

# Date and time – Codes for calendar systems

## Working Draft Standard

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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

Calendars are an essential element in date tracking.

With multiple calendar systems in common use across the international community, it is necessary for a number of applications to identify calendar systems used for particular dates and times, including for computing, archiving, communication and bibliography.

This standard sets out the necessary procedures to maintain the registry of calendar systems. == Scope

This document provides a list of codes to represent calendar systems 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.



# Date and time — Codes for calendar systems

## 1. 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, *Codes for the representation of names of languages—Part 1: Alpha-2 code*

ISO 639-2, *Codes for the representation of names of languages—Part 2: Alpha-3 code*

ISO 3166-1, *Codes for the representation of names of countries and their subdivisions—Part 1: Country code*

ISO 5127 (all parts), *Information and documentation – Foundation and vocabulary*

ISO 15924:2004, *Information and documentation—Codes for the representation of names of scripts*

ISO/CD 34000, *Date and time—Concepts and vocabulary*

## 2. Terms and definitions

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

### 2.1.

#### **script**

particular graphic representation or class of representations of a set of characters used to write one or more languages

[SOURCE: ISO 5127 (all parts), Clause 3.1.6.02]

### 2.2.

#### **code**

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

[SOURCE: ISO 639-2]

### 2.3.

#### **language code**

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

[SOURCE: ISO 5127 (all parts), Clause 3.2.5.14]

### 2.4.

#### **script code**

combination of characters used to represent the name of a script

[SOURCE: ISO 15924:2004, Clause 3.8]

### 2.5.

#### **calendar code**

code ([Clause 2.2](#)) used to represent a calendar system

## 3. Calendar system models overview

The data models are arranged as shown in the following structure.

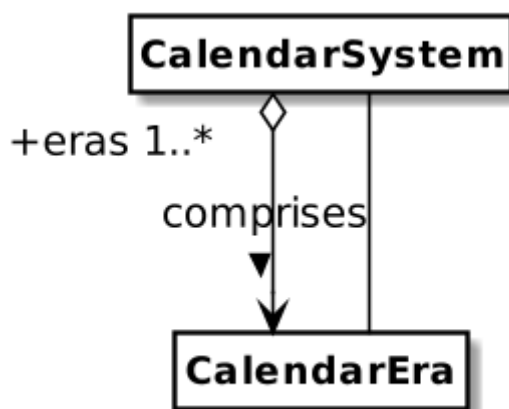


Figure 1 — Calendar system model overview in UML

## 4. Data types

### 4.1. Core data types

These are the core data types used within this document.

