CalConnect TC DATETIME

Date and time — Codes for calendar systems

Working Draft Standard

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The Calendaring and Scheduling Consortium, Inc. 2019

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Foreword

The Calendaring and Scheduling Consortium ("CalConnect") is a global non-profit organization with the aim to facilitate interoperability of collaborative technologies and tools through open standards.

CalConnect works closely with international and regional partners, of which the full list is available on our website (https://www.calconnect.org/about/liaisons-and-relationships).

The procedures used to develop this document and those intended for its further maintenance are described in the CalConnect Directives.

In particular the different approval criteria needed for the different types of CalConnect documents should be noted. This document was drafted in accordance with the editorial rules of the CalConnect Directives.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CalConnect shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be provided in the Introduction.

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

This document was prepared by Technical Committee *DATETIME*.

Introduction

Calendar systems are essential to the tracking of dates and events.

Date and time tracking applications, such as in computing, archiving, communication and bibliography, all depend on the accurate identification of calendar systems for their performance. Moreover, accuracy of date and time tracking is often paramount to important activities from civilian to military use.

This document describes methods to unambiguously define calendar systems, their properties, and provides a mechanism to assign unique identifiers to these data elements.

This document also sets out the necessary procedures to maintain an international registry of calendar systems.

Date and time — Codes for calendar systems

1. Scope

This document provides a list of codes to represent calendar systems, metadata to support the usage of those codes, and the corresponding maintenance procedures.

The codes were devised for usage of any application requiring the expression of calendar systems in coded form, including for data interchange.

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 639-1:2002, International Organization for Standardization (committee). *Codes for the representation of names of languages — Part 1: Alpha-2 code*. First edition. 2002. Geneva: International Organization for Standardization. https://www.iso.org/standard/22109.html.

ISO 639-2:1998, International Organization for Standardization (committee). *Codes for the representation of names of languages — Part 2: Alpha-3 code*. First edition. 1998. Geneva: International Organization for Standardization. https://www.iso.org/standard/4767.html.

ISO 3166-1:2013, International Organization for Standardization (committee). *Codes for the representation of names of countries and their subdivisions — Part 1: Country codes*. Third edition. 2013. Geneva: International Organization for Standardization. https://www.iso.org/standard/63545.html.

ISO 5127:2017, International Organization for Standardization (committee). *Information and documentation — Foundation and vocabulary*. Second edition. 2017. Geneva: International Organization for Standardization. https://www.iso.org/standard/59743.html.

ISO 15924:2004, International Organization for Standardization (committee). *Information and documentation — Codes for the representation of names of scripts*. First edition. 2004. Geneva: International Organization for Standardization. https://www.iso.org/standard/29546.html.

ISO 19135-1:2015, International Organization for Standardization (committee). *Geographic information — Procedures for item registration — Part 1: Fundamentals*. First edition. 2015. Geneva: International Organization for Standardization. https://www.iso.org/standard/54721.html.

3. Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 34000 and the following apply.

3.1.
code
data representation in different forms according to a pre-established set of rules

[SOURCE: ISO 639-2:1998]

3.2.
calendar code
code (Clause 3.1) used to represent a calendar system

3.3.
language code
combination of characters used to represent the name of a language or languages

[SOURCE: ISO 5127:2017, Clause 3.2.5.14]

3.4.
script code
combination of characters used to represent the name of a script

[SOURCE: ISO 15924:2004, Clause 3.8]

3.5.
registration item
data element in a register

3.6.
registration code
code that identifies a *registration item* (Clause 3.5) within a register

3.7.
ISO 34300 registration authority
ISO 34300/RA
registration authority that manages the *ISO 34300 register* (Clause 3.8)

3.8.
ISO 34300 register
register containing *ISO 34300 registration items* (Clause 3.10)

3.9.
ISO 34300 advisory group
ISO 34300/AG
group that provides advice to the *ISO 34300 registration authority* (Clause 3.7) on the contents of the *ISO 34300 register* (Clause 3.8)

3.10.
ISO 34300 registration item
registration item identified by a registration code unique to the *ISO 34300 register* (Clause 3.8)

4. Calendar systems and calendar eras

4.1. Calendar systems

The calendar system is an important component for date and time organisation in human history, as described in ISO 34000, Clause 9.5.2.

Different calendar systems are in use globally, whether for timekeeping, administrative, archival, cultural, religious or other purposes.

This document provide identifiers and information models that facilitate interoperability of date and time representations using calendar systems across information systems.

4.2. Calendar eras

The calendar era is a time scale unit utilized by some calendar systems, representing periods of time each, for the specification of date and time.

