
Intelligent transport systems — Graphic data dictionary —

Part 2: Examples

*Systèmes de transport intelligents — Dictionnaire de données
graphiques —
Partie 2: Exemples*

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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 documents 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).

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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 204, *Intelligent transport systems*.

A list of all parts in the ISO 14823 series can be found on the ISO website.

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 presents examples of ASN.1 coding of a Graphic Data Dictionary (GDD) that has been developed with the intent of creating a common basis for transmitting encoded information for existing road traffic signs and pictograms. The coding system has been developed to be language independent, such that data that can be interpreted, irrespective of language or regional differences. It supports Intelligent Transport System (ITS) applications such as in-vehicle signage or in-vehicle information.

This document supports

- the efficient IT-centric encoding for ITS messaging to represent specific road traffic signs and pictograms, and
- the consistent decoding of encoded road traffic signs and pictogram data for display in ITS.

This document can support the translation of signs and pictograms with a similar purpose from the representation used in one country to the representation used in another country.

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Intelligent transport systems — Graphic data dictionary —

Part 2: Examples

1 Scope

This document reports examples of ASN.1 codes based on ISO 14823-1¹⁾, which specifies a graphic data dictionary (GDD) including the ASN.1 coding rule for GDD.

NOTE Some of the ASN.1 codes described in this document are re-formatted based on ISO 14813-6.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions 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 <http://www.electropedia.org/>

3.1

attribute

code attached to the *pictogram* (3.4) in order to clarify the meaning of the pictogram

3.2

country code

internationally recognised codes stipulated by ISO 3166-1 when referring to countries and subdivisions of countries

3.3

graphic data dictionary

GDD

catalogue of codes for *pictograms* (3.4) organised systematically

3.4

pictogram

sign or icon rendered on a display of an IT system such as a computer or VMS to inform travellers of information such as traffic regulations or public facilities

3.5

pictogram category code

codes assigned to the more detailed category of a *pictogram* (3.4) type under the service category

3.6

qualifier

parameter for an *attribute* (3.1) used to express the meaning of *pictogram* (3.4) quantitatively

1) To be published.

4 Abbreviated terms

ASN.1	Abstract Syntax Notation One
ITS	Intelligent Transport Systems
IT	Information Technology
UML	Unified Modelling Language
U.N.	United Nations
VMS	Variable Message Sign

5 Use case

A typical use case of GDD is in-vehicle signage service, which is detailed in ISO/TS 17425.