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

### 4.2. Common data types

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

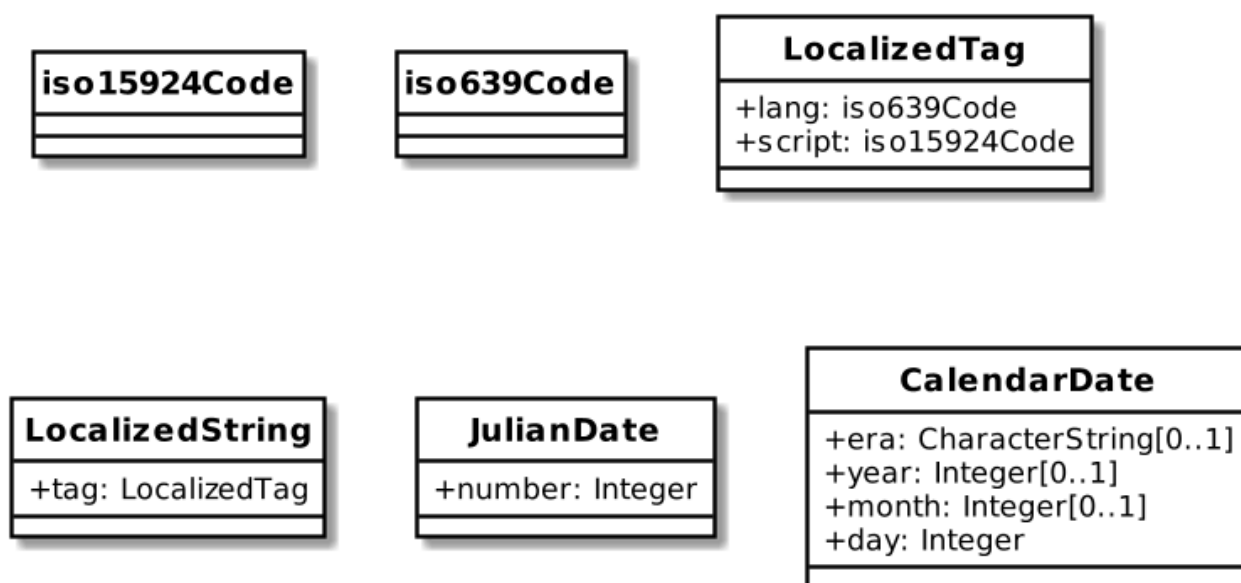


Figure 2 — Data types used in this document



### 4.3. iso15924Code

The [ISO 15924:2004](#) code list is used in this document to represent scripts.

### 4.4. iso639Code

The [ISO 639-2](#) code list is used in this document to represent languages.

### 4.5. LocalizedTag

The LocalizedTag is a data structure used to tag a text with the script, language and transcription codes.

**Table 1 — LocalizedTag attributes**

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
lang	ISO 639-2 code for identification of language.	M	1	iso639Code
script	ISO 15924 code for identification of script.	M	1	iso15924Code

### 4.6. LocalizedString

This represents a localized string with corresponding localization information.

**Table 2 — LocalizedString attributes**

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
tag	Localization information	M	1	LocalizedTag

### 4.7. JulianDate

This represents a reference to a day in the Julian Date system.

**Table 3 — JulianDate attributes**

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
number	Number of days since Julian Date 0.	M	1	Integer

### 4.8. CalendarDate

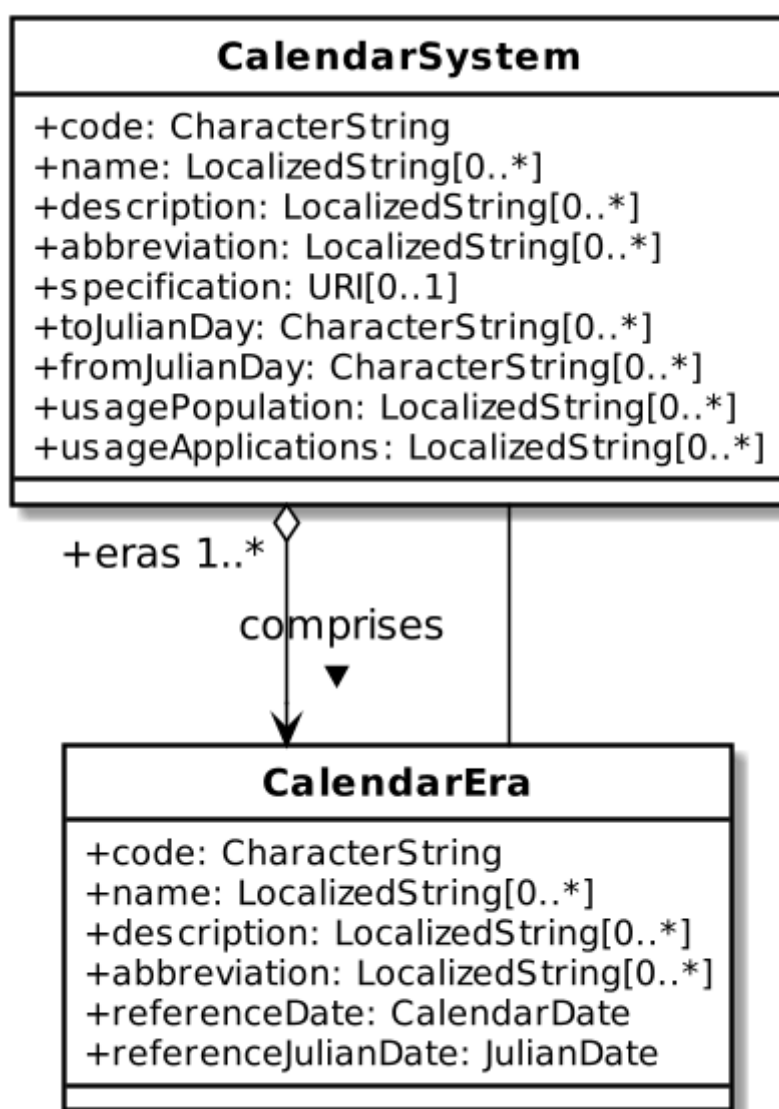
This represents a date reference in a calendar system.

