Cookware Service (CWS)

***Bluetooth*® Test Suite**

- **Revision:** CWS.TS.p0
- **Revision Date:** 2025-11-04
- **Prepared By:** Automation Working Group
- **Published during TCRL:** TCRL.pkg101

This document, regardless of its title or content, is not a Bluetooth Specification as defined in the Bluetooth Patent/Copyright License Agreement ("PCLA") and Bluetooth Trademark License Agreement. Use of this document by members of Bluetooth SIG is governed by the membership and other related agreements between Bluetooth SIG Inc. ("Bluetooth SIG") and its members, including the PCLA and other agreements posted on Bluetooth SIG's website located at www.bluetooth.com.

THIS DOCUMENT IS PROVIDED "AS IS" AND BLUETOOTH SIG, ITS MEMBERS, AND THEIR AFFILIATES MAKE NO REPRESENTATIONS OR WARRANTIES AND DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY WARRANTY OF MERCHANTABILITY, TITLE, NON-INFRINGEMENT, FITNESS FOR ANY PARTICULAR PURPOSE, THAT THE CONTENT OF THIS DOCUMENT IS FREE OF ERRORS.

TO THE EXTENT NOT PROHIBITED BY LAW, BLUETOOTH SIG, ITS MEMBERS, AND THEIR AFFILIATES DISCLAIM ALL LIABILITY ARISING OUT OF OR RELATING TO USE OF THIS DOCUMENT AND ANY INFORMATION CONTAINED IN THIS DOCUMENT, INCLUDING LOST REVENUE, PROFITS, DATA OR PROGRAMS, OR BUSINESS INTERRUPTION, OR FOR SPECIAL, INDIRECT, CONSEQUENTIAL, INCIDENTAL OR PUNITIVE DAMAGES, HOWEVER CAUSED AND REGARDLESS OF THE THEORY OF LIABILITY, AND EVEN IF BLUETOOTH SIG, ITS MEMBERS, OR THEIR AFFILIATES HAVE BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

This document is proprietary to Bluetooth SIG. This document may contain or cover subject matter that is intellectual property of Bluetooth SIG and its members. The furnishing of this document does not grant any license to any intellectual property of Bluetooth SIG or its members.

This document is subject to change without notice.

Copyright © 2025 by Bluetooth SIG, Inc. The Bluetooth word mark and logos are owned by Bluetooth SIG, Inc. Other third-party brands and names are the property of their respective owners.

Contents

1 Scope

This Bluetooth document contains the Test Suite Structure (TSS) and test cases to test the implementation of the Bluetooth Cookware Service 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] Bluetooth Core Specification, Version 5.4 or later

[2] Test Strategy and Terminology Overview

[3] Cookware Service

[4] ICS Proforma for Cookware Service

[5] IXIT Proforma for Cookware Service

[6] Characteristic and Descriptor descriptions are accessible via the Bluetooth SIG Assigned Numbers

[7] GATT Test Suite, GATT.TS

[8] Permitted Characteristics

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 Cookware Service [3] requires the presence of GAP, SM (when used over LE transport), SDP (when used over BR/EDR transport), L2CAP, and GATT. This is illustrated in Figure 3.1.

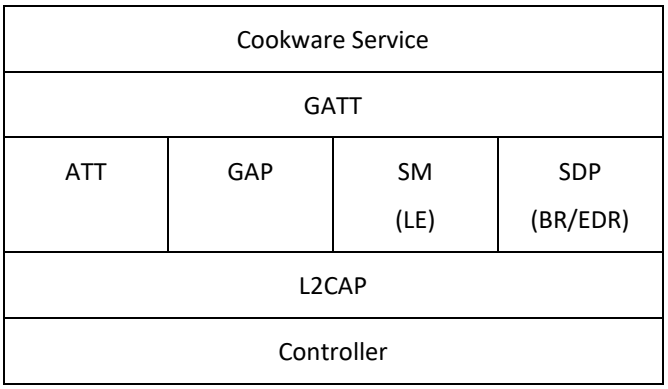

Figure 3.1: Cookware Service test model

3.2 Test Strategy

The test objectives are to verify the functionality of the Cookware Service (CWS) 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 system 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 system. 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
- Characteristic Reads
- Characteristic Writes
- Characteristic Notifications/Indications
- Recipe Control Point