6 Examples of ASN.1 description

6.1 ASN.1 schema

The ASN.1 description of GDD consists of pictogramCode and attributes. Attributes are optionally utilised when a pictogram has quantitative factors such as time, length or angle. The ASN.1 schema of GDD is as follows.

```
GDD {iso (1) standard (0) gdd(14823) version1 (0)}  
DEFINITIONS AUTOMATIC TAGS::=  
BEGIN
```

```
GddStructure ::= SEQUENCE {  
    pictogramCode      Pictogram,  
    attributes          GddAttributes OPTIONAL  
}  
Pictogram ::= SEQUENCE {  
    countryCode      Pictogram-countryCode OPTIONAL,  
    serviceCategoryCode Pictogram-serviceCategory,  
    pictogramCategoryCode Pictogram-category  
}
```

```
Pictogram-countryCode ::= OCTET STRING (SIZE (2))
```

```
Pictogram-serviceCategory ::= CHOICE {  
    trafficSignPictogram      Pictogram-trafficSign,  
    publicFacilitiesPictogram Pictogram-publicFacilitySign,  
    ambientOrRoadConditionPictogram Pictogram-conditionsSign  
}  
Pictogram-category ::= SEQUENCE {  
    nature      Pictogram-nature,  
    serialNumber Pictogram-serialNumber  
}
```

```
Pictogram-trafficSign ::= ENUMERATED {  
    dangerWarning (11),  
    regulatory (12),  
    informative (13),  
    ...  
}  
Pictogram-publicFacilitySign ::= ENUMERATED {  
    publicFacilities (21),  
    ...  
}  
Pictogram-conditionsSign ::= ENUMERATED {  
    ambientCondition (31),
```



```

    roadCondition (32),
    ...
}
Pictogram-nature::=INTEGER (1..9)
Pictogram-serialNumber::=INTEGER (0..99)

GddAttributes::= SEQUENCE (SIZE(1..8),...) OF CHOICE{
dtm InternationalSign-applicablePeriod,
edt InternationalSign-exemptedApplicablePeriod,
dfl InternationalSign-directionalFlowOfLane,
ved InternationalSign-applicableVehicleDimensions,
spe InternationalSign-speedLimits,
roi InternationalSign-rateOfIncline,
dbv InternationalSign-distanceBetweenVehicles,
ddd InternationalSign-distinationInformation,
set InternationalSign-section,
nol InternationalSign-numberOfLane
}

InternationalSign-applicablePeriod::= SEQUENCE {
year SEQUENCE {
yearRangeStartYear Year,
yearRangeEndYear Year
} OPTIONAL,
month-day SEQUENCE {
dateRangeStartMonthDate MonthDay,
dateRangeEndMonthDate MonthDay
} OPTIONAL,
repeatingPeriodDayTypes RPDT OPTIONAL,
hourMinutes SEQUENCE {
timeRangeStartTime HoursMinutes,
timeRangeEndTime HoursMinutes
} OPTIONAL,
dateRangeOfWeek DayOfWeek OPTIONAL,
durationHourminute HoursMinutes OPTIONAL
}

MonthDay::= SEQUENCE {
month MonthDay-month,
day MonthDay-day
}
HoursMinutes::= SEQUENCE {
hours HoursMinutes-hours,
mins HoursMinutes-mins
}
Year::=INTEGER(2000..2127,...)
MonthDay-month::=INTEGER (1..12)
MonthDay-day::=INTEGER (1..31)
HoursMinutes-hours::=INTEGER (0..23)
HoursMinutes-mins::=INTEGER (0..59)
RPDT::= BIT STRING {national-holiday (0), even-days(1), odd-days(2), market-day(3) } (SIZE
(4))
DayOfWeek::= BIT STRING {unused(0), monday(1), tuesday(2), wednesday(3), thursday(4),
friday(5), saturday(6), sunday(7)} (SIZE (8))

InternationalSign-exemptedApplicablePeriod::= InternationalSign-applicablePeriod

InternationalSign-section::= SEQUENCE{
startingPointLength Distance OPTIONAL,
continuityLength Distance OPTIONAL
}

InternationalSign-numberOfLane::= INTEGER(0..99)

InternationalSign-directionalFlowOfLane::= INTEGER {
sDL (1),
sLT (2),
sRT (3),
lTO (4),
rTO (5),
cLL (6),

```

```

    cRI      (7),
    oVL      (8)
} (1..8)

```

```

InternationalSign-applicableVehicleDimensions ::= SEQUENCE{
    vehicleHeight    Distance OPTIONAL,
    vehicleWidth     Distance OPTIONAL,
    vehicleLength    Distance OPTIONAL,
    vehicleWeight    Weight OPTIONAL
}

```

```

Distance ::= SEQUENCE{
    value INTEGER(1..16384),
    unit Code-Units(2..4|6..8)
}

```

```

Weight ::= SEQUENCE {
    value INTEGER(1..16384),
    unit Code-Units (10..12)
}

```

```

Code-Units ::= INTEGER {
    kmperh (0),
    milesperh (1),
    kilometre (2),
    metre (3),
    decimetre (4),
    centimetre (5),
    mile (6),
    yard (7),
    foot (8),
    minutesOfTime (9),
    tonnes (10),
    hundredkg (11),
    pound (12),
    rateOfIncline (13),
    durationinminutes (14)
} (0..15)

```

```

InternationalSign-speedLimits ::= SEQUENCE{
    speedLimitMax INTEGER(0..250) OPTIONAL,
    speedLimitMin INTEGER(0..250) OPTIONAL,
    unit Code-Units(0..1)
}

