indicators, end-user interface specifications, in order to achieve the previously mentioned goals.

1.2 Purpose

Unlike standalone technical normative standards, this standard focuses on reaching a consensus from a business perspective, especially with the aim of protecting consumer rights in cryptocurrency exchange. The adoption of a unified approach promotes quality of service, transparency, fairness, and security with the goal of developing a cooperative and healthy ecosystem for the cryptocurrency market.

1.3 Word usage

The word *shall* indicates mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to).^{1,2}

The word *should* indicates that among several possibilities one is recommended as particularly suitable, without mentioning or excluding others; or that a certain course of action is preferred but not necessarily required (should equals is recommended that).

The word *may* is used to indicate a course of action permissible within the limits of the standard (may equals is permitted to).

The word *can* is used for statements of possibility and capability, whether material, physical, or causal (can equals is able to).

¹The use of the word *must* is deprecated and cannot be used when stating mandatory requirements, *must* is used only to describe unavoidable situations.

²The use of *will* is deprecated and cannot be used when stating mandatory requirements, *will* is only used in statements of fact.