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## **Health informatics — Point-of-care medical device communication — Part 10101: Nomenclature**

*Informatique de santé — Communication entre dispositifs médicaux sur le  
site des soins —  
Partie 10101: Nomenclature*



**IEEE**

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# **Health informatics — Point-of-care medical device communication — Part 10101: Nomenclature**

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**IEEE 1073™ Standard Committee**

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**IEEE Engineering in Medicine and Biology Society**

Approved 24 June 2004

**IEEE-SA Standards Board**



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**Abstract:** Within the context of the ISO/IEEE 11073 family of standards for point-of-care (POC) medical device communication (MCD), this standard provides the nomenclature that supports both the domain information model and service model components of the standards family, as well as the semantic content exchanged with medical devices. The nomenclature is specialized for patient vital signs information representation and medical device informatics, with major areas including concepts for electrocardiograph (ECG), haemodynamics, respiration, blood gas, urine, fluid-related metrics, and neurology, as well as specialized units of measurement, general device events, alarms, and body sites. The standard defines both the architecture and major components of the nomenclature, along with extensive definitions for each conceptual area.

**Keywords:** codes, information model, medical device communication, nomenclature, ontology, patient, point-of-care, POC, semantics, service model, terminology

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Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75% of the member bodies casting a vote.

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## IEEE Introduction

This introduction is not part of ISO/IEEE 11073-10101:2004(E), Health informatics — Point-of-care medical device communication — Part 10101: Nomenclature.

ISO/IEEE 11073 standards enable communication between medical devices and external computer systems. They provide automatic and detailed electronic data capture of patient vital signs information and device operational data. The primary goals are to:

- Provide real-time plug-and-play interoperability for patient-connected medical devices
- Facilitate the efficient exchange of vital signs and medical device data, acquired at the point-of-care, in all health care environments

“Real-time” means that data from multiple devices can be retrieved, time correlated, and displayed or processed in fractions of a second. “Plug-and-play” means that all the clinician has to do is make the connection — the systems automatically detect, configure, and communicate without any other human interaction.

“Efficient exchange of medical device data” means that information that is captured at the point-of-care (e.g., patient vital signs data) can be archived, retrieved, and processed by many different types of applications without extensive software and equipment support, and without needless loss of information. The standards are especially targeted at acute and continuing care devices, such as patient monitors, ventilators, infusion pumps, ECG devices, etc. They comprise a family of standards that can be layered together to provide connectivity optimized for the specific devices being interfaced.

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### Interpretations

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# Health informatics — Point-of-care medical device communication — Part 10101: Nomenclature

## 1. Scope

The scope of this standard is nomenclature architecture for point-of-care (POC) medical device communication (MDC). It consists of three parts: the body of the standard, which defines the overall architecture of the organization and relationships among nomenclature components; normative Annex A and Annex B, which provide specifications of semantics and syntaxes, respectively; and informative Annex C, the bibliography.

This standard is intended for use within the context of IEEE Std 1073,<sup>1</sup> which sets out the relationship between this and other documents in the POC MDC series.

## 2. Conformance

There are no particular implementation conformance requirements defined in this standard, but some requirements for nomenclature representation are established in this standard to guide specification of semantics and syntax in other parts of the overall standard.

## 3. Normative references

The following normative documents contain provisions that, through reference in this text, constitute provisions of ISO/IEEE 11073-10101. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on ISO/IEEE 11073-10101 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid international standards.

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<sup>1</sup>Information on references can be found in Clause 3.

CEN ENV 12611, Medical Informatics — Categorical structure of systems of concepts — Medical Devices.<sup>2</sup>

IEEE Std 1073™, IEEE Standard for Medical Device Communications—Overview and Framework.<sup>3</sup>

ISO/IEC 8824 (all parts), Information technology — Abstract Syntax Notation One (ASN.1).<sup>4</sup>

ISO/IEC 8825 (all parts), Information technology —ASN.1 encoding rules.

ISO/IEC 9596-1, Information technology — Open systems interconnection — Common Management Information Protocol — Part 1: Specification.

ISO/IEEE 11073-10201, Health informatics — Point-of-care medical device communication — Part 10201: Domain information model (referred to hereinafter as the “DIM”).

ISO/IEEE 11073-20101, Health informatics — Point-of-care medical device communication — Part 20101: Application profiles – Base standard.

## 4. Terms and definitions

For the purposes of this standard, the following terms and definitions apply. *The Authoritative Dictionary of IEEE Standards Terms*, Seventh Edition, [B10]<sup>5</sup> should be referenced for terms not defined in this clause.

**4.1 corollary:** a semantic and a syntactical representation that are correlated by a unique code.

**4.2 -tuple:** a component of a relation; e.g., a 2-tuple has two relational components.

**4.3 unique:** nonredundant.

## 5. Symbols (and abbreviated terms)

|        |                                                                               |
|--------|-------------------------------------------------------------------------------|
| API    | application program interface                                                 |
| ASN.1  | Abstract Syntax Notation One (ISO/IEC 8824)                                   |
| BAEP   | brainstem acoustic evoked potential                                           |
| BCC    | bedside communication controller                                              |
| BER    | basic encoding rules (ISO/IEC 8825-1).                                        |
| CMDISE | communication medical device information service element (CEN ENV 13735 [B5]) |
| CMIP   | Common Management Information Protocol (ISO/IEC 9596-1)                       |
| CMIP*  | Common Management Information Protocol using ISO/IEEE 11073 MDDL/<br>MDER     |
| CNS    | central nervous system                                                        |

<sup>2</sup>CEN publications are available from the European Committee for Standardization (CEN), 36, rue de Stassart, B-1050 Brussels, Belgium (<http://www.cenorm.be>).

<sup>3</sup>IEEE publications are available from the Institute of Electrical and Electronics Engineers, Inc., 445 Hoes Lane, Piscataway, NJ 08854, USA (<http://www.standards.ieee.org/>).

<sup>4</sup>ISO/IEC documents can be obtained from the ISO office, 1 rue de Varembé, Case Postale 56, CH-1211, Genève 20, Switzerland/Suisse (<http://www.iso.ch/>) and from the IEC office, 3 rue de Varembé, Case Postale 131, CH-1211, Genève 20, Switzerland/Suisse (<http://www.iec.ch/>). ISO/IEC publications are also available in the United States from the Sales Department, American National Standards Institute, 25 West 43rd Street, 4th Floor, New York, NY 10036, USA (<http://www.ansi.org/>).

<sup>5</sup>The numbers in brackets correspond to the numbers of the bibliography in Annex C.

|                   |                                                                                                                                                                                                                                        |
|-------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CSF               | cerebrospinal fluid                                                                                                                                                                                                                    |
| CVS               | cardiovascular system                                                                                                                                                                                                                  |
| DCC               | device communication controller                                                                                                                                                                                                        |
| DIM               | domain information model, as defined in vital signs information representation (VITAL), interoperability of patient-connected medical devices (INTERMED), and medical device data language (MDDL) (ISO/IEEE 11073-10201 <sup>6</sup> ) |
| ECG               | electrocardiogram or electrocardiograph                                                                                                                                                                                                |
| ECoG              | electrocochleograph                                                                                                                                                                                                                    |
| EEG               | electroencephalogram or electroencephalograph                                                                                                                                                                                          |
| EMG               | electromyogram or electromyograph                                                                                                                                                                                                      |
| EOG               | electrooculogram                                                                                                                                                                                                                       |
| ERG               | electroretinogram or electroretinograph                                                                                                                                                                                                |
| FEF               | file exchange format (CEN/TC251/PT-40 [B7])                                                                                                                                                                                            |
| FFT               | fast Fourier transform                                                                                                                                                                                                                 |
| FSM               | finite state machine                                                                                                                                                                                                                   |
| HL7 <sup>®7</sup> | Health Level Seven                                                                                                                                                                                                                     |
| ICU               | intensive care unit                                                                                                                                                                                                                    |
| ID                | identifier                                                                                                                                                                                                                             |
| INTERMED          | interoperability of patient-connected medical devices (CEN ENV 13735 [B5])                                                                                                                                                             |
| LLAEP             | long latency acoustic evoked potential                                                                                                                                                                                                 |
| MDAP              | medical device application profile (The acronym <i>MDAP</i> may be substituted for the phrase <i>ISO/IEEE 11073-20000 family of standards.</i> )                                                                                       |
| MDC               | medical device communication                                                                                                                                                                                                           |
| MDDL              | medical device data language (The acronym <i>MDDL</i> may be substituted for the phrase <i>ISO/IEEE 11073-10000 family of standards.</i> )                                                                                             |
| MDER              | medical device encoding rules, as defined in medical device application profile (MDAP)                                                                                                                                                 |
| MDIB              | medical data information base, as defined in ISO/IEEE 11073-10201                                                                                                                                                                      |
| MDS               | medical device system, an abstraction for a medical device (ISO/IEEE 11073-10201)                                                                                                                                                      |
| MIB               | management information base                                                                                                                                                                                                            |
| MLAEP             | middle latency acoustic evoked potential                                                                                                                                                                                               |
| NCS               | nerve conductens study                                                                                                                                                                                                                 |
| NOS               | not otherwise specified                                                                                                                                                                                                                |
| OO                | object-oriented                                                                                                                                                                                                                        |
| OID               | object identifier                                                                                                                                                                                                                      |
| PCA               | patient-controlled analgesia                                                                                                                                                                                                           |
| PDU               | protocol data unit (also referred to as a <i>message</i> ; by convention, the term <i>PDU</i> s is used in text to indicate multiplicity)                                                                                              |
| PFC               | physiological function code, which represents a physiological concept such as heart rate, blood pressure, etc.                                                                                                                         |
| POC               | point of care or point-of-care                                                                                                                                                                                                         |
| SCADA             | supervisory control and data acquisition                                                                                                                                                                                               |
| SCO               | service and control object                                                                                                                                                                                                             |

<sup>6</sup>The DIM was originally defined in CEN ENV 13734 [B4] and CEN ENV 13735 [B5], which are now superseded by ISO/IEEE 11073-10201.

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|                      |                                                                                                                                                                                                                                                        |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| SCP-ECG              | Standard Communications Protocol for Computer-Assisted Electrocardiography (CEN ENV 1064 [B1])                                                                                                                                                         |
| SEP                  | somatosensory evoked potential (also <i>systolic ejection period</i> in the context of haemodynamic monitoring measurements)                                                                                                                           |
| SNOMED <sup>®8</sup> | Systematized Nomenclature of Medicine                                                                                                                                                                                                                  |
| VEP                  | visual evoked potential                                                                                                                                                                                                                                |
| VMD                  | virtual medical device; an abstraction of a medical device modality; e.g., a <i>vital signs monitor medical device system (MDS)</i> might comprise electrocardiogram (ECG), blood pressure, temperature, and other related VMDs (ISO/IEEE 11073-10201) |
| VMO                  | virtual medical object (ISO/IEEE 11073-10201)                                                                                                                                                                                                          |
| VMS                  | virtual medical system (ISO/IEEE 11073-10201)                                                                                                                                                                                                          |
| VITAL                | vital signs information representation (CEN ENV 13734 [B4])                                                                                                                                                                                            |
| 0x<value>            | hexadecimal encoding; e.g., the notation 0x0001 implies a 16-bit code with a decimal value of 1                                                                                                                                                        |

## 6. Application

Nomenclature in this standard is primarily intended to be used in protocol data units (PDUs) as values of fields, typically object-oriented attributes, which specify particular alternatives among a related semantic set. The following are the most common field types.

- *Managed object class ID*, e.g., MDS [medical device system], VMS [virtual medical system], VMD [virtual medical device], VMO [virtual medical object], Channel, Metric, Alert, Scanner, SCO [service and control object], etc.
- *Event type ID*, e.g., a numerical observation type of event report.
- *Attribute ID*: various attributes in the domain information model (DIM)
  - *Type ID*: in general, a concept not covered by a class definition per se, but by a well-known or commonly used type of a class, e.g., a VMD (e.g., ventilator, gas analyzer), Metric object class physiological function code (PFC) (e.g., heart rate, cerebral perfusion pressure), or the body site of a measurement (e.g., left toe).
  - *State*: mode, status or finite state machine (FSM) state, e.g., associated.
  - *Dimension*: unit of measurement, e.g., deciliters per hour [dl/h].
  - *Indication*: alarm, e.g., asystole, INOP (e.g., malfunction), or advisory (e.g., check calibration).
- *Action type ID*, e.g., activate.
- *External nomenclature ID*, e.g., Systematized Nomenclature for Medicine (SNOMED).

Technically, information is initially defined in an abstract syntax, e.g., Abstract Syntax Notation One (ASN.1) or medical device data language (MDDL), and then mapped to and interchanged through a transfer syntax, e.g., basic encoding rules (BER) or medical device encoding rules (MDER), typically for efficiency in the form of integers. However, abstract syntax languages are generally unsuitable for high-precision human understanding, especially of medical terms. As a result, both semantic and syntactical definitions are needed; as covered in Clause 7 and Clause 8.

## 7. Semantics

Clause 7 establishes specification guidelines. Refer to Annex A for the detailed specification.

<sup>8</sup>SNOMED is a registered trademark of the College of American Pathologists; Norfield, IL; (800) 323-4040 (<http://www.cap.org>).