4 Test cases (TC)

4.1 Introduction

4.1.1 Test case identification conventions

Test cases are assigned unique identifiers per the conventions in [2]. 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>**
CWS	Cookware Service
Identifier Abbreviation	**Role Identifier <IUT role>**
SR	Server
Identifier Abbreviation	**Reference Identifier <GGIT class>**
SGGIT	Server Generic GATT Integrated Tests
Identifier Abbreviation	**Reference Identifier <GGIT class>**
CHA	Characteristic
DES	Descriptor
SDP	Validate SDP record
SER	Service
Identifier Abbreviation	**Features and Behaviors Identifier <feat>**
RCP	Recipe Control Point
SCI	Service Characteristic Indications
SCN	Service Characteristic Notifications
SCR	Service Characteristic Reads
SCW	Service Characteristic Writes
SPE	Service Procedure – Error Handling

Table 4.1: CWS 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, then 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 system 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

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

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

4.3 Generic GATT Integration Tests

Execute the Generic GATT Integrated Tests defined in [7] in Section 6.3, Server test procedures, using Table 4.2 below as input:

TCID	Service / Characteristic / Descriptor	Reference	Properties	Value Length (Octets)	Type
CWS/SR/SGGIT/SER/BV-01-C [Service GGIT – Cookware Service, Unique]	Cookware Service	[3] 2.7	-	-	Unique
CWS/SR/SGGIT/CHA/BV-01-C [Characteristic GGIT – Cookware Description]	Cookware Description Characteristic	[3] 3.1	0x02 (Read)	skip	Unique
CWS/SR/SGGIT/CHA/BV-02-C [Characteristic GGIT – Cookware Description, Indicate]	Cookware Description Characteristic	[3] 3.1	0x22 (Read, Indicate)	skip	Unique
CWS/SR/SGGIT/CHA/BV-03-C [Characteristic GGIT – Recipe Parameters]	Recipe Parameters Characteristic	[3] 3.2	0x1A (Read, Write, Notify)	skip	Unique
CWS/SR/SGGIT/CHA/BV-04-C [Characteristic GGIT – Recipe Control]	Recipe Control Characteristic	[3] 3.3	0x08 (Write)	skip	Unique
CWS/SR/SGGIT/CHA/BV-05-C [Characteristic GGIT – Cooking Step Status]	Cooking Step Status Characteristic	[3] 3.4	0x12 (Read, Notify)	skip	Unique
CWS/SR/SGGIT/CHA/BV-06-C [Characteristic GGIT – Cooking Zone Capabilities]	Cooking Zone Capabilities Characteristic	[3] 3.5	0x08 (Write)	skip	Unique
CWS/SR/SGGIT/CHA/BV-07-C [Characteristic GGIT – Cooking Zone Desired Cooking Conditions]	Cooking Zone Desired Cooking Conditions Characteristic	[3] 3.6	0x20 (Indicate)	skip	Unique
CWS/SR/SGGIT/CHA/BV-08-C [Characteristic GGIT – Cooking Zone Actual Cooking Conditions]	Cooking Zone Actual Cooking Conditions Characteristic	[3] 3.7	0x08 (Write)	skip	Unique
CWS/SR/SGGIT/CHA/BV-09-C [Characteristic GGIT – Cookware Sensor Data]	Cookware Sensor Data Characteristic	[3] 3.8	0x12 (Read, Notify)	skip	-
CWS/SR/SGGIT/CHA/BV-10-C [Characteristic GGIT – Cookware Sensor Aggregate]	Cookware Sensor Aggregate Characteristic	[3] 3.9	0x12 (Read, Notify)	skip	Unique
CWS/SR/SGGIT/SDP/BV-01-C [SDP Record]	Cookware Service	[3] 4	-	-	-

Table 4.2 Input for the GGIT Server test procedure

4.4 Cookware Tests

4.4.1 Cookware Description

- Test Purpose

  Verify that a Cookware Description characteristic required by the service returns valid values when read.

- Reference

  [3] 3.1

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The IUT has its Cookware Type set to the appropriate type as specified in Table 4.3.

- Test Case Configuration

Test Case
CWS/SR/SCR/BV-01-C [Cookware Description, Vessel Type]
CWS/SR/SCR/BV-02-C [Cookware Description, Pressure Vessel Type]
CWS/SR/SCR/BV-03-C [Cookware Description, Others]

Table 4.3: Cookware Description test cases

- Test Procedure

  1. The Lower Tester performs a GATT Read Characteristic Value procedure for the Cookware Description characteristic.

- Expected Outcome

  Pass verdict

  The IUT returns a Cookware Description value that is formatted correctly for the Cookware Type specified in Table 4.3 and with valid values.