This document provide identifiers and information models that facilitate interoperability of date and time specified using calendar systems that utilize calendar eras.

5. Data types

5.1. Core data types

These are the core data types used within this document.

— `CharacterString`
— `DateTime`, `Date`, `Time`
— `Number`, `Integer`, `Decimal`, `Real`
— `Vector`
— `Boolean`

5.2. Common data types

The following data models are used by other data models specified in this document.

Figure 1

6. Data models

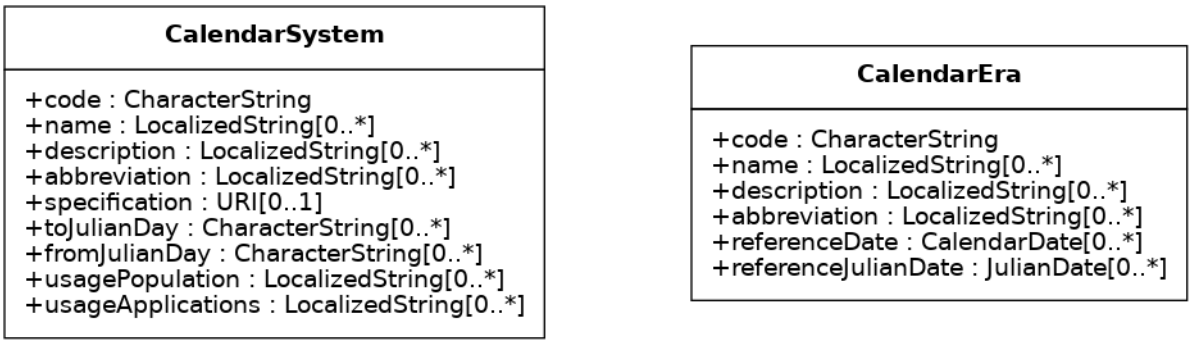

Figure 2

7. Codes and identifiers

7.1. Requirements

7.1.1. General

A calendar system is eligible for assignment of an entry based on its usage of date identification and the need for international interchange.

Usage of a calendar system is determined by at least one of the following conditions, by presentation of evidence:

— The system has been approved for official use at some level of government (current, historic, or will be in the near future);
— The system has been used to identify with dates, such as in bibliographic information (current, historic, or will be in the near future).

Justification should be given to indicate that international interchange is necessary.

A similar set of requirements apply to the registration of calendar eras. A calendar era entry must be associated with at least one calendar system entry.

7.2. Principles for allocation of code elements

7.2.1. Relationship with names

Calendar systems codes represent a respective calendar system by virtue of a mapping maintained by the ISO 34300/AG.

The calendar system code is an alphabetic code, and the code may be constructed from alphabetical elements from the name of the corresponding calendar system.

EXAMPLE

> The Gregorian calendar, whose specification is provided in ISO 8601-1:2019, is assigned the code `gregorian` and the short alias code `gre`.

7.2.2. Construction of the alphabetic code

The following rules are to be adhered to for the assignment of the alphabetic code:

— The alphabetic code uses combinations, in lower case, of between 3 and 20 fixed letters of the 26-character Latin alphabet.
— Codes shall encourage descriptive and distinguishable alphabetic names.
— An optional short alias for the alphabetic code composed of 3 fixed letters of the 26-character Latin alphabet is allowed.

7.2.3. User assigned code elements

If users need code elements to represent calendar systems not included in the calendar code registry, the code prefix of `zz` can be used.

The code length for the calendar system identifier must be 3 letters.

Such calendar system identifiers are in the following format:


```
zz[calendar-system-identifier]
```

Figure 3 — User-assigned calendar system identifier pattern

NOTE Users are advised that the above series of codes are not universal, as such those code elements are not meant to be compatible between different entities.

7.3. List of calendar system and their code elements

The list of items composing the content of the country code is initially compiled in a separate dataset outside of this document. Additional and new entries will be listed by the ISO 34300/AG.

Data attributes provided in the list is defined in Clause 7.

7.4. ISO 34300 registration authority

7.4.1. General

ISO has designated a Registration Authority for this International Standard (ISO 34300/RA) to operate under guidelines provided in this document.

ISO 34300 defines the ISO 34300 register, which contains ISO 34300 registration items. Requirements of the ISO 34300 registration item and relevant data models used to represent calendars and calendar eras are also provided in the same document.

7.4.2. Responsibilities

7.4.2.1. Maintenance of the ISO 34300 register

The ISO 34300/RA is responsible for the maintenance of the ISO 34300 register, including code assignments for individual registration items and the information associated with each.