## 7.1 Attribution

Nomenclature semantics are represented as a set of attributes, as shown in Table 1.

**Table 1—Nomenclature attributes**

| Attribute               | Description/Definition                                                                                                                                                                                        | Purpose                                                             | Interpretability                                                    | Presence  |
|-------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|---------------------------------------------------------------------|-----------|
| Systematic, or DIM name | An organization of differentiating, relational descriptors; see Table 2 and Table 3                                                                                                                           | Formal or semiformal but human-readable derivation                  | Shall be unambiguous                                                | Mandatory |
| Common term             | A brief description of the name                                                                                                                                                                               | Human-readable identification or efficient lookup                   | Should be unambiguous                                               | Optional  |
| Acronym                 | An abbreviated form of the name                                                                                                                                                                               | Mnemonic or parametric abbreviation                                 | Should be unambiguous                                               | Optional  |
| Description/Definition  | A long, or sentence, form of the name                                                                                                                                                                         | Human-readable and as understandable as possible                    | Shall be unambiguous with the exception of synonyms                 | Mandatory |
| Reference ID            | A symbolic, programmatic form of the term                                                                                                                                                                     | Development of application program interfaces (APIs)                | Shall be unambiguous                                                | Mandatory |
| Code                    | [Alpha]numeric identifier                                                                                                                                                                                     | Human- and machine-readable and efficiently processable by machines | Shall be unique, but context-sensitive parts are permitted; see 7.2 | Mandatory |
| Others                  | As appropriate for the semantic and as specified in the detailed tables in Annex A. For example, a Reference ID, or corollary to the programmatic form, may be used in some cases to facilitate table lookup. |                                                                     |                                                                     |           |

Refer to Table 2 for an example pertaining to medical device typology and to Table 3 for a partial derivation of the systematic name used for this partition. As is shown in Table 3, the systematic name is an <n>-tuple of a base concept and a series of differentiating criteria, and the value of the systematic name is a string separated by ”|” delimiters. [A null indicates not otherwise specified (NOS).]

**Table 2—Attribution example**

| Systematic name                                 | Common term              | Description/Definition                                                                          | Code |
|-------------------------------------------------|--------------------------|-------------------------------------------------------------------------------------------------|------|
| Analyzer                                        |                          |                                                                                                 |      |
| Analyzer       <type>                           | Generic analyzer         | Instrument that analyzes acquired patient information                                           | 4100 |
| Analyzer   Concentration [Sat]   Blood   <type> | SpO <sub>2</sub> monitor | Instrument that derives the % of arterial O <sub>2</sub> and pulse rate parameters (blood flow) | 4104 |

## 7.2 Coding

Several coding methods are used to promote interoperability.

**Table 3—Systematic name derivation—medical device type example**

| Base concept                               | Differentiating criteria                                |                                   |                                         |
|--------------------------------------------|---------------------------------------------------------|-----------------------------------|-----------------------------------------|
|                                            | 1 <sup>st</sup> <Device>                                | 2 <sup>nd</sup> <has target>      | 3 <sup>rd</sup> <type>                  |
| Analyzer,<br>Filter,<br>Calculator,<br>... | Concentration,<br>Electrical Potential,<br>Flow,<br>... | Airway,<br>Blood,<br>Body,<br>... | Nonspecific,<br>MDS,<br>VMD,<br>Channel |

### 7.2.1 Context-sensitivity

For processing efficiency, especially bandwidth conservation, some nomenclature codes are defined as fixed-length integer 2-tuples, consisting of a code block number and a term code (within the code block). Provided that the code block context can be properly mapped, e.g., by implicit syntactical parsing, the processor requires only the term code to correlate the semantic, in which case the term code is context-sensitive with respect to the code block, whereas the 2-tuple is context-free.

For additional processing efficiency, code block numbers and term codes are mapped to 16-bit and 32-bit words, as follows.

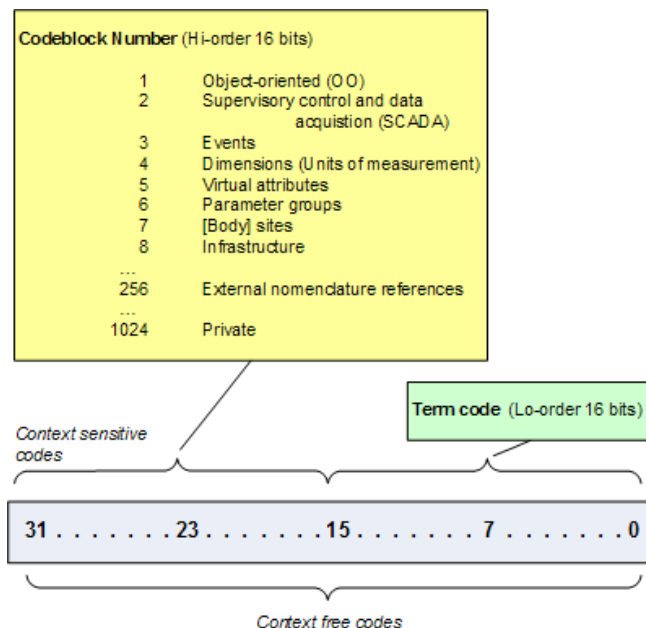
$$[\text{context-free}] \text{ Nomenclature Code} == (\text{Code Block number} * 2^{**16}) + [\text{context-sensitive}] \text{ Term Code},$$

where

Term Code has the range  $2^{**16}$ .

For example, the context-free nomenclature code for a term in code block number 1 whose term code=4100 is equal to  $((1 * 2^{**16}) + 4100) = 65536 + 4100 = 69636$  (which uniquely identifies the SpO<sub>2</sub> monitor term in Table 2).

Refer to Figure 1 for an illustration of the relationship between code block number and term codes.

**Figure 1—Context-sensitive coding illustration**

Code interpretation may also be context-sensitive with respect to nomenclature versions; however, nomenclature revision coding is outside of the scope of this standard and should be provided by application PDUs during device association.

### 7.2.2 Grouping

Term codes may be grouped into code ranges as follows:

- A partition is a group of semantics that are assigned to a contiguous term code range within a code block and that have a categorical relationship. For example, object classes, attributes, and notifications are partitions of the object-oriented code block. Partitions are prefixed as high-order bit masks that are computed by offset, typically in multiples of binary orders of magnitude, e.g., 0x1000, 0x2000, etc.
- Code blocks or partitions may be designated as public and private. Syntactical conformance shall be mandatory for all code blocks and partitions, but semantic conformance for private code blocks or partitions shall not be mandatory. By convention, each code block should allocate private partitions consistently; the range 0xF000–0xFFFF is recommended.
- A discriminator is a group of related semantics assigned to a contiguous code range that have a regular relationship, e.g., maximum/minimum/mean or systolic/diastolic/mean. Discriminators are embedded as low-order bit code that are computed by relative offset to a base term.

For example, Table 1 is an example of a 2-bit device <type> discriminator, in which the relative offsets 0–3 correspond, respectively, with the following semantics:

- NOS, offset=0),
- MDS class [offset=1],
- VMD class [offset=2], and
- Channel class [offset=3], respectively.

## 8. Syntax

Nomenclature codes are intended to be mapped to machine-processable forms using various protocols (e.g., ISO/IEEE 11073-20101) and program (e.g., C++) presentation forms. However, because it is impractical to do all mappings, this standard shall provide mappings to a set of nominal forms, as follows:

- Transfer: numeric form suitable for use in transfer syntaxes; refer to 8.1.
- Programmatic: symbolic form suitable for use in programming languages; refer to 8.2.

### 8.1 Transfer

#### 8.1.1 Types

There are several types of transfer forms:

- a) *Global* corresponds with Common Management Information Protocol (CMIP) *globalForm*, i.e., is an ISO ASN.1 object identifier (OID). This form is bandwidth-intensive; therefore, complete abstract and transfer syntaxes may not be explicitly enumerated.
- b) *Local* corresponds with CMIP *localForm*, i.e., is an unsigned integer. Various canonical forms are defined as follows:
  - 1) *Fixed-length* is intended to minimize bandwidth and takes two forms, as follows:
    - i) *Short*: a context-sensitive code; refer to 7.2.1. It is intended that the short form be used in real-time or monitoring applications with appropriate association controls, as defined in

medical device application profile (MDAP) and interoperability of patient-connected medical devices (INTERMED) profiles.

- ii) *Long*: a context-free code; refer to 7.2.1. It is intended that this form be used to export nomenclatures through a gateway or persistent medium.
- 2) *Variable-length* is intended to provide an efficient form for use with fully compliant CMIP-based syntaxes, using BER integers. Short and long forms may be presented analogous with the fixed-length form described in this subclause.

### 8.1.2 Notation

Refer to Figure 2, which lists ISO ASN.1 OID assignments for this standard.

An arc in the "iso(1) ... fixedForm(0)" branch indicates that the blockCode-termCode scheme defined in this standard is to be used during the association; refer to Clause 7 and Figure 1 for bit maps.

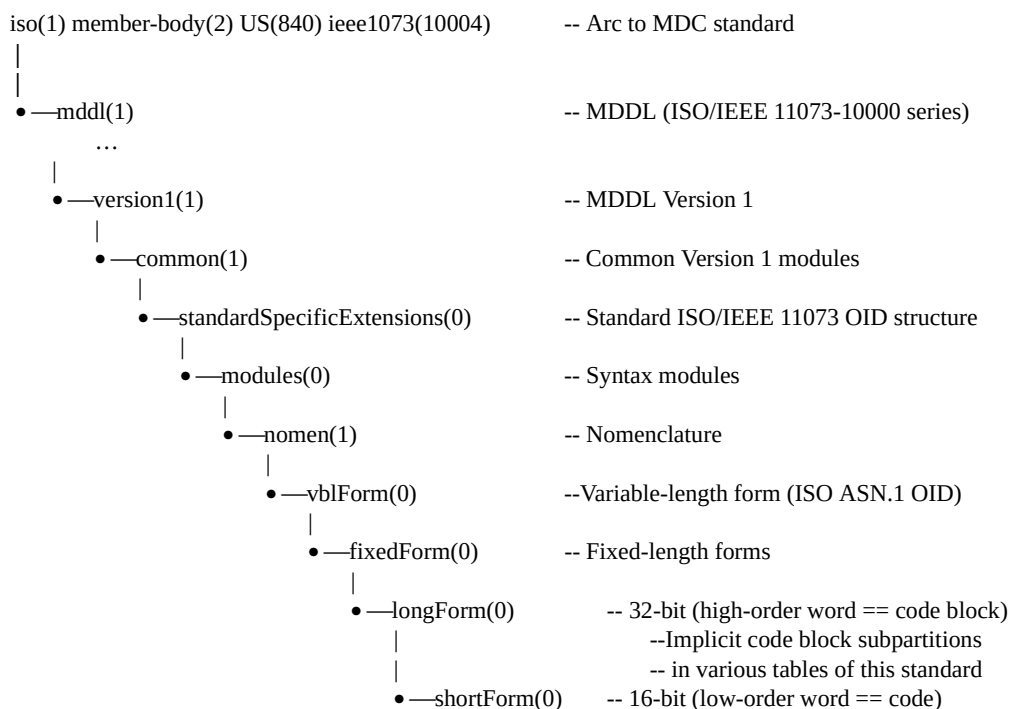


Figure 2—ISO ASN.1 OID assignments

## 8.2 Programmatic

Programmatic, or symbolic, form is intended to be used to develop APIs in a way that applications can reuse different implementations with minimum impact on symbol mapping.

### 8.2.1 Attribution

The term code is used as a reference in correlating semantic and syntactical definitions through the use of additional attributes, as follows:

- *Title, or Reference ID*: a symbolic, programmatic form of the term. The form is correlated to the context-free code (i.e., titles are by definition context-free with respect to all other titles); all terms are prefixed with “MDC\_” for consistency.
- *AutoCode*: a numerical value associated with the term. The value is used as an generic identifier; the AutoCode is assigned at the time the term is created and remains assigned to that term independent of term code revisions. The AutoCode is not normative, but may be used for editorial, indexing purposes when context-sensitive components (i.e., Code Block and Term Code) are remapped.

### 8.2.2 Notation

While there are many program bases that could be used, the C[++] language is used as a canonical basis in this standard.

Notation conventions for the C[++] programming language are as follows:

```
#define    MDC_<TERM>          <Term Code>    /* <Acronym>  <Auto Code> */
```

where

`#define` denotes a static assignment, e.g., of the value `<c>` to the symbol `<MDC_term>`.

`MDC_<TERM>` is the nomenclature symbol (or title); the title is all uppercase.

- The prefix `MDC_` is used for all terms in this standard.
- Partitions may be identified by common prefixes, e.g., `_DEV` or `_LEAD`.
- Discriminators are identified by regular suffixes, e.g., `_MDS`, `_VMD`, or `_CHAN`; see the example that follows.

`<Term Code>` is a decimal number in the range specified during association, e.g., 0–65535 for 16-bit, context-sensitive coding.

`<Acronym>` (may be absent) is an abbreviation.

`<Auto Code>` is the generic record number of the term.

The last components are enclosed in the syntax `/* */`, which represents a comment.

