

Glucose Profile (GLP)

Bluetooth® Test Suite

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1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth Glucose Profile Specification with the objective to provide a high probability of air interface interoperability between the tested implementation and other manufacturers' Bluetooth devices.



2 References, definitions, and abbreviations

2.1 References

This document incorporates provisions from other publications by dated or undated reference. These references are cited at the appropriate places in the text, and the publications are listed hereinafter. Additional definitions and abbreviations can be found in [1] and [2].

- [1] Test Strategy and Terminology Overview
- [2] Bluetooth Core Specification, Version 4.0 or later
- [3] Glucose Profile Specification, Version 1.0 or later
- [4] ICS Proforma for Glucose Profile
- [5] GAP Test Suite, GAP.TS
- [6] SM Test Suite, SM.TS
- [7] GATT Test Suite ,GATT.TS
- [8] Glucose Service Specification, Version 1.0 or later
- [9] Device Information Service Specification, Version 1.0 or later
- [10] Glucose Service Test Suite, GLS.TS
- [11] ICS Proforma for Glucose Profile Implementation

2.2 Definitions

In this Bluetooth document, the definitions from [1] and [2] apply.

2.3 Acronyms and abbreviations

In this Bluetooth document, the definitions, acronyms, and abbreviations from [1] and [2] apply.



3 Test Suite Structure (TSS)

3.1 Overview

The Glucose Profile requires the presence of GAP, SM, and GATT. This is illustrated in [Figure 3.1](#).

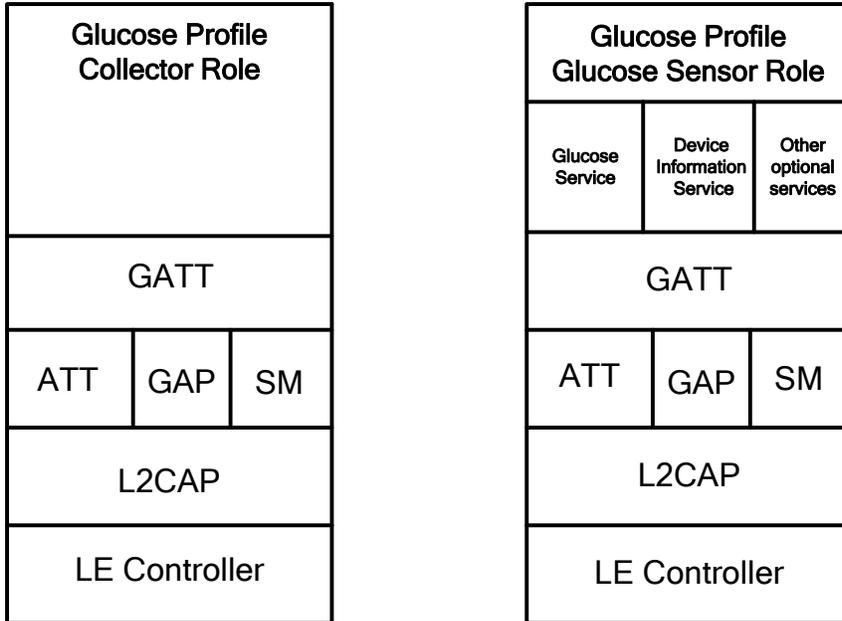


Figure 3.1: Glucose test models

3.2 Test Strategy

The test objectives are to verify functionality of the Glucose Profile within a Bluetooth Host and enable interoperability between Bluetooth Hosts on different devices. The testing approach covers mandatory and optional requirements in the specification and matches these to the support of the IUT as described in the ICS. Any defined test herein is applicable to the IUT if the ICS logical expression defined in the Test Case Mapping Table (TCMT) evaluates to true.

The test equipment provides an implementation of the Radio Controller and the parts of the Host needed to perform the test cases defined in this Test Suite. A Lower Tester acts as the IUT’s peer device and interacts with the IUT over the air interface. The configuration, including the IUT, needs to implement similar capabilities to communicate with the test equipment. For some test cases, it is necessary to stimulate the IUT from an Upper Tester. In practice, this could be implemented as a special test interface, a Man Machine Interface (MMI), or another interface supported by the IUT.

This Test Suite contains Valid Behavior (BV) tests complemented with Invalid Behavior (BI) tests where required. The test coverage mirrored in the Test Suite Structure is the result of a process that started with catalogued specification requirements that were logically grouped and assessed for testability enabling coverage in defined test purposes.

3.3 Test groups

The following test groups have been defined:

- Generic GATT Integrated Tests
- Glucose Features
- Service Procedures



4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [1]. The convention used here is:

<spec abbreviation>/<IUT role>/<class>/<feat>/<func>/<subfunc>/<cap>/<xx>-<nn>-<y>.

Additionally, testing of this specification includes tests from the GATT Test Suite [7] referred to as Generic GATT Integrated Tests (GGIT); when used, the test cases in GGIT are referred to through a TCID string using the following convention:

<spec abbreviation>/<IUT role>/<GGIT test group>/< GGIT class >/<xx>-<nn>-<y>.

Identifier Abbreviation	Spec Identifier <spec abbreviation>
GLP	Glucose Profile
Identifier Abbreviation	Role Identifier <IUT role>
COL	Collector Role
SEN	Glucose Sensor Role
Identifier Abbreviation	Reference Identifier <GGIT test group>
CGGIT	Client Generic GATT Integrated Tests
SGGIT	Server Generic GATT Integrated Tests
Identifier Abbreviation	Reference Identifier <GGIT class>
CHA	Characteristic
ISFC	Indication Supported Features Characteristic
SDPNF	SDP Record Not Found
SER	Service
Identifier Abbreviation	Feature and Behaviors Identifier <feat>
GLD	Discovery of Services and Characteristics
GLF	Features
SPA	Service Procedure – Abort
SPD	Service Procedure – Delete
SPE	Service Procedure – Error Handling
SPN	Service Procedure – Number
SPR	Service Procedure – Report
SPT	Service Procedure – Time Updates

Table 4.1: GLP TC feature naming conventions

4.1.2 Conformance

When conformance is claimed for a particular specification, all capabilities are to be supported in the specified manner. The mandated tests from this Test Suite depend on the capabilities to which conformance is claimed.

The Bluetooth Qualification Program may employ tests to verify implementation robustness. The level of implementation robustness that is verified varies from one specification to another and may be revised for cause based on interoperability issues found in the market.



Such tests may verify:

- That claimed capabilities may be used in any order and any number of repetitions not excluded by the specification
- That capabilities enabled by the implementations are sustained over durations expected by the use case
- That the implementation gracefully handles any quantity of data expected by the use case
- That in cases where more than one valid interpretation of the specification exists, the implementation complies with at least one interpretation and gracefully handles other interpretations
- That the implementation is immune to attempted security exploits

A single execution of each of the required tests is required to constitute a Pass verdict. However, it is noted that to provide a foundation for interoperability, it is necessary that a qualified implementation consistently and repeatedly pass any of the applicable tests.

In any case, where a member finds an issue with the test plan generated by the Bluetooth SIG qualification tool, with the test case as described in the Test Suite, or with the test system utilized, the member is required to notify the responsible party via an erratum request such that the issue may be addressed.

4.1.3 Pass/Fail verdict conventions

Each test case has an Expected Outcome section. The IUT is granted the Pass verdict when all the detailed pass criteria conditions within the Expected Outcome section are met.

The convention in this Test Suite is that, unless there is a specific set of fail conditions outlined in the test case, the IUT fails the test case as soon as one of the pass criteria conditions cannot be met. If this occurs, the outcome of the test is a Fail verdict.

4.2 Setup preambles

The procedures defined in this section are used to achieve specific conditions on the IUT and the test equipment within the tests defined in this document. The preambles here are commonly used to establish initial conditions.

4.2.1 ATT Bearer on LE transport

- Preamble Procedure
 1. Establish an LE transport connection between the IUT and the Lower Tester.
 2. Establish an L2CAP channel 0x0004 between the IUT and the Lower Tester over that LE transport.

4.2.2 ATT Bearer on BR/EDR transport

- Preamble Procedure
 1. Establish a BR/EDR transport connection between the IUT and the Lower Tester.
 2. Establish an L2CAP channels (PSM 0x001F) between the IUT and the Lower Tester over that BR/EDR transport.



4.2.3 Collector: Configure Sensor for use with RACP

- Preamble Purpose

This preamble procedure specifies how the Collector IUT configures the Sensor for use with Record Access Control Point.

- Preamble Procedure

1. Establish an ATT Bearer connection between the Lower Tester and IUT as described in Section 4.2.1.
2. The handles of the Glucose Measurement characteristic, Glucose Measurement Context characteristic and Record Access Control Point characteristic have been previously discovered by the IUT during the test procedures in Section 4.3 or are known to the Upper Tester by other means.
3. The handles of the Client Characteristic Configuration descriptor of the Glucose Measurement characteristic, Glucose Measurement Context characteristic and Record Access Control Point characteristic have been previously discovered by the IUT during the test procedure in Section 4.3 or are known to the Upper Tester by other means.
4. If the Lower Tester and IUT were not previously bonded, perform a bonding procedure. If previously bonded, enable encryption if not already enabled.
5. The Glucose Measurement characteristic and Glucose Measurement Context characteristic are configured for notifications.
6. The Record Access Control Point characteristic is configured for indications.

4.2.4 Collector: Scan to detect Sensor advertisements

- Preamble Purpose

This preamble procedure specifies how the Collector IUT scans for Sensor advertisements for the case when a Sensor has new records available.

- Reference

[3] Section 5.2, [2] GAP 9.3.3, 9.3.4

- Initial Condition

- A preamble procedure defined in Section 4.2.3 is used as a prerequisite to this preamble.
- The Collector has been configured to accept commands from the Upper Tester to request and receive Glucose measurements.

- Preamble Procedure

1. The Upper Tester commands the Collector IUT to initiate a connection and the IUT starts scanning.
2. The Glucose Sensor (Lower Tester) advertises to the Collector IUT either using:
 - ALT 1: GAP Directed Connectable Mode (send ADV_DIRECT_IND packets)
 - or
 - ALT 2: GAP Undirected Connectable Mode (send ADV_IND packets).
3. The Lower Tester waits for responses from the Collector IUT.
4. The Collector IUT sends a CONNECT_REQ and an optionally empty PDU to the Lower Tester.



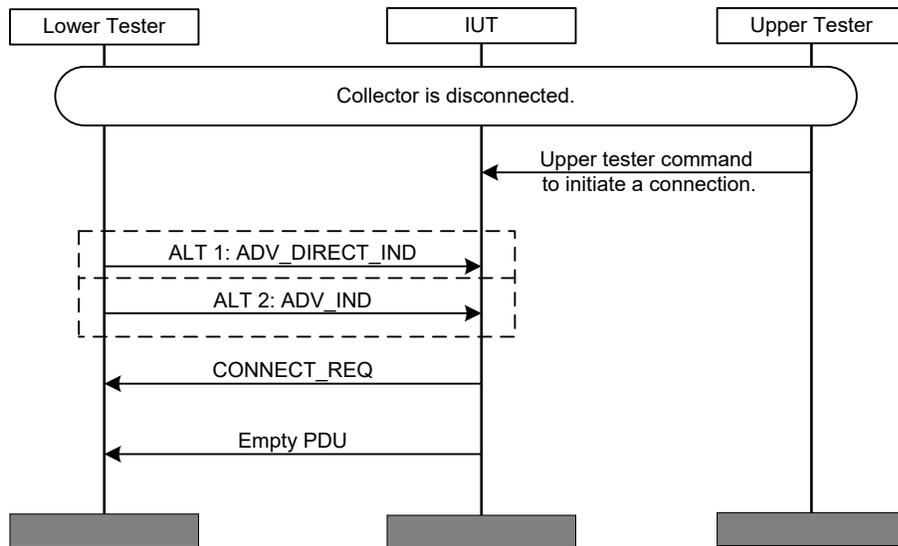


Figure 4.1: Collector: Scan to detect Sensor advertisements preamble

4.3 Generic GATT Integrated Tests

Execute the Generic GATT Integrated Tests defined in Section 6.4, Client test procedures (CGGIT), in [7] using Table 4.2 below as input:

TCID	Service / Characteristic	Reference	Properties	Value Length (Octets)	Type
GLP/COL/CGGIT/SER/BV-01-C [Service GGIT – Glucose]	Glucose Service	[3] 4.2.1	-	-	Primary Service
GLP/COL/CGGIT/SER/BV-02-C [Service GGIT – Device Information]	Device Information Service	[3] 4.2.2	-	-	Primary Service
GLP/SEN/SGGIT/SDPNF/BV-03-C [Not discoverable over BR/EDR – Glucose Service]	Glucose Service	[3] 2.5	-	-	-
GLP/COL/CGGIT/CHA/BV-04-C [Characteristic GGIT – Glucose Measurement]	Glucose Measurement characteristic	[3] 4.3.1.1	0x10 (Notify)	Skip	-
GLP/COL/CGGIT/CHA/BV-05-C [Characteristic GGIT – Glucose Measurement Context]	Glucose Measurement Context characteristic	[3] 4.3.1.2	0x10 (Notify)	Skip	-
GLP/COL/CGGIT/CHA/BV-06-C [Characteristic GGIT – Glucose Feature]	Glucose Feature characteristic	[3] 4.3.1.3	0x22 (Read, Indicate)	2	-
GLP/COL/CGGIT/CHA/BV-07-C [Characteristic GGIT – Record Access Control Point]	Record Access Control Point characteristic	[3] 4.3.1.4	0x28 (Write, Indicate)	Skip	-

Table 4.2: Input for the GGIT Client test procedure

4.3.1 Generic GATT Indication Supported Features characteristic

Execute the Generic GATT Indication Supported Features Characteristic tests defined in Section 6.4, Client test procedures (CGGIT), in [7] using Table 4.3 below as input:

TCID	Characteristic	Reference	TC Configuration
GLP/COL/CGGIT/ISFC/BV-08-C [Characteristic GGIT – Glucose Feature indication]	Glucose Feature	[3] 4.6	N/A

Table 4.3: GGIT Indication Supported Features Characteristic test procedure

GLP/COL/GLD/BV-11-C [Discover Device Information Service Characteristics]

- Test Purpose

Verify that a Collector IUT can discover all characteristics of a Device Information Service supported by the IUT.

- Reference

[3] 4.3.2

- Initial Condition

- TSPX_iut_supported_dis_characteristics_uuid_list entry in the IXIT [11] specifies all characteristics of the Device Information Service supported by the IUT.
- Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.
- The Lower Tester has one instance of the Device Information Service including all defined characteristics. This instantiation also contains two «future» characteristics:
 - One inserted before the first characteristic defined in [9].
 - One appended after the last characteristic defined in [9].
 - The «future» characteristic is a 16-bit UUID randomly selected from unassigned UUIDs at the time of the test.
- The IUT has executed the procedure included in GLP/COL/CGGIT/SER/BV-02-C [Service GGIT – Device Information], and has saved the handle range for the instantiation of the Device Information Service. The Device Information Service contains one or more characteristics.

- Test Procedure

1. The Upper Tester issues a command to the IUT to discover all characteristics of the Device Information Service supported by the IUT.
2. The IUT executes either alternative 2A or 2B:

Alternative 2A (Discover All Characteristics of a Service sub-procedure):

2A: Discover All Characteristics of a Service with the specified handle range, with the Lower Tester instantiating the database specified in the Initial Condition.

Alternative 2B (Discover Characteristic by UUID sub-procedure):

2B: Discover Characteristics by UUID using each of the UUIDs for the characteristics of the Device Information Service supported by the IUT, with the Lower Tester instantiating the database specified in the Initial Condition.

- Expected Outcome

Pass verdict

For each characteristic supported by the IUT contained in the Lower Tester's instantiation of the Device Information Service, the IUT reports an attribute handle/value pair for each characteristic specified in the IXIT [11] to the Upper Tester.



GLP/COL/GLD/BV-12-C [Read Device Information Service Characteristics]

- Test Purpose

Verify that a Collector IUT can read all characteristics of a Device Information Service supported by the IUT.

- Reference

[3] 3.2, 4.3.2

- Initial Condition

- TSPX_iut_supported_dis_characteristics_uuid_list entry in the IXIT [11] specifies all characteristics of the Device Information Service supported by the IUT.
- Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.
- The Lower Tester includes one instantiation of the Device Information Service [9] including all defined characteristics.
- The IUT has previously executed the procedure included in GLP/COL/GLD/BV-11-C [Discover Device Information Service Characteristics], so it has the handle/value pairs for all characteristics of the Device Information Service supported by the IUT.

- Test Procedure

This test is run twice and a disconnection may occur between the two tests. In the first pass, the string includes only character values in the ASCII printable range (i.e., 0x20 – 0x7E). In the second pass, the string includes character values outside the ASCII printable range.

1. The Upper Tester issues a command to the IUT to read all characteristics of the Device Information Service supported by the IUT.
2. For each characteristic of the Device Information Service supported by the IUT, the IUT sends an ATT_Read_Request command to the Lower Tester.

- Expected Outcome

Pass verdict

For each characteristic contained in the Lower Tester's instantiation of the Device Information Service supported by the IUT, the IUT reports the characteristic value for all characteristics specified in the IXIT [11] to the Upper Tester, including any printable or non-printable ASCII values.

4.4 Glucose Features

The procedures defined in this test group verify implementation of the Features defined in the Glucose Profile Specification [3] by a Glucose Sensor IUT, and usage of the same features by a Collector IUT.

GLP/SEN/GLF/BV-01-C [Glucose Service UUID in AD]

- Test Purpose

Verify that the Glucose Service UUID is included in AD (Advertising Data) from the Glucose Sensor IUT when in a GAP discoverable mode.

- Reference

[3] Section 3.1.1



- Initial Condition
 - The IUT is induced to enter a GAP discoverable mode and start advertising.
- Test Procedure

The Lower Tester listens for Advertising Packets from the IUT.
- Expected Outcome

Pass verdict

The Advertising Packets contain the defined Service UUID for «Glucose Service».

GLP/SEN/GLF/BV-02-C [Local Name included in AD or Scan Response]

- Test Purpose

Verify that the Local Name is included in AD (Advertising Data) or Scan Response data from the Glucose Sensor IUT.
- Reference

[3] Section 3.1.2
- Initial Condition
 - The IUT is induced to enter a GAP connectable mode and start advertising.
- Test Procedure

The Lower Tester listens for Advertising Packets from the IUT. When the Lower Tester receives an Advertising Packet from IUT, it sends a Scan Request to the IUT. Then the Lower Tester listens for a Scan Response from the IUT.

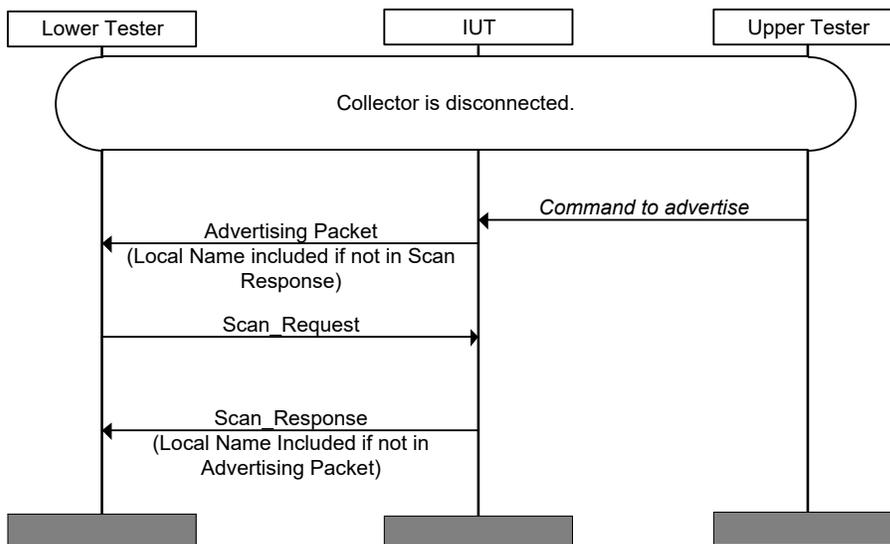


Figure 4.2: GLP/SEN/GLF/BV-02-C [Local Name included in AD or Scan Response]

- Expected Outcome

Pass verdict

The IUT sends an Advertising packet and a Scan Response packet.

The IUT includes the Local Name in either the Advertising packet or Scan Response packet, but not both.

GLP/SEN/GLF/BV-03-C [Public Address in AD or Scan Response]

- Test Purpose

Verify that a Glucose Sensor IUT that supports multiple bonds and supports a Target Address AD Type includes the Public Target Address AD Type in Advertising or Scan Response data and the Multiple Bond Supported bit is properly set.

- Reference

[3] Section 3.1.4, 5.1.5

- Initial Condition

- The Lower Tester has previously bonded to the IUT using a public address.
- The IUT is induced to enter a GAP connectable mode and start advertising.

- Test Procedure

1. The Lower Tester listens for Advertising Packets from the IUT. When the Lower Tester receives an Advertising Packet from the IUT, the Lower Tester sends a Scan Request to the IUT. Then the Lower Tester listens for a Scan Response from the IUT.
2. Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.
3. The Lower Tester executes the procedure included in [GLP/COL/CGGIT/SER/BV-01-C \[Service GGIT – Glucose\]](#), and saves the handle range for the Glucose Service.
4. The Lower Tester sends a request to the IUT to read a Glucose Feature characteristic.

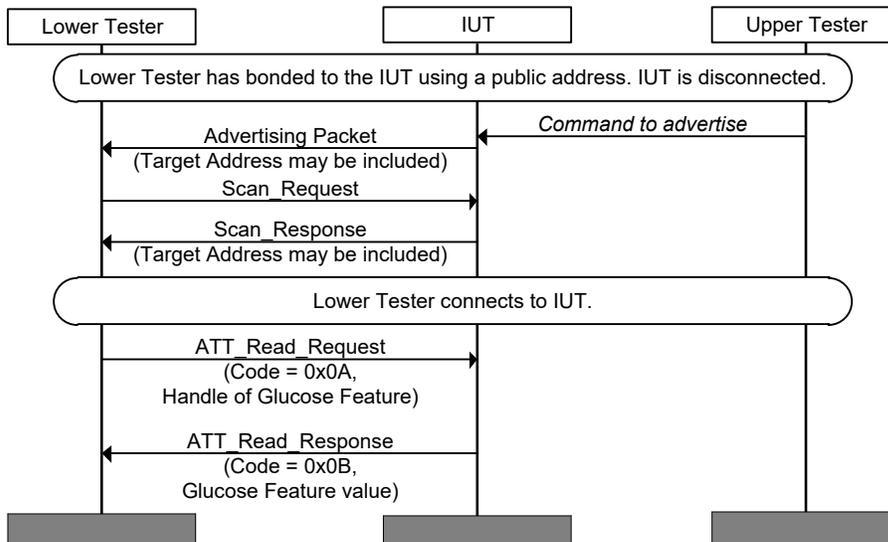


Figure 4.3: GLP/SEN/GLF/BV-03-C [Public Address in AD or Scan Response]



- Expected Outcome

Pass verdict

The value of the Multiple Bond Supported bit of the Glucose Feature characteristic is set to 1.

The IUT includes a Target Address in either the Advertising packet or Scan Response packet, but not both.

The Target Address is a Public Address and 6 octets in length.

GLP/SEN/GLF/BV-04-C [Random Target Address in AD or Scan Response]

- Test Purpose

Verify that a Glucose Sensor IUT that supports multiple bonds and supports a Target Address AD Type includes the Random Target Address AD Type in Advertising or Scan Response data and the Multiple Bond Supported bit is properly set.

- Reference

[3] Section 3.1.4, 5.1.5

- Initial Condition

- The Lower Tester has previously bonded to the IUT using a random address.
- The IUT is induced to enter a GAP connectable mode and start advertising.

- Test Procedure

1. The Lower Tester listens for Advertising Packets from the IUT. When the Lower Tester receives an Advertising Packet from the IUT, the Lower Tester sends a Scan Request to the IUT. Then the Lower Tester listens for a Scan Response from the IUT.
2. Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.
3. The Lower Tester executes the procedure included in [GLP/COL/CGGIT/SER/BV-01-C \[Service GGIT – Glucose\]](#), and saves the handle range for the Glucose Service.
4. The Lower Tester sends a request to the IUT to read a Glucose Feature characteristic.

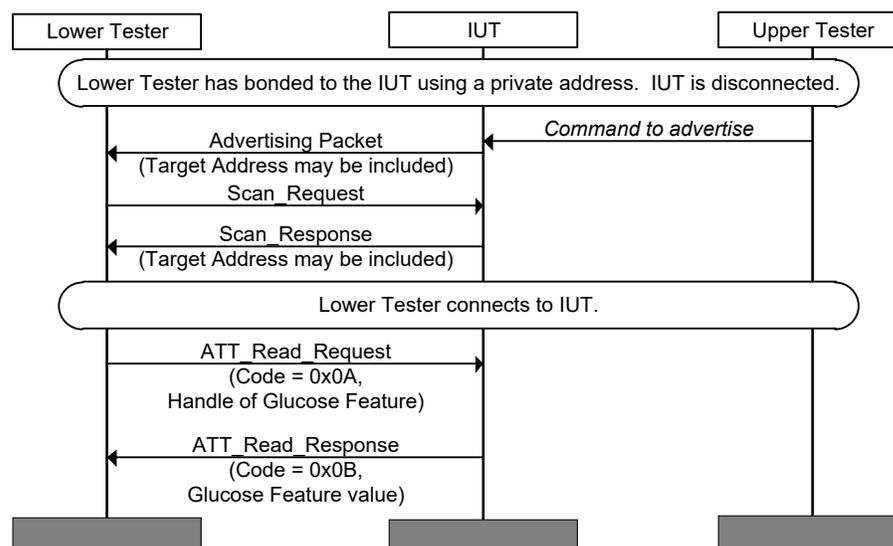


Figure 4.4: GLP/SEN/GLF/BV-04-C [Random Target Address in AD or Scan Response]



- Expected Outcome

Pass verdict

The value of the Multiple Bond Supported bit of the Glucose Feature characteristic is set to 1.

The IUT includes a Target Address in either the Advertising packet or Scan Response packet, but not both.

The Target Address is a Random Address and six octets in length.

GLP/SEN/GLF/BV-06-C [No Target Address in AD or Scan Response – Multi-Bond]

- Test Purpose

Verify that a Glucose Sensor IUT that supports multiple bonds and does not claim to support a Target Address AD Type does not include a Target Address AD Type in Advertising or Scan Response data and the Multiple Bond Supported bit is properly set.

- Reference

[3] Section 3.1.4, 5.1.5

- Initial Condition

- The Lower Tester has previously bonded to the IUT.
- The IUT is induced to enter a GAP connectable mode and starts advertising.

- Test Procedure

1. The Lower Tester listens for Advertising Packets from the IUT. When the Lower Tester receives an Advertising Packet from the IUT, the Lower Tester sends a Scan Request to the IUT. Then the Lower Tester listens for a Scan Response from the IUT.
2. Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.
3. The Lower Tester executes the procedure included in [GLP/COL/CGGIT/SER/BV-01-C \[Service GGIT – Glucose\]](#), and saves the handle range for the Glucose Service.
4. The Lower Tester sends a request to the IUT to read a Glucose Feature characteristic.

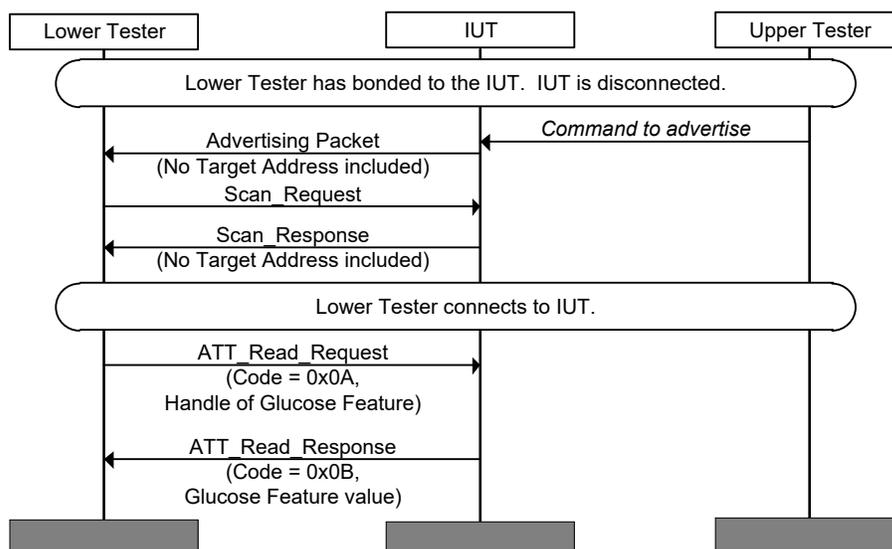


Figure 4.5: GLP/SEN/GLF/BV-06-C [No Target Address in AD or Scan Response – Multi-Bond]



- Expected Outcome

Pass verdict

The value of the Multiple Bond Supported bit of the Glucose Feature characteristic is set to 1.

The IUT does not include the Target Address in an Advertising packet or in a Scan Response packet.

GLP/SEN/GLF/BV-07-C [No Target Address in AD or Scan Response – Single Bond]

- Test Purpose

Verify that a Glucose Sensor IUT that does not support multiple bonds does not include the Target Address AD Type in Advertising or Scan Response data and the Multiple Bond Supported bit is properly set.

- Reference

[3] Section 3.1.4

- Initial Condition

- The Lower Tester has previously bonded to the IUT.
- The IUT is induced to enter a GAP connectable mode and start advertising.

- Test Procedure

1. The Lower Tester listens for Advertising Packets from the IUT. When the Lower Tester receives an Advertising Packet from the IUT, the Lower Tester sends a Scan Request to the IUT. Then the Lower Tester listens for a Scan Response from the IUT.
2. Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.
3. The Lower Tester executes the procedure included in [GLP/COL/CGGIT/SER/BV-01-C \[Service GGIT – Glucose\]](#), and saves the handle range for the Glucose Service.
4. The Lower Tester sends a request to the IUT to read a Glucose Feature characteristic.

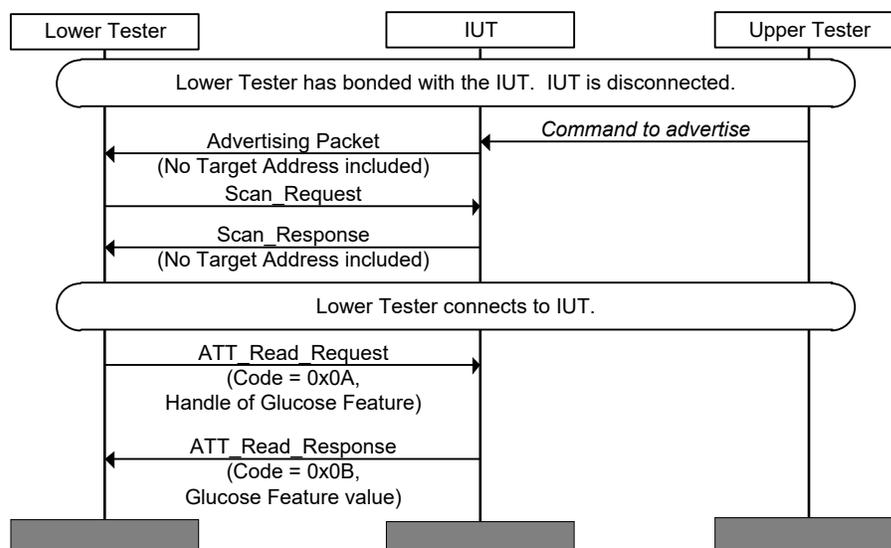


Figure 4.6: GLP/SEN/GLF/BV-07-C [No Target Address in AD or Scan Response – Single Bond]

- Expected Outcome

Pass verdict

The value of the Multiple Bond Supported bit of the Glucose Feature characteristic is set to 0.

The IUT does not include the Target Address in an Advertising packet or in a Scan Response packets.

GLP/SEN/GLF/BV-08-C [Glucose Service as Primary Service]

- Test Purpose

Verify that the Glucose Service in a Glucose Sensor IUT is instantiated as a primary service.

- Reference

[3] Section 3

- Initial Condition

- Run the preamble procedure to enable the Collector to initiate connection to a Glucose Sensor included in Section 4.2.4.

- Test Procedure

1. The Lower Tester sends an ATT_Find_By_Type_Value_Requests to the IUT with type set to «Primary Service» and service UUID set to «Glucose Service».
2. Verify that one attribute handle range is returned, containing the starting handle and the ending handle of the service definition.

- Expected Outcome

Pass verdict

The IUT has one instantiation of the Glucose Service.

The Glucose Service is a primary service.

GLP/COL/GLF/BV-09-C [Configure Glucose Measurement Characteristic for Notification]

- Test Purpose

Verify that the Collector IUT can configure a Glucose Sensor (Lower Tester) to Notify Glucose Measurement characteristics.

- Reference

[3] Section 4.4

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the LE transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/CGGIT/CHA/BV-04-C \[Characteristic GGIT – Glucose Measurement\]](#), which returns the handle of a Client Characteristic Configuration Descriptor for a Glucose Measurement characteristic contained in the Lower Tester.

- Test Procedure

The Upper Tester sends a command to the IUT to configure it to receive Glucose Measurement characteristic notifications.



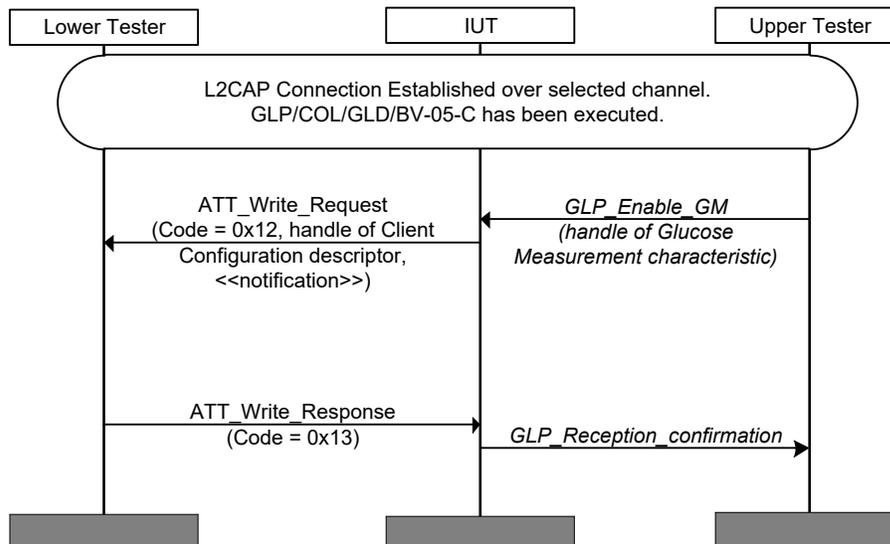


Figure 4.7: GLP/COL/GLF/BV-09-C [Configure Glucose Measurement Characteristic for Notification]

- Expected Outcome

Pass verdict

The IUT sends a correctly formatted *ATT_Write_Request* (0x12) to the Lower Tester, with the handle set to that of the Client Characteristic Configuration Descriptor for a Glucose Measurement characteristic, and the value set to «notification».

GLP/COL/GLF/BV-10-C [Receive Glucose Measurement Notifications]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Characteristic for various field configurations.

- Reference

[3] Section 4.4

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-09-C \[Configure Glucose Measurement Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Notification.
- The IUT has the handle of the Glucose Measurement characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement characteristic value to the IUT.
3. The Lower Tester sends one Glucose Measurement characteristic notification for each Test Pattern shown in the following table. For each Test Pattern, the value of the Flags field is shown



along with the corresponding pass criteria. For the case where bit 4 is set, the Lower Tester will also notify a corresponding Glucose Measurement Context characteristic.

Test Pattern	Flags Field Value	Pass Criteria
1	000000000	No optional fields are present and no Glucose Measurement Context characteristic is notified.
2	000000001	Only optional field present is Time Offset and no Glucose Measurement Context characteristic is notified.
3	000000010	Only optional fields present are Glucose concentration and Type-Sample Location fields and Glucose concentration is in units of kg/L and no Glucose Measurement Context characteristic is notified.
4	000000110	Only optional fields present are Glucose concentration and Type-Sample Location fields and Glucose concentration is in units of mol/L and no Glucose Measurement Context characteristic is notified.
5	000001000	Only optional field present is Sensor Status Annunciation and no Glucose Measurement Context characteristic is notified.
6	000010000	No optional fields are present and Glucose Measurement Context characteristic is notified

Table 4.4: Pass Criteria for Glucose Measurement Characteristic

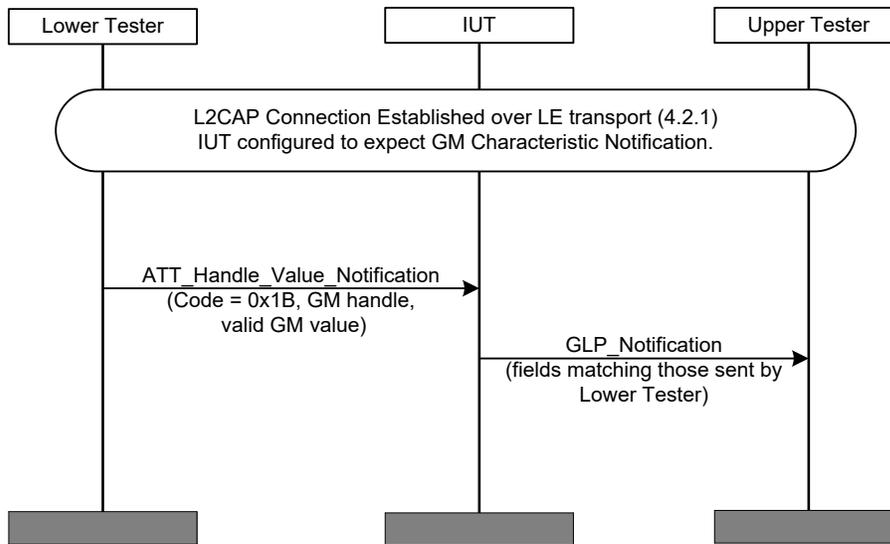


Figure 4.8: GLP/COL/GLF/BV-10-C [Receive Glucose Measurement Notifications]

- Expected Outcome

Pass verdict

The IUT sends notifications of Glucose Measurement values in expected combinations to the Upper Tester using the pass criteria in the table above.

The reported field values and units match the ones sent by the Lower Tester.



GLP/COL/GLF/BI-01-C [Receive Glucose Measurement Notifications with reserved Flags bits]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Characteristic from a Glucose Sensor including reserved Flags bits.
- Reference

[3] Section 4.4
- Initial Condition
 - A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
 - The IUT has executed the procedure included in [GLP/COL/GLF/BV-09-C \[Configure Glucose Measurement Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Notification.
 - The IUT has the handle of the Glucose Measurement characteristic.
- Test Procedure
 1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
 2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement characteristic value to the IUT. There are many combinations of reserved flag settings. For this test use Flags = 0xEB (valid and reserved Flags bits, sequence number, base time, time offset, glucose concentration, type-sample location, sensor status annunciation). Any valid values for the Sensor Status Annunciation field may be sent by the Lower Tester.

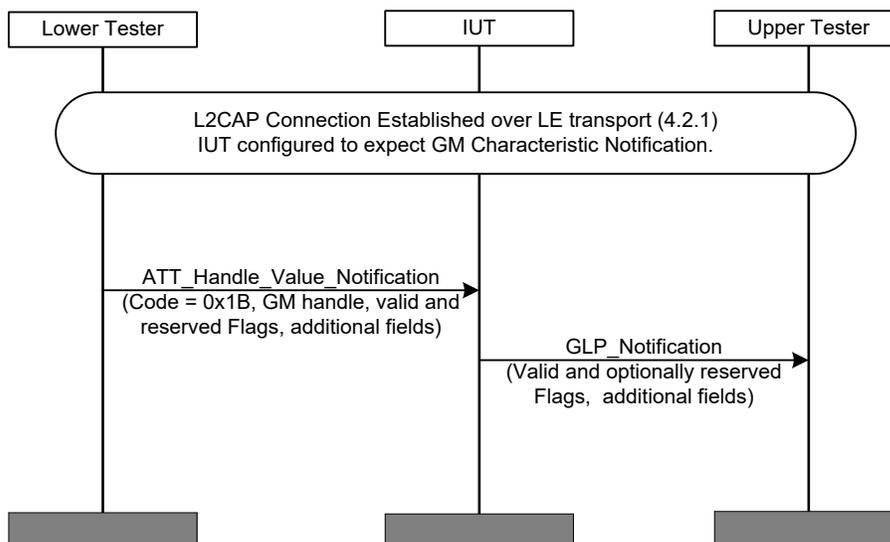


Figure 4.9: GLP/COL/GLF/BI-01-C [Receive Glucose Measurement Notifications with reserved Flags bits]

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement characteristic value to the Upper Tester, e.g., *GLP_Notification* (sequence number, base time, time offset, glucose concentration in kg/L, type-



sample location, sensor status annunciation). The reported field values match the ones sent by the Lower Tester optionally including the reserved bits of the Flags field.

GLP/COL/GLF/BI-02-C [Receive Glucose Measurement Notifications with reserved Type-Sample Location]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Characteristic from a Glucose Sensor including reserved value of the type nibble and the sample location nibble of the type-sample location field.

- Reference

[3] Section 4.4

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-09-C \[Configure Glucose Measurement Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Notifications.
- The IUT has the handle of the Glucose Measurement characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
2. The Lower Tester sends an *ATT_Handle_Value_Notification* to the IUT containing a Glucose Measurement characteristic value. That value contains: flags = 0x0A, valid glucose concentration in kg/L, reserved value in the type nibble, reserved value in the sample location nibble, valid sensor status annunciation bits.

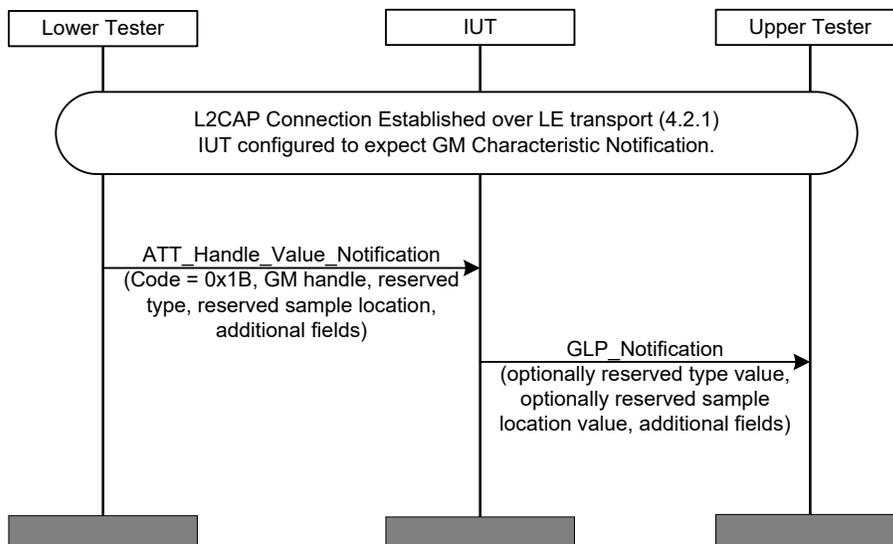


Figure 4.10: GLP/COL/GLF/BI-02-C [Receive Glucose Measurement Notifications with reserved Type-Sample Location]

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement characteristic value to the Upper Tester, e.g., *GLP_Notification* (sequence number, base time, glucose concentration in kg/L, optionally reserved type value, optionally reserved sample location value, sensor status annunciation bits). The reported field values match the ones sent by the Lower Tester.

GLP/COL/GLF/BI-03-C [Receive Glucose Measurement Notifications with reserved sensor status annunciation bits]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Characteristic from a Glucose Sensor including reserved bits of the sensor status annunciation field.

- Reference

[3] Section 4.4

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-09-C \[Configure Glucose Measurement Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Notifications.
- The IUT has the handle of the Glucose Measurement characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
2. The Lower Tester sends an *ATT_Handle_Value_Notification* to the IUT containing a Glucose Measurement characteristic value. That value contains: flags = 0x0A, valid glucose concentration in kg/L, Type-Sample Location, sensor status annunciation bits (e.g., 0xFFFF).



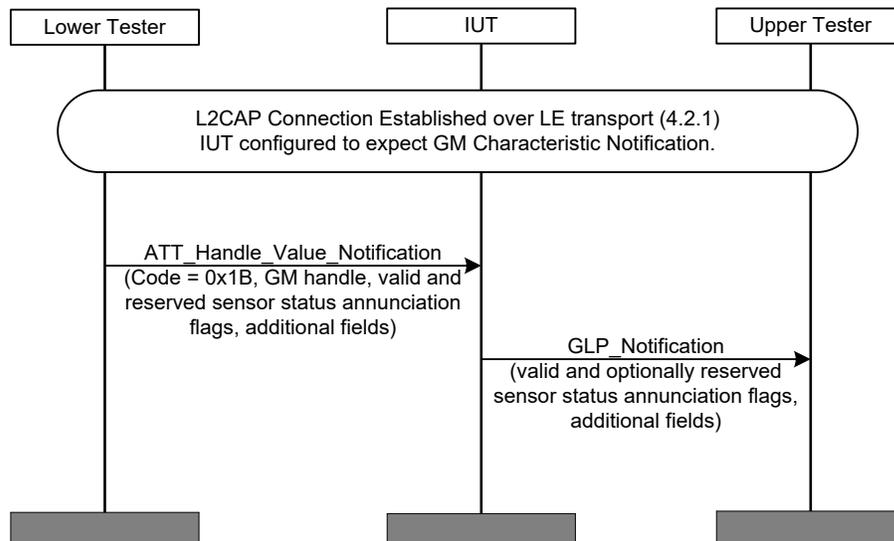


Figure 4.11: GLP/COL/GLF/BI-03-C [Receive Glucose Measurement Notifications with reserved sensor status annunciation bits]

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement characteristic value to the Upper Tester, e.g., *GLP_Notification* (sequence number, base time, glucose concentration in kg/L, valid type-sample location, valid and optionally reserved sensor status annunciation bits). The reported field values match the ones sent by the Lower Tester.

GLP/COL/GLF/BI-04-C [Receive Glucose Measurement Notifications with additional octets not comprehended]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Characteristic from a Glucose Sensor including additional octets not comprehended by the Collector.

- Reference

[3] Section 4.4

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-09-C \[Configure Glucose Measurement Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Notifications.
- The IUT has the handle of the Glucose Measurement characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
2. The Lower Tester sends an *ATT_Handle_Value_Notification* to the IUT containing a Glucose Measurement characteristic value. That value contains: flags = 0x02 or, optional reserved Flags



bits set, valid glucose concentration in kg/L, valid type-sample location, and at least two additional octets not comprehended by the Collector. The total number of octets does not exceed the maximum MTU size.

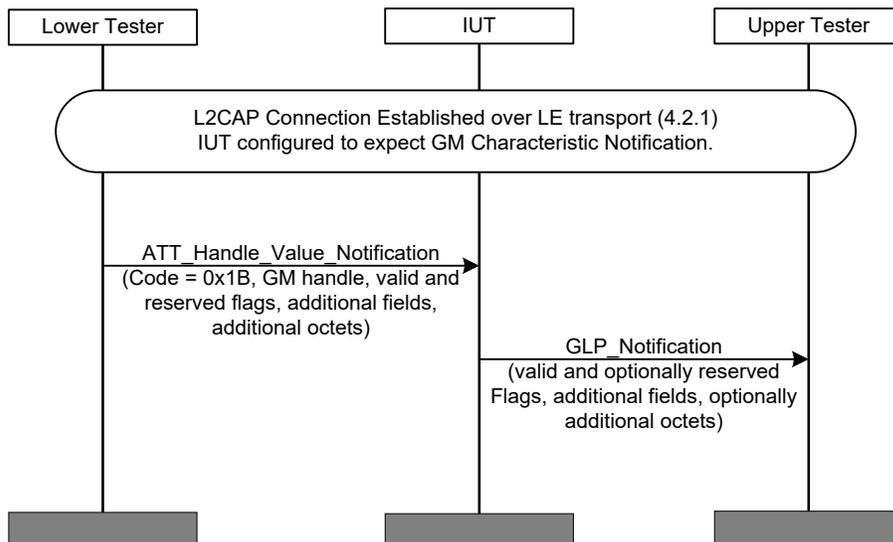


Figure 4.12: GLP/COL/GLF/BI-04-C [Receive Glucose Measurement Notifications with additional octets not comprehended]

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement characteristic value to the Upper Tester, e.g., *GLP_Notification* (valid and optionally reserved Flags, glucose concentration in kg/L, type-sample location, optionally additional octets). The reported field values match the ones sent by the Lower Tester.

GLP/COL/GLF/BV-11-C [Configure Glucose Measurement Context Characteristic for Notification]

- Test Purpose

Verify that the Collector IUT can configure a Glucose Sensor (Lower Tester) to Notify Glucose Measurement Context characteristics.

- Reference

[3] Section 4.5

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the LE transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/CGGIT/CHA/BV-05-C \[Characteristic GGIT – Glucose Measurement Context\]](#), which returns the handle of a Client Characteristic Configuration Descriptor for a Glucose Measurement Context characteristic contained in the Lower Tester.



- Test Procedure

The Upper Tester sends a command to the IUT to configure it to receive Glucose Measurement Context characteristic notifications.

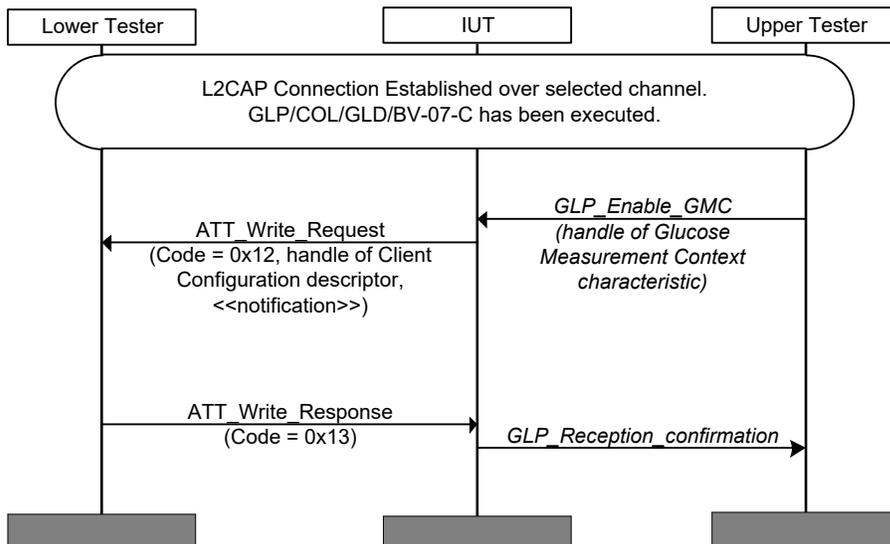


Figure 4.13: GLP/COL/GLF/BV-11-C [Configure Glucose Measurement Context Characteristic for Notification]

- Expected Outcome

Pass verdict

The IUT sends a correctly formatted *ATT_Write_Request* (0x12) to the Lower Tester, with the handle set to that of the Client Characteristic Configuration Descriptor for a Glucose Measurement Context characteristic, and the value set to «notification».

GLP/COL/GLF/BV-12-C [Receive Glucose Measurement Context Notifications]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Context Characteristic for various field configurations.

- Reference

[3] Section 4.5

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-11-C \[Configure Glucose Measurement Context Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Context characteristic Notification.
- The IUT has the handle of the Glucose Measurement Context characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.

2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT.
3. The Lower Tester sends one Glucose Measurement characteristic notification and one Glucose Measurement Context characteristic notification for each Test Pattern shown in the following table. For each Test Pattern, the value of the Flags field is shown along with the corresponding pass criteria. Note that a Flags combination of 00000000 is not valid since, by definition, at least one optional field for this characteristic is to be present.

Test Pattern	Flags Field Value	Pass Criteria
1	00000001	Only optional fields present are the Carbohydrate ID and Carbohydrate fields
2	00000010	Only optional field present is the Meal field
3	00000100	Only optional field present is the Tester-Health field
4	00001000	Only optional fields present are the Exercise Duration and Exercise Intensity fields
5	00010000	Only optional fields present are the Medication ID and Medication fields and Medication is in units of kilograms
6	00110000	Only optional fields present are the Medication ID and Medication fields and Medication is in units of liters
7	01000000	Only optional field present is the HbA1c field
8	10000000	Only optional field present is the Extended Flags field

Table 4.5: Pass Criteria for Glucose Measurement Context Characteristic

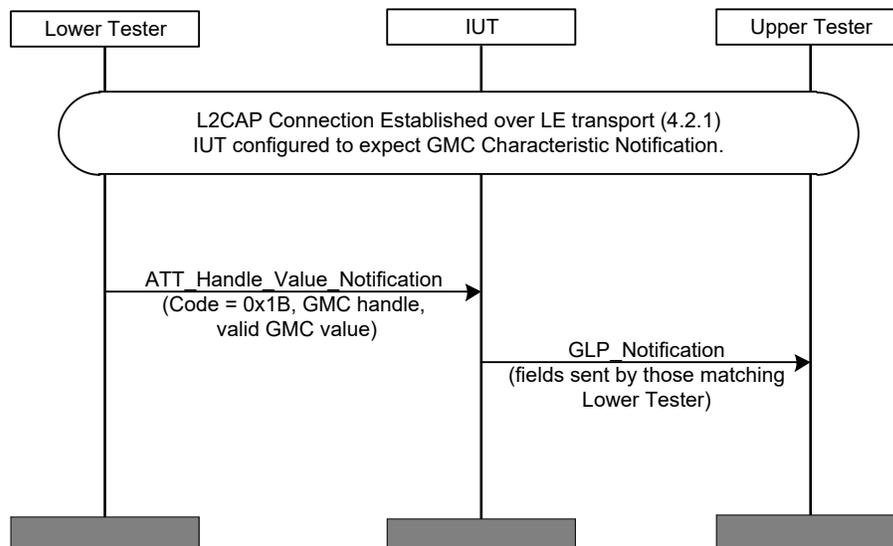


Figure 4.14: GLP/COL/GLF/BV-12-C [Receive Glucose Measurement Context Notifications]

- Expected Outcome

Pass verdict

The IUT sends notifications of Glucose Measurement Context values in expected combinations to the Upper Tester using the pass criteria in the table above.

The reported field values and units match the ones sent by the Lower Tester.



GLP/COL/GLF/BI-06-C [Receive Glucose Measurement Context Notifications with reserved Extended Flags bits]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Context characteristic from a Glucose Sensor including reserved bits of the Extended Flags field.
- Reference

[3] Section 4.5
- Initial Condition
 - A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
 - The IUT has executed the procedure included in [GLP/COL/GLF/BV-11-C \[Configure Glucose Measurement Context Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Context characteristic notification.
 - The IUT has the handle of the Glucose Measurement Context characteristic.
- Test Procedure
 1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
 2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT. There are many combinations of reserved flag settings. For this test use Flags = 0xFF (Flags bits, sequence number, reserved extended flags, carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c).

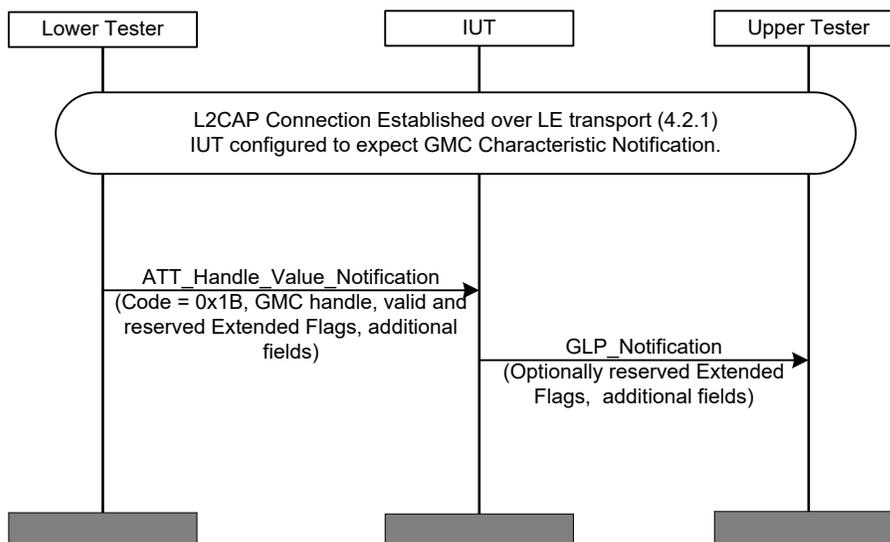


Figure 4.15: GLP/COL/GLF/BI-06-C [Receive Glucose Measurement Context Notifications with reserved Extended Flags bits]

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement Context characteristic value to the Upper Tester, e.g., *GLP_Notification* (Flags bits, sequence number, optionally reserved extended flags,



carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c). The reported field values match the ones sent by the Lower Tester optionally including the reserved bits of the Extended Flags field.

GLP/COL/GLF/BI-07-C [Receive Glucose Measurement Context Notifications with reserved Carbohydrate ID value]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Context characteristic from a Glucose Sensor including at least two different reserved values of the Carbohydrate ID field.

- Reference

[3] Section 4.5

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-11-C \[Configure Glucose Measurement Context Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Context characteristic notifications.
- The IUT has the handle of the Glucose Measurement Context characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT. There are many combinations of reserved flag settings. For this test use Flags = 0x7F (Flags bits, sequence number, reserved carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c).

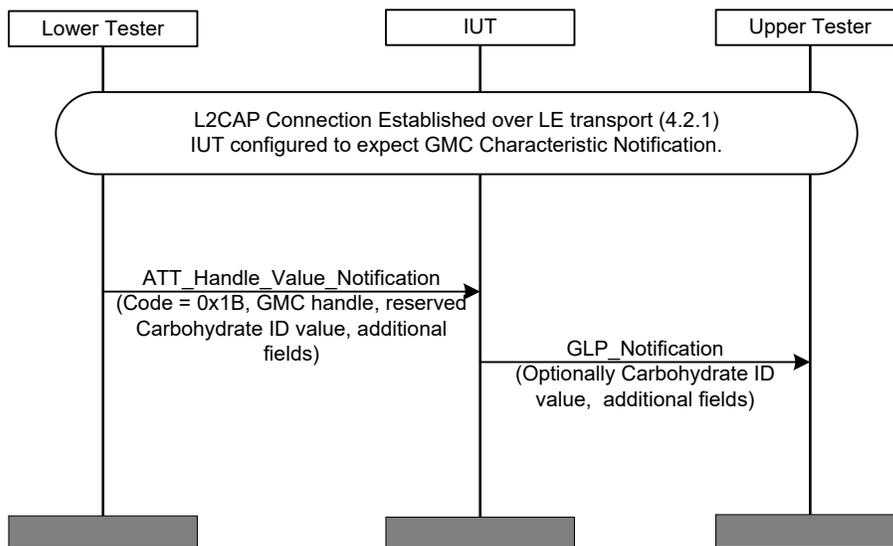


Figure 4.16: GLP/COL/GLF/BI-07-C [Receive Glucose Measurement Context Notifications with reserved Carbohydrate ID value]



The Lower Tester sends a second *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT, this time with a different Carbohydrate ID value than was sent with the first Glucose Measurement Context notification.

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement Context characteristic values to the Upper Tester, e.g., *GLP_Notification* (Flags bits, sequence number, reserved carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c).

The reported field values in each of the Glucose Measurement Context notifications match the ones sent by the Lower Tester optionally including the reserved values of the Carbohydrate ID field.

GLP/COL/GLF/BI-08-C [Receive Glucose Measurement Context Notifications with reserved Meal value]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Context characteristic from a Glucose Sensor including at least two different reserved values of the Meal field.

- Reference

[3] Section 4.5

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-11-C \[Configure Glucose Measurement Context Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Context characteristic notification.
- The IUT has the handle of the Glucose Measurement Context characteristic.

- Test Procedure

1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT. There are many combinations of reserved flag settings. For this test use Flags = 0x7F (Flags bits, sequence number, carbohydrate ID, carbohydrate, reserved meal value, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c).



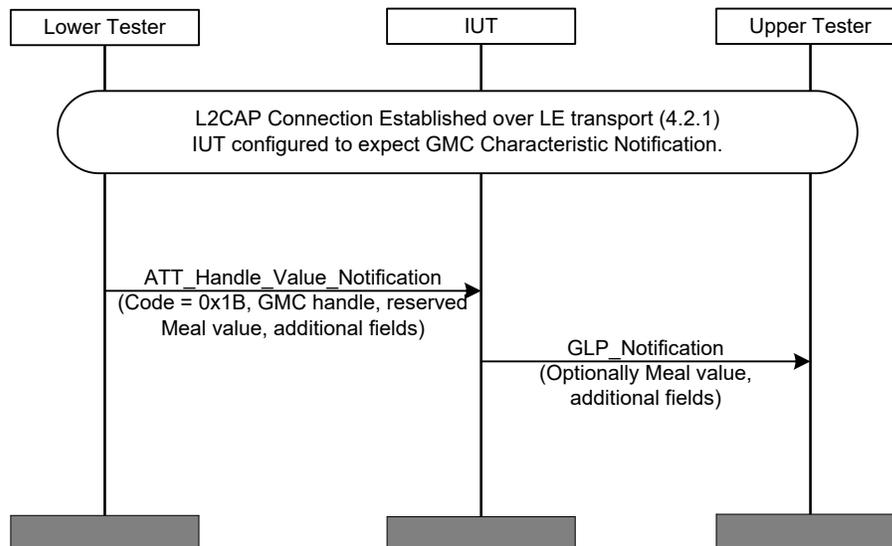


Figure 4.17: GLP/COL/GLF/BI-08-C [Receive Glucose Measurement Context Notifications with reserved Meal value]

The Lower Tester sends a second *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT, this time with a different Meal value than was sent with the first Glucose Measurement Context notification.

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement Context characteristic values to the Upper Tester, e.g., *GLP_Notification* (Flags bits, sequence number, reserved carbohydrate ID, carbohydrate, optionally reserved meal value, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c).

The reported field values in each of the Glucose Measurement Context notifications match the ones sent by the Lower Tester optionally including the reserved bits of the Extended Flags field.

GLP/COL/GLF/BI-09-C [Receive Glucose Measurement Context Notifications with reserved Medication ID value]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Context characteristic from a Glucose Sensor including a reserved value of the Medication ID field.

- Reference

[3] Section 4.5

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.
- The IUT has executed the procedure included in [GLP/COL/GLF/BV-11-C \[Configure Glucose Measurement Context Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Context characteristic notification.
- The IUT has the handle of the Glucose Measurement Context characteristic.



- Test Procedure
 1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
 2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT. There are many combinations of reserved flag settings. For this test use Flags = 0x7F (Flags bits, sequence number, carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, reserved medication ID value, medication, HbA1c).

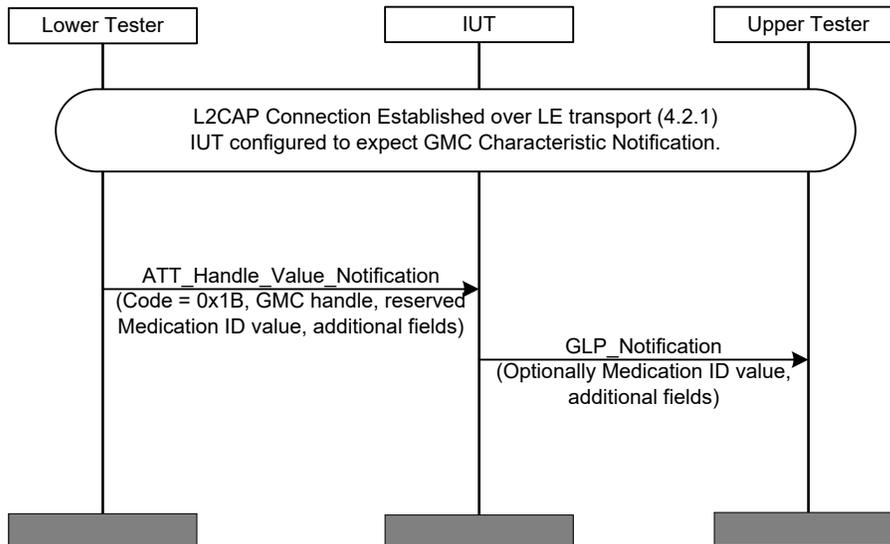


Figure 4.18: GLP/COL/GLF/BI-09-C [Receive Glucose Measurement Context Notifications with reserved Medication ID value]

- Expected Outcome

Pass verdict

The IUT reports the received Glucose Measurement Context characteristic value to the Upper Tester, e.g., *GLP_Notification* (Flags bits, sequence number, reserved carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, optionally medication ID value, medication, HbA1c).

The reported field values match the ones sent by the Lower Tester optionally including the reserved bits of the Extended Flags field.

GLP/COL/GLF/BI-10-C [Receive Glucose Measurement Context Notifications with additional octets not comprehended]

- Test Purpose

Verify that the Collector IUT can receive notifications of the Glucose Measurement Context Characteristic from a Glucose Sensor including additional octets not comprehended by the Collector.

- Reference

[3] Section 4.5

- Initial Condition

- A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel and initiate connection to a Glucose Sensor.



- The IUT has executed the procedure included in [GLP/COL/GLF/BV-11-C \[Configure Glucose Measurement Context Characteristic for Notification\]](#), which configures it to expect Glucose Measurement Context characteristic notification.
 - The IUT has the handle of the Glucose Measurement Context characteristic.
- Test Procedure
 1. The IUT writes the Report Stored Records Op Code (0x01) to the RACP of the Lower Tester using an Operator of 'All records' (0x01) and no Operand.
 2. The Lower Tester sends an *ATT_Handle_Value_Notification* containing a Glucose Measurement Context characteristic value to the IUT. That value contains: flags = 0xFF, 2 Extended Flags bits set (0x03), sequence number, carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c, and at least two additional octets not comprehended by the Collector. The total number of octets does not exceed the maximum MTU size.

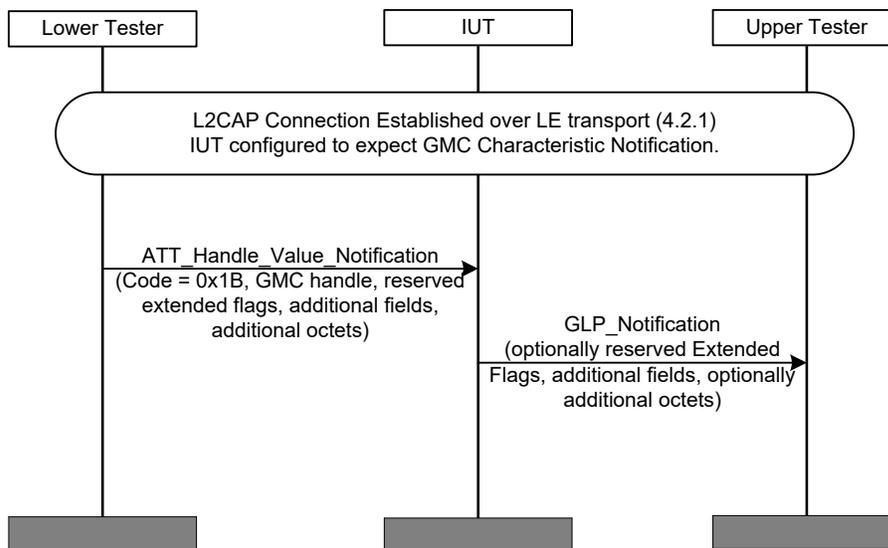


Figure 4.19: [GLP/COL/GLF/BI-10-C \[Receive Glucose Measurement Context Notifications with additional octets not comprehended\]](#)

- Expected Outcome

Pass verdict

The IUT reports the received Glucose value to the Upper Tester, e.g., *GLP_Notification* (optionally Extended Flags bits set, sequence number, carbohydrate ID, carbohydrate, meal, tester-health, exercise duration, exercise intensity, medication ID, medication, HbA1c, and at least two additional octets not comprehended by the Collector). The reported field values match the ones sent by the Lower Tester.

[GLP/COL/GLF/BI-11-C \[Read Glucose Feature characteristic with reserved value\]](#)

- Test Purpose

Verify that the Collector IUT can read the Glucose Feature characteristic from a Glucose Sensor and can ignore reserved values.

- Reference

[\[3\]](#) Section 4.6



- Initial Condition
 - A preamble procedure defined in Section 4.2.4 is used to set up the transport and L2CAP channel.
 - The Upper Tester has the handle of a Glucose Feature characteristic contained in the Lower Tester
- Test Procedure
 1. Send a command from the Upper Tester to request the IUT to read a Glucose Feature characteristic from the Lower Tester e.g., *GLP_ReadRequest (handle)*.
 2. After receipt of the expected result by the Lower Tester, send an *ATT_Read_Response (0x0B)* from the Lower Tester to the IUT containing a reserved value e.g., 0xFFFF.

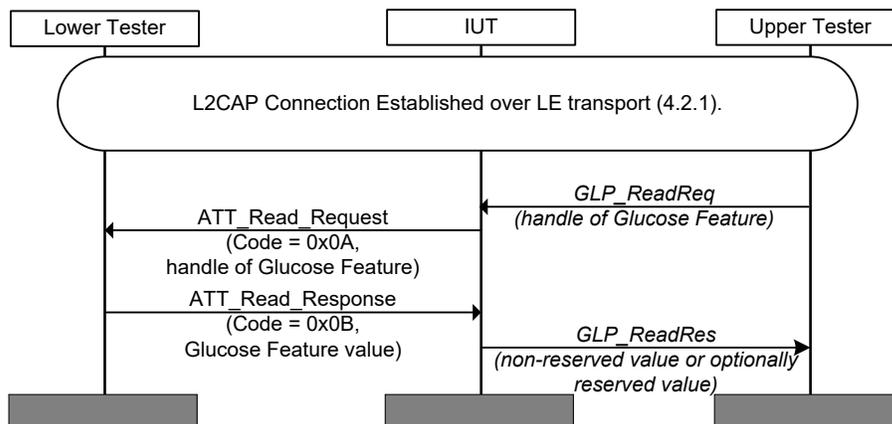


Figure 4.20: GLP/COL/GLF/BI-11-C [Read Glucose Feature characteristic with reserved value]

- Expected Outcome

Pass verdict

The IUT sends a correctly formatted *ATT_Read_Request (0x0A)* to the Lower Tester, containing the handle specified by the Upper Tester.

The IUT receives the response from the Lower Tester and ignores the reserved bits.

The IUT reports the non-reserved values and optionally reports the reserved values to the Upper Tester.

GLP/COL/GLF/BV-14-C [Verify Bond Status on Reconnection]

- Test Purpose

Verify that the Collector IUT starts encryption with a bonded Glucose Sensor on reconnection.
- Reference

[3] Section 5.2.2
- Initial Condition
 - The IUT and Lower Tester are bonded.
 - Perform the preamble procedure defined in Section 4.2.3 to enable indications and notifications on the required characteristics of the Lower Tester’s Glucose Service.
 - If a connection exists, it should be disconnected.

- Test Procedure
 1. The Lower Tester begins advertising using a GAP connectable mode.
 2. The IUT establishes a connection to the Lower Tester.
 3. The Lower Tester does not send any indications or notifications to the IUT.
 4. The IUT starts encryption when the connection is established.

- Expected Outcome

Pass verdict

The IUT starts encryption when the connection is established.

GLP/COL/GLF/BV-15-C [Read Glucose Feature characteristic - Bonding enabled]

- Test Purpose

Verify that, after the initial connection and bonding, the IUT can read the Glucose Feature characteristic.

- Reference

[3] 4.6

- Initial Condition

- The Upper Tester knows the handle of the Glucose Feature characteristic contained in the Lower Tester.
- Establish an ATT Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using an LE transport, or 4.2.2 if using a BR/EDR transport.
- The IUT is bonded with the Lower Tester.

- Test Procedure

1. The Upper Tester commands the IUT to read the Glucose characteristic from the Lower Tester.
2. The IUT sends an ATT_Read_Request to the Lower Tester containing the handle specified by the Upper Tester.
3. The Lower Tester receives the ATT_Read_Request and then sends an ATT_Read_Response to the IUT containing the value of the characteristic.
4. The IUT receives the ATT_Read_Response and reports the value to the Upper Tester.

- Expected Outcome

Pass verdict

The IUT reads the Glucose Feature characteristic and reports its value to the Upper Tester.

Reserved for Future use bit values are ignored.

GLP/COL/GLF/BV-16-C [Enable Glucose Feature characteristic for indication or read characteristic upon reconnection]

- Test Purpose

Verify that the IUT can either enable for indication the Glucose Feature characteristic or read the characteristic upon reconnection.

- Reference

[3] 4.6



- Initial Condition
 - The handles of the Glucose Feature characteristic and Client Characteristic Configuration descriptors have been previously discovered by the Upper Tester during the test procedure in Section 4.3 or are known to the Upper Tester by other means.
 - Establish an ATT Bearer connection between the Lower Tester and the IUT as described in Section 4.2.1, if using an LE transport, or 4.2.2 if using a BR/EDR transport.
 - The IUT is not paired and bonded with the Lower Tester.
- Test Procedure
 1. The Upper Tester orders the IUT to initiate pairing and bonding.
 2. The Upper Tester commands the IUT to perform, either alternative 2A or 2B:

Alternative 2A (Configure the Glucose Feature characteristic for indication):

2A.1. The IUT configures the Glucose Feature characteristic for indication.

Or,

Alternative 2B (Read the Glucose Feature characteristic upon reconnection):

2B.1. The Upper Tester commands the IUT to disconnect, and the IUT terminates the connection with the Lower Tester.

2B.2. The Upper Tester commands the IUT to reconnect to the Lower Tester.

2B.3. The IUT reads the Glucose Feature characteristic from the Lower Tester and reports the value to the Upper Tester.
- Expected Outcome

Pass verdict

In Step 1, The IUT successfully completes pairing and bonding.

In Step 2A.1, the IUT enables the Glucose Feature characteristic for indication.

In Step 2B.3, the IUT reads the Glucose Feature characteristic and reports its value to the Upper Tester.

4.5 Service Procedures – Report Stored Records

This test group contains test cases to verify compliant operation when the Record Access Control Point (RACP) Report Stored Records procedure is used.

GLP/COL/SPR/BV-01-C [Report Stored Records – All records]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'All records'.
- Reference

[3] 4.7.3.4
- Initial Condition
 - If a connection exists, it should be disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.



2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 4. The Lower Tester sends three notifications of Glucose Measurement characteristics with a notification for Glucose Measurement Context characteristic after the second Glucose Measurement Characteristic, representing all records.
 5. The IUT receives three ATT_Handle_Value_Notification from the Lower Tester containing the Glucose Measurement characteristic handle and value and one ATT_Handle_Value_Notification of the Glucose Measurement Context characteristic handle and value, all in the order sent by the Lower Tester.
 6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 7. The IUT receives an ATT_Handle_Value_Indication from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 8. The IUT sends an ATT_Handle_Value_Confirmation to the Lower Tester.
 9. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome

Pass verdict

The IUT receives three notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic after the second Glucose Measurement characteristic.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The IUT receives the Request Op Code 'success'.

GLP/COL/SPR/BV-02-C [Report Stored Records – Less than or equal to Sequence Number]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'Less than or equal to' and using the Sequence Number Filter Type.
- Reference

[3] 4.7.3.4
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'Less than or equal to' (0x02) and an Operand representing the Sequence Number Filter Type (0x01) and the maximum value for the filter representing sequence number of the second record.



4. The Lower Tester sends two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic representing the oldest two records.
 5. The IUT receives two ATT_Handle_Value_Notification from the Lower Tester containing the Glucose Measurement characteristic handle and value and one ATT_Handle_Value_Notification of the Glucose Measurement Context characteristic handle and value.
 6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 7. The IUT receives an ATT_Handle_Value_Indication from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 8. The IUT sends an ATT_Handle_Value_Confirmation to the Lower Tester.
 9. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome

Pass verdict

The IUT receives two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic after the second Glucose Measurement characteristic that represent the oldest two records.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The IUT receives the Request Op Code 'success'.

GLP/COL/SPR/BV-03-C [Report Stored Records – Greater than or equal to Sequence Number]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'Greater than or equal to' and using the Sequence Number Filter Type.
- Reference

[3] 4.7.3.4
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'Greater than or equal to' (0x03) and an Operand representing the Sequence Number Filter Type (0x01) followed by the value of the sequence number for the second record.
 4. The Lower Tester sends two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic representing the two most recent records.



5. The IUT receives two ATT_Handle_Value_Notification from the Lower Tester containing the Glucose Measurement characteristic handle and value and one ATT_Handle_Value_Notification of the Glucose Measurement Context characteristic handle and value.
6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
7. The IUT receives an ATT_Handle_Value_Indication from the Lower Tester containing the Record Access Control Point characteristic handle and value.
8. The IUT sends an ATT_Handle_Value_Confirmation to the Lower Tester.
9. Perform Step 3 again using a Sequence Number greater than the most recent record.
10. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'no records found' (0x06).
11. Verify that the characteristic value meets the requirements of the service.

- Expected Outcome

Pass verdict

The IUT receives two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic after the first Glucose Measurement characteristic representing the two most recent records.

For the 'success' case, the IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand. The IUT receives the Request Op Code 'success'.

For the 'no records found' case, the IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

GLP/COL/SPR/BV-04-C [Report Stored Records – Greater than or equal to User Facing Time]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'Greater than or equal to' and using the User Facing Time Filter Type.

- Reference

[3] 4.7.3.4

- Initial Condition

- Perform the preamble described in Section 4.2.3.
- If a connection exists, it is disconnected.

- Test Procedure

1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'Greater than or equal to' (0x03) and an Operand representing the User Facing Time Filter Type (0x02) followed by the value of the user facing time for the second record.



4. The Lower Tester sends two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic representing the two most recent records.
 5. The IUT receives two *ATT_Handle_Value_Notification* from the Lower Tester containing the Glucose Measurement characteristic handle and value and one *ATT_Handle_Value_Notification* of the Glucose Measurement Context characteristic handle and value.
 6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 7. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 8. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
 9. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome

Pass verdict

The IUT receives two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic after the first Glucose Measurement characteristic representing the two most recent records.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The IUT receives the Request Op Code 'success'.

GLP/COL/SPR/BV-05-C [Report Stored Records – Within range of Sequence Number value pair]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'Within range of (inclusive)' and using the Sequence Number Filter Type.
- Reference

[3] 4.7.3.4
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 4 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'Within range of (inclusive)' (0x04) and an Operand representing the Sequence Number Filter Type (0x01) followed by a pair of sequence number values representing the value of the second record and the value of the third record.
 4. The Lower Tester sends two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic representing the second and third records.



5. The IUT receives two *ATT_Handle_Value_Notification* from the Lower Tester containing the Glucose Measurement characteristic handle and value and one *ATT_Handle_Value_Notification* of the Glucose Measurement Context characteristic handle and value.
 6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 7. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 8. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
 9. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome

Pass verdict

The IUT receives two notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic after the first Glucose Measurement characteristic representing the second and third records.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The IUT receives the Request Op Code 'success'.

GLP/COL/SPR/BV-06-C [Report Stored Records – First record]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'First record'.
- Reference

[3] 4.7.3.4
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'First record' (0x05) and no Operand.
 4. The Lower Tester sends one notification of the Glucose Measurement characteristic representing the oldest record.
 5. The IUT receives one *ATT_Handle_Value_Notification* from the Lower Tester containing the Glucose Measurement characteristic handle and value.
 6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 7. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 8. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.



9. Verify that the characteristic value meets the requirements of the service.

- Expected Outcome

Pass verdict

The IUT receives one notification of the Glucose Measurement characteristic representing the oldest record.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The IUT receives the Request Op Code 'success'.

GLP/COL/SPR/BV-07-C [Report Stored Records – Last record]

- Test Purpose

Verify that the Collector IUT can perform the Report Stored Records procedure with an Operator of 'Last record'.

- Reference

[3] 4.7.3.4

- Initial Condition

- If a connection exists, it is disconnected.

- Test Procedure

1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'Last record' (0x06) and no Operand.
4. The Lower Tester sends one notification of the Glucose Measurement characteristic representing the most recent record.
5. The IUT receives one *ATT_Handle_Value_Notification* from the Lower Tester containing the Glucose Measurement characteristic handle and value.
6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
7. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
8. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
9. Verify that the characteristic value meets the requirements of the service.

- Expected Outcome

Pass verdict

The IUT receives one notification of the Glucose Measurement characteristic representing the most recent record.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The IUT receives the Request Op Code 'success'.



GLP/COL/SPR/BV-08-C [Report Stored Records – All records – Record Added]

- Test Purpose

Verify that the Collector IUT responds properly for the case where a record is added between the Report Number of Stored Records procedure and the Report Stored Records procedure.

- Reference

[3] 4.7.3.4

- Initial Condition

- If a connection exists, it is disconnected.

- Test Procedure

1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
4. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Number of stored records response Op Code (0x05) an Operator of Null (0x00) and an Operand representing that three records were found (0x0003).
5. A new record is added at the Lower Tester via the user interface or other means.
6. IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
7. The Lower Tester sends four notifications of Glucose Measurement characteristics with a notification for Glucose Measurement Context characteristic after the second Glucose Measurement Characteristic, representing all records (one more record than the IUT expected).
8. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
9. Verify that the IUT continues to process commands normally.

- Expected Outcome

Pass verdict

The IUT receives four notifications of the Glucose Measurement.

The IUT continues to process commands normally.

GLP/COL/SPR/BV-09-C [Report Stored Records – All records – Record Deleted]

- Test Purpose

Verify that the Collector IUT responds properly for the case where a record is deleted between the Report Number of Stored Records procedure and the Report Stored Records procedure.

- Reference

[3] 4.7.3.4

- Initial Condition

- If a connection exists, it is disconnected.



- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 4. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Number of stored records response Op Code (0x05) an Operator of Null (0x00) and an Operand representing that three records were found (0x0003).
 5. The second record is deleted at the Lower Tester via the user interface or other means.
 6. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 7. The Lower Tester sends two notifications of Glucose Measurement characteristics, representing all records (one less record than the IUT expected).
 8. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 9. Verify that the IUT continues to process commands normally.
- Expected Outcome

Pass verdict

The IUT receives two notifications of the Glucose Measurement.

The IUT continues to process commands normally.

4.6 Service Procedures – Delete Stored Records

This test group contains test cases to verify compliant operation when the Record Access Control Point (RACP) Delete Stored Records procedure is used.

GLP/COL/SPD/BV-01-C [Delete Stored Records – All records]

- Test Purpose

Verify that the Collector IUT can perform the Delete Stored Records procedure with an Operator of 'All records'.
- Reference

[3] 4.7.3.3
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.



4. The Lower Tester sends three notifications of Glucose Measurement characteristics with a notification for Glucose Measurement Context characteristic after the second Glucose Measurement Characteristic, representing all records.
 5. The IUT receives three *ATT_Handle_Value_Notification* from the Lower Tester containing the Glucose Measurement characteristic handle and value and one *ATT_Handle_Value_Notification* of the Glucose Measurement Context characteristic handle and value, all in the order sent by the Lower Tester.
 6. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x01) followed by the Response Code for 'success' (0x01).
 7. IUT writes the Delete Stored Records Op Code (0x02) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 8. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x02) followed by the Response Code for 'success' (0x01).
 9. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 10. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
 11. Verify that there are no longer any records in the Lower Tester.
 12. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome

Pass verdict

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

All records have been deleted from the Lower Tester.

The IUT receives the Request Op Code 'success'.

GLP/COL/SPD/BV-02-C [Delete Stored Records – Within range of Sequence Number value pair]

- Test Purpose

Verify that the Collector IUT can perform the Delete Stored Records procedure with an Operator of "Within range of (inclusive)" and using the Sequence Number Filter Type.
- Reference

[3] 4.7.3.3
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 4 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Delete Stored Records Op Code (0x02) to the RACP using an Operator of 'Within range of (inclusive)' (0x04) and a Operand containing the Sequence Number Filter Type



- (0x01) followed by a pair of sequence number values representing the value of the second record and the value of the third record.
4. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x02) followed by the Response Code for 'success' (0x01).
 5. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 6. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
 7. Verify that the second and third records have been deleted from the Lower Tester.
 8. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome

Pass verdict

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The second and third records have been deleted from the IUT.

The IUT receives the Request Op Code 'success'.

4.7 Service Procedures – Abort Operation

This test group contains test cases to verify compliant operation when the Record Access Control Point (RACP) Abort Operation procedure is used.

GLP/COL/SPA/BV-01-C [Abort Operation – Report Stored Records]

- Test Purpose

Verify that the Collector IUT can perform an Abort of the Report Stored Records procedure.
- Reference

[3] 4.7.3.4, 4.7.3.5
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate enough records such that the transmission is not able to complete before the RACP abort is attempted. In most cases ~200 records is sufficient since this will take over 5 seconds to transfer. The records may or may not contain Glucose Measurement Context characteristics.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 4. The Lower Tester starts to send notifications of the Glucose Measurement characteristic and optionally, the Glucose Measurement Context characteristic.
 5. The IUT receives one or more *ATT_Handle_Value_Notification* from the Lower Tester containing the Glucose Measurement characteristic handle and value and one or more notifications of the Glucose Measurement Context characteristic handle and value.
 6. IUT writes the Abort Operation Op Code (0x03) to the RACP with an Operator of Null and no Operand.



7. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code (0x03) followed by the Response Code for 'success' (0x01).
 8. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 9. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
 10. Verify that the notifications stop.
 11. Verify that the characteristic value meets the requirements of the service.
- Expected Outcome
- Pass verdict

The IUT receives some, but not all notifications of the Glucose Measurement characteristic which may include notifications of the Glucose Measurement Context characteristic.

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand for Abort Operation.

4.8 Service Procedures – Report Number of Stored Records

This test group contains test cases to verify compliant operation when the Record Access Control Point (RACP) Report Number of Stored Records procedure is used.

GLP/COL/SPN/BV-01-C [Report Number of Stored Records – All records]

- Test Purpose

Verify that the Collector IUT can perform the Report Number of Stored Records procedure with an Operator of 'All records'.
- Reference

[3] 4.7.3.2
- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Number of Stored Records Op Code (0x04) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 4. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Number of stored records response Op Code (0x05) an Operator of Null (0x00) and an Operand representing that three records were found (0x0003).
 5. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
 6. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
 7. Verify that the characteristic value meets the requirements of the service.

- Expected Outcome

Pass verdict

The IUT receives one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The value of the Operand represents that 3 records were found.

GLP/COL/SPN/BV-02-C [Report Number of Stored Records – Greater than or equal to Sequence Number]

- Test Purpose

Verify that the Collector IUT can perform the Report Number of Stored Records procedure with an Operator of 'Greater than or equal to' and using the Sequence Number as Filter Type.

- Reference

[3] 4.7.3.2

- Initial Condition

- If a connection exists, it is disconnected.

- Test Procedure

1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
3. The IUT writes the Report Number of Stored Records Op Code (0x04) to the RACP using an Operator of 'Greater than or equal to' (0x03) and an Operand containing the Sequence Number Filter Type (0x01) followed by the value of the sequence number for second record.
4. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Number of stored records response Op Code (0x05) an Operator of Null (0x00) and an Operand representing that two records were found (0x0002).
5. The IUT receives an *ATT_Handle_Value_Indication* from the Lower Tester containing the Record Access Control Point characteristic handle and value.
6. The IUT sends an *ATT_Handle_Value_Confirmation* to the Lower Tester.
7. Verify that the characteristic value meets the requirements of the service.

- Expected Outcome

Pass verdict

The IUT sends one indication of the Record Access Control Point characteristic with the Response Code Op Code containing a valid Operator and Operand.

The value of the Operand represents that two records were found.



4.9 Service Procedures – General Error Handling

This test group contains test cases to verify compliant operation when an error is caused by the Server side.

GLP/COL/SPE/BI-01-C [Unsupported Op Code]

- Test Purpose

Verify that the Collector IUT behaves appropriately when it receives an ‘Op Code not supported’ RACP Response Code.

- Reference

[3] 4.7.2 and 4.7.4

- Initial Condition

- If a connection exists, it is disconnected.

- Test Procedure

1. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
2. The IUT writes any Op Code that is not supported by the Sensor to the RACP using an appropriate Operator and Operand for the Op Code.
3. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code followed by the Response Code Value for ‘Op Code not supported’ (0x02).
4. Verify that the IUT considers the procedure to have failed.

- Expected Outcome

Pass verdict

The IUT receives the Response Code Value for ‘Op Code not supported’ from the Lower Tester.

The IUT reports the Response Code Value to the Upper Tester and returns to a stable state, and can process commands normally.

GLP/COL/SPE/BI-02-C [Unsupported Operator]

- Test Purpose

Verify that the Collector IUT behaves appropriately when it receives an ‘Operator not supported’ RACP Response Code.

- Reference

[3] 4.7.2 and 4.7.4

- Initial Condition

- If a connection exists, it is disconnected.

- Test Procedure

1. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
2. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using any Operator not supported by the Sensor.



3. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code followed by the Response Code Value for 'Operator not supported' (0x04).
4. Verify that the IUT considers the procedure to have failed.

- Expected Outcome

Pass verdict

The IUT receives the Response Code Value for 'Operator not supported' from the Lower Tester.

The IUT reports the Response Code Value to the Upper Tester and returns to a stable state, and can process commands normally.

GLP/COL/SPE/BI-03-C [Unsupported Operand]

- Test Purpose

Verify that the Collector IUT behaves appropriately when it receives an 'Operand not supported' RACP Response Code.

- Reference

[3] 4.7.2 and 4.7.4

- Initial Condition

- If a connection exists, it is disconnected.

- Test Procedure

1. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
2. The IUT writes any Op Code to the RACP using an appropriate Operator and Operand not supported by the Sensor for the Op Code.
3. The Lower Tester sends an indication of the Record Access Control Point characteristic with the Response Code Op Code (0x06) an Operator of Null (0x00) and an Operand representing Request Op Code followed by the Response Code Value for 'Operand not supported' (0x09).
4. Verify that the IUT considers the procedure to have failed.

- Expected Outcome

Pass verdict

The IUT receives the Response Code Value for 'Operand not supported' from the Lower Tester.

The IUT reports the Response Code Value to the Upper Tester and returns to a stable state, and can process commands normally.

GLP/COL/SPE/BI-04-C [RACP Procedure Timeout]

- Test Purpose

Verify that if the Collector IUT does not receive a response to an RACP Op Code, it will time out after the Attribute Protocol Timeout.

- Reference

[3] 4.7.3.4 and 4.7.5



- Initial Condition
 - If a connection exists, it is disconnected.
- Test Procedure
 1. Perform an action on the Lower Tester that will induce it to generate 3 records, of which a Glucose Measurement Context characteristic is in only the second record.
 2. A connection is established between the IUT and Lower Tester using the Preamble defined in Section 4.2.3.
 3. The IUT writes the Report Stored Records Op Code (0x01) to the RACP using an Operator of 'All records' (0x01) and no Operand.
 4. The Lower Tester sends three notifications of the Glucose Measurement characteristic and one notification of the Glucose Measurement Context characteristic representing all records.
 5. The Lower Tester does NOT send an indication of the Record Access Control Point characteristic for at least longer than the Attribute Protocol Timeout.
 6. Verify that the IUT considers the procedure to have failed and notifies the local upper layer.

- Expected Outcome

Pass verdict

After the Attribute Protocol Timeout, the IUT notifies the local upper layer of the time out.

5 Test case mapping

The Test Case Mapping Table (TCMT) maps test cases to specific requirements in the ICS. The IUT is tested in all roles for which support is declared in the ICS document.

The columns for the TCMT are defined as follows:

Item: Contains a logical expression based on specific entries from the associated ICS document. Contains a logical expression (using the operators AND, OR, NOT as needed) based on specific entries from the applicable ICS document(s). The entries are in the form of y/x references, where y corresponds to the table number and x corresponds to the feature number as defined in the ICS document for the Glucose Profile [4].

If a test case is mandatory within the respective layer, then the y/x reference is omitted.

Feature: A brief, informal description of the feature being tested.

Test Case(s): The applicable test case identifiers are required for Bluetooth Qualification if the corresponding y/x references defined in the Item column are supported. Further details about the function of the TCMT are elaborated in [1].

For the purpose and structure of the ICS/IXIT, refer to [1].

Item	Feature	Test Case(s)
GLP 1/2	General Error Handling	GLP/COL/SPE/BI-01-C GLP/COL/SPE/BI-02-C GLP/COL/SPE/BI-03-C
GLP 3/1	Glucose Service as a Primary Service	GLP/SEN/GLF/BV-08-C
GLP 3/2	Glucose Service UUID in AD in GAP Discoverable Mode	GLP/SEN/GLF/BV-01-C
GLP 3/3	Local Name in AD or Scan Response	GLP/SEN/GLF/BV-02-C
GLP 3/4 AND GLP 3/8	Public Target Address in AD or Scan Response	GLP/SEN/GLF/BV-03-C
GLP 3/4a AND GLP 3/8	Random Target Address in AD or Scan Response	GLP/SEN/GLF/BV-04-C
GLP 3/8 AND NOT GLP 3/4b	No Target Address in AD or Scan Response – Multi-Bond	GLP/SEN/GLF/BV-06-C
GLP 3/9 AND NOT GLP 3/8	No Target Address in AD or Scan Response – Single Bond	GLP/SEN/GLF/BV-07-C
GATT 1a/4 AND GLP 1/1 AND GLP 2/2 AND NOT GLP 2/1	Glucose Sensor support for BR/EDR/LE	GLP/SEN/SGGIT/SDPNF/BV-03-C
GLP 8/1	Discover Glucose Service	GLP/COL/CGGIT/SER/BV-01-C
GLP 8/2 AND GLP 8/3	Discover Glucose Measurement characteristic	GLP/COL/CGGIT/CHA/BV-04-C
GLP 8/4 AND GLP 8/5	Discover Glucose Measurement Context characteristic	GLP/COL/CGGIT/CHA/BV-05-C
GLP 8/6	Discover Glucose Feature characteristic	GLP/COL/CGGIT/CHA/BV-06-C
GLP 8/7 AND GLP 8/8	Discover Record Access Control Point characteristic	GLP/COL/CGGIT/CHA/BV-07-C



Item	Feature	Test Case(s)
GLP 9a/1	Characteristic GGIT – Glucose Feature indication	GLP/COL/CGGIT/ISFC/BV-08-C
GLP 9/1	Configure Glucose Measurement characteristic for notifications	GLP/COL/GLF/BV-09-C
GLP 9/2	Receive Glucose Measurement characteristic notifications	GLP/COL/GLF/BV-10-C GLP/COL/GLF/BI-01-C GLP/COL/GLF/BI-02-C GLP/COL/GLF/BI-03-C GLP/COL/GLF/BI-04-C
GLP 9/3	Configure Glucose Measurement Context characteristic for notifications	GLP/COL/GLF/BV-11-C
GLP 9/4	Receive Glucose Measurement Context characteristic notifications	GLP/COL/GLF/BV-12-C GLP/COL/GLF/BI-06-C GLP/COL/GLF/BI-07-C GLP/COL/GLF/BI-08-C GLP/COL/GLF/BI-09-C GLP/COL/GLF/BI-10-C
GLP 9/8	Report Stored Records Op Code of RACP Characteristic – RACP Procedure Timeout	GLP/COL/SPE/BI-04-C
GLP 9/10	Abort Procedure Op Code of RACP Characteristic	GLP/COL/SPA/BV-01-C
GLP 9/14	Read Glucose Feature characteristic	GLP/COL/GLF/BI-11-C
GLP 9/15	Verify Bond Status on Reconnection	GLP/COL/GLF/BV-14-C
GLP 9a/2	Read Glucose Feature characteristic - Bonding enabled	GLP/COL/GLF/BV-15-C
GLP 9a/1 AND GLP 9a/2	Enable Glucose Feature characteristic for indication or read characteristic upon reconnection	GLP/COL/GLF/BV-16-C
GLP 10/1	Report Stored Records Op Code of RACP Characteristic - All Records Operator	GLP/COL/SPR/BV-01-C
GLP 10/1 AND GLP 12/1	Report Stored Records Op Code of RACP Characteristic - Record Added/Deleted	GLP/COL/SPR/BV-08-C GLP/COL/SPR/BV-09-C
GLP 10/3	Report Stored Records Op Code of RACP Characteristic - Less than or equal to Sequence Number	GLP/COL/SPR/BV-02-C
GLP 10/6	Report Stored Records Op Code of RACP Characteristic - Greater than or equal to Operator – Sequence Number Operand	GLP/COL/SPR/BV-03-C
GLP 10/7	Report Stored Records Op Code of RACP Characteristic - Greater than or equal to User Facing Time	GLP/COL/SPR/BV-04-C
GLP 10/9	Report Stored Records Op Code of RACP Characteristic – Within Range of Sequence Number value pair	GLP/COL/SPR/BV-05-C
GLP 10/11	Report Stored Records Op Code of RACP Characteristic – First Record Operator	GLP/COL/SPR/BV-06-C



Item	Feature	Test Case(s)
GLP 10/12	Report Stored Records Op Code of RACP Characteristic – Last Record Operator	GLP/COL/SPR/BV-07-C
GLP 11/1	Delete Stored Records Op Code of RACP Characteristic – All Records	GLP/COL/SPD/BV-01-C
GLP 11/9	Delete Stored Records Op Code of RACP Characteristic – Within Range Of Sequence Number value pair	GLP/COL/SPD/BV-02-C
GLP 12/1	Report Number of Stored Records Op Code of RACP Characteristic - All Records Operator	GLP/COL/SPN/BV-01-C
GLP 12/6	Report Number of Stored Records Op Code of RACP Characteristic - Greater than or equal to Operator – Sequence Number Operand	GLP/COL/SPN/BV-02-C
GLP 13/1	Discover Device Information Service	GLP/COL/CGGIT/SER/BV-02-C
GLP 13/2 OR GLP 13/3 OR GLP 13/4	Manufacturer Name String Characteristic Model Number String Characteristic System ID Characteristic	GLP/COL/GLD/BV-11-C GLP/COL/GLD/BV-12-C

Table 5.1: Test case mapping

6 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.0.0	2012-04-03	Adopted by the SIG Board of Directors
	1.0.1r1	2013-05-05	TSE 5158: Change all the GATT Client Discovery test case references from –I to –C: TP/GLD/CO/BV-01-I, TP/GLD/CO/BV-02-I, TP/GLD/CO/BV-04-I, TP/GLD/CO/BV-05-I, TP/GLD/CO/BV-06-I, TP/GLD/CO/BV-07-I, TP/GLD/CO/BV-08-I, TP/GLD/CO/BV-09-I, TP/GLD/CO/BV-10-I, TP/GLD/CO/BV-11-I (GLP/COL/GLD/BV-01-I, GLP/COL/GLD/BV-02-I, GLP/COL/GLD/BV-04-I, GLP/COL/GLD/BV-05-I, GLP/COL/GLD/BV-06-I, GLP/COL/GLD/BV-07-I, GLP/COL/GLD/BV-08-I, GLP/COL/GLD/BV-09-I, GLP/COL/GLD/BV-10-I, and GLP/COL/GLD/BV-11-I, after ID conversion)
1	1.0.1	2013-07-02	Prepare for Publication
	1.0.2r01	2013-09-30	TSE 5296: Updated first sentence of test procedure in TP/GLD/CO/BV-12-I (GLP/COL/GLD/BV-12-I after ID conversion) to add, “and a disconnection may occur between the two tests” for clarification. TSE 5339: Updated the flags in the test procedure for TP/GLF/CO/BI-01-I to “0xEB” (GLP/COL/GLD/BI-01-I after ID conversion), for TP/GLF/CO/BI-02-I and TP/GLF/CO/BI-03-I to “0x0A” (GLP/COL/GLF/BI-02-I and GLP/COL/GLF/BI-03-I after ID conversion) and for GLF/CO/BI-04-I to “0x02 or optional reserved flags” (GLP/COL/GLF/BI-04-I after ID conversion).
2	1.0.2	2013-12-03	Prepare for Publication
	1.0.3r00	2014-04-11	TSE 5361: Removed TP/GLF/CO/BI-05-I and associated TCMT entry.
	1.0.3r01	2014-06-01	Added Pass/Fail Verdict Conventions according to applicable test specification template.
3	1.0.3	2014-07-07	TCRL 2014-1 Publication
	1.0.4r00	2015-05-10	TSE 6282: Updated mapping in TCMT for TP/GLF/GL/BV-05-I, 06-I, 07-I (GLP/SEN/GLF/BV-05-I, 06-I, 07-I after ID conversion) for changes to GLP.ICS.
	1.0.4r01	2015-05-25	Converted to current document template.
4	1.0.4	2015-07-14	Prepared for TCRL 2015-1 publication



Publication Number	Revision Number	Date	Comments
	1.0.5r00	2016-04-20	TSE 5395: Updated RACP Preamble for test cases GLP/COL/GLF/BV-10-I, GLP/COL/GLF/BI-01-I, GLP/COL/GLF/BI-02-I, GLP/COL/GLF/BI-03-I, GLP/COL/GLF/BI-04-I, GLP/COL/GLF/BV-12-I, GLP/COL/GLF/BI-06-I, GLP/COL/GLF/BI-07-I, GLP/COL/GLF/BI-08-I, GLP/COL/GLF/BI-09-I, GLP/COL/GLF/ BI-10-I. TSE 6999: Added RACP procedure to Test Procedure for test cases GLP/COL/GLF/BV-10-I, GLP/COL/GLF/BI-01-I, GLP/COL/GLF/ BI-02-I, GLP/COL/GLF/BI-03-I, GLP/COL/GLF/BI-04-I, GLP/COL/GLF/BV-12-I, GLP/COL/GLF/BI-06-I, GLP/COL/GLF/BI-07-I, GLP/COL/GLF/BI-08-I, GLP/COL/GLF/BI-09-I, and GLP/COL/GLF/BI-10-I. Other editorial changes made by Alicia Courtney and Magnus Sommansson.
	1.0.5r01	2016-04-20	Converted to new Test Case ID conventions as described in TSTO v4.1
5	1.0.5	2016-07-13	Prepared for TCRL 2016-1 publication.
	1.0.6r00	2018-10-03	TSE 10179 (rating 2): Updated TCMT for GLP/SEN/GLD/BV-03-I
6	1.0.6	2018-11-21	Approved by BTI. Prepared for TCRL 2018-2 publication.
	1.0.7r00	2019-09-06	TSE 12246 (rating 1): Updated test case GLP/SEN/GLD/BV-03-I so that step 2 of the test procedure references test case GLS/SEN/SD/BV-01-C instead of GLS/SR/SD/BV-01-C. Additionally, deleted abstract, moved revision history and contributors lists to the end of the doc, and updated copyright page text.
7	1.0.7	2020-01-07	Approved by BTI on 2019-11-03. Prepared for TCRL 2019-2 publication.
	p8r00–r07	2021-03-10 – 2021-12-23	TSE 16856 (rating 4): Changes from E16276. Added new test group ISFC. New test cases added GLP/COL/CGGIT/ISFC/BV-08-C and GLP/COL/GLF/BV-15-I and -16-I. Updated TCMT for the new test cases. Minor editorial updates to the preambles. TSE 18150 (rating 3): Removed GLP/SEN/GLF/BV-05-I. Updated the description for GLP/SEN/GLF/BV-04-I and the test purpose, test procedure, and pass verdict to cover the “Random Target Address” AD Type. Updated the TCMT for the ICS changes. Editorial changes for the other Target Address test cases. TSE 18152 (rating 2): Converted the following test cases into GGIT tests: GLP/COL/GLD/BV-01-I, -02-I, and -04-I – -10-I, GLP/COL/GLF/BV-13-I, and GLP/SEN/GLD/BV-03-I. The new GGIT converted TCIDs are: GLP/COL/CGGIT/SER/BV-01-C and -02-C, GLP/COL/CGGIT/CHA/BV-04-C – -07-C, and GLP/SEN/SGGIT/SDPNF/BV-03-C. Updated TCMT



Publication Number	Revision Number	Date	Comments
			for the new GGIT tests and tests impacted by the GGIT conversion. TSE 18153 (rating 1): Removed direct references to GATT test cases in the following test cases: GLP/COL/GLD/BV-11-I, GLP/COL/GLD/BV-12-I, GLP/SEN/GLF/BV-08-I. Editorials, including updating to the latest TS template, consistency checker fixes, and aligning the copyright page with the latest DNMD.
8	p8	2022-01-25	Approved by BTI on 2022-01-06. Prepared for TCRL 2021-2 publication.
	p9r00–r01	2023-10-23 – 2023-11-07	TSE 23272 (rating 1): Converted -I tests to -C tests as appropriate; updated the TCMT and TCRL accordingly. Performed editorials to align the document with the latest TS template, including updates to the Test Strategy section. Deleted draft revision history comments prior to p0.
9	p9	2024-07-01	Approved by BTI on 2024-04-21. Prepared for TCRL 2024-1 publication.
	p10r00	2025-07-18	TSE 27518 (rating 2): Removed reference to GAP 0/3 in the TCMT entry for GLP/SEN/SGGIT/SDPNF/BV-03-C.
10	p10	2025-11-04	Approved by BTI on 2025-10-02. Prepared for TCRL pkg101 publication.

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