

Industrial Measurement Device Profile (IMDP)

Bluetooth® Implementation Conformance Statement (ICS) Proforma

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1 Identification of the implementation

1.1 Implementation Under Test (IUT) identification

Identification of the Implementation Under Test (IUT) is to be filled in to provide as much detail as possible regarding version numbers and configuration options.

An ICS contact person to respond to queries regarding information supplied in this ICS proforma is named in the Declaration of Compliance: Summary of Selected Specifications in Implementation.

1.2 Version

Table 0: X.Y Versions (IMD Server)

Prerequisite: IMDP 3/1 “IMD Server”

Item	Version	Reference	Status
1	IMDP v1.0	[1]	M

Table 0a: X.Y.Z Versions (IMD Server)

Table number reserved but not yet in use.

Table 1: X.Y Versions (Collector)

Prerequisite: IMDP 3/2 “Collector”

Item	Version	Reference	Status
1	IMDP v1.0	[1]	M

Table 1a: X.Y.Z Versions (Collector)

Table number reserved but not yet in use.

1.3 Transports

Table 2: Transport Requirements

Item	Transport	Reference	Status
1	Profile supported over BR/EDR	[1] 2.6	C.1
2	Profile supported over LE	[1] 2.6	C.1

C.1: Mandatory to support at least one.

1.4 Roles

Table 3: Role Requirements

Item	Role	Reference	Status
1	IMD Server	[1] 2.1	C.1
2	Collector	[1] 2.1	C.1

C.1: Mandatory to support at least one.

1.5 IMD Server role

1.5.1 Service references (IMD Server)

Table 4: Services Included in IMD Server

Prerequisite: IMPD 3/1 “IMD Server”

Item	Service	Reference	Status	Inter-Layer Dependency
1	Industrial Measurement Device Service	[1] 3	M	[2] IMDS
2	Device Information Service	[1] 3	M	[3] DIS
3	Battery Service	[1] 3	O	[4] BAS
4	Elapsed Time Service	[1] 3	C.1	[5] ETS

C.1: Mandatory IF IMPD 5/1 “IMD Historical Data characteristic”, otherwise Optional.

1.5.2 Industrial Measurement Device Service (IMD Server)

Table 5: Main Features of Industrial Measurement Device Service

Prerequisite: IMPD 3/1 “IMD Server”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	IMD Historical Data characteristic	[1] 3	O	[2] IMDS 4/14
2	Industrial Measurement Device Service UUID in AD Type field of Advertising Data	[1] 3.1.1.1	C.1	N/A
3	Local Name included in AD or Scan Response	[1] 3.1.1.2	C.1	N/A
4	Appearance included in AD or Scan Response	[1] 3.1.1.4	C.1	N/A
5	Service Data in AD	[1] 3.1.1.1	C.1	N/A

C.1: Optional IF IMPD 2/2 “Profile supported over LE”, otherwise Excluded.

1.5.3 Device Information Service requirements (IMD Server)

Table 6: Device Information Service Requirements (IMD Server)

Prerequisite: IMPD 3/1 “IMD Server”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Manufacturer Name String Characteristic	[1] 3.2	M	[3] DIS 2/2
2	Serial Number String Characteristic	[1] 3.2	M	[3] DIS 2/4
3	Hardware Revision String Characteristic	[1] 3.2	M	[3] DIS 2/5
4	Firmware Revision String Characteristic	[1] 3.2	M	[3] DIS 2/6

1.5.4 Elapsed Time Service requirements (IMD Server)

Table 7: Elapsed Time Service Requirements (IMD Server)

Prerequisite: IMDP 4/4 “Elapsed Time Service”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Current Elapsed Time characteristic with write	[1] 3.4	O	[5] ETS 4/2

1.5.5 GAP requirements (IMD Server)

Table 8: GAP Requirements (IMD Server)

Prerequisite: IMDP 3/1 “IMD Server” AND IMDP 2/2 “Profile supported over LE”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Peripheral	[1] 2.4.1	M	[7] GAP 5/3 OR GAP 38/3

1.6 Collector role

1.6.1 Service references (Collector)

Table 9: Services Included in Collector Role

Prerequisite: IMDP 3/2 “Collector”

Item	Service	Reference	Status
1	Discover Industrial Measurement Device Service	[1] 4	M
2	Discover Device Information Service	[1] 4	O
3	Discover Battery Service	[1] 4	O
4	Discover Elapsed Time Service	[1] 4	O

1.6.2 Industrial Measurement Device Service (Collector role)

Table 10: Discover Industrial Measurement Device Service Characteristics

Prerequisite: IMDP 9/1 “Discover Industrial Measurement Device Service”