CWS/SR/SCI/BV-01-C [Cookware Description, Indications]

- Test Purpose

  Verify that the Cookware Description characteristic sends an indication upon reconnection if the IUT updates its field values, for example, during a firmware update.

- Reference

  [3] 3.1.2

- Initial Condition
  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
- Test Procedure
  1. The Lower Tester configures the Cookware Description characteristic for Indications.
  2. The Lower Tester reads and caches the Cookware Description value.
  3. The Lower Tester disconnects from the IUT.
  4. The Upper Tester orders the IUT to update the value of the Cookware Description to a different value.
  5. The Lower Tester connects to the IUT.
  6. The Lower Tester receives a GATT Characteristic Value Indication from the IUT.
- Expected Outcome

  Pass verdict

  The IUT sends an Indication of the Cookware Description characteristic in Step 6.

4.4.2 Cooking Step Status Notifications

- Test Purpose

  Verify that the Cooking Step Status characteristic sends a notification when a recipe step is completed.
- Reference

  [3] 3.3.2
- Test Case Configuration

Test Case	Capability	Rounds
CWS/SR/SCR/BV-04-C [Cooking Step Status Notifications, Temperature]	0b0110	1 & 2
CWS/SR/SCR/BV-05-C [Cooking Step Status Notifications, Humidity]	0b1000	3 & 4

Table 4.4: Cooking Step Status Notifications test cases

- Initial Condition
  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
- Test Procedure
  1. The Lower Tester configures the Cooking Zone Desired Cooking Conditions characteristic for Indications.
  2. The Lower Tester configures the Recipe Parameters and Cooking Step Status characteristic for Notifications.

3. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with valid values.
4. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and the Duration field set to 10–20 seconds in duration.
5. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Opcode set to 0x01 (Start).
6. The Lower Tester performs a GATT Characteristic Value Read procedure for the Recipe Parameters characteristic.
7. The IUT may send an Indication of the Cooking Zone Desired Cooking Conditions characteristic.
8. The Lower Tester performs a GATT Characteristic Value Read procedure for the Cooking Step Status characteristic.
9. The Lower Tester waits 5 seconds.
10. The Lower Tester performs a GATT Characteristic Value Read procedure for the Cooking Step Status characteristic.
11. The Lower Tester waits until the duration written in Step 2 expires.
12. The IUT sends a notification of the Cooking Step Status characteristic.

Repeat Steps 13–17 for each Round in Table 4.5:

13. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and the Termination Condition field is set to Condition as specified in Table 4.5.
14. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Opcode set to 0x01 (Start).
15. The Lower Tester waits until it receives a notification.
16. The Upper Tester forces the IUT to complete the Recipe Step in Step 13.
17. The IUT sends a notification of the Cooking Step Status characteristic.
18. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and the Duration field set to 10–20 seconds in duration and the Last Step Completed flag is set.
19. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Opcode set to 0x01 (Start).
20. The Lower Tester waits until the duration written in Step 18 expires.
21. The IUT sends a notification of the Cooking Step Status characteristic.
22. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and the Duration field set to 10–20 seconds in duration and the User Action Required flag is set.
23. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Opcode set to 0x01 (Start).
24. The Lower Tester waits until the duration written in Step 22 expires.
25. The IUT sends a notification of the Cooking Step Status characteristic.
26. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and the Duration field set to 10–20 seconds in duration and the Cooking Process Type set to 0 (No Cooking).
27. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Opcode set to 0x01 (Start).
28. The IUT sends a notification of the Cooking Step Status characteristic.
29. The Lower Tester waits until the duration written in Step 26 expires.

Round	Termination Condition
1	Temperature Increase Condition
2	Temperature Decrease Condition
3	Humidity Increase Condition
4	Humidity Decrease Condition

Table 4.5: Cooking Step Status Notification rounds

- Expected Outcome

  Pass verdict

  The IUT returns the same value in Step 4 that was written in Step 3 for the Recipe Parameters characteristic.

  The Remaining Time field value returned in Step 6 is approximately the value written in Step 4.

  The Remaining Time field value returned in Step 8 is approximately the correct value.

