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# Health informatics — Personal health device communication

## Part 20601:
## Application profile — Optimized exchange protocol

TECHNICAL CORRIGENDUM 1

*Informatique de santé — Communication entre dispositifs de santé personnels —*

*Partie 20601: Profil d'application — Protocole d'échange optimisé*

*RECTIFICATIF TECHNIQUE 1*

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(Corrigendum to
IEEE Std 11073-20601-2014)

**Health informatics—Personal health device communication**

# Part 20601: Application profile—Optimized Exchange Protocol

# Corrigendum 1

Sponsor

**IEEE 11073™ Standards Committee**
of the
**IEEE Engineering in Medicine and Biology Society**

Approved 3 September 2015

**IEEE-SA Standards Board**

**Abstract:** Within the context of the ISO/IEEE 11073 family of standards for device communication, this standard defines a common framework for making an abstract model of personal health data available in transport-independent transfer syntax required to establish logical connections between systems and to provide presentation capabilities and services needed to perform communication tasks. The protocol is optimized to personal health usage requirements and leverages commonly used methods and tools wherever possible.

This corrigendum removes the ambiguities and corrects the wrong nomenclature codes and qualifier status that have been identified in IEEE Std 11073-20601-2014 to improve implementation of the standard in an interoperable fashion.

**Keywords:** IEEE 11073™, IEEE 11073-20601™, medical device communication, personal health devices

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## Introduction

This introduction is not part of IEEE Std 11073-20601™-2014/Cor 1-2015, Health informatics—Personal health device communication—Part 20601: Application profile—Optimized Exchange Protocol—Corrigendum 1.

ISO and IEEE 11073 standards enable communication between medical devices and external computer systems. This standard and corresponding IEEE 11073-104xx standards address a need for a simplified and optimized communication approach for personal health devices, which may or may not be regulated devices. These standards align with, and draw upon, the existing clinically focused standards to provide easy management of data from either a clinical or personal health device.

This document addresses a need for an openly defined, independent standard for converting the collected information into an interoperable transmission format so the information can be exchanged between agents and managers.

This standard removes the ambiguities and corrects the wrong nomenclature codes and qualifier status that have been identified in IEEE Std 11073-20601-2014 to improve implementation of the standard in an interoperable fashion.

## Contents

## Health informatics—Personal health device communication

# Part 20601: Application profile—Optimized Exchange Protocol

# Corrigendum 1

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# 6. Personal health device DIM

## 6.3 Personal health object class definitions

***Change Source-Handle-Reference and Source-Handle-Reference-List rows in Table 6 as shown:***

**Table 6—Metric Attributes**

| Attribute name | Attribute ID | Attribute type | Remark | Qualifiers |
|---|---|---|---|---|
| Source-Handle-Reference | MDC_ATTR_SOURCE_HANDLE_REF | HANDLE | This attribute establishes a relation of this object instance to a source object (e.g., pulse references sourcing SpO2). This attribute is used whenever it is required to model an explicit relation between object instances to define dependencies. The usage of this attribute is defined by device specializations. A metric object may contain one of Source-Handle-Reference or Source-Handle-Reference-List, but not both. If a measurement reports a Source-Handle-Reference or Source-Handle-Reference-List attribute, the measurement from the object(s) that it references shall be sent by the agent to the manager ~~must have been sent~~t prior to the sending of this measurement. | Optional Dynamic |
| Source-Handle-Reference-List | MDC_ATTR_SOURCE_HANDLE_REF_LIST | HANDLE List | This attribute establishes a relation of this object instance to more than one source objects (e.g., body mass index (BMI) references sourcing Height and Weight). This attribute is used whenever it is required to model an explicit relation between object instances to define dependencies. The usage of this attribute is defined by device specializations. A metric object may contain one of Source-Handle-Reference or Source-Handle-Reference-List, but not both. If a measurement reports a Source-Handle-Reference or Source-Handle-Reference-List attribute, the measurement from the object(s) that it references shall be sent by the agent to the manager ~~must have been sent~~ prior to the sending of this measurement. | Optional Dynamic |

### 6.3.7 PM-store class

#### 6.3.7.3 PM-store class attributes

***Delete the following text:***

~~The attributes Handle and PM-Store-Capab are part of the agent configuration; therefore, the manager knows the corresponding attribute values after the Configuring procedure.~~

#### 6.3.7.4 PM-store object methods

***Change the first paragraph after Table 11 as shown:***

If an agent supports the PM-store class, the support of the Get-Segment-Info ~~or Get-Segment-Id-List methods is mandatory,~~ and ~~support of~~ the Trig-Segment-Data-Xfer method is mandatory. Support for the Clear-Segments and Get-Segment-Id-List method is optional and is indicated in the PM-Store-Capab attribute.

***Delete text in Get-Segment-Info as shown:***

— **Get-Segment-Info:**

This method allows the manager to retrieve PM-segment attributes of one or more PM-segments, with the exception of the Fixed-Segment-Data attribute, which contains the actual stored data and is retrieved by using the Trig-Segment-Data-Xfer method. In particular, the Get-Segment-Info method allows the manager to retrieve the attributes and their data contents from the PM-segment object instances identified by the SegmSelection parameter.

The agent shall support the all-segments choice in the SegmSelection action-info-args of the Get-Segment-Info method. The agent may support the segm-id-list and/or abs-time-range and/or bo-time-range choice in the SegmSelection action-info-args of the Get-Segment-Info method. In this case the agent shall set the pmsc-segm-id-list-select and/or pmsc-abs-time-select flag in the PM-Store-Capab attribute. If the manager sends the Get-Segment-Info method with the choice that the agent does not support, the agent shall reply with an unsupported-choice error (roer).

For PM-segment info returned by time, the segments are selected using the same mechanism as described under Clear-Segments.

If the manager supports sending the Get-Segment-Info method, the manager shall support at least the choice all-segments in the SegmSelection action-info-args of the Get-Segment-Info method. The manager may support additional choices.

If a standard configuration contains any PM-Store object, the manager must send Get-Segment-info or Get-Segment-Id-List at the beginning of accessing any PM-Store object.

If no PM-Segment matches the selection criteria in the SegmSelection action-info-args so that no PM-segments are found by the action, then this is not an error, a normal response is sent, and the segment info list will just be empty.

If the choice of SegmSelection in the Get-Segment-Info method is segm-id-list and the segm-id-list is empty, then the response shall be a segment-info-list that is empty.

~~If the agent supports the Get-Segment-Info method, the agent shall set the pmsc-get-segm-info-sup flag in the PM-Store-Capab attribute.~~

***Insert text in Get-Segment-Id-List as shown:***

— **Get-Segment-Id-List**

This method allows the manager to retrieve a list of the instance numbers of all the PM-segments of a PM-store. In particular, the Get-Segm-Id-List method allows the manager to then retrieve the attributes of selected PM-segment object instances and their data contents without needing to retrieve information of all PM-segments. This also allows the manager to retrieve multiple PM-segments as a series of requests.

If a standard configuration contains any PM-Store object, the manager must send Get-Segment-Info or Get-Segment-Id-List at the beginning of accessing any PM-Store object.

If the agent supports the Get-Segment-Id-List method, the agent shall set the pmsc-get-segm-id-list-sup flag in the PM-Store-Capab attribute.

If the agent supports the Get-Segment-Id-List method, the agent shall also support the Get-Segment-Info method with the segm-id-list choice in the SegmSelection action-info-args.

# 7. Personal health device service model

## 7.4 Specific application of object access EVENT REPORT services for personal health devices

### 7.4.3 Configuration event report

#### 7.4.3.2 Agent device configuration

***Change the second paragraph as shown:***

The MDS object is not considered part of the configuration. A manager reassociating with an agent offering the same Dev-Configuration-Id cannot expect the MDS attribute values to be the same; for example, an agent may clear the mds-time-mgr-set-time~~manager-set-time~~ bit as its clock has already been set.

# 8. Communication model

## 8.7 Associating procedure

### 8.7.3 Normal procedures

#### 8.7.3.1 Agent procedure

#### 8.7.3.1.2 Data exchange protocol –defined by this standard

***Change the first dash-list item as shown***:

— The protocol-version field contains the versions of the data exchange protocol the agent can support.

## 8.9 Operating procedure

### 8.9.3 Normal procedures

#### 8.9.3.3 Measurement data transfer

#### 8.9.3.3.7 Scan report number management

***Change the last paragraph as shown:***

An agent-initiated transfer from the MDS or scanner objects, by way of contrast, establishes a flow that terminates only when the association is broken. Thus for the agent-initiated transfer, the scan-report-no starts at 0, but cannot be reset by the manager within the context of the association. Setting the scanner's Operational-State attribute to disabled halts transmission of event reports, i.e., internal observation of metric objects is halted and continues again after setting the Operational-State attribute to enabled again. The scan-report-no in this case will continue counting from where it was halted. Note that there will be a separate scan-report-no for confirmed (data-req-id 0xF000) and unconfirmed (data-req-id 0xF001) scan event reports.

#### 8.9.3.4 Persistently stored metric data transfer

#### 8.9.3.4.2 Persistently stored metric data transmission

***Change the last paragraph in item b) as shown:***

b) **Retrieving the PM-segment information.** The manager retrieves information on the segments in a PM-store by sending an ACTION.Get-Segment-Info or ACTION.Get-Segment-Id-List command to the specific PM-store (see Figure 21 and Figure 22) with a request to return information from all segments, a particular list of segments, or any segments within a given time range. If there is no segment in any of these three cases, the agent responds with an empty list. The agent shall support the first selection criteria and may provide support for the second and third selection criteria. The manager is able to determine whether the agent provides support by inspecting pmsc-abs-time-select in the PM-Store-Capab attribute of the PM-store information retrieved earlier.

The agent responds to the ACTION.Get-Segment-Info command with a list of segment numbers followed by the full attribute list for each of the segments. The agent responds to the ACTION. Get-Segment-Id-List command with a list of the instance numbers.

If the manager invokes one of the ~~optional~~ Get-Segment-Info or Get-Segment-Id-List methods but the agent does not support the particular optional action (list of segments or range of segments by time), then the agent shall respond with a roer DataApdu with an RoerErrorValue of “not-allowed-by-object”.

# Annex A

(normative)

# ASN.1 definitions

## A.4 ACTION-method-related data types

***Insert the following new lines:***

```
--
-- SegmIdList selects PM-segments by ID.
-- SegmIdList may be returned in response to the Get-Segment-Id-List method, containing a list of
-- the instance numbers of all the PM-segments of a PM-store.
SegmIdList ::= SEQUENCE OF InstNumber
```

***Change the text as shown:***

```
--
-- SegmentInfoList returns the object attributes (except the Fixed-Segment-Data) of all
-- selected PM-segment object instances in response to the Get-Segment-Info or Get-Segment-Id-List
-- PM-store method.
-- This is required by the manager to retrieve the dynamic information about the segments.
--
SegmentInfoList ::= SEQUENCE OF SegmentInfo
```

## A.11 Data types for new object attributes and object services

### A.11.8 PM-store and PM-segment related data types

***Delete the line containing "pmsc-get-segm-info-sup" as shown:***

```
--
-- The PM-Store-Capab attribute defines specific static capabilities and properties of the PM-store object
-- instance. The default value of this attribute is 0 (no bits set).
-- All unassigned " PmStoreCapab " bit values are reserved for future expansion and shall be set to zero.
--
PmStoreCapab ::=BITS-16 {
                pmsc-var-no-of-segm(0),         -- indicates that the number of PM-segments
                                                -- contained in this PM-store is dynamic and may
                                                -- change
                pmsc-segm-id-list-select(3),    -- PM-segments in the SegmSelection data type can
                                                -- be selected by defining a list of segment IDs
                pmsc-epi-seg-entries(4),        -- some/all PM-segments contain
                                                -- episodic/aperiodic entries and therefore have
                                                -- to contain explicit time stamp information
                pmsc-peri-seg-entries(5),       -- some/all PM-segments contain periodically
                                                -- sampled entries and therefore the PM-segment
                                                -- or PM-store shall support the
```

```
                                        -- Sample-Period attribute
        pmsc-abs-time-select(6),        -- PM-segments in the SegmSelection data type can
                                        -- be selected by defining an abs-time-range or
                                        -- bo-time-range depending upon which time
                                        -- mode the device supports
        pmsc-clear-segm-by-list-sup(7), -- clearing a list of segments is supported
        pmsc-clear-segm-by-time-sup(8), -- clearing segments by abs-time-range or
                                        -- bo-time-range is supported depending
                                        -- upon which time mode the device supports
        pmsc-clear-segm-remove(9),      -- if this bit is set, the agent will completely remove
                                        -- the specified PM-segment instance as part of the
                                        -- Clear-Segment method. If this bit is not set, it will
                                        -- just remove all entries from the specified
                                        -- PM-segment.
        pmsc-clear-segm-all-sup(10),    -- clearing all segments is supported
        pmsc-multi-person(12)           -- The PM-store supports PM-segment for more
                                        -- than one person
        ~~pmsc-get-segm-info-sup(13),~~       ~~-- The Get-Segment-Info method is supported.~~
        pmsc-get-segm-id-list-sup(14),  -- The Get-Segment-Id-List method is supported.
}
```

## Annex I

(normative)

## Nomenclature codes

***Insert the following row of code into the MDC_PART_OBJ partition after the row that begins with #define MDC_ATTR_SEG_FIXED_DATA 2641*** /* */

#define MDC_ATTR_PM_SEG_ELEM_STAT_ATTR 2642 /* */

***Insert the following row of code into the MDC_PART_OBJ partition after the row that begins with #define MDC_ATTR_SCAN_HANDLE_LIST 2679*** /* */

#define MDC_ATTR_SOURCE_HANDLE_REF_LIST 2681 /* */

***Delete one row under the MDC_PART_INFRA partition as shown:***

~~#define MDC_DEV_SPEC_PROFILE_RESP_RATE 4114 /* Respiration rate */~~

***Change five rows of code under the MDC_PART_INFRA partition as shown:***

#define MDC_DEV_SPEC_PROFILE_COAG 4118~~3~~4 /* International normalized ratio */
#define MDC_DEV_SPEC_PROFILE_URINE_ANALYZER 4119~~7~~8 /* Urine analyzer */
#define MDC_DEV_SPEC_PROFILE_SLEEP_QUALITY 4119~~2~~0 /* Sleep quality monitor */
#define MDC_DEV_SPEC_PROFILE_SABTE~~SLEEP_APONEA~~ 4121~~1~~0 /* Sleep ape~~n~~oea breathing therapy ~~device~~equipment */
#define MDC_DEV_SPEC_PROFILE_CGM 4122~~2~~1 /* Continuous glucose monitor */

***Insert the following two rows of code into the MDC_PART_INFRA partition after the row that begins with:***

| | |
|---|---|
| ***#define MDC_TIME_SYNC_OTHER*** | ***7948 /*A time sync method that is out of the scope of IEEE Std 11073-20601*/*** |
| #define MDC_TIME_SYNC_OTHER_MOBILE | 7949 /*A time sync method based on other mobile network technology which is not listed above */ |
| #define MDC_TIME_SYNC_GPS | 7950 /*A time sync method based on GPS information */ |