For example, the SpO<sub>2</sub> Analyzer <types> in Table 2 are represented programmatically as follows:

| #define | Term Title (or Reference ID) | Term Code | Auto Code |
|---------|------------------------------|-----------|-----------|
| #define | MDC_DEV_ANALY_SAT_O2         | 4104 /*   | 2474 */   |
| #define | MDC_DEV_ANALY_SAT_O2_MDS     | 4105 /*   | 4962 */   |
| #define | MDC_DEV_ANALY_SAT_O2_VMD     | 4106 /*   | 5095 */   |
| #define | MDC_DEV_ANALY_SAT_O2_CHAN    | 4107 /*   | 5227 */   |

The derived term titles post-fix `<null>`, `_MDS`, `_VMD`, and `_CHAN`, respectively. The `<#define>`, `<Term Title>`, and `<Term Code>` symbols are normative, while the comment `</* ... */>` and the AutoCode embedded in it are informative.

As these term codes are assigned to code block number 1, the context-free nomenclature codes are  $1*65536+[4104 + [0,1,2,3]] \rightarrow 69640, \dots, 69643$ .

## 9. Extensibility

Terms defined in Annex B shall not be normative unless a semantic corollary is specified in this standard. However, terms in Annex B may be reorganized for presentation, e.g., into sequential code order, as appropriate to facilitate application programming.

## 10. Version exporting

The syntax *ISO MDC <ver>*, where <ver> is the version ID as shown in Figure 2, should be used when nomenclatures of this standard are used in registered external data communications standards, e.g., Health Level Seven (HL7).

## Annex A

(normative)

### Nomenclature semantics

#### A.1 Overview of nomenclature for vital signs—semantics

##### A.1.1 Introduction

Annex A presents the medical data information base (MDIB), i.e., the set of objects and object instantiations occurring in any device of the communicating system as described in the DIM (see ISO/IEEE 11073-10201). This common data dictionary is the prerequisite for interoperability of medical devices and device systems.

All subclauses in this annex that correspond to the code blocks in A.2.3 contain explanatory parts to support the understanding of this approach in the design of the data dictionary. After these explanations, a code table is presented. This structuring is designed to ease and promote maintenance. The authors are well aware that despite their strong efforts for completion during development of this standard, application-specific supplements are to be expected. Comments and proposals for improvement are most welcome.

Because the number of different object-oriented modelling elements resulting from the DIM is limited, no specific nomenclature has been designed for these elements. They are listed in the tables in A.3. Regarding the demographics, there are so few that they do not deserve semantic analysis and systematic names. They are listed in several tables in A.3.2.9.

Communication infrastructure is presented in A.4 due to its close relation to the Communication Package of the DIM. A set of tables gives the terms and corresponding code values for communication infrastructure objects and attributes. Objects in these tables (e.g., the Device Interface object, the MibElement [management information base element] object) and their attributes are not part of the MDIB.

The nomenclature, i.e., the systematic names, for the terms concerning devices, metrics (measurements and enumerations), alerts, etc., is presented in A.5 through A.10.

For the nomenclature of vital signs devices, for metrics (measurements and enumerations), for body sites, for alerts, etc., systematic names have been constructed following the methodology described in the European standard CEN ENV 12264 [B2]. The systematic name is constructed by means of generative patterns and consists of the base concept and two or three descriptors forming with the semantic links the differentiating criteria. Each differentiating criterion is built by means of a semantic link and an associated category (see Clause 7). The constituents of the systematic name are separated by vertical bars. Unused fields are left blank and identified by double bars.

In order to avoid a long list of similar terms, a variable field was employed in some terms. For instance, the signal from an electrocardiogram (ECG) obtained from different leads should be identified as ECG | I, ECG | II, ECG | III, etc. The corresponding term used in Table A.7.1.2 is *ECG <lead>* where *<lead>* stands for a general lead that has to be specified according to a separate code table.

The tables for metrics/enumerations in A.7 are mainly organized according to the target system (e.g., body compartment, body part, body function), following some anatomical systematics.

The tables in A.5 through A.10 show basically six columns: Systematic name, Common term, Acronym, Description/Definition, Reference ID, and Code. The common term is the name that is in common use in medicine and well-known to medical professionals. The same is true for the acronym except that it refers to the corresponding English abbreviations. Description/Definition gives a description, as precise as possible, to ensure the correct understanding. It is to be used as basic information for developing the systematic name.

## A.2 Code assignment to the MDIB elements

### A.2.1 Overview

Before embarking on the development of the vital signs nomenclature, an investigation was made to discover whether existing nomenclatures met the needs of POC MDC. A similar investigation had been instigated by the IEEE 1073 Working Group, and in both cases no appropriate nomenclature had been found. As a result, the CEN and IEEE teams collaborated on a vital signs nomenclature and coding system, which forms the bulk of this standard.

This standard is meant to be temporary, in that other efforts to incorporate the terms from this standard into a more global medical nomenclature effort may happen, either by incorporating the tables and codes from this standard directly into the larger nomenclature (using some referencing scheme to establish context) or by simply incorporating the terms and recoding them. In the meantime, the vital signs nomenclature and coding system in this standard should be used as a default.

### A.2.2 Basic rules

The coding of the vital signs nomenclature is based on a number of basic rules:

- a) The codes should fit within 16 bits in order to minimize the resulting message lengths. Because the vital signs nomenclature is used for communication with some very small and cost-constrained devices, it was important to try to accommodate their needs to the extent possible and practical.
- b) As a result of the requirement to keep the codes less than 16 bits, the code space was separated into a number of context-sensitive, orthogonal spaces. As a result, the same code can mean different things depending on its context, an arrangement that is not appropriate in a more general coding effort, but works well in the context of this standard. In the general case, a prefix can be used to distinguish between similar codes; however, that practice will tend to double the size of each code.

- c) Each code space has a block of 4096 entries allocated for private use. The current nomenclature is not complete, and in addition, new relevant terms are created all the time. Therefore, space has been reserved for private codes that should be used until they are accepted as public and placed into the appropriate table.
- d) Reviewing the coding, one may find tables where the codes increment regularly, while others seem to be allocated randomly. These irregularities are generally side effects of how the codes were allocated and whether historically some term codes had already been allocated (e.g., by the original IEEE 1073 working group). In general, the codes are not meant to have any context, and it is dangerous to base implementations on any perceived order or range.
- e) In some cases, it may seem that codes are missing or were skipped. This situation may be due to the following:
  - 1) Nomenclature and resulting codes may have been used in early versions of the standard, but were not required in the CEN ENV 13735 [B5] vital signs nomenclature.
  - 2) Buffer space may have been allocated for future use.
- f) In many cases, the codes will jump by a step of 2, 4, etc. This practice is done to account for entries that have discriminators, which result in an offset from a base number to fully describe them. The use of these discriminators and resulting offsets is described in more detail for each coding space (see A.2.3).

### A.2.3 Coding spaces

As previously mentioned, the coding space is separated into orthogonal independent spaces. Each space can use the full 16-bit (65 536 entry) coding space available. The spaces are as follows:

- Block A: Object-oriented elements  
Device nomenclature
- Block B: Units of measurement
- Block C: Metrics
- Block D: Body sites
- Block E: Alerts
- Block F: External nomenclatures
- Block G: Communication infrastructure
- Block H: Reserved for file exchange format (FEF)

Of these coding spaces, the most densely populated is the metrics space (Block C), which contains many physiological measurement instantiations.

**A.2.3.1 Block A**

Block A is populated with the object-oriented elements and device nomenclature codes as follows:

| Description          | Current     |
|----------------------|-------------|
| Object-Oriented      | 0000–3343   |
| Devices <sup>a</sup> | 4000–4511   |
| Private              | 61440–65535 |

<sup>a</sup>Each device code is separated by a count of 4 to allocate space for the four different classes of device. These classes are defined as follows:

- 0 = Generic device
- 1 = MDS
- 2 = VMD
- 3 = Channel

**A.2.3.2 Block B**

Block B is populated with the units of measurement codes as follows:

| Description                       | Current     |
|-----------------------------------|-------------|
| Units of measurement <sup>a</sup> | 00000–06047 |
| Private                           | 61440–65535 |

<sup>a</sup>Each unit of measurement code is separated by a count of 32 to allocate space for the various orders of magnitude. These orders of magnitude are defined as follows (refer to Table A.6.1 for the complete list):

- |                       |                       |                              |
|-----------------------|-----------------------|------------------------------|
| 0 = 10 <sup>0</sup>   | 1 = 10 <sup>1</sup>   | 2 = 10 <sup>2</sup>          |
| 3 = 10 <sup>3</sup>   | ....                  | 16 = 10 <sup>-1</sup>        |
| 17 = 10 <sup>-2</sup> | 18 = 10 <sup>-3</sup> | 19 = 10 <sup>-4</sup> , etc. |

### A.2.3.3 Block C

Block C is populated with the metrics nomenclature codes as follows:

| Description                        | Current     |
|------------------------------------|-------------|
| ECG metrics                        |             |
| ECG leads                          | 00000–00255 |
| ECG measurements <sup>a</sup>      | 00256–16383 |
| ECG diagnostic patterns            | 16384–17656 |
| Haemodynamic metrics               |             |
| Haemodynamic <sup>b</sup>          | 18432–19368 |
| Respiratory metrics                |             |
| Respiratory <sup>c</sup>           | 20480–21360 |
| Ventilation modes                  | 53280–53281 |
| Blood gas, urine, etc., metrics    |             |
| Blood gas, urine, etc.             | 28676–28988 |
| Fluid-related metrics              |             |
| Fluid output <sup>c</sup>          | 26624–26684 |
| Pump data <sup>c</sup>             | 26688–26876 |
| Substance/Type                     | 53396–53408 |
| Neurological metrics               |             |
| Neurological <sup>c</sup>          | 22528–23016 |
| Neurological patterns <sup>d</sup> | 23560–25160 |
| Neurological stimulation           | 53504–53553 |
| Miscellaneous measurements         |             |
| Miscellaneous <sup>c</sup>         | 57348–57672 |
| Private                            | 61440–65535 |

<sup>a</sup>Most of the ECG measurement codes are offset by 8 bits (256 counts) to allocate space for up to 256 different ECG lead discriminators. These are defined as follows (refer to A.7.1 for the complete list):

0 = ECG lead unspecified

1 = ECG Lead I

2 = ECG Lead II

3 = ECG Lead V1

....

61 = ECG Lead III

62 = ECG Lead aVR, etc.

<sup>b</sup>Most of the haemodynamic measurement codes are offset by 2 bits (4 counts) to allocate space for the following discriminators:

- 0 = Base measurement
- 1 = Systolic
- 2 = Diastolic
- 3 = Mean

<sup>c</sup>These codes are offset by 2 bits (4 counts) to allocate space for the following discriminators:

- 0 = Base measurement
- 1 = Maximum
- 2 = Minimum
- 3 = Mean

<sup>d</sup>The neurological pattern codes are offset by 3 bits (8 counts) to allocate space for the following discriminators:

- 0 = Base pattern
- 1 = Number of occurrences of the base
- 2 = Rate of counted events
- 3 = Maximum rate of counted events
- 4 = Minimum rate of counted events
- 5 = Mean rate of counted events

#### A.2.3.4 Block D

Block D is populated with the body sites codes as follows:

| Description                 | Current                |
|-----------------------------|------------------------|
| Body sites <sup>a</sup>     | 0000–1810              |
| Neuro nerves                | 0000–0246              |
| Neuro muscles               | 0248–0994              |
| Electroencephalogram (EEG)  | 0996–1318              |
| Electrooculogram (EOG)      | 1320–1402              |
| Neuro monitoring            | 1404–1422              |
| Cardio<br>Coronary arteries | 1424–1506<br>1812–1840 |
| Miscellaneous sites         | 1508–1810              |
| Private                     | 61440–65535            |

<sup>a</sup>Except for entries that include specific discriminators, the codes are offset by 2 bits (4 counts) to allocate space for the following discriminators:

- 0 = Orientation - nominal
- 1 = Orientation - left
- 2 = Orientation - right

**A.2.3.5 Block E**

Block E is populated with alert/event codes as follows:

| Description                | Current     |
|----------------------------|-------------|
| Alerts/Events <sup>a</sup> | 0000–6600   |
| Device events              | 0000–0596   |
| Pattern events             | 3072–3294   |
| Status events              | 6144–6730   |
| Private                    | 61440–65535 |

<sup>a</sup>Except for entries that include specific discriminators, the codes are offset by 1 bit (2 counts) to allocate space for the following discriminators:

- 0 = Refers to metric
- 1 = Refers to object

**A.2.3.6 Block F**

Block F is populated with external nomenclature codes as follows:

| Description                         | Current     |
|-------------------------------------|-------------|
| External nomenclatures <sup>a</sup> | 0000–1600   |
| Private                             | 61440–65535 |

<sup>a</sup>The codes are offset by 6 bits (64 counts) to allocate space for the various new revisions of one external nomenclature.

**A.2.3.7 Block G**

Block G is populated with communication infrastructure codes as follows:

| Description    | Current     |
|----------------|-------------|
| Infrastructure | 0000–8194   |
| Private        | 61440–65535 |

**A.2.3.8 Block H**

Block H is reserved for FEF codes as follows:

| Description | Reserved    |
|-------------|-------------|
| FEF         | 0000–61439  |
| Private     | 61440–65535 |

A.3 Data dictionary and codes for object-oriented modeling elements  
(Block A)

A.3.1 Introduction

The purpose of this inventory is to provide a schematic presentation and identification scheme for all types of object-oriented modeling elements used in the DIM (see ISO/IEEE 11073-10201). These elements build up the different parts (subject areas or “packages”) of the DIM that refer to separate application areas.

- a) The tables in A.3 are ordered following the order of subject areas in the DIM:
  - 1) General (or Top object in the DIM)
  - 2) Medical Package
  - 3) Alert Package
  - 4) System Package
  - 5) Control Package
  - 6) Extended Services Package
  - 7) Communication Package
  - 8) Archival Package
  - 9) Patient Package

For the communication infrastructure (Block G) objects and attributes that are closely related to the Communication Package, but use a different code block (see A.2.3.7), a separate set of tables is provided in A.4.

- b) For each of the subject areas, a set of five separate tables for the different types of object-oriented modeling elements used in the DIM is provided:
  - 1) Object class items
  - 2) Attributes
  - 3) Attribute groups
  - 4) Behavior (methods)
  - 5) Notifications
- c) In order to enhance readability and usability of the tables, the scheme

Table A.3.x.x—Object-oriented modeling elements:  
[subject area]—[object-oriented modeling element type]

is applied strictly in numbering the tables (even accepting that some tables remain empty).

Thus, to give an example, in Table A.3.9.2. for the Patient Package (subject area 9), the attributes (object-oriented modeling element type 2) are given.

- d) The name of the object-oriented modeling element item as introduced in the DIM appears in the first column, DIM name, of each table. The second column, Reference ID, provides equivalent systematic acronyms that allow direct mapping onto the MDIB database, which is also used for ISO/IEEE 11073 standardization activities in this field. The content of the third column in the object class item tables differs from all other tables (see next two paragraphs). The fourth column, Code, contains the corresponding codes from this database for each item, as far as exist at publication of this standard.

For the object class item tables (A.3.\*.1), the third column, Derived from, refers to the inheritance relation between each item and the object class item from which it is derived. The virtual object class item at the top of the inheritance hierarchy is denoted *Top*.

For all other tables (A.3.\*.2–A.3.\*.5), the third column, Belongs to object, indicates the assignment of attribute groups, attributes, notifications, or methods to corresponding object class items.

- e) For structural reasons related to the DIM, attributes or attribute groups are in some cases used with different objects that are not derived from each other by inheritance. This situation leads to duplicated terms that may cause problems when automated queries require unique matches, especially for table updates or changes. Therefore, duplicated or multiple terms are generally marked by an asterisk (\*). Only the first occurrence of such a term is regarded as a code and reference ID definition and is marked by **bold letters** for the DIM name, the referenced object in the third column, and the code, as shown in the following example:

|                     |                     |                                                                                          |             |
|---------------------|---------------------|------------------------------------------------------------------------------------------|-------------|
| <b>Start-Time *</b> | MDC_ATTR_TIME_START | <b>Metric</b> and derived objects,<br>Session Archive,<br>Session Test,<br>Session Notes | <b>2538</b> |
|---------------------|---------------------|------------------------------------------------------------------------------------------|-------------|

In addition to the asterisk on the DIM name, all further occurrences of the term explicitly refer to this first occurrence (by the expression: "see: <referenced object>/<subject area>" in the first column). The referenced object in the third column again is in **bold letters**, and the code value is set in parentheses (<code>), as shown in the following example:

|                                                   |                     |                                                                                          |        |
|---------------------------------------------------|---------------------|------------------------------------------------------------------------------------------|--------|
| Start-Time *<br>(see: Metric/<br>Medical Package) | MDC_ATTR_TIME_START | <b>Metric</b> and derived objects,<br>Session Archive,<br>Session Test,<br>Session Notes | (2538) |
|---------------------------------------------------|---------------------|------------------------------------------------------------------------------------------|--------|

This scheme is intended to be appropriate for the work with both the DIM and the MDIB.

### A.3.2 Object-oriented modeling elements: inventory tables

#### A.3.2.1 General

**Table A.3.1.1—Object-oriented modeling elements—general—object class items**

| DIM name | Reference ID | Derived from | Code |
|----------|--------------|--------------|------|
| Top      | MDC_MOC_TOP  |              | 70   |

**Table A.3.1.2—Object-oriented modeling elements—general—attributes**

| DIM name     | Reference ID          | Belongs to object       | Code |
|--------------|-----------------------|-------------------------|------|
| Class        | MDC_ATTR_CLASS        | Top and derived objects | 2491 |
| Name-Binding | MDC_ATTR_NAME_BINDING | Top and derived objects | 2510 |
| Locale       | MDC_ATTR_LOCALE       | Top and derived objects | 2600 |

**Table A.3.1.3—Object-oriented modeling elements—general—attribute groups**

| DIM name                                                                                                                                                                             | Reference ID | Belongs to object | Code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| This table has no content. Following the construction and ordering scheme (see item c in A.3.1), empty tables are not left out in order to enhance readability and usability of A.3. |              |                   |      |

**Table A.3.1.4—Object-oriented modeling elements—general—behavior**

| DIM name                                                                                                                                                                             | Reference ID | Belongs to object | Code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| This table has no content. Following the construction and ordering scheme (see item c in A.3.1), empty tables are not left out in order to enhance readability and usability of A.3. |              |                   |      |

**Table A.3.1.5—Object-oriented modeling elements—general—notifications**

| DIM name         | Reference ID       | Belongs to object       | Code |
|------------------|--------------------|-------------------------|------|
| Attribute-Update | MDC_NOTI_ATTR_UPDT | Top and derived objects | 3330 |

### A.3.2.2 Medical Package

**Table A.3.2.1—Object-oriented modeling elements—Medical Package—object class items**

| DIM name                  | Reference ID             | Derived from | Code |
|---------------------------|--------------------------|--------------|------|
| VMO                       | MDC_MOC_VMO              | Top          | 1    |
| VMD                       | MDC_MOC_VMO_VMD          | VMO          | 2    |
| Channel                   | MDC_MOC_VMO_CHAN         | VMO          | 3    |
| Metric                    | MDC_MOC_VMO_METRIC       | VMO          | 4    |
| Numeric                   | MDC_MOC_VMO_METRIC_NU    | Metric       | 6    |
| Sample Array              | MDC_MOC_VMO_METRIC_SA    | Metric       | 7    |
| Real Time Sample Array    | MDC_MOC_VMO_METRIC_SA_RT | Sample Array | 9    |
| Time Sample Array         | MDC_MOC_VMO_METRIC_SA_T  | Sample Array | 10   |
| Distribution Sample Array | MDC_MOC_VMO_METRIC_SA_D  | Sample Array | 8    |
| Enumeration               | MDC_MOC_VMO_METRIC_ENUM  | Metric       | 5    |
| PM-Store                  | MDC_MOC_VMO_PMSTORE      | VMO          | 61   |
| PM-Segment                | MDC_MOC_PM_SEGMENT       | Top          | 62   |
| Complex Metric            | MDC_MOC_VMO_METRIC_CMPLX | Metric       | 79   |

**Table A.3.2.2—Object-oriented modeling elements—  
Medical Package—attributes**

| DIM name                          | Reference ID              | Derived from                                                                                                                                                                                                                                                                                    | Code        |
|-----------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Type                              | MDC_ATTR_ID_TYPE          | VMO and derived objects                                                                                                                                                                                                                                                                         | 2351        |
| <b>Handle *</b>                   | MDC_ATTR_ID_HANDLE        | <b>VMO</b> and derived objects,<br>VMS and derived objects,<br>Log and derived objects,<br>Battery,<br>Scanner and derived objects,<br>Discriminator,<br>Multipatient Archive,<br>Patient Archive,<br>Session Archive,<br>Session Test,<br>Session Notes,<br>Physician,<br>Patient Demographics | <b>2337</b> |
| Label                             | MDC_ATTR_ID_LABEL_STRING  | VMO and derived objects                                                                                                                                                                                                                                                                         | 2343        |
| <b>Ext-Obj-Relations *</b>        | MDC_ATTR_EXT_OBJ_RELATION | <b>VMO</b> and derived objects,<br>VMS and derived objects                                                                                                                                                                                                                                      | <b>2499</b> |
| Vmd-Status                        | MDC_ATTR_VMD_STAT         | VMD and derived objects                                                                                                                                                                                                                                                                         | 2466        |
| <b>Vmd-Model *</b>                | MDC_ATTR_ID_MODEL         | <b>VMD</b> and derived objects,<br>VMS and derived objects                                                                                                                                                                                                                                      | <b>2344</b> |
| <b>Instance-Number *</b>          | MDC_ATTR_ID_INSTNO        | <b>VMD</b> and derived objects,<br>PM-Segment,<br>Operation and derived<br>objects,<br>Scanner and derived objects                                                                                                                                                                              | <b>2338</b> |
| <b>Production-Specification *</b> | MDC_ATTR_ID_PROD_SPECN    | <b>VMD</b> and derived objects,<br>VMS and derived objects,<br>Battery                                                                                                                                                                                                                          | <b>2349</b> |
| <b>Compatibility-Id *</b>         | MDC_ATTR_ID_COMPAT        | <b>VMD</b> and derived objects,<br>VMS and derived objects                                                                                                                                                                                                                                      | <b>2336</b> |
| Parameter-Group                   | MDC_ATTR_ID_PARAM_GRP     | VMD and derived objects,<br>Channel                                                                                                                                                                                                                                                             | 2346        |
| Position                          | MDC_ATTR_ID_POSN          | VMD and derived objects                                                                                                                                                                                                                                                                         | 2348        |
| Operating-Hours                   | MDC_ATTR_TIME_PD_OP_HRS   | VMD and derived objects                                                                                                                                                                                                                                                                         | 2444        |
| Operation-Cycles                  | MDC_ATTR_CYC_OP           | VMD and derived objects                                                                                                                                                                                                                                                                         | 2325        |
| Measurement-Principle             | MDC_ATTR_MSMT_PRINCIPLE   | VMD and derived objects,<br>Channel                                                                                                                                                                                                                                                             | 2560        |
| Channel-Id                        | MDC_ATTR_CHAN_ID          | Channel                                                                                                                                                                                                                                                                                         | 2318        |
| Channel-Status                    | MDC_ATTR_CHAN_STAT        | Channel                                                                                                                                                                                                                                                                                         | 2320        |
| Physical-Channel-Number           | MDC_ATTR_CHAN_NUM_PHYS    | Channel                                                                                                                                                                                                                                                                                         | 2319        |
| Logical-Channel-Number            | MDC_ATTR_CHAN_NUM_LOGICAL | Channel                                                                                                                                                                                                                                                                                         | 2606        |
| Color                             | MDC_ATTR_COLOR            | Channel,<br>Metric and derived objects                                                                                                                                                                                                                                                          | 2321        |
| Metric-Specification              | MDC_ATTR_METRIC_SPECN     | Metric and derived objects                                                                                                                                                                                                                                                                      | 2367        |
| Max-Delay-Time                    | MDC_ATTR_DELAY_TIME_MAX   | Metric and derived objects                                                                                                                                                                                                                                                                      | 2583        |
| Metric-Status                     | MDC_ATTR_METRIC_STAT      | Metric and derived objects                                                                                                                                                                                                                                                                      | 2368        |

**Table A.3.2.2—Object-oriented modeling elements—  
Medical Package—attributes (continued)**

| DIM name                   | Reference ID                                           | Derived from                                                                                       | Code         |
|----------------------------|--------------------------------------------------------|----------------------------------------------------------------------------------------------------|--------------|
| Measurement-Status         | MDC_ATTR_MSMT_STAT                                     | Metric and derived objects                                                                         | 2375         |
| Metric-Id                  | MDC_ATTR_ID_TYPE_METRIC_STA<br>T                       | Metric and derived objects,<br>PM-Segment                                                          | 2353         |
| Metric-Id-Ext              | MDC_ATTR_ID_MSMT_EXT                                   | Metric and derived objects,<br>PM-Store                                                            | 2502         |
| <b>Unit-Code *</b>         | MDC_ATTR_UNIT_CODE                                     | <b>Metric</b> and derived objects,<br>Set Value Operation,<br>Limit Alert Operation                | <b>2454</b>  |
| Unit-Label-String          | MDC_ATTR_UNIT_LABEL_STRING                             | Metric and derived objects                                                                         | 2457         |
| Vmo-Source-List            | MDC_ATTR_VMO_LIST_SRC                                  | Metric and derived objects                                                                         | 2467         |
| Metric-Source-List         | MDC_ATTR_METRIC_LIST_SRC                               | Metric and derived objects                                                                         | 2366         |
| Msmt-Site-List             | MDC_ATTR_SITE_LIST_MSMT<br>MDC_ATTR_SITE_LIST_MSMT_EXT | Metric and derived objects                                                                         | 2430<br>2551 |
| Body-Site-List             | MDC_ATTR_SITE_LIST_BODY<br>MDC_ATTR_SITE_LIST_BODY_EXT | Metric and derived objects                                                                         | 2429<br>2550 |
| Metric-Calibration         | MDC_ATTR_METRIC_CALIB                                  | Metric and derived objects                                                                         | 2362         |
| Measure-Mode               | MDC_ATTR_MODE_MSMT                                     | Metric and derived objects                                                                         | 2373         |
| Measure-Period             | MDC_ATTR_TIME_PD_MSMT                                  | Metric and derived objects                                                                         | 2443         |
| Averaging-Period           | MDC_ATTR_TIME_PD_AVG                                   | Metric and derived objects                                                                         | 2535         |
| <b>Start-Time *</b>        | MDC_ATTR_TIME_START                                    | <b>Metric</b> and derived objects,<br>Session Archive,<br>Session Test,<br>Session Notes           | <b>2538</b>  |
| <b>Stop-Time *</b>         | MDC_ATTR_TIME_STOP                                     | <b>Metric</b> and derived objects,<br>Session Archive,<br>Session Test,<br>Session Notes           | <b>2539</b>  |
| Metric-Info-Label-String   | MDC_ATTR_METRIC_INFO_LABEL_<br>STR                     | Metric and derived objects                                                                         | 2365         |
| Substance                  | MDC_ATTR_ID_SUBSTANCE                                  | Metric and derived objects                                                                         | 2542         |
| Substance-Label-String     | MDC_ATTR_ID_SUBSTANCE_LABEL_<br>STRING                 | Metric and derived objects                                                                         | 2508         |
| Nu-Observed-Value          | MDC_ATTR_NU_VAL_OBS                                    | Numeric and derived objects                                                                        | 2384         |
| Compound-Nu-Observed-Value | MDC_ATTR_NU_CMPD_VAL_OBS                               | Numeric and derived objects                                                                        | 2379         |
| Absolute-Time-Stamp        | MDC_ATTR_TIME_STAMP_ABS                                | Numeric,<br>Time Sample Array,<br>Distribution Sample Array,<br>Enumeration and derived<br>objects | 2448         |
| Relative-Time-Stamp        | MDC_ATTR_TIME_STAMP_REL                                | Numeric,<br>Time Sample Array,<br>Distribution Sample Array,<br>Enumeration and derived<br>objects | 2449         |