  The Remaining Time field value is 0 in Steps 10 and 28.

  The Last Step Completed flag is set in the Notification sent in Step 21.

  The User Action Required flag is set in the Notification sent in Step 25.

  The IUT does not send any notifications during Step 29.

CWS/SR/RCP/BV-01-C [Read and Delete of Cooking Steps]

- Test Purpose

  Verify that the IUT properly handles the writing of the Read and Delete Op Code.

- Reference

  [3] 3.3.2.1, 3.3.2.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The IUT has no Recipe Parameters stored.

- Test Procedure

  1. The Lower Tester configures the Recipe Parameters and Cooking Step Status characteristics for Notifications.
  2. The Lower Tester configures the Cooking Zone Desired Cooking Condition characteristic for Indications.
  3. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with valid values.
  4. The Lower Tester reads the Cooking Step Status characteristic.
  5. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Parameters characteristic of the IUT with valid parameters and a valid Cooking Step Index.

6. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Parameters characteristic of the IUT with valid parameters and Cooking Step Index greater than the value used in Step 5.
7. The IUT sends an ATT error response.
8. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x00 (Read) and Cooking Step Index as used in Step 5.
9. The IUT sends a notification for the Recipe Parameters characteristic.
10. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x00 (Read) and Cooking Step Index value other than the Cooking Step Index used in Step 5.
11. The IUT sends an ATT error response.
12. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x03 (Delete) and a valid Cooking Step Index.
13. The IUT sends a notification for the Cooking Step Status characteristic.
14. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Parameters characteristic of the IUT with valid parameters and a valid Cooking Step Index.
15. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x01 (Start Op Code) and Cooking Step Index set to the value used in Step 14.
16. The IUT sends a notification for the Cooking Step Status and Cooking Zone Desired Cooking Conditions characteristic.
17. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x02 (Stop Op Code).
18. The IUT sends a notification for the Cooking Zone Desired Cooking Conditions characteristic.
19. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x01 (Start Op Code) and no Cooking Step.
20. The IUT sends a notification for the Cooking Step Status characteristic.
21. The Lower Tester performs a GATT Write Characteristic Value for the Recipe Control characteristic of the IUT with Op Code set to 0x03 (Delete) and a valid Cooking Step Index.
22. The IUT sends a notification for the Cooking Step Status and Cooking Zone Desired Cooking Conditions characteristic.

- Expected Outcome

  Pass verdict

  The IUT reports a value of one for the Number of Cooking Steps value in Step 3.

  The IUT sends a «Too Many Recipe Steps» error code in Step 7.

  The IUT sends a «Invalid Cooking Step Index» error code in Step 11.

  The IUT sends a notification of the Recipe Parameters characteristic in Step 9 where the values match the values written in Step 5 for the corresponding Cooking Step Index.

  The IUT sends a notification of the Cooking Step Status characteristic in Steps 16 and 20 where the Cooking Step Index matches the values written in Step 14 and the Last Cooking Step flag is set correctly.

  The IUT sends a notification of the Cooking Zone Desired Cooking Conditions characteristic in Steps 16 and 18.

4.4.3 Recipe Parameters – Error Handling

CWS/SR/SCW/BI-01-C [Recipe Parameters, Unset Cooking Zone Capabilities]

- Test Purpose

  Verify that the IUT rejects values being written to the Recipe Parameters characteristic when the Cooking Zone Capabilities are not set on the IUT by sending an error response.

- Reference

  [3] 3.2.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The Cooking Zone Capabilities characteristic on the IUT is not set.

- Test Procedure

  1. The Lower Tester configures the Cooking Zone Desired Cooking Conditions characteristic for Indications.
  2. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and a Cooking Process Type field set to a value other than zero.
  3. The IUT returns an ATT error response.

- Expected Outcome

  Pass verdict

  The IUT sends a «Cooking Zone Capabilities Not Set» error code in Step 3.

CWS/SR/SCW/BI-02-C [Recipe Parameters, Invalid Writes]

- Test Purpose

  Verify that the Recipe Parameters characteristic rejects values being written when not supported by the IUT and sends an error response.

- Reference

  [3] 3.2.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).

- Test Procedure

  1. The Lower Tester configures the Cooking Zone Desired Cooking Conditions characteristic for Indications.

  For each round 1–3 in Table 4.6, execute Steps 2–4:

  2. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with the Flag field set with values that do not support the Flag values specified in Table 4.6.
  3. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with the Flag field set with Flag values specified in Table 4.6.
  4. The IUT returns an ATT error response.