The ISO 34300/RA is also responsible for administering reservations of the codes in the register.

7.4.2.2. Handling data change requests for the ISO 34300 register

ISO 34300/RA is responsible for receiving and reviewing applications for data change requests, including the addition, modification and elimination of registration items within the ISO 34300 register.

It is responsible for informing the applicant of the result of ISO 34300/RA actions.

It shall propose a practical mechanism to apply the proposed change assignment when the relevant criteria are met according to ISO 34300.

After approval by the members of the ISO 34300/AG, the ISO 34300/RA will update and publish the appropriate registrations, with all agreed corrections, if any.

Data changes performed to the ISO 34300 register should be kept for traceability.

7.4.2.3. Publisher of ISO 34300 register

ISO 34300/RA is responsible for disseminating the contents of the ISO 34300 register to the public.

Changes to the content of the list of entries becomes effective immediately upon publication.

The ISO 34300/AGS may consult individual ISO 34300/AG members directly concerning particular problems of implementation raised by users or potential users.

Data changes of the ISO 34300 register should be published and the history of changes made available.

7.4.2.4. Advice to users of the ISO 34300 register

ISO 34300/RA is responsible for providing advice to the public and ISO member bodies on the application, use and implementation of ISO 34300, thereby seeking to promote its widest possible use.

7.4.3. Other responsibilities

Other responsibilities of the ISO 34300/RA include:

1) indicate in operations that it has been designated as ISO 34300/RA by ISO;
2) provide an annual summary report on activity to ISO/TC 154.

7.5. ISO 34300 advisory group

7.5.1. General

The ISO 34300 advisory group (ISO 34300/AG) is appointed to ensure the operations of the registration authority (ISO 34300/RA) are in accordance with guidelines provided in this document.

7.5.2. Responsibilities

The ISO 34300/AG is responsible for providing guidance to ISO 34300/RA on handling of updates and data changes to the ISO 34300 register.

It is also responsible for providing consultation and assistance on the use of ISO 34300 to ISO member bodies.

7.5.3. Voting members

7.5.3.1. General

The ISO 34300/AG voting membership consists of:

- ISO 34300/AG convenor (no vote)
- ISO 34300/AG vice-convenor
- at least 6 to 12 individually named members representing voting member bodies as follows:
  - three (3) to six (6) standing members from international organizations other than ISO;
  - three (3) standing members from within ISO/TC 154 participating member bodies (P-members);
  - three (3) (maximum) rotating members from within ISO/TC 154 participating member bodies (P-members).

ISO/TC 154 should review the membership structure of the ISO 34300/AG at regular intervals to ensure that its members fulfil their obligations (Clause 7.5.5).

Recommendations for changes to the structure shall be submitted to ISO/TC 154 for consideration and, if approved, will be implemented by the time of the next plenary meeting.

The ISO 34300/AG membership list is available on the ISO 34300/AG ISO Documents website.

7.5.3.2. International organization (other than ISO) standing members

A minimum of three (3) and not more than six (6) international organizations that are not within ISO may be appointed to ISO 34300/AG.

These international organizations are selected based on the role that they can play in achieving the greatest use and promotion of ISO 34300. These international organizations are appointed by ISO/TC 154 as standing members. These international organizations are required to be existing Category A liaisons to ISO/TC 154.

7.5.3.3. ISO P-members

7.5.3.3.1. Standing ISO P-members

Three (3) standing P-members may be appointed to consecutive terms in the ISO 34300/AG. These members should reflect the greatest responsibility and productivity within the technical committee structure for this purpose. The P-members are selected by ISO/TC 154 for three-year (3-year) periods which can be renewed automatically for consecutive terms. The composition of the standing members is established by ISO/TC 154.

7.5.3.3.2. Rotating ISO P-members

Any P-members from ISO/TC 154 who are not standing members may apply to be a rotating P-member of ISO 34300/AG. ISO/TC 154 selects up to four (4) P-members amongst the candidates taking into account the following considerations.

— Up to three (3) rotating P-members may sit on the ISO 34300/AG at one time.
— The membership term of a rotating P-member is two (2) years.

NOTE Members leaving the ISO 34300/AG may be re-elected an indefinite number of times. It is recognised that all willing P-members have an opportunity to serve on the ISO 34300/AG.

— Members should be selected in view of the best cultural diversity and geographical representation, for example amongst:
  — African states,
  — Asia and Pacific states,
  — European states,
  — North and South American states.

— Where insufficient nominations are received, the relevant number of seats on the ISO 34300/AG may remain unassigned.

At the first election, three (3) members will be elected, of which two (2) will serve two (2) years before leaving and being replaced whilst the other one will serve three (3) years before leaving and being replaced. Those leaving after two (2) years shall be selected by the drawing of lots.

7.5.4. Non-voting members

7.5.4.1. Associate members

At the acceptance of ISO 34300/AG, non-members of ISO/TC 154 P-members and international organizations may be associated with the work of the ISO 34300/AG.

An associate member body has the same status as a voting member but does not participate in voting.

7.5.4.2. Members for information

These members of the ISO 34300/RA are non-voting members participating directly or indirectly in the maintenance of ISO 34300.

7.5.4.3. Secretariat

The ISO 34300/AG is served by a secretariat (ISO 34300/AGS), as designated by ISO 34300/AG.

7.5.5. Member responsibilities

7.5.5.1. Voting members

Voting members shall have one vote each and shall nominate within their respective organizations:

— one person to act as the representative voting member;
— one person to act as a substitute to its representative in case of unavailability.

These representatives should preferably be chosen to have the expertise necessary to understand ISO 34300 issues.

The ISO 34300/AG shall decide upon changes to registration items in the ISO 34300 register under conditions specified in ISO 34300.

Members are expected to vote, respond and comment without delay within specified time limits on ISO 34300/AG matters and attend meetings of the ISO 34300/AG, as required.

7.5.5.2. Officers

Officers of the ISO 34300/AG include its convenor and vice-convenor. Both roles are nominated by ISO/TC 154.

These two (2) officers shall be representatives of the two (2) different membership groups:

— one (1) from the ISO P-members;
— one (1) from non-ISO international organizations.

These nominations will be submitted to ISO/TC 154 for approval.

When necessary, the vice-convenor replaces the convenor and assumes their responsibilities.

In accordance with ISO's neutrality policy, the convenor will not have a vote on ISO 34300/AG matters. Therefore, if the appointment of the convenor leaves a voting member vacancy from one of its member bodies, the member body shall name a new member to the ISO 34300/AG.

After the appointment of new officers, the outgoing and incoming officers should ensure a smooth and efficient handling of the work with the support of the ISO 34300/AGS during a transitional period.

7.5.5.3. Secretariat

The ISO 34300/AGS is responsible for the administration of maintenance procedures of ISO 34300/AG, including:

— updating and maintaining the ISO 34300/AG membership list;
— calling meetings of ISO 34300/AG voting and/or non-voting members when necessary;

— preparing meeting agendas and providing the minutes from meetings;
— consensus procedures and their reporting.

The ISO 34300/AGS is also responsible for maintaining an efficient arrangement concerning communication and documentation to ISO 34300/AG members and other interested parties.

7.6. Working procedure

7.6.1. Principles

The maintenance procedure shall be as expedient as possible. It generally functions by means of communication technologies. When any of the ISO 34300/AG voting members consider that a meeting is required, the ISO 34300/AGS consults the ISO 34300/AG members about the convening of such a meeting.

As a general principle, to ensure continuity and stability in the system, code elements shall be changed only for compelling reasons.

7.6.2. Consultation phase and procedure

Before opening any vote, a consultation period of at least ten working days shall be conducted amongst the ISO 34300/AG members.

ISO 34300/AG members are invited to provide comments concerning the subject of consultation during this period.

Based on findings from this consultation, the consensus phase may be initiated.

7.6.3. Consensus phase and procedure

Each voting member of the ISO 34300/AG shall have one vote. Votes shall be cast by the nominated representative or the substitute of each voting member. Members shall actively cast their votes, i.e. yes, no or abstention.

Agreement to proposed changes shall be obtained by means of remote communication or at a meeting of the ISO 34300/AG, provided that the matter has been included in the draft agenda of the meeting. These agreements shall be confirmed in writing.

The length of the reply period shall be six working days but at the request of the Convenor or at least one ISO 34300/RA voting member, the reply period may be extended.

For the purposes of the ISO 34300/RA and ISO 34300/AG, the term “working days” shall exclude Saturdays and Sundays. The term “working days” shall also exclude the last five days of December.

Positive consensus is confirmed once there is a two-thirds majority and at least four (4) positive votes.

When there is a two-thirds majority of positive votes, but fewer than four (4) positive votes because of the high number of abstentions, a second round of voting is held.

After the second round, there will be no further ballots on the same proposal.

Recorded abstentions do not count. Voting members not fulfilling their responsibilities by casting an active vote will be reminded of their responsibilities.

7.6.4. Reporting

ISO 34300/AG is responsible for communicating data change decisions to the ISO 34300/RA.

7.7. Maintenance procedures for the ISO 34300 register

7.7.1. General

The maintenance of the ISO 34300 register follows the following criteria:

— requirements and procedures provided by this document;
— registration operations shall adhere to the requirements stated in ISO 19135-1:2015, in which purpose ISO 34300/AG takes the role of "`Control Body`" in the concept system of ISO 19135-1:2015;
— requirements provided in Clause 7.7.2 and Clause 7.7.3.

7.7.2. Change requests

7.7.2.1. General

Requests for additions, deletions, and changes of registration items are received by ISO 34300/RA.

The proposer is responsible for providing justification regarding the eligibility of such change.

The procedure for treating such requests is as follows:

1) ISO 34300/RA verifies that the request is supported by justification meeting the necessary eligibility criteria.
   NOTE Meeting the criteria is necessary for consideration but might not be sufficient for inclusion in ISO 34300.

2) ISO 34300/RA initiates a consultation in ISO 34300/AG about the proposed update and possible changes necessary. When ISO 34300/RA consults ISO 34300/AG about the proposed inclusion, deletion or change, and proposes a mechanism to implement such change, ISO 34300/AG is obliged to respond within one month.
3) Following the consultation, ISO 34300/AG decides through the defined consensus procedure whether the requested change is to be applied.
   a) If ISO 34300/AG confirms the adoption of the change, the change will be implemented by the ISO 34300/RA.
   b) Otherwise, the request is rejected and the party that made the request informed.

7.7.2.2. Registration of a new calendar system and calendar era

A calendar system and calendar era is eligible for registration if it meets the requirements stated in ISO 34300.

The ISO 34300/AG will decide upon the addition, on the basis of eligibility and usage justification.

Code elements will be allocated by the ISO 34300/AG at its discretion.

Since a calendar system requires at least one calendar era, the application and assignment of calendar system and calendar era codes can be performed at once.

7.7.2.3. Modification of a calendar system or calendar era code

The ISO 34300/AG will decide upon the modification, on the basis of the information received.

The previously assigned code is reserved after modification for backwards-compatibility purposes.

7.7.2.4. Removal of a calendar system or a calendar era code

The ISO 34300/AG will decide upon the deletion, on the basis of the information received.

The corresponding code element is reserved.

7.7.2.5. Modification of associated data elements to registered calendar systems and calendar era codes

The ISO 34300/AG will decide upon the proposed modification based on information received.

A significant change of name may require the ISO 34300/AG to change the code of the registered element concerned. The ISO 34300/AG, however, shall endeavor to maintain stability in the list of codes.

7.7.3. Reservation of code elements

7.7.3.1. General

Some code elements are reserved:

— for a limited period when their reservation is the result of the deprecation (Clause 7.7.2.4) or the alteration (Clause 7.7.2.5) of an entry;
— for an indeterminate period when the reservation is the result of the application of international law or of exceptional requests (Clause 7.7.3.3).

7.7.3.2. Period of non-allocation

Code elements that the ISO 34300/AG has altered or deleted should not be reallocated during a period of at least ten years after the change.

The exact period is determined in each case on the basis of the extent to which the former code element was used.

7.7.3.3. Exceptional reservations

Code elements may be reserved, in exceptional cases, for calendar systems and calendar eras which the ISO 34300/AG has decided not to include in the lists maintained by ISO 34300/RA, but for which an interchange or encoding requirement exists.

7.7.3.4. Reallocation

Before reallocating a former code element or a formerly reserved code element, the ISO 34300/AG shall consult, as appropriate, the authority or agency on whose behalf the code element was reserved, and consideration shall be given to difficulties which might arise from the reallocation.

7.7.3.5. User-assigned code elements

ISO 34300/RA and ISO 34300/AG do not keep a record of the notifications concerning user-assigned code elements received.

7.7.3.6. List of reserved code elements

A list of reserved code elements is kept by the ISO 34300/RA.

Bibliography

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[2] ISO/IEC TR 15285:1998, International Organization for Standardization (committee). *Information technology — An operational model for characters and glyphs*. First edition. 1998. Geneva: International Organization for Standardization and International Electrotechnical Commission. https://www.iso.org/standard/27163.html.

[3] ISO 8601-1:2019, International Organization for Standardization (committee). *Date and time — Representations for information interchange — Part 1: Basic rules*. First edition. 2019. Geneva: International Organization for Standardization. https://www.iso.org/standard/70907.html.

[4] The XXIIIrd International Astronomical Union General Assembly, *The XXIIIrd International Astronomical Union General Assembly*, 1997. Available at: https://www.iers.org/IERS/EN/Science/Recommendations/resolutionB1.html

[5] ISO 34000, ISO.