Item	Capability	Reference	Status
1	Discover IMD Measurement characteristic	[1] 4	M
2	Discover Measurement Description descriptor	[1] 4	O
3	Discover Characteristic User Description descriptor	[1] 4	O
4	Discover Manufacturer Limits descriptor	[1] 4	O
5	Discover Process Tolerances descriptor	[1] 4	O
6	Discover Trigger Settings descriptor	[1] 4	O
7	Discover Valid Range descriptor	[1] 4	O
8	Discover IMDS Descriptor Value Changed characteristic	[1] 4	O

Item	Capability	Reference	Status
9	Discover First Use Date characteristic	[1] 4	O
10	Discover Life Cycle Data characteristic	[1] 4	O
11	Discover Work Cycle Data characteristic	[1] 4	O
12	Discover Service Cycle Data characteristic	[1] 4	O
13	Discover IMD Control characteristic	[1] 4	O
14	Discover IMD Historical Data characteristic	[1] 4	O
15	Discover Record Access Control Point characteristic	[1] 4	O
16	Discover IMD Status characteristic	[1] 4	O

Table 11: IMD Measurement Characteristics

Prerequisite: IMDP 10/1 “Discover IMD Measurement characteristic”

Item	Capability	Reference	Status
1	Acceleration	[1] 4, [8], [9]	C.1
2	Force	[1] 4, [8], [9]	C.1
3	Linear Position	[1] 4, [8], [9]	C.1
4	Rotational Speed	[1] 4, [8], [9]	C.1
5	Length	[1] 4, [8], [9]	C.1
6	Torque	[1] 4, [8], [9]	C.1
7	Temperature	[1] 4, [8], [9]	C.1

C.1: Mandatory to support at least one.

Table 12: Industrial Measurement Device Service Procedure Requirements

Prerequisite: IMDP 9/1 “Discover Industrial Measurement Device Service”

Item	Capability	Reference	Status
1	Read IMD Measurement characteristic	[1] 4.4.2	O
2	Notify IMD Measurement characteristic	[1] 4.4.2	O
3	Write IMD Measurement characteristic	[1] 4.4.2	O
4	Read Measurement Description descriptor	[1] 4.4.2.1	C.1
5	Read Characteristic User Description descriptor	[1] 4.4.2.2	C.2
6	Write Characteristic User Description descriptor	[1] 4.4.2.2	C.2
7	Read Manufacturer Limits descriptor	[1] 4.4.2.3	C.3
8	Read Process Tolerances descriptor	[1] 4.4.2.4	C.4
9	Write Process Tolerances descriptor	[1] 4.4.2.4	C.4
10	Read Trigger Settings descriptor	[1] 4.4.2.5	C.5
11	Write Trigger Settings descriptor	[1] 4.4.2.5	C.5
12	Read Valid Range descriptor	[1] 4.4.2.6	C.6
13	Read Characteristic Extended Properties descriptor	[1] 4.4.2.2	O
14	Indicate IMDS Descriptor Value Changed characteristic	[1] 4.4.4	C.7
15	Read First Use Date characteristic	[1] 4.4.5	C.8

Item	Capability	Reference	Status
16	Write First Use Date characteristic	[1] 4.4.5	C.8
17	Read Life Cycle Data characteristic	[1] 4.4.6	C.9
18	Write Life Cycle Data characteristic	[1] 4.4.6	C.9
19	Read Work Cycle Data characteristic	[1] 4.4.7	C.10
20	Write Work Cycle Data characteristic	[1] 4.4.7	C.10
21	Notify Work Cycle Data characteristic	[1] 4.4.7	C.10
22	Read Service Cycle Data characteristic	[1] 4.4.8	C.11
23	Write Service Cycle Data characteristic	[1] 4.4.8	C.11
24	Write IMD Control characteristic	[1] 4.4.9	C.12
25	Notify IMD Historical Data characteristic	[1] 4.4.10	C.13
26	Write Record Access Control Point	[1] 4.4.10.2	C.14
27	Indicate Record Access Control Point	[1] 4.4.9.1	C.14
28	Notify IMD Status characteristic	[1] 4.4.3	C.15

- C.1: Optional IF IMDP 10/2 “Discover Measurement Description descriptor”, otherwise Excluded.
- C.2: Optional IF IMDP 10/3 “Discover Characteristic User Description descriptor”, otherwise Excluded.
- C.3: Optional IF IMDP 10/4 “Discover Manufacturer Limits descriptor”, otherwise Excluded.
- C.4: Optional IF IMDP 10/5 “Discover Process Tolerances descriptor”, otherwise Excluded.
- C.5: Optional IF IMDP 10/6 “Discover Trigger Settings descriptor”, otherwise Excluded.
- C.6: Optional IF IMDP 10/7 “Discover Valid Range descriptor”, otherwise Excluded.
- C.7: Mandatory IF IMDP 10/8 “Discover IMDS Descriptor Value Changed characteristic”, otherwise Excluded.
- C.8: Optional IF IMDP 10/9 “Discover First Use Date characteristic”, otherwise Excluded.
- C.9: Optional IF IMDP 10/10 “Discover Life Cycle Data characteristic”, otherwise Excluded.
- C.10: Optional IF IMDP 10/11 “Discover Work Cycle Data characteristic”, otherwise Excluded.
- C.11: Optional IF IMDP 10/12 “Discover Service Cycle Data characteristic”, otherwise Excluded.
- C.12: Optional IF IMDP 10/13 “Discover IMD Control characteristic”, otherwise Excluded.
- C.13: Optional IF IMDP 10/14 “Discover IMD Historical Data characteristic”, otherwise Excluded.
- C.14: Optional IF IMDP 10/15 “Discover Record Access Control Point characteristic”, otherwise Excluded.
- C.15: Mandatory IF IMDP 10/16 “Discover IMD Status characteristic”, otherwise Excluded.

Table 13: IMD Control Op Code Support

Prerequisite: IMDP 12/24 “Write IMD Control characteristic”

Item	Capability	Reference	Status
1	Request to start measurement	[1] 4.4.9.1	O
2	Request to abort current operation	[1] 4.4.9.2	O

Table 14: RACP Procedures*Prerequisite: IMDP 12/26 “Write Record Access Control Point”*

Item	Capability	Reference	Status
1	Delete Stored Records	[1] 4.4.10.2.4	O
2	Abort Operation	[1] 4.4.10.2.5	M
3	Report Number of Stored Records	[1] 4.4.10.2.2	M
4	Combined Report	[1] 4.4.10.2.3	M

Table 15: RACP Delete Stored Records*Prerequisite: IMDP 14/1 “Delete Stored Records”*

Item	Capability	Reference	Status
1	All records	[1] 4.4.10.2.4	M
2	Less than or equal to with Sequence Number operand	[1] 4.4.10.2.4	M
3	Less than or equal to with Timestamp operand	[1] 4.4.10.2.4	O
4	Greater than or equal to with Sequence Number operand	[1] 4.4.10.2.4	O
5	Greater than or equal to with Timestamp operand	[1] 4.4.10.2.4	O
6	Within range of (inclusive) with Sequence Number operand	[1] 4.4.10.2.4	O
7	Within range of (inclusive) with Timestamp operand	[1] 4.4.10.2.4	O
8	First record	[1] 4.4.10.2.4	O
9	Last record	[1] 4.4.10.2.4	O

Table 16: RACP Report Number of Stored Records*Prerequisite: IMDP 14/3 “Report Number of Stored Records”*

Item	Capability	Reference	Status
1	All records	[1] 4.4.10.2.2	M
2	Less than or equal to with Sequence Number operand	[1] 4.4.10.2.2	O
3	Less than or equal to with Timestamp operand	[1] 4.4.10.2.2	O
4	Greater than or equal to with Sequence Number operand	[1] 4.4.10.2.2	M
5	Greater than or equal to with Timestamp operand	[1] 4.4.10.2.2	O
6	Within range of (inclusive) with Sequence Number operand	[1] 4.4.10.2.2	O
7	Within range of (inclusive) with Timestamp operand	[1] 4.4.10.2.2	O
8	First record	[1] 4.4.10.2.2	O
9	Last record	[1] 4.4.10.2.2	O

Table 17: RACP Combined Report*Prerequisite: IMDP 14/4 “Combined Report”*

Item	Capability	Reference	Status
1	All records	[1] 4.4.10.2.3	M
2	Less than or equal to with Sequence Number operand	[1] 4.4.10.2.3	M
3	Less than or equal to with Timestamp operand	[1] 4.4.10.2.3	O
4	Greater than or equal to with Sequence Number operand	[1] 4.4.10.2.3	M
5	Greater than or equal to with Timestamp operand	[1] 4.4.10.2.3	O
6	Within range of (inclusive) with Sequence Number operand	[1] 4.4.10.2.3	M
7	Within range of (inclusive) with Timestamp operand	[1] 4.4.10.2.3	O
8	First record	[1] 4.4.10.2.3	M
9	Last record	[1] 4.4.10.2.3	M

1.6.3 Device Information Service (Collector)

Table 18: Discover Device Information Service Characteristics*Prerequisite: IMDP 9/2 “Discover Device Information Service”*

Item	Capability	Reference	Status
1	Discover Manufacturer Name String characteristic	[1] 4.5	O
2	Discover Serial Number String characteristic	[1] 4.5	O
3	Discover Hardware Revision String characteristic	[1] 4.5	O
4	Discover Firmware Revision String characteristic	[1] 4.5	O
5	Discover other DIS characteristics	[1] 4.5	O

1.6.4 Battery Service (Collector)

Table 19: Discover Battery Service Characteristics*Prerequisite: IMDP 9/3 “Discover Battery Service”*

Item	Capability	Reference	Status
1	Discover Battery Level characteristic	[1] 4.6	O
2	Discover other BAS characteristics	[1] 4.6	O

1.6.5 Elapsed Time Service (Collector)

Table 20: Discover Elapsed Time Service Characteristics*Prerequisite: IMDP 9/4 “Discover Elapsed Time Service”*

Item	Capability	Reference	Status
1	Discover Current Elapsed Time characteristic	[1] 4.7	O

1.6.6 GATT requirements (Collector)

Table 21: GATT Requirements (Collector)

Prerequisite: IMDP 3/2 “Collector”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	GATT Client over LE	[1] 4.1	C.1	[6] GATT 1a/1
2	GATT Client over BR/EDR	[1] 4.1	C.2	[6] GATT 1a/2
3	Discover All Primary Services	[1] 4.1	C.3	[6] GATT 3/2
4	Discover Primary Services by Service UUID	[1] 4.1	C.3	[6] GATT 3/3
5	Discover All Characteristics of a Service	[1] 4.1	C.4	[6] GATT 3/5
6	Discover Characteristics by UUID	[1] 4.1	C.4	[6] GATT 3/6
7	Discover All Characteristic Descriptors	[1] 4.1	M	[6] GATT 3/7
8	Read Characteristic Value	[1] 4.1	M	[6] GATT 3/8
9	Write Characteristic Value	[1] 4.1	C.5	[6] GATT 3/14
10	Read Characteristic Descriptors	[1] 4.1	M	[6] GATT 3/19
11	Write Characteristic Descriptors	[1] 4.1	C.6	[6] GATT 3/21
12	Read Long Characteristic Values	[1] 4.1	C.7	[6] GATT 3/10
13	Write Long Characteristic Values	[1] 4.1	C.8	[6] GATT 3/15
14	Read Long Characteristic Descriptors	[1] 4.1	C.9	[6] GATT 3/20
15	Write Long Characteristic Descriptors	[1] 4.1	C.10	[6] GATT 3/22
16	Notifications	[1] 4.1	M	[6] GATT 3/17
17	Indications	[1] 4.1	M	[6] GATT 3/18

- C.1: Mandatory IF IMDP 2/2 “Profile supported over LE”, otherwise not defined.
- C.2: Mandatory IF IMDP 2/1 “Profile supported over BR/EDR”, otherwise not defined.
- C.3: Mandatory to support at least one IF IMDP 2/2 “Profile supported over LE”, otherwise not defined.
- C.4: Mandatory to support at least one.
- C.5: Mandatory IF IMDP 12/3 “Write IMD Measurement characteristic” OR IMDP 12/16 “Write First Use Date characteristic” OR IMDP 12/18 “Write Life Cycle Data characteristic” OR IMDP 12/23 “Write Service Cycle Data characteristic” OR IMDP 12/24 “Write IMD Control characteristic” OR IMDP 12/26 “Write Record Access Control Point”, otherwise not defined.
- C.6: Mandatory IF IMDP 12/6 “Write Characteristic User Description descriptor” OR IMDP 12/9 “Write Process Tolerances descriptor” OR IMDP 12/11 “Write Trigger Settings descriptor”, otherwise not defined.
- C.7: Mandatory IF IMDP 12/17 “Read Life Cycle Data characteristic”, otherwise Optional.
- C.8: Mandatory IF IMDP 12/18 “Write Life Cycle Data characteristic”, otherwise Optional.
- C.9: Mandatory IF IMDP 12/5 “Read Characteristic User Description descriptor”, otherwise Optional.
- C.10: Mandatory IF IMDP 12/6 “Write Characteristic User Description descriptor”, otherwise Optional.

1.6.7 GAP requirements (Collector)

Table 22: GAP Requirements (Collector)

Prerequisite: IMDP 3/2 “Collector” AND IMDP 2/2 “Profile supported over LE”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Central	[1] 2.4.1	M	[7] GAP 5/4 OR GAP 38/4

2 References

- [1] Industrial Measurement Device Profile, Version 1.0
- [2] ICS Proforma for Industrial Measurement Device Service (IMDS)
- [3] ICS Proforma for Device Information Service (DIS)
- [4] ICS Proforma for Battery Service (BAS)
- [5] ICS Proforma for Elapsed Time Service (ETS)
- [6] ICS Proforma for Generic Attribute Profile (GATT)
- [7] ICS Proforma for Generic Access Profile (GAP)
- [8] Permitted Characteristics (<https://www.bluetooth.com/specifications/assigned-numbers>)
- [9] GATT Specification Supplement (<https://www.bluetooth.com/specifications/assigned-numbers>)

3 Revision history and acknowledgments

Revision History

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