Round	Flag	Capability
1	Temperature	0b0110
2	Temperature Gradient	0b0110
3	Humidity	0b1000

Table 4.6: Recipe Parameters Invalid Writes rounds

- Expected Outcome

  Pass verdict

  The IUT sends an «Unsupported by Cooking Zone» error code in Step 4.

4.4.4 Recipe Parameters, Unsupported By Cooking Zone

- Test Purpose

  Verify that the IUT rejects values being written to the Recipe Parameters characteristic when a Flag parameter is not supported.

- Reference

  [3] 3.2.2

- Test Case Configuration

Test Case	Flags	Capability
CWS/SR/SCW/BI-03-C [Unsupported By Cooking Zone, Temperature]	Temperature	0b0110
CWS/SR/SCW/BI-04-C [Unsupported By Cooking Zone, Temperature Gradient]	Temperature Gradient	0b0110
CWS/SR/SCW/BI-05-C [Unsupported By Cooking Zone, Humidity]	Humidity	0b1000

Table 4.7: Recipe Parameters, Unsupported By Cooking Zone test cases

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.

- The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
- The Lower Tester has the Cooking Zone Desired Cooking Conditions characteristic CCCD configured for indications.
- The IUT does not support the capability as specified in Table 4.7.

- Test Procedure

  1. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with Flags field where the Capability values specified in Table 4.7 are not set.
  2. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with the Flag field set with Flag values specified in Table 4.7.
  3. The IUT returns an ATT error response.

- Expected Outcome

  Pass verdict

  The IUT sends an «Unsupported By Cooking Zone» error code in Step 3.

CWS/SR/SCW/BI-06-C [Recipe Parameters, Value Not Allowed]

- Test Purpose

  Verify that the IUT rejects incorrect Flags values of the Termination Condition field in the Recipe Parameters characteristic.

- Reference

  [3] 3.2.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The Lower Tester configures Indications for the Cooking Zone Desired Cooking Conditions characteristic.

- Test Procedure

  1. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with valid values.

  Repeat Steps 2 and 3 for each round in Table 4.8:

  2. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values and the bits set in the Termination Field as specified in Table 4.8.
  3. The IUT returns an ATT error response.

Round	Bits
1	Temperature Increase Condition / Temperature Decrease Condition (0b0011)
2	Humidity Increase Condition / Humidity Decrease Condition (0b1100)

Table 4.8: Recipe Parameters, Value Not Allowed rounds

- Expected Outcome

  Pass verdict

  The IUT sends a «Value Not Allowed» error code in Step 3.

CWS/SR/SCW/BI-07-C [Recipe Control, CCCD Not Configured]

- Test Purpose

  Verify that the IUT rejects values being written to the Recipe Control characteristic when the CCCD is not configured for the Recipe Parameters.

- Reference

  [3] 3.2.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The Lower Tester does not have the Recipe Parameters characteristic CCCD configured for notifications.
  - The Lower Tester does not have any recipe steps stored on the IUT.

- Test Procedure

  1. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Op Code of 0x01 (Read).
  2. The IUT returns an ATT error response.
  3. The Lower Tester configures Cooking Zone Desired Cooking Conditions for notifications.
  4. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with valid values.
  5. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with valid values.
  6. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Control characteristic with Op Code of 0x01 (Read) and the Cooking Step Index used in Step 5.
  7. The IUT returns an ATT error response.

- Expected Outcome

  Pass verdict

  The IUT sends a «Client Characteristic Configuration Descriptor Improperly Configured» error code in Steps 2 and 7.

4.4.5 Cooking Zone

CWS/SR/SCI/BV-02-C [Cooking Zone Desired Cooking Conditions, Indications]

- Test Purpose

  Verify that the Cooking Zone Desired Cooking Conditions characteristic sends an indication when the Recipe Parameters characteristic is written with a combination of values.

- Reference

  [3] 3.5

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).

- Test Procedure

  1. The Lower Tester configures the Cooking Zone Desired Cooking Conditions characteristic for Indications.

  For each round 1–4 in Table 4.9, execute Steps 2–9:

  2. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Capabilities characteristic with the Flag field set to support the Flag values specified in Table 4.9.
  3. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with appropriate values.
  4. The Upper Tester causