Glucose Service (GLS)

***Bluetooth*®** **Implementation Conformance Statement (ICS) Proforma**

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- ▪ **Prepared By:** Medical Devices Working Group
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Contents

1   General principles

1.1   Implementation Under Test (IUT) identification

Using the Bluetooth SIG qualification tool, the implementer is expected to declare details about what will be implemented.

1.2   Enforcement of inter-layer dependencies

This ICS includes one or more tables with inter-layer dependencies (ILDs). ILDs are used for specification requirements that are dependent on other supporting specifications. ILDs can refer to an individual ICS item in a separate layer (individual ILD), or it can refer to the full layer (full-layer ILD).

ILDs residing in an X2Core layer will be enforced from the Bluetooth SIG qualification tool in the following conditions, depending on where the referred ILD is residing:

Referred ILD resides in	Individual ILD	Full-layer ILD
Controller layer	Core-Complete configuration, or Referred layer is supported	N/A
Lower HCI layer	HCI is supported	N/A
Upper HCI layer	Core-Host configuration, or UHCI is supported	N/A
Host layer	Core-Host configuration, or Core-Complete configuration, or Referred layer is supported	N/A
X2Core layer	Core-Host configuration, or Core-Complete configuration, or Referred layer is supported	Core-Host configuration, or Core-Complete configuration

Table 1.1: Enforcement of an ILD within the Bluetooth SIG qualification tool

2   ICS declarations

2.1   Versions

Table 0: X.Y Versions

Item	Version	Reference	Status
1	GLS v1.0	[1]	C.1, C.2

C.1:   Mandatory.

C.2:   Can only be supported with an active X.Y.Z version after Deprecation or Withdrawal. Deprecated 2023-02-01. Withdrawn 2025-02-01.

Table 0a: X.Y.Z Versions

Item	Version	Reference	Status
1	GLS v1.0.1	[1]	C.1

C.1:   Mandatory IF GLS 0/1 "GLS v1.0", otherwise Excluded.

2.2   Transports

Table 1: Transport Requirements

Item	Transport	Reference	Status
1	Service supported over BR/EDR	[1] 1.5	C.1
2	Service supported over LE	[1] 1.5	C.2, C.3

C.1:   Excluded for this Service.

C.2:   Excluded for this Service IF CORE 41/1 "BR/EDR Core Configuration" OR CORE 40/1 "Core-Controller".

C.3:   Mandatory for this Service.

2.3   Service requirements

Table 2: Service Requirements

Item	Capability	Reference	Status
1	Glucose Service	[1] 2	M
2	Glucose Measurement Characteristic	[1] 3.1	M
3	Time Offset field of Glucose Measurement Characteristic	[1] 3.1.1.4	M
3a	Time Offset field of Glucose Measurement Characteristic: Sensor capable of user-facing date and time adjustment	[1] 3.1.1.4	O
4	Glucose Concentration field of Glucose Measurement Characteristic – Units of kg/L	[1] 3.1.1.5	C.1
4a	Glucose Concentration field of Glucose Measurement Characteristic – Units of mol/L	[1] 3.1.1.5	C.1
5	Type nibble of the Type-Sample Location field of Glucose Measurement Characteristic	[1] 3.1.1.5	C.6

Item	Capability	Reference	Status
6	Sample Location nibble of the Type-Sample Location field of Glucose Measurement Characteristic	[1] 3.1.1.5	C.6
7	Sensor Status Annunciation field of Glucose Measurement Characteristic	[1] 3.1.1.6	O
8	Glucose Measurement Context Characteristic	[1] 3.2	O
9	Extended Flags field of Glucose Measurement Context Characteristic	[1] 3.2.1.3	C.2
10	Carbohydrate ID field of Glucose Measurement Context Characteristic	[1] 3.2.1.4	C.2, C.3
11	Carbohydrate field of Glucose Measurement Context Characteristic	[1] 3.2.1.4	C.2, C.3
12	Meal field of Glucose Measurement Context Characteristic	[1] 3.2.1.5	C.2
13	Tester nibble of the Tester-Health field of Glucose Measurement Context Characteristic	[1] 3.2.1.6	C.2, C.4
14	Health nibble of the Tester-Health field of Glucose Measurement Context Characteristic	[1] 3.2.1.6	C.2, C.4
15	Exercise Duration field of Glucose Measurement Context Characteristic	[1] 3.2.1.7	C.2, C.5
16	Exercise Intensity field of Glucose Measurement Context Characteristic	[1] 3.2.1.7	C.2, C.5
17	Medication ID field of Glucose Measurement Context Characteristic	[1] 3.2.1.8	C.2
18	Medication field of Glucose Measurement Context Characteristic	[1] 3.2.1.8	C.2
19	HbA1c field of Glucose Measurement Context Characteristic	[1] 3.2.1.9	C.2
20	Glucose Feature Characteristic	[1] 3.3	M
21	Record Access Control Point (RACP) Characteristic	[1] 3.4	M
22	Report Stored Records Op Code	[1] 3.4.2, 3.4.3.4	M
23	Delete Stored Records Op Code	[1] 3.4.2, 3.4.3.3	O
24	Abort Operation Op Code	[1] 3.4.2, 3.4.3.5	M
25	Report Number of Stored Records Op Code	[1] 3.4.2, 3.4.3.2	M
26	Number of Stored Records Response Op Code	[1] 3.4.2, 3.4.3.2	M
27	Response Code Op Code	[1] 3.4.2	M
28	Support for Multiple Bonds	[1] 3.3.1	O
29	Indications for changes of supported features	[4] 3.3.1	M

C.1: Mandatory to support at least one IF GLS 2/5 "Type nibble of the Type-Sample Location field of Glucose Measurement Characteristic" OR GLS 2/6 "Sample Location nibble of the Type-Sample Location field of Glucose Measurement Characteristic", otherwise Excluded.

C.2: Mandatory to support at least one IF GLS 2/8 "Glucose Measurement Context Characteristic", otherwise Excluded.

C.3: Mandatory to support none or all.

C.4: Mandatory to support none or all.

C.5: Mandatory to support none or all.

C.6: Mandatory IF GLS 2/4 "Glucose Concentration field of Glucose Measurement Characteristic – Units of kg/L" OR GLS 2/4a "Glucose Concentration field of Glucose Measurement Characteristic – Units of mol/L", otherwise Excluded.

Table 2a: Indications for changes of supported features

Prerequisite: GLS 2/29 "Indications for changes of supported features"

Item	Capability	Reference	Status
1	Changeable Glucose Feature	[4] 3	O
2	Glucose Feature characteristic indication	[4] 3, 3.3.1	C.1

C.1: Mandatory IF GLS 2a/1 "Changeable Glucose Feature" AND GLS 10/2 "Bonding procedure", otherwise Excluded.

Table 3: Report Stored Records Filter Parameters

Prerequisite: GLS 2/22 "Report Stored Records Op Code"

Item	Capability	Reference	Status
1	All Records Operator	[1] 3.4.2, 3.4.3.4	M
2	Less than or equal to Operator	[1] 3.4.2, 3.4.3.4	O
3	Less than or equal to Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.4	C.1
4	Less than or equal to Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.4	C.2
5	Greater than or equal to Operator	[1] 3.4.2, 3.4.3.4	M
6	Greater than or equal to Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.4	M
7	Greater than or equal to Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.4	C.3
8	Within range of (inclusive) Operator	[1] 3.4.2, 3.4.3.4	O
9	Within range of (inclusive) Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.4	C.4
10	Within range of (inclusive) Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.4	C.5
11	First record Operator	[1] 3.4.2, 3.4.3.4	O
12	Last record Operator	[1] 3.4.2, 3.4.3.4	O

C.1: Mandatory IF GLS 3/2 "Less than or equal to Operator", otherwise Excluded.
C.2: Optional IF GLS 3/2 "Less than or equal to Operator", otherwise Excluded.
C.3: Optional IF GLS 3/5 "Greater than or equal to Operator", otherwise Excluded.
C.4: Mandatory IF GLS 3/8 "Within range of (inclusive) Operator", otherwise Excluded.
C.5: Optional IF GLS 3/8 "Within range of (inclusive) Operator", otherwise Excluded.

Table 4: Delete Stored Records Filter Parameters

Prerequisite: GLS 2/23 "Delete Stored Records Op Code"

Item	Capability	Reference	Status
1	All Records Operator	[1] 3.4.2, 3.4.3.3	M
2	Less than or equal to Operator	[1] 3.4.2, 3.4.3.3	O
3	Less than or equal to Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.3	C.1
4	Less than or equal to Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.3	C.2
5	Greater than or equal to Operator	[1] 3.4.2, 3.4.3.3	O
6	Greater than or equal to Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.3	C.3
7	Greater than or equal to Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.3	C.4
8	Within range of (inclusive) Operator	[1] 3.4.2, 3.4.3.3	O
9	Within range of (inclusive) Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.3	C.5
10	Within range of (inclusive) Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.3	C.6
11	First record Operator	[1] 3.4.2, 3.4.3.3	O
12	Last record Operator	[1] 3.4.2, 3.4.3.3	O

C.1:   Mandatory IF GLS 4/2 "Less than or equal to Operator", otherwise Excluded.

C.2:   Optional IF GLS 4/2 "Less than or equal to Operator", otherwise Excluded.

C.3:   Mandatory IF GLS 4/5 "Greater than or equal to Operator", otherwise Excluded.

C.4:   Optional IF GLS 4/5 "Greater than or equal to Operator", otherwise Excluded.

C.5:   Mandatory IF GLS 4/8 "Within range of (inclusive) Operator", otherwise Excluded.

C.6:   Optional IF GLS 4/8 "Within range of (inclusive) Operator", otherwise Excluded.

Table 5: Abort Operation Filter Parameters

Prerequisite: GLS 2/24 "Abort Operation Op Code"

Item	Capability	Reference	Status
1	Null Operator	[1] 3.4.2, 3.4.3.5	M

Table 6: Report Number of Stored Records Filter Parameters

Prerequisite: GLS 2/25 "Report Number of Stored Records Op Code"

Item	Capability	Reference	Status
1	All Records Operator	[1] 3.4.2, 3.4.3.2	M
2	Less than or equal to Operator	[1] 3.4.2, 3.4.3.2	O
3	Less than or equal to Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.2	C.1
4	Less than or equal to Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.2	C.2

Item	Capability	Reference	Status
5	Greater than or equal to Operator	[1] 3.4.2, 3.4.3.2	M
6	Greater than or equal to Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.2	M
7	Greater than or equal to Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.2	C.3
8	Within range of (inclusive) Operator	[1] 3.4.2, 3.4.3.2	O
9	Within range of (inclusive) Operator – Sequence Number Operand	[1] 3.4.2, 3.4.3.2	C.4
10	Within range of (inclusive) Operator – User Facing Time Operand	[1] 3.4.2, 3.4.3.2	C.5
11	First record Operator	[1] 3.4.2, 3.4.3.2	O
12	Last record Operator	[1] 3.4.2, 3.4.3.2	O

C.1:   Mandatory IF GLS 6/2 "Less than or equal to Operator", otherwise Excluded.

C.2:   Optional IF GLS 6/2 "Less than or equal to Operator", otherwise Excluded.

C.3:   Optional IF GLS 6/5 "Greater than or equal to Operator", otherwise Excluded.

C.4:   Mandatory IF GLS 6/8 "Within range of (inclusive) Operator", otherwise Excluded.

C.5:   Optional IF GLS 6/8 "Within range of (inclusive) Operator", otherwise Excluded.

Table 7: Number of Stored Records Response Filter Parameters

Prerequisite: GLS 2/26 "Number of Stored Records Response Op Code"

Item	Capability	Reference	Status
1	Null Operator	[1] 3.4.2	M

Table 8: Response Code Filter Parameters

Prerequisite: GLS 2/27 "Response Code Op Code"

Item	Capability	Reference	Status
1	Null Operator	[1] 3.4.2	M

2.4   GATT requirements

Table 9: GATT Requirements

Item	Capability	Reference	Status	Inter-Layer Dependency
1	No longer used	N/A	N/A	N/A
2	GATT Server over LE	[1] 1.4	M	[2] GATT 1a/3
3	Indication	[1] 1.4	M	[2] GATT 4/18
4	Read Characteristic Descriptor	[1] 1.4	M	[2] GATT 4/19
5	Write Characteristic Descriptor	[1] 1.4	M	[2] GATT 4/21
6	Single Notification	[1] 1.4	M	[2] GATT 4/17
7	Write Characteristic Value	[1] 1.4	M	[2] GATT 4/14

2.5   GAP requirements

Table 10: GAP Requirements

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Bondable mode	[1] 3.3.1	C.1	[3] GAP 24/2
2	Bonding procedure	[1] 3.3.1	O	[3] GAP 24/3

C.1:   Mandatory IF GLS 10/2 "Bonding procedure", otherwise not defined.

3   References

[1]   Glucose Service Specification, Version 1.0 or later

[2]   ICS Proforma for Generic Attribute Profile (GATT)

[3]   ICS Proforma for Generic Access Profile (GAP)

[4]   Glucose Service Specification, Version 1.0.1

4   Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.0.0	2012-04-03	Adopted by the Bluetooth SIG Board of Directors
	1.0.1r1	2013-08-16	TCRL 2013-2 TSE 5216: Updated Table 2, Item 3 from "O" to "M"
1	1.0.1	2013-12-03	Prepare for Publication
	1.0.2r00	2014-04-11	TSE 5521: Added item 2/3a, Time Offset field of Glucose Measurement Characteristics: Sensor capable of user-facing date and time adjustment. TSE 5573: Edited Feature description for 2/4, Added 2/4a (Glucose Concentration field of Glucose Measurement Characteristic - Units of mol/L). Updated statuses, 2/5 to C.6; 2/6 to C.6; 2/8 to O; 2/9 and 2/12 and 2/17 and 2/18 and 2/19 to C.2; 2/10 and 2/11 to C.2, C.3; 2/13 and 2/14 to C.2, C.4; 2/15 and 2/16 to C.2, C.5. Updated conditional language to match BTI standard.
2	1.0.2	2014-07-07	TCRL 2014-1 Release
	1.0.3r00	2016-10-05	TSE 7517: Table 0 added; Table 6 Item #s recalibrated; "References" edited/updated; new template.
3	1.0.3	2016-12-13	Approved by BTI. Prepared for TCRL 2016-2 publication.
	1.0.4r00–r01	2019-04-02	TSE 11377 (rating 1): Updated template. Corrected conditional expression in Table 2 C.1 from 2/4b to 2/4a. Moved Revision History and Contributors tables to the end of the document.
4	1.0.4	2019-07-29	Approved by BTI. Prepared for TCRL 2019-1 publication.
	1.0.4ed2r00–1.0.4ed2r02	2021-03-24 – 2021-05-22	TSE 15946 (rating 1): Fixed minor typos in Tables 3 and 6. Editorials: Template updates and consistency checker feedback. Added a Publication Number column and assigned publication number 4 to the previous v1.0.4.
5	1.0.4 edition 2	2021-05-25	Approved by BTI on 2021-05-06. Prepared for edition 2 publication.
	p6r00–r07	2021-03-10 – 2021-12-21	TSE 16855 (rating 4): Added new ICS item 0a/1 for GLS v1.0.1 and new conditional C.1 in Table 0 for GLS v1.0. New Table 10 added for GAP inter-layer dependencies. Added new ICS item 2/29 and table (Table 2a) for E16855 - proper handling of changing supported features by characteristic indication. Added a reference for Glucose Service Specification v1.0.1. TSE 17485 (rating 1): Corrected the typo in item 4/7 and updated "User F acing Time" to "User Facing Time".

Publication Number	Revision Number	Date	Comments
			TSE 18146 (rating 3): Added ICS item 9/7 for missing GATT Inter-layer Dependency "Write Characteristic Value". Editorials, including updating the ICS to the latest template, removing a reference to the Core Specification, consistency checker fixes, and aligning the copyright info with v2 of the DNMD.
6	p6	2022-01-25	Approved by BTI on 2022-01-06. Prepared for TCRL 2021-2 publication.
	p7r00–r01	2023-09-26 – 2023-12-12	TSE 23664 (rating 2): Resolved GATT inter-layer dependencies. In Table 1, updated the Status value for Item 1 (GLS v1.0), added a new C.1, and updated the existing C.1 (now C.2). Updated C.1 for Table 0a. In Table 2, updated the Status value for Item 29, updated C.1–C.6, and deleted C.7. In Table 9, marked Item 1 as no longer used and updated all values for Item 2. Made editorial edits to align the document with the latest ICS template, including removal of "is supported" language.
7	p7	2024-07-01	Approved by BTI on 2024-04-21. Prepared for TCRL 2024-1 publication.
	p7ed2r00–r01	2025-07-09 – 2025-07-15	TSE 27296 (rating 1): Updated the language in C.2 of Table 0. Updated the Status for GLS 1/2 and added conditions C.2 and C.3.
	p7 edition 2	2025-08-05	Approved by BTI on 2025-08-05. Prepared for edition 2 publication.
	p8r00–r01	2025-12-04 – 2025-12-31	TSE 28169 (rating 1): Updated the conditions in the transport table to make sure the layer is excluded when the design is an implementation of the Core-Controller Configuration by adding "OR CORE 40/1 "Core-Controller"" to an already excluded transport based on Core Configuration support.
8	p8	2026-02-17	Approved by BTI on 2026-01-21. Prepared for TCRL pkg102 publication.