**Table A.3.2.2—Object-oriented modeling elements—  
Medical Package—attributes (continued)**

| DIM name                      | Reference ID                                                                             | Derived from                                                                                               | Code                 |
|-------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|----------------------|
| HiRes-Time-Stamp              | MDC_ATTR_TIME_STAMP_REL_HI_RES                                                           | Numeric and derived objects, Time Sample Array, Distribution Sample Array, Enumeration and derived objects | 2537                 |
| Nu-Measure-Range              | MDC_ATTR_NU_RANGE_MSMT                                                                   | Numeric and derived objects                                                                                | 2382                 |
| Nu-Physiological-Range        | MDC_ATTR_NU_RANGE_PHYSIO                                                                 | Numeric and derived objects                                                                                | 2383                 |
| Nu-Measure-Resolution         | MDC_ATTR_NU_MSMT_RES                                                                     | Numeric and derived objects                                                                                | 2381                 |
| Display-Resolution            | MDC_ATTR_DISP_RES                                                                        | Numeric and derived objects                                                                                | 2327                 |
| Accuracy                      | MDC_ATTR_NU_ACCUR_MSMT                                                                   | Numeric and derived objects                                                                                | 2378                 |
| Sa-Observed-Value             | MDC_ATTR_SA_VAL_OBS                                                                      | Sample Array and derived objects                                                                           | 2414                 |
| Compound-Sa-Observed-Value    | MDC_ATTR_SA_CMPD_VAL_OBS                                                                 | Sample Array and derived objects                                                                           | 2407                 |
| Sa-Specification              | MDC_ATTR_SA_SPECN                                                                        | Sample Array and derived objects                                                                           | 2413                 |
| Sa-Marker-List                | MDC_ATTR_SA_MARKER_LIST_I8<br>MDC_ATTR_SA_MARKER_LIST_I16<br>MDC_ATTR_SA_MARKER_LIST_I32 | Sample Array and derived objects                                                                           | 2603<br>2582<br>2604 |
|                               | MDC_ATTR_SA_FIXED_VAL_SPECN                                                              | (Synonym)                                                                                                  | 2582                 |
| Dsa-Marker-List               | MDC_ATTR_DSA_MARKER_LIST                                                                 | Sample Array and derived objects                                                                           | 2605                 |
| Compression                   | MDC_ATTR_COMPRES                                                                         | Sample Array and derived objects                                                                           | 2322                 |
| Scale-and-Range-Specification | MDC_ATTR_SCALE_SPECN_I8                                                                  | Sample Array and derived objects                                                                           | 2417                 |
|                               | MDC_ATTR_SCALE_SPECN_I16                                                                 |                                                                                                            | 2415                 |
|                               | MDC_ATTR_SCALE_SPECN_I32                                                                 |                                                                                                            | 2416                 |
| Sa-Physiological-Range        | MDC_ATTR_SA_RANGE_PHYS_I8                                                                | Sample Array and derived objects                                                                           | 2412                 |
|                               | MDC_ATTR_SA_RANGE_PHYS_I16                                                               |                                                                                                            | 2410                 |
|                               | MDC_ATTR_SA_RANGE_PHYS_I32                                                               |                                                                                                            | 2411                 |
| Visual-Grid                   | MDC_ATTR_GRID_VIS_I8                                                                     | Sample Array and derived objects                                                                           | 2332                 |
|                               | MDC_ATTR_GRID_VIS_I16                                                                    |                                                                                                            | 2330                 |
|                               | MDC_ATTR_GRID_VIS_I32                                                                    |                                                                                                            | 2331                 |
| Sa-Calibration-Data           | MDC_ATTR_SA_CALIB_I8                                                                     | Sample Array and derived objects                                                                           | 2406                 |
|                               | MDC_ATTR_SA_CALIB_I16                                                                    |                                                                                                            | 2404                 |
|                               | MDC_ATTR_SA_CALIB_I32                                                                    |                                                                                                            | 2405                 |
| Filter-Specification          | MDC_ATTR_FILTER_SPECN                                                                    | Sample Array and derived objects                                                                           | 2329                 |
| Filter-Label-String           | MDC_ATTR_FILTER_LABEL_STRING                                                             | Sample Array and derived objects                                                                           | 2626                 |
| Sa-Signal-Frequency           | MDC_ATTR_SA_FREQ_SIG                                                                     | Sample Array and derived objects                                                                           | 2408                 |
| Sa-Measure-Resolution         | MDC_ATTR_SA_MSMT_RES                                                                     | Sample Array and derived objects                                                                           | 2409                 |

**Table A.3.2.2—Object-oriented modeling elements—  
Medical Package—attributes (continued)**

| DIM name                         | Reference ID                                                                    | Derived from                                                                                            | Code                 |
|----------------------------------|---------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------|----------------------|
| Sample-Period                    | MDC_ATTR_TIME_PD_SAMP                                                           | Real Time Sample Array,<br>Time Sample Array,<br>PM-Store                                               | 2445                 |
| Sweep-Speed                      | MDC_ATTR_SPD_SWEEP_DEFAULT                                                      | Real Time Sample Array,<br>Time Sample Array                                                            | 2431                 |
| Tsa-Marker-List                  | MDC_ATTR_TSA_MARKER_LIST                                                        | Time Sample Array                                                                                       | 2452                 |
| Distribution-Range-Specification | MDC_ATTR_RANGE_DISTRIB                                                          | Distribution Sample Array                                                                               | 2403                 |
| x-Unit-Code                      | MDC_ATTR_UNIT_CODE_X                                                            | Distribution Sample Array                                                                               | 2455                 |
| x-Unit-Label-String              | MDC_ATTR_UNIT_LABEL_STRING_X                                                    | Distribution Sample Array                                                                               | 2458                 |
| Enum-Observed-Value              | MDC_ATTR_VAL_ENUM_OBS                                                           | Enumeration                                                                                             | 2462                 |
| Compound-Enum-Observed-Value     | MDC_ATTR_VAL_ENUM_OBS_CMPD                                                      | Enumeration                                                                                             | 2463                 |
| Enum-Measure-Range               | MDC_ATTR_ENUM_RANGE_MSMT                                                        | Enumeration                                                                                             | 2561                 |
| Enum-Measure-Range-Bit-String    | MDC_ATTR_ENUM_RANGE_MSMT_BIT_STRING                                             | Enumeration                                                                                             | 2568                 |
| Enum-Measure-Range-Labels        | MDC_ATTR_ENUM_RANGE_MSMT_LABELS                                                 | Enumeration                                                                                             | 2627                 |
| Enum-Additional-Data             | MDC_ATTR_ENUM_ADD_DATA                                                          | Enumeration                                                                                             | 2498                 |
| Metric-Class                     | MDC_ATTR_METRIC_CLASS                                                           | PM-Store                                                                                                | 2363                 |
| Store-Sample-Algorithm           | MDC_ATTR_METRIC_STORE_SAMPLE_ALG                                                | PM-Store                                                                                                | 2371                 |
| Storage-Format                   | MDC_ATTR_METRIC_STORE_FORMAT                                                    | PM-Store                                                                                                | 2370                 |
| Store-Capacity-Count             | MDC_ATTR_METRIC_STORE_CAPACITY_CNT                                              | PM-Store                                                                                                | 2369                 |
| Store-Usage-Count                | MDC_ATTR_METRIC_STORE_USAGE_CNT                                                 | PM-Store                                                                                                | 2372                 |
| <b>Operational-State *</b>       | MDC_ATTR_OP_STAT                                                                | <b>PM-Store</b> ,<br>Operation and derived<br>objects, Scanner and derived<br>objects,<br>Discriminator | <b>2387</b>          |
| Number-of-Segments               | MDC_ATTR_NUM_SEG                                                                | PM-Store                                                                                                | 2385                 |
| Vmo-Global-Reference             | MDC_ATTR_VMO_REF_GLB                                                            | PM-Segment                                                                                              | 2469                 |
| Segment-Start-Abs-Time           | MDC_ATTR_TIME_START_SEG                                                         | PM-Segment                                                                                              | 2450                 |
| Segment-End-Abs-Time             | MDC_ATTR_TIME_END_SEG                                                           | PM-Segment                                                                                              | 2442                 |
| Segment-Usage-Count              | MDC_ATTR_SEG_USAGE_CNT                                                          | PM-Segment                                                                                              | 2427                 |
| Segment-Data                     | MDC_ATTR_SEG_DATA_GEN<br>MDC_ATTR_SEG_DATA_NU_OPT<br>MDC_ATTR_SEG_DATA_RTSA_OPT | PM-Segment                                                                                              | 2424<br>2425<br>2426 |

**Table A.3.2.2—Object-oriented modeling elements—  
Medical Package—attributes (continued)**

| DIM name                | Reference ID                    | Derived from           | Code |
|-------------------------|---------------------------------|------------------------|------|
| Average-Reporting-Delay | MDC_ATTR_REPORTING_DELAY_AVG    | Real Time Sample Array | 2616 |
| Sample-Time-Sync        | MDC_ATTR_SAMPLE_TIME_SYNC       | Real Time Sample Array | 2617 |
| HiRes-Sample-Time-Sync  | MDC_ATTR_SAMPLE_TIME_SYNC_HIRES | Real Time Sample Array | 2618 |
| Cmplx-Metric-Info       | MDC_attr_cmplx_info             | Complex Metric         | 2619 |
| Cmplx-Observed-Value    | MDC_attr_cmplx_val_obs          | Complex Metric         | 2620 |
| Cmplx-Dyn-Attr          | MDC_attr_cmplx_dyn_attr         | Complex Metric         | 2621 |
| Cmplx-Static-Attr       | MDC_attr_cmplx_static_attr      | Complex Metric         | 2622 |
| Cmplx-Recursion-Depth   | MDC_attr_cmplx_recursion_depth  | Complex Metric         | 2623 |

**Table A.3.2.3—Object-oriented modeling elements—  
Medical Package—attribute groups**

| DIM name                              | Reference ID                | Belongs to object                                       | Code        |
|---------------------------------------|-----------------------------|---------------------------------------------------------|-------------|
| <b>VMO Static Context Group *</b>     | MDC_ATTR_GRP_VMO_STATIC     | <b>VMO</b> and derived objects, SCO and derived objects | <b>2065</b> |
| <b>VMO Dynamic Context Group *</b>    | MDC_ATTR_GRP_VMO_DYN        | <b>VMO</b> and derived objects, SCO and derived objects | <b>2064</b> |
| <b>Relationship Attribute Group *</b> | MDC_ATTR_GRP_RELATION       | <b>VMO</b> and derived objects, VMS and derived objects | <b>2072</b> |
| VMD Application Attribute Group       | MDC_ATTR_GRP_VMD_APPL       | VMD and derived objects                                 | 2062        |
| VMD Production Attribute Group        | MDC_ATTR_GRP_VMD_PROD       | VMD and derived objects                                 | 2063        |
| Metric Observed Value Group           | MDC_ATTR_GRP_METRIC_VAL_OBS | Metric and derived objects                              | 2051        |
| PM-Store Attribute Group              | MDC_ATTR_GRP_PMSTORE        | Persistent Metric Store                                 | 2054        |

**Table A.3.2.4—Object-oriented modeling elements—Medical Package—behavior**

| DIM name         | Reference ID         | Belongs to object | Code |
|------------------|----------------------|-------------------|------|
| Clear-Segments   | MDC_ACT_SEG_CLR      | PM-Store          | 3084 |
| Get-Segments     | MDC_ACT_SEG_GET      | PM-Store          | 3085 |
| Get-Segment-Info | MDC_ACT_SEG_GET_INFO | PM-Store          | 3086 |

**Table A.3.2.5—Object-oriented modeling elements—Medical Package—notifications**

| DIM name                                                                                                                                                                             | Reference ID | Belongs to object | Code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| This table has no content. Following the construction and ordering scheme (see item c in A.3.1), empty tables are not left out in order to enhance readability and usability of A.3. |              |                   |      |

**A.3.2.3 Alert Package****Table A.3.3.1—Object-oriented modeling elements—Alert Package—object class items**

| DIM name      | Reference ID        | Derived from | Code |
|---------------|---------------------|--------------|------|
| Alert         | MDC_MOC_VMO_AL      | VMO          | 52   |
| Alert Status  | MDC_MOC_VMO_AL_STAT | VMO          | 53   |
| Alert Monitor | MDC_MOC_VMO_AL_MON  | VMO          | 54   |

**Table A.3.3.2—Object-oriented modeling elements—Alert Package—attributes**

| DIM name               | Reference ID                | Belongs to object                               | Code |
|------------------------|-----------------------------|-------------------------------------------------|------|
| Alert-Condition        | MDC_ATTR_AL_COND            | Alert                                           | 2476 |
| Limit-Specification    | MDC_ATTR_AL_LIMIT           | Alert                                           | 2477 |
| Vmo-Reference *        | MDC_ATTR_VMO_REF            | Alert,<br>SCO,<br>Operation and derived objects | 2468 |
| Alert-Capab-List       | MDC_ATTR_AL_STAT_AL_C_LIST  | Alert Status                                    | 2312 |
| Tech-Alert-List        | MDC_ATTR_AL_STAT_T_AL_LIST  | Alert Status                                    | 2315 |
| Physio-Alert-List      | MDC_ATTR_AL_STAT_P_AL_LIST  | Alert Status                                    | 2314 |
| Limit-Spec-List        | MDC_ATTR_AL_LIMIT_SPEC_LIST | Alert Status,<br>Alert Monitor                  | 2305 |
| Device-Alert-Condition | MDC_ATTR_DEV_AL_COND        | Alert Monitor                                   | 2326 |
| Device-P-Alarm-List    | MDC_ATTR_AL_MON_P_AL_LIST   | Alert Monitor                                   | 2306 |
| Device-T-Alarm-List    | MDC_ATTR_AL_MON_T_AL_LIST   | Alert Monitor                                   | 2308 |
| Device-Sup-Alarm-List  | MDC_ATTR_AL_MON_S_AL_LIST   | Alert Monitor                                   | 2307 |
| Suspension-Period      | MDC_ATTR_TIME_PD_AL_SUSP    | Alert Monitor                                   | 2446 |

**Table A.3.3.3—Object-oriented modeling elements—Alert Package—attribute groups**

| DIM name                                                      | Reference ID            | Belongs to object                                             | Code   |
|---------------------------------------------------------------|-------------------------|---------------------------------------------------------------|--------|
| VMO Static Context Group *<br>(see: VMO/<br>Medical Package)  | MDC_ATTR_GRP_VMO_STATIC | <b>VMO</b> and derived objects,<br>SCO and<br>derived objects | (2065) |
| VMO Dynamic Context Group *<br>(see: VMO/<br>Medical Package) | MDC_ATTR_GRP_VMO_DYN    | <b>VMO</b> and derived objects,<br>SCO and<br>derived objects | (2064) |
| Alert Group                                                   | MDC_ATTR_GRP_AL         | Alert                                                         | 2067   |
| Alert Status Group                                            | MDC_ATTR_GRP_AL_STAT    | Alert Status                                                  | 2050   |
| Alert Monitor Group                                           | MDC_ATTR_GRP_AL_MON     | Alert Monitor                                                 | 2049   |

**Table A.3.3.4—Object-oriented modeling elements—Alert Package—behavior**

| DIM name                                                                                                                                                                             | Reference ID | Belongs to object | Code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| This table has no content. Following the construction and ordering scheme (see item c in A.3.1), empty tables are not left out in order to enhance readability and usability of A.3. |              |                   |      |

**Table A.3.3.5—Object-oriented modeling elements—Alert Package—notifications**

| DIM name                                                                                                                                                                             | Reference ID | Belongs to object | Code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| This table has no content. Following the construction and ordering scheme (see item c in A.3.1), empty tables are not left out in order to enhance readability and usability of A.3. |              |                   |      |

### A.3.2.4 System Package

**Table A.3.4.1—Object-oriented modeling elements—System Package—object class items**

| DIM name                   | Reference ID                      | Derived from | Code |
|----------------------------|-----------------------------------|--------------|------|
| VMS                        | MDC_MOC_VMS                       | Top          | 32   |
| MDS                        | MDC_MOC_VMS_MDS                   | VMS          | 33   |
| Simple MDS                 | MDC_MOC_VMS_MDS_SIMP              | MDS          | 37   |
| Hydra MDS                  | MDC_MOC_VMS_MDS_HYD               | MDS          | 36   |
| Composite Single Bed MDS   | MDC_MOC_VMS_MDS_COMPOS_SINGLE_BED | MDS          | 35   |
| Composite Multiple Bed MDS | MDC_MOC_VMS_MDS_COMPOS_MULTI_BED  | MDS          | 34   |
| Log                        | MDC_MOC_LOG                       | Top          | 38   |
| Event Log                  | MDC_MOC_LOG_EVENT                 | Log          | 72   |
| Battery                    | MDC_MOC_BATT                      | Top          | 41   |
| Clock                      | MDC_MOC_CLOCK                     | Top          | 78   |

**Table A.3.4.2—Object-oriented modeling elements—  
System Package—attributes**

| DIM name                                                       | Reference ID              | Belongs to object                                                                                                                                                                                                                                                                               | Code        |
|----------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| Handle *<br>(see: VMO/<br>Medical Package)                     | MDC_ATTR_ID_HANDLE        | <b>VMO</b> and derived objects,<br>VMS and derived objects,<br>Log and derived objects,<br>Battery,<br>Scanner and derived objects,<br>Discriminator,<br>Multipatient Archive,<br>Patient Archive,<br>Session Archive,<br>Session Test,<br>Session Notes,<br>Physician,<br>Patient Demographics | (2337)      |
| System-Type                                                    | MDC_ATTR_SYS_TYPE         | VMS and derived objects                                                                                                                                                                                                                                                                         | 2438        |
| System-Model *<br>(see: VMD Model/<br>VMD/<br>Medical Package) | MDC_ATTR_ID_MODEL         | <b>VMD</b> and derived objects,<br>VMS and derived objects                                                                                                                                                                                                                                      | (2344)      |
| <b>System-Id *</b>                                             | MDC_ATTR_SYS_ID           | <b>VMS</b> and derived objects,<br>Multipatient Archive,<br>Patient Archive                                                                                                                                                                                                                     | <b>2436</b> |
| Compatibility-Id *<br>(see: VMD/<br>Medical Package)           | MDC_ATTR_ID_COMPAT        | <b>VMD</b> and derived objects,<br>VMS and derived objects                                                                                                                                                                                                                                      | (2336)      |
| Nomenclature-Version                                           | MDC_ATTR_NOM_VERS         | VMS and derived objects                                                                                                                                                                                                                                                                         | 2376        |
| System-Capability                                              | MDC_ATTR_SYS_CAPAB        | VMS and derived objects                                                                                                                                                                                                                                                                         | 2435        |
| System-Specification                                           | MDC_ATTR_SYS_SPECN        | VMS and derived objects                                                                                                                                                                                                                                                                         | 2437        |
| Production-Specification *<br>(see: VMD/<br>Medical Package)   | MDC_ATTR_ID_PROD_SPECN    | <b>VMD</b> and derived objects,<br>VMS and derived objects,<br>Battery                                                                                                                                                                                                                          | (2349)      |
| Ext-Obj-Relations *<br>(see: VMO/<br>Medical Package)          | MDC_ATTR_EXT_OBJ_RELATION | <b>VMO</b> and derived objects,<br>VMS and derived objects                                                                                                                                                                                                                                      | (2499)      |
| Mds-Status                                                     | MDC_ATTR_VMS_MDS_STAT     | MDS and derived objects                                                                                                                                                                                                                                                                         | 2471        |
| Bed-Label                                                      | MDC_ATTR_ID_BED_LABEL     | MDS and derived objects                                                                                                                                                                                                                                                                         | 2334        |
| Soft-Id                                                        | MDC_ATTR_ID_SOFT          | MDS and derived objects                                                                                                                                                                                                                                                                         | 2350        |
| Operating-Mode                                                 | MDC_ATTR_MODE_OP          | MDS and derived objects                                                                                                                                                                                                                                                                         | 2374        |
| Application-Area                                               | MDC_ATTR_AREA_APPL        | MDS and derived objects                                                                                                                                                                                                                                                                         | 2317        |
| <b>Patient-Type *</b>                                          | MDC_ATTR_PT_TYPE          | <b>MDS</b> and derived objects,<br>Patient Demographics                                                                                                                                                                                                                                         | <b>2402</b> |
| Date-and-Time                                                  | MDC_ATTR_TIME_ABS         | MDS and derived objects                                                                                                                                                                                                                                                                         | 2439        |
| Relative-Time                                                  | MDC_ATTR_TIME_REL         | MDS and derived objects                                                                                                                                                                                                                                                                         | 2447        |
| HiRes-Relative-Time                                            | MDC_ATTR_TIME_REL_HI_RES  | MDS and derived objects                                                                                                                                                                                                                                                                         | 2536        |
| Time Capabilities                                              | MDC_ATTR_TIME_SUPPORT     | Clock                                                                                                                                                                                                                                                                                           | 2607        |
| Time Status                                                    | MDC_ATTR_DATE_TIME_STATUS | Clock                                                                                                                                                                                                                                                                                           | 2608        |
| Date and Time in ISO Format                                    | MDC_ATTR_TIME_ABS_ISO     | Clock                                                                                                                                                                                                                                                                                           | 2609        |

**Table A.3.4.2—Object-oriented modeling elements—  
System Package—attributes (continued)**

| DIM name                                                | Reference ID                         | Belongs to object                       | Code        |
|---------------------------------------------------------|--------------------------------------|-----------------------------------------|-------------|
| List of External (different format) Time Stamps         | MDC_ATTR_TIME_STAMP_LIST_EXT         | Clock                                   | 2610        |
| Attribute for synchronization between Abs and Rel Times | MDC_ATTR_TIME_ABS_REL_SYNC           | Clock                                   | 2611        |
| Time Zone                                               | MDC_ATTR_TIME_ZONE                   | Clock                                   | 2612        |
| Info for daylight savings time transition               | MDC_ATTR_TIME_DAYLIGHT_SAVINGS_TRANS | Clock                                   | 2613        |
| Cumulative leap seconds                                 | MDC_ATTR_CUM_LEAP_SECONDS            | Clock                                   | 2614        |
| Time stamp for next leap second                         | MDC_ATTR_NEXT_LEAP_SECOND            | Clock                                   | 2615        |
| Power-Status                                            | MDC_ATTR_POWER_STAT                  | MDS and derived objects                 | 2389        |
| Altitude                                                | MDC_ATTR_ALTITUDE                    | MDS and derived objects                 | 2316        |
| Battery-Level ("charge")                                | MDC_ATTR_VAL_BATT_CHARGE             | MDS and derived objects                 | 2460        |
| <b>Remaining-Battery-Time *</b>                         | MDC_ATTR_TIME_BATT_REMAIN            | <b>MDS and derived objects, Battery</b> | <b>2440</b> |
| Line-Frequency                                          | MDC_ATTR_LINE_FREQ                   | MDS and derived objects                 | 2357        |
| Association-Invoke-Id                                   | MDC_ATTR_ID_ASSOC_NO                 | MDS and derived objects                 | 2333        |
| Current-Log-Entries                                     | MDC_ATTR_LOG_ENTRIES_CURR            | Log and derived objects                 | 2360        |
| Max-Log-Entries                                         | MDC_ATTR_LOG_ENTRIES_MAX             | Log and derived objects                 | 2361        |
| Event-Log-Entry-List                                    | MDC_ATTR_EVENT_LOG_ENTRY_LIST        | Event Log                               | 2564        |
| Event-Log-Info                                          | MDC_ATTR_EVENT_LOG_INFO              | EventLog                                | 2591        |
| Log-Change-Count                                        | MDC_ATTR_LOG_CHANGE_COUNT            | Log and derived objects                 | 2592        |
| Battery-Status                                          | MDC_ATTR_BATT_STAT                   | Battery                                 | 2484        |
| Capacity-Remaining                                      | MDC_ATTR_CAPAC_BATT_REMAIN           | Battery                                 | 2488        |
| Capacity-Full-Charge                                    | MDC_ATTR_CAPAC_BATT_FULL             | Battery                                 | 2487        |
| Capacity-Specified                                      | MDC_ATTR_CAPAC_BATT_SPECN            | Battery                                 | 2489        |
| Voltage                                                 | MDC_ATTR_BATT_VOLTAGE                | Battery                                 | 2485        |
| Voltage-Specified                                       | MDC_ATTR_BATT_VOLTAGE_SPECN          | Battery                                 | 2486        |
| Current                                                 | MDC_ATTR_BATT_CURR                   | Battery                                 | 2483        |
| Battery-Temperature                                     | MDC_ATTR_TEMP_BATT                   | Battery                                 | 2534        |
| Charge-Cycles                                           | MDC_ATTR_BATT_CHARGE_CYCLES          | Battery                                 | 2482        |

**Table A.3.4.3—Object-oriented modeling elements—System Package—attribute groups**

| DIM name                                                         | Reference ID          | Belongs to object                                          | Code   |
|------------------------------------------------------------------|-----------------------|------------------------------------------------------------|--------|
| System Identification Attribute Group                            | MDC_ATTR_GRP_SYS_ID   | VMS and derived objects                                    | 2059   |
| System Application Attribute Group                               | MDC_ATTR_GRP_SYS_APPL | VMS and derived objects                                    | 2058   |
| System Production Attribute Group                                | MDC_ATTR_GRP_SYS_PROD | VMS and derived objects                                    | 2060   |
| Relationship Attribute Group *<br>(see: VMO/<br>Medical Package) | MDC_ATTR_GRP_RELATION | <b>VMO</b> and derived objects,<br>VMS and derived objects | (2072) |
| Clock Attribute Group                                            | MDC_ATTR_GRP_CLOCK    | Clock                                                      | 2078   |
| Battery Attribute Group                                          | MDC_ATTR_GRP_BATT     | Battery                                                    | 2069   |

**Table A.3.4.4—Object-oriented modeling elements—System Package—behavior**

| DIM name              | Reference ID                  | Belongs to object       | Code |
|-----------------------|-------------------------------|-------------------------|------|
| Mds-Set-Status        | MDC_ACT_SET_MDS_STATE         | MDS and derived objects | 3087 |
| Clear-Log             | MDC_ACT_CLR_LOG               | Log and derived objects | 3075 |
| Get-Event-Log-Entries | MDC_ACT_GET_EVENT_LOG_ENTRIES | EventLog                | 3092 |
| Set-Time              | MDC_ACT_SET_TIME              | Clock                   | 3095 |
| Set-Time-Zone         | MDC_ACT_SET_TIME_ZONE         | Clock                   | 3096 |
| Set-Leap-Seconds      | MDC_ACT_SET_LEAP_SECONDS      | Clock                   | 3097 |
| Set-ISO-Time          | MDC_ACT_SET_TIME_ISO          | Clock                   | 3098 |

**Table A.3.4.5—Object-oriented modeling elements—System Package—notifications**

| DIM name                | Reference ID               | Belongs to object       | Code |
|-------------------------|----------------------------|-------------------------|------|
| System-Error            | MDC_NOTI_SYS_ERR           | MDS and derived objects | 3349 |
| Mds-Create-Notification | MDC_NOTI_MDS_CREAT         | MDS and derived objects | 3334 |
| Mds-Attribute-Update    | MDC_NOTI_MDS_ATTR_UPDT     | MDS and derived objects | 3333 |
| Date-Time Changed       | MDC_NOTE_DATE_TIME_CHANGED | Clock                   | 3355 |

### A.3.2.5 Control Package

**Table A.3.5.1—Object-oriented modeling elements—Control Package—object class items**

| DIM name              | Reference ID                    | Derived from | Code |
|-----------------------|---------------------------------|--------------|------|
| SCO                   | MDC_MOC_CNTRL_SCO               | Top          | 43   |
| Operation             | MDC_MOC_CNTRL_OP                | Top          | 44   |
| Select Item Operation | MDC_MOC_CNTRL_OP_SEL_IT         | Operation    | 45   |
| Set Value Operation   | MDC_MOC_CNTRL_OP_SEL_VAL        | Operation    | 47   |
| Set String Operation  | MDC_MOC_CNTRL_OP_SET_STRIN<br>G | Operation    | 73   |
| Toggle Flag Operation | MDC_MOC_CNTRL_OP_TOG            | Operation    | 49   |
| Activate Operation    | MDC_MOC_CNTRL_OP_ACTIV          | Operation    | 50   |
| Limit Alert Operation | MDC_MOC_CNTRL_OP_LIM            | Operation    | 51   |
| Set Range Operation   | MDC_MOC_CNTRL_OP_SET_<br>RANGE  | Operation    | 80   |

**Table A.3.5.2—Object-oriented modeling elements—  
Control Package—attributes**

| DIM name                                                   | Reference ID                      | Belongs to object                                                                                                  | Code   |
|------------------------------------------------------------|-----------------------------------|--------------------------------------------------------------------------------------------------------------------|--------|
| Sco-Capability                                             | MDC_ATTR_SCO_CAPAB                | SCO                                                                                                                | 2422   |
| Sco-Help-Text-String                                       | MDC_ATTR_SCO_HELP_TEXT_STRIN<br>G | SCO                                                                                                                | 2549   |
| Vmo-Reference *<br>(see: Alert/<br>Alert Package)          | MDC_ATTR_VMO_REF                  | <b>Alert,</b><br>SCO,<br>Operation and derived objects                                                             | (2468) |
| Activity-Indicator                                         | MDC_ATTR_INDIC_ACTIV              | SCO                                                                                                                | 2355   |
| Lock-State                                                 | MDC_ATTR_STAT_LOCK                | SCO                                                                                                                | 2432   |
| Invoke-Cookie                                              | MDC_ATTR_ID_INVOK_COOKIE          | SCO                                                                                                                | 2339   |
| Instance-Number *<br>(see: VMD/<br>Medical Package)        | MDC_ATTR_ID_INSTNO                | <b>VMD</b> and derived objects,<br>PM-Segment,<br>Operation and derived<br>objects,<br>Scanner and derived objects | (2338) |
| Operation-Spec                                             | MDC_ATTR_OP_SPEC                  | Operation and derived objects                                                                                      | 2386   |
| Operation-Text-String                                      | MDC_ATTR_OP_TEXT_STRING           | Operation and derived objects                                                                                      | 2514   |
| Operation-Text-String-Dynamic                              | MDC_ATTR_OP_TEXT_STRING_DY<br>N   | Operation and derived objects                                                                                      | 2602   |
| Operational-State *<br>(see: PM-Store/<br>Medical Package) | MDC_ATTR_OP_STAT                  | <b>PM-Store,</b><br>Operation and derived<br>objects, Scanner and derived<br>objects,<br>Discriminator             | (2387) |
| Selected-Item-Index                                        | MDC_ATTR_INDEX_SEL                | Select Item Operation                                                                                              | 2354   |

**Table A.3.5.2—Object-oriented modeling elements—  
Control Package—attributes (continued)**

| DIM name                                         | Reference ID                     | Belongs to object                                                                   | Code   |
|--------------------------------------------------|----------------------------------|-------------------------------------------------------------------------------------|--------|
| Nom-Partition                                    | MDC_ATTR_ID_NOM_PARTITION        | Select Item Operation                                                               | 2345   |
| Select-List                                      | MDC_ATTR_LIST_SEL                | Select Item Operation                                                               | 2358   |
| Current-Value                                    | MDC_ATTR_VAL_CURR                | Set Value Operation                                                                 | 2461   |
| Set-Value-Range                                  | MDC_ATTR_VAL_RANGE               | Set Value Operation,<br>Limit Alert Operation                                       | 2464   |
| Step-Width                                       | MDC_ATTR_VAL_STEP_WIDTH          | Set Value Operation                                                                 | 2465   |
| Unit-Code *<br>(see: Metric/<br>Medical Package) | MDC_ATTR_UNIT_CODE               | <b>Metric</b> and derived objects,<br>Set Value Operation,<br>Limit Alert Operation | (2454) |
| Current-String                                   | MDC_ATTR_STRING_CURR             | Set String Operation                                                                | 2565   |
| Set-String-Spec                                  | MDC_ATTR_SET_STRING_SPEC         | Set String Operation                                                                | 2567   |
| Toggle-State                                     | MDC_ATTR_STAT_OP_TOG             | Toggle Flag Operation                                                               | 2433   |
| Toggle-Label-Strings                             | MDC_ATTR_TOG_LABELS_STRING       | Toggle Flag Operation                                                               | 2540   |
| Alert-Op-Capability                              | MDC_ATTR_AL_OP_CAPAB             | Limit Alert Operation                                                               | 2309   |
| Alert-Op-State                                   | MDC_ATTR_AL_OP_STAT              | Limit Alert Operation                                                               | 2310   |
| Limit Alert Operation                            | MDC_ATTR_LIMIT_CURR              | Limit Alert Operation                                                               | 2356   |
| Alert-Op-Text-String                             | MDC_ATTR_AL_OP_TEXT              | Limit Alert Operation                                                               | 2311   |
| Metric-Id<br>("Physio ID")                       | MDC_ATTR_ID_PHYSIO               | Limit Alert Operation                                                               | 2347   |
| Current-Range                                    | MDC_ATTR_RANGE_CURR              | Set Range Operation                                                                 | 2624   |
| Range-Op-Text                                    | MDC_ATTR_RANGE_OP_TEXT<br>STRING | Set Range Operation                                                                 | 2625   |

**Table A.3.5.3—Object-oriented modeling elements—Control Package—attribute groups**

| DIM name                                                     | Reference ID                     | Belongs to object                                          | Code   |
|--------------------------------------------------------------|----------------------------------|------------------------------------------------------------|--------|
| VMO Static Context Group *<br>(see VMO/<br>Medical Package)  | MDC_ATTR_GRP_VMO_STATIC          | <b>VMO</b> and derived objects,<br>SCO and derived objects | (2065) |
| VMO Dynamic Context Group *<br>(see VMO/<br>Medical Package) | MDC_ATTR_GRP_VMO_DYN             | <b>VMO</b> and derived objects,<br>SCO and derived objects | (2064) |
| Operation Static Context Group                               | MDC_ATTR_GRP_OP_STATIC_CTXT      | Operation and derived objects                              | 2053   |
| Operation Dynamic Context<br>Group                           | MDC_ATTR_GRP_OP_DYN_CTXT         | Operation and derived objects                              | 2052   |
| SCO Transaction Group                                        | MDC_ATTR_GRP_SCO_<br>TRANSACTION | SCO,<br>Operation and derived objects                      | 2057   |

**Table A.3.5.4—Object-oriented modeling elements—Control Package—behavior**

| DIM name         | Reference ID          | Belongs to object | Code |
|------------------|-----------------------|-------------------|------|
| Operation-Invoke | MDC_ACT_SCO_OP_INVOK  | SCO               | 3083 |
| Get-Ctxt-Help    | MDC_ACT_GET_CTXT_HELP | SCO               | 3077 |

**Table A.3.5.5—Object-oriented modeling elements—Control Package—notifications**

| DIM name                   | Reference ID              | Belongs to object | Code |
|----------------------------|---------------------------|-------------------|------|
| Sco-Operating-Request      | MDC_NOTI_SCO_OP_REQ       | SCO               | 3347 |
| Sco-Operation-Invoke-Error | MDC_NOTI_SCO_OP_INVOK_ERR | SCO               | 3346 |

### A.3.2.6 Extended Services Package

**Table A.3.6.1—Object-oriented modeling elements—  
Extended Services Package—object class items**

| DIM name                           | Reference ID               | Derived from                  | Code |
|------------------------------------|----------------------------|-------------------------------|------|
| Scanner                            | MDC_MOC_SCAN               | Top                           | 16   |
| Configurable Scanner               | MDC_MOC_SCAN_CFG           | Scanner                       | 17   |
| Episodic Configurable Scanner      | MDC_MOC_SCAN_CFG_EPI       | Configurable Scanner          | 18   |
| Periodic Configurable Scanner      | MDC_MOC_SCAN_CFG_PERI      | Configurable Scanner          | 19   |
| Fast Periodic Configurable Scanner | MDC_MOC_SCAN_CFG_PERI_FAST | Periodic Configurable Scanner | 20   |
| Unconfigurable Scanner             | MDC_MOC_SCAN_UCFG          | Scanner                       | 21   |
| Context Scanner                    | MDC_MOC_SCAN_UCFG_CTXT     | Unconfigurable Scanner        | 23   |
| Alert Scanner                      | MDC_MOC_SCAN_UCFG_ALSTAT   | Unconfigurable Scanner        | 22   |
| Operating Scanner                  | MDC_MOC_SCAN_UCFG_OP       | Unconfigurable Scanner        | 24   |
| Discriminator                      | MDC_MOC_DISCRIM            | Top                           | 66   |

**Table A.3.6.2—Object-oriented modeling elements—  
Extended Services Package—attributes**

| DIM name                                                   | Reference ID               | Belongs to object                                                                                                                                                                                                                                                                               | Code   |
|------------------------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Handle *<br>(see: VMO/<br>Medical Package)                 | MDC_ATTR_ID_HANDLE         | <b>VMO</b> and derived objects,<br>VMS and derived objects,<br>Log and derived objects,<br>Battery,<br>Scanner and derived objects,<br>Discriminator,<br>Multipatient Archive,<br>Patient Archive,<br>Session Archive,<br>Session Test,<br>Session Notes,<br>Physician,<br>Patient Demographics | (2337) |
| Instance-Number *<br>(see: VMD/<br>Medical Package)        | MDC_ATTR_ID_INSTNO         | <b>VMD</b> and derived objects,<br>PM-Segment,<br>Operation and derived<br>objects,<br>Scanner and derived objects                                                                                                                                                                              | (2338) |
| Operational-State *<br>(see: PM-Store/<br>Medical Package) | MDC_ATTR_OP_STAT           | <b>PM-Store</b> ,<br>Operation and derived<br>objects, Scanner and derived<br>objects,<br>Discriminator                                                                                                                                                                                         | (2387) |
| Scan-List                                                  | MDC_ATTR_SCAN_LIST         | Configurable Scanner and<br>derived objects                                                                                                                                                                                                                                                     | 2420   |
| Confirm-Mode                                               | MDC_ATTR_CONFIRM_MODE      | Configurable Scanner and<br>derived objects                                                                                                                                                                                                                                                     | 2323   |
| Confirm-Timeout                                            | MDC_ATTR_CONFIRM_TIMEOUT   | Configurable Scanner and<br>derived objects,<br>Unconfigurable Scanner and<br>derived objects                                                                                                                                                                                                   | 2324   |
| Transmit-Window                                            | MDC_ATTR_TX_WIND           | Configurable Scanner and<br>derived objects,<br>Unconfigurable Scanner and<br>derived objects                                                                                                                                                                                                   | 2453   |
| Scan-Config-Limit                                          | MDC_ATTR_SCAN_CFG_LIMIT    | Configurable Scanner and<br>derived objects                                                                                                                                                                                                                                                     | 2558   |
| Scan-Extensibility                                         | MDC_ATTR_SCAN_EXTEND       | Periodic Configurable<br>Scanner and derived objects                                                                                                                                                                                                                                            | 2419   |
| Reporting-Interval                                         | MDC_ATTR_SCAN_REP_PD       | Periodic Configurable<br>Scanner and derived objects,<br>Alert Scanner                                                                                                                                                                                                                          | 2421   |
| Context-Mode                                               | MDC_ATTR_SCAN_CTXT_MODE    | Context Scanner                                                                                                                                                                                                                                                                                 | 2418   |
| Discriminator-Construct                                    | MDC_ATTR_DISCRIM_CONSTRUCT | Discriminator                                                                                                                                                                                                                                                                                   | 2497   |

**Table A.3.6.3—Object-oriented modeling elements—  
Extended Services Package—attribute groups**

| DIM name                      | Reference ID         | Belongs to object           | Code |
|-------------------------------|----------------------|-----------------------------|------|
| Scanner Attribute Group       | MDC_ATTR_GRP_SCAN    | Scanner and derived objects | 2056 |
| Discriminator Attribute Group | MDC_ATTR_GRP_DISCRIM | Discriminator               | 2070 |

**Table A.3.6.4—Object-oriented modeling elements—Extended Services Package—behavior**

| DIM name                     | Reference ID          | Belongs to object                                 | Code |
|------------------------------|-----------------------|---------------------------------------------------|------|
| Refresh-Episodic-Data        | MDC_ACT_REFR_EPI_DATA | Episodic Configurable Scanner and derived objects | 3080 |
| Refresh-Context              | MDC_ACT_REFR_CTXT     | Context Scanner                                   | 3079 |
| Refresh-Operation-Context    | MDC_ACT_REFR_OP_CTXT  | Operating Scanner                                 | 3082 |
| Refresh-Operation-Attributes | MDC_ACT_REFR_OP_ATTR  | Operating Scanner                                 | 3081 |

**Table A.3.6.5—Object-oriented modeling elements—  
Extended Services Package—notifications**

| DIM name                   | Reference ID               | Belongs to object                                 | Code |
|----------------------------|----------------------------|---------------------------------------------------|------|
| Unbuf-Scan-Report          | MDC_NOTI_UNBUF_SCAN_RPT    | Episodic Configurable Scanner and derived objects | 3350 |
| Buf-Scan-Report            | MDC_NOTI_BUF_SCAN_RPT      | Periodic Configurable Scanner and derived objects | 3331 |
| Fast-Buf-Scan-Report       | MDC_NOTI_FAST_BUF_SCAN_RPT | Fast Periodic Configurable Scanner                | 3332 |
| Object-Create-Notification | MDC_NOTI_OBJ_CREAT         | Context Scanner, Operating Scanner                | 3336 |
| Object-Delete-Notification | MDC_NOTI_OBJ_DEL           | Context Scanner, Operating Scanner                | 3338 |
| Alert-Scan-Report          | MDC_NOTI_AL_STAT_SCAN_RPT  | Alert Scanner                                     | 3329 |
| Oper-Create-Notification   | MDC_NOTI_OP_CREAT          | Operating Scanner                                 | 3340 |
| Oper-Delete-Notification   | MDC_NOTI_OP_DEL            | Operating Scanner                                 | 3341 |
| Oper-Attribute-Update      | MDC_NOTI_OP_ATTR_UPDT      | Operating Scanner                                 | 3339 |

**A.3.2.7 Communication Package****Table A.3.7.1—Object-oriented modeling elements—  
Communication Package—object class items**

| DIM name                               | Reference ID | Derived from             | Code |
|----------------------------------------|--------------|--------------------------|------|
| Communication Controller               | MDC_MOC_CC   | Top                      | 28   |
| DCC [device communication controller]  | MDC_MOC_DCC  | Communication Controller | 76   |
| BCC [bedside communication controller] | MDC_MOC_BCC  | Communication Controller | 77   |

**Table A.3.7.2—Object-oriented modeling elements—Communication Package—attributes**

| DIM name                                   | Reference ID               | Belongs to object                                                                                                                                                                                                                                                                                                       | Code   |
|--------------------------------------------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Handle *<br>(see: VMO/<br>Medical Package) | MDC_ATTR_ID_HANDLE         | VMO and derived objects,<br>VMS and derived objects,<br>Log and derived objects,<br>Battery,<br>Scanner and derived<br>objects,<br>Discriminator,<br>Communication Controller<br>Multipatient Archive,<br>Patient Archive,<br>Session Archive,<br>Session Test,<br>Session Notes,<br>Physician,<br>Patient Demographics | (2337) |
| Capability                                 | MDC_ATTR_CC_CAPAB          | Communication Controller                                                                                                                                                                                                                                                                                                | 2593   |
| CC-Type                                    | MDC_ATTR_CC_TYPE           | Communication Controller                                                                                                                                                                                                                                                                                                | 2594   |
| Number-Of-Difs                             | MDC_ATTR_CC_NUM_DIFS       | Communication Controller                                                                                                                                                                                                                                                                                                | 2595   |
| This-Connection-Dif-Index                  | MDC_ATTR_CC_THIS_DIF_INDEX | Communication Controller                                                                                                                                                                                                                                                                                                | 2596   |
| Cc-Ext-Mgmt-Proto-Id                       | MDC_ATTR_CC_EXT_MNG_PROT   | Communication Controller                                                                                                                                                                                                                                                                                                | 2597   |

**Table A.3.7.3—Object-oriented modeling elements—  
Communication Package—attribute groups**

| DIM name                                    | Reference ID    | Belongs to object        | Code |
|---------------------------------------------|-----------------|--------------------------|------|
| Communication Controller<br>Attribute Group | MDC_ATTR_GRP_CC | Communication Controller | 2077 |

**Table A.3.7.4—Object-oriented modeling elements—Communication Package—behavior**

| DIM name            | Reference ID           | Belongs to object        | Code |
|---------------------|------------------------|--------------------------|------|
| Clear-Segments      | MDC_ACT_GET_MIB_DATA   | Communication Controller | 3093 |
| Poll Clear-Segments | MDC_ACT_POLL_MDIB_DATA | Communication Controller | 3094 |

**Table A.3.7.5—Object-oriented modeling elements—Communication Package—notifications**

| DIM name                                                                                                                                                                             | Reference ID | Belongs to object | Code |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-------------------|------|
| This table has no content. Following the construction and ordering scheme (see item c in A.3.1), empty tables are not left out in order to enhance readability and usability of A.3. |              |                   |      |

**A.3.2.8 Archival Package****Table A.3.8.1—Object-oriented modeling elements—Archival Package—object class items**

| DIM name             | Reference ID             | Derived from | Code |
|----------------------|--------------------------|--------------|------|
| Multipatient Archive | MDC_MOC_ARCHIVE_MULTI_PT | Top          | 63   |
| Patient Archive      | MDC_MOC_ARCHIVE_PT       | Top          | 64   |
| Session Archive      | MDC_MOC_ARCHIVE_SESSION  | Top          | 65   |
| Physician            | MDC_MOC_PHYSICIAN        | Top          | 67   |
| Session Test         | MDC_MOC_SESSION_TEST     | Top          | 69   |
| Session Notes        | MDC_MOC_SESSION_NOTES    | Top          | 68   |

**Table A.3.8.2—Object-oriented modeling elements—Archival Package—attributes**

| DIM name                                     | Reference ID       | Belongs to object                                                                                                                                                                                                                                                                        | Code   |
|----------------------------------------------|--------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| Handle *<br>(see: VMO/<br>Medical Package)   | MDC_ATTR_ID_HANDLE | VMO and derived objects,<br>VMS and derived objects,<br>Log and derived objects,<br>Battery,<br>Scanner and derived objects,<br>Discriminator,<br>Multipatient Archive,<br>Patient Archive,<br>Session Archive,<br>Session Test,<br>Session Notes,<br>Physician,<br>Patient Demographics | (2337) |
| System-Id *<br>(see: VMS/<br>System Package) | MDC_ATTR_SYS_ID    | VMS and derived objects,<br>Multipatient Archive<br>Patient Archive                                                                                                                                                                                                                      | (2436) |
| Location                                     | MDC_ATTR_LOCATION  | Multipatient Archive                                                                                                                                                                                                                                                                     | 2509   |

**Table A.3.8.2—Object-oriented modeling elements—  
Archival Package—attributes (continued)**

| DIM name                                          | Reference ID                         | Belongs to object                                                                        | Code   |
|---------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------|--------|
| Study-Name                                        | MDC_ATTR_NAME_STUDY                  | Multipatient Archive                                                                     | 2531   |
| Version                                           | MDC_ATTR_ARCHIVE_VERS                | Multipatient Archive                                                                     | 2480   |
| System-Name                                       | MDC_ATTR_NAME_SYS                    | Patient Archive                                                                          | 2543   |
| Processing-History                                | MDC_ATTR_PROC_HIST                   | Patient Archive                                                                          | 2517   |
| Protection                                        | MDC_ATTR_PROTECTION                  | Patient Archive,<br>Session Archive,<br>Session Test,<br>Session Notes                   | 2519   |
| S-Archive-Id                                      | MDC_ATTR_ID_SESS_ARCHIVE             | Session Archive                                                                          | 2507   |
| S-Archive-Name                                    | MDC_ATTR_NAME_SESS_ARCHIVE           | Session Archive                                                                          | 2513   |
| S-Archive-Comments                                | MDC_ATTR_SESS_ARCHIVE_COMMENTS       | Session Archive                                                                          | 2530   |
| Start-Time *<br>(see: Metric/<br>Medical Package) | MDC_ATTR_TIME_START                  | <b>Metric</b> and derived objects,<br>Session Archive,<br>Session Test,<br>Session Notes | (2538) |
| Stop-Time *<br>(see: Metric/<br>Medical Package)  | MDC_ATTR_TIME_STOP                   | <b>Metric</b> and derived objects,<br>Session Archive,<br>Session Test,<br>Session Notes | (2539) |
| Physician-Id                                      | MDC_ATTR_ID_Physician                | Physician                                                                                | 2503   |
| Authorization-Level                               | MDC_ATTR_Auth_Level                  | Physician                                                                                | 2481   |
| Name                                              | MDC_ATTR_PHYSICIAN_NAME              | Physician                                                                                | 2544   |
| Given-Name                                        | MDC_ATTR_PHYSICIAN_NAME_GIVEN        | Physician                                                                                | 2546   |
| Family-Name                                       | MDC_ATTR_PHYSICIAN_NAME_FAMILY       | Physician                                                                                | 2545   |
| Middle-Name                                       | MDC_ATTR_PHYSICIAN_NAME_MIDDLE       | Physician                                                                                | 2547   |
| Title-Name                                        | MDC_ATTR_PHYSICIAN_NAME_TITLE        | Physician                                                                                | 2548   |
| St-Archive-Id                                     | MDC_ATTR_ID_SESS_TEST_ARCHIVE        | Session Test                                                                             | 2506   |
| St-Archive-Name                                   | MDC_ATTR_NAME_SESS_TEST_ARCHIVE      | Session Test                                                                             | 2512   |
| St-Archive-Comments                               | MDC_ATTR_SESS_TEST_ARCHIVE_COMMENTS  | Session Test                                                                             | 2529   |
| Sn-Id                                             | MDC_ATTR_ID_SESS_NOTES_ARCHIVE       | Session Notes                                                                            | 2505   |
| Sn-Name                                           | MDC_ATTR_NAME_SESS_NOTES_ARCHIVE     | Session Notes                                                                            | 2511   |
| Sn-Comments                                       | MDC_ATTR_SESS_NOTES_ARCHIVE_COMMENTS | Session Notes                                                                            | 2528   |
| Findings                                          | MDC_ATTR_Findings                    | Session Notes                                                                            | 2500   |