```

```

InternationalSign-rateOfIncline ::= INTEGER(1..32)

```

```

InternationalSign-distanceBetweenVehicles ::= Distance

```

```

InternationalSign-distinationInformation ::= SEQUENCE{
    junctionDirection    DistinInfo-junctionDirection OPTIONAL,
    roundaboutCwDirection DistinInfo-roundaboutCwDirection OPTIONAL,
    roundaboutCcWDirection DistinInfo-roundaboutCcWDirection OPTIONAL,
    ioList                SEQUENCE (SIZE (1..8,...)) OF DistinationInformationIO
}

```

```

DistinationInformationIO ::= SEQUENCE{
    arrowDirection    IO-arrowDirection,
    destPlace         SEQUENCE (SIZE (1..4,...)) OF DestinationPlace OPTIONAL,
    destRoad          SEQUENCE (SIZE (1..4,...)) OF DestinationRoad OPTIONAL,
    roadNumberIdentifier IO-roadNumberIdentifier OPTIONAL,
    streetName        IO-streetName OPTIONAL,
    streetNameText    IO-streetNameText OPTIONAL,
    distanceToDivergingPoint DistanceOrDuration OPTIONAL,
    distanceToDestinationPlace DistanceOrDuration OPTIONAL
}

```

```

DestinationPlace ::= SEQUENCE{
    destType    DestinationType,
    destRSCode  GddStructure (WITH COMPONENTS {..., attributes ABSENT}) OPTIONAL,
    destBlob    DestPlace-destBlob OPTIONAL,
    placeNameIdentification DestPlace-placeNameIdentification OPTIONAL,
    placeNameText    DestPlace-placeNameText OPTIONAL
}

```

```

    }

DestinationRoad ::= SEQUENCE {
    derType      DestinationRoadType,
    roadNumberIdentifier  DestRoad-roadNumberIdentifier OPTIONAL,
    roadNumberText  DestRoad-roadNumberText OPTIONAL
}

DistanceOrDuration ::= SEQUENCE {
    value DistOrDuration-value,
    unit DistOrDuration-Units
}

DistinInfo-junctionDirection ::= INTEGER(1..128)
DistinInfo-roundaboutCwDirection ::= INTEGER(1..128)
DistinInfo-roundaboutCcwDirection ::= INTEGER(1..128)

IO-arrowDirection ::= INTEGER(0..7)
IO-roadNumberIdentifier ::= INTEGER(1..999)
IO-streetName ::= INTEGER(1..999)
IO-streetNameText ::= UTF8String

DestPlace-destBlob ::= OCTET STRING
DestPlace-placeNameIdentification ::= INTEGER(1..999)
DestPlace-placeNameText ::= UTF8String

DestRoad-roadNumberIdentifier ::= INTEGER(1..999)
DestRoad-roadNumberText ::= UTF8String

DistOrDuration-value ::= INTEGER(1..16384)
DistOrDuration-Units ::= Code-Units(2..9)

DestinationRoadType ::= INTEGER {
    none (0),
    nationalHighway (1),
    localHighway (2),
    tollExpresswayMotorway (3),
    internationalHighway (4),
    highway (5),
    expressway (6),
    nationalRoad (7),
    regionalProvincialRoad (8),
    localRoad (9),
    motorwayJunction (10),
    diversion (11),
    rfu1 (12),
    rfu2 (13),
    rfu3 (14),
    rfu4 (15)
} (0..15, ...)

DestinationType ::= INTEGER {
    none (0),
    importantArea (1),
    principalArea (2),
    generalArea (3),
    wellKnownPoint (4),
    country (5),
    city (6),
    street (7),
    industrialArea (8),
    historicArea (9),
    touristicArea (10),
    culturalArea (11),
    touristicRoute (12),
    recommendedRoute (13),
    touristicAttraction (14),
    geographicArea (15)
} (0..15, ...)

```

END