**Table 4 — CalendarDate attributes**

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
era	Code of calendar era	O	1	CharacterString
year	Ordinal number of year in the calendar era	O	1	Integer
month	Ordinal number of month in the calendar year	O	1	Integer

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
day	Ordinal number of day in the previous date reference construct	M	1	Integer

## 5. Data models



**Figure 3 — Calendar system and era models in UML**

### 5.1. CalendarSystem

This represents a calendar system. Calendar systems are used to identify and mark days within a year.

**Table 5 — CalendarSystem attributes**

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
code	Unique identifying code of this calendar era.	M	1	CharacterString

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
name	Name of this calendar era.	O	N	LocalizedString
description	Localized versions of the calendar system names tagged with script codes ( <a href="#">ISO 15924:2004</a> ) and language codes ( <a href="#">ISO 639-1</a> ).	O	N	LocalizedString
abbreviation	Abbreviation of this calendar era. Multiple abbreviations are accepted.	O	N	LocalizedString
specification	A URI that provides the full specification of this calendar system.	O	1	URI
toJulianDay	Mechanism to convert a calendar date in this calendar system to a calendar date in the Julian Date system.	O	N	CharacterString
fromJulianDay	Mechanism to convert a calendar date in the Julian Date system to a calendar date in this calendar system.	O	N	CharacterString
usagePopulation	Populations that this calendar system is relevant to.	O	N	LocalizedString
usageApplications	Applications that this calendar system is relevant to.	O	N	LocalizedString

## 5.2. CalendarEra

This represents a calendar era.

NOTE calendar eras within a calendar system may overlap, and is therefore unnecessary to have an end reference date.

**Table 6 – CalendarEra attributes**

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
code	Unique identifying code of this calendar era.	M	1	CharacterString
name	Name of this calendar era.	O	N	LocalizedString
description	Localized versions of the calendar era names tagged with script codes ( <a href="#">ISO 15924:2004</a> ) and language codes ( <a href="#">ISO 639-1</a> ).	O	N	LocalizedString
abbreviation	Abbreviation of this calendar era. Multiple abbreviations are accepted.	O	N	LocalizedString

Name	Definition	Mandatory/ Optional/ Conditional	Max Occur	Data Type
referenceDate	Date of current calendar era at the day referred to by referenceJulianDate.	M	1	CalendarDate
referenceJulianDate	Julian date that marks the beginning of this calendar era.	M	1	JulianDate

## 6. Codes and identifiers

### 6.1. Requirements

#### 6.1.1. 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.

### 6.2. Principles for allocation of code elements

#### 6.2.1. Relationship with names

Calendar systems have codes in the following format:

[system-code]

**Figure 4**

#### EXAMPLE

gregorian or gre for the Gregorian calendar, whose specification is provided in [ISO 8601-1](#).

#### 6.2.2. 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 additional short alias for the alphabetic code composed of 3 fixed letters of the 26-character Latin alphabet is allowed.

### 6.2.3. 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 5**

NOTE Users are advised that the above series of codes are not universals, those code elements are not compatible between different entities.

### 6.3. List of calendar system and their code elements

The list of items composing the content of the country code is initially defined in [\[annex-system-codes\]](#). Additional and new entries will be listed by the ISO 34300/AG.

Data attributes provided in the list is defined in [Clause 6](#).

## **Appendix A (normative) Registration**

### **A.1. Registration authority (ISO 34300/RA)**

A registration authority (ISO 34300/RA) has been appointed to operate under guidelines provided in this Annex.

It has been entrusted with the following functions with regard to the list of calendar systems and calendar eras, together with code assignments and information associated with each entry:

- a) to add and eliminate these entries, in accordance with the rules in this document;
- b) to advise users and ISO member bodies regarding application of such information;
- c) to update and disseminate such information;
- d) to maintain a reference list of such information;
- e) to publish changes made to such information and the history of changes allowing traceability;
- f) to administer the reservation of the codes.

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

The criteria provided in [Appendix A.3.1](#) to [Appendix A.6](#) shall be observed by the ISO 34300/RA for changes to the list of calendar systems and calendar eras, their code assignments and associated information, and for reservations of code elements.

### **A.2. Advisory group (ISO 34300/AG)**

An advisory group (ISO 34300/AG) has been appointed to ensure the operations of the registration authority (ISO 34300/RA) are in accordance with guidelines provided in this Annex.

### **A.3. Operations on list of calendar systems and calendar eras and their codes**

#### **A.3.1. Registration of a new calendar system and calendar era**

Additions to the list of calendar systems and calendar eras shall be made on the basis of information from upon the request of a member of ISO 34300/AG.

A calendar system is eligible for registration if it meets the requirements stated in [Clause 6.1](#).

The proposer is responsible for providing justification to the ISO 34300/AG regarding the eligibility of such addition.

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.

#### **A.3.2. Modification of a calendar system or calendar era code**

Modifications of a code within the list of calendar systems and calendar eras shall be made upon the request of a member of ISO 34300/AG.

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.

#### **A.4. Removal from the list of calendar system and calendar era codes**

Removal of a code from the list of calendar systems and calendar eras shall be made upon the request of a member of ISO 34300/AG.

The ISO 34300/AG will decide upon the deletion, on the basis of the information received. The corresponding code element is reserved.

#### **A.5. Removal of elements from the list of calendar system and calendar era codes**

Deletion from the list of calendar system and calendar era codes shall be made only by the ISO 34300/AG or upon a request to it.

The ISO 34300/AG will decide upon the deletion, on the basis of the information received. The corresponding code element is reserved.

#### **A.6. Alterations to elements on list of calendar system and calendar era codes**

Alterations to a registered element shall be made only by the ISO 34300/AG or upon a request to it.

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

#### **A.7. Reservation of code elements**

##### **A.7.1. Introduction**

Some code elements are reserved:

- for a limited period when their reservation is the result of the deprecation ([Appendix A.4](#)) or the alteration ([Appendix A.6](#)) of an entry;
- for an indeterminate period when the reservation is the result of the application of international law or of exceptional requests ([Appendix A.7.3](#)).

##### **A.7.2. 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.

##### **A.7.3. 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.

##### **A.7.4. 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.

##### **A.7.5. List of reserved code elements**

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

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## **A.8. Advice regarding use of code elements**

The ISO 34300/AG is available for consultation and assistance on the use of codes for calendar systems and calendar eras.



## Bibliography

- [1] ISO/IEC 10646-2, *Information technology— Universal Multiple-Octet Coded Character Set (UCS)— Part 2: Supplementary Planes*
- [2] ISO/IEC TR 15285:1998, *Information technology—An operational model for characters and glyphs*
- [3] ISO 8601-1, *Date and time— Representations for information interchange— Part 1: Basic rules*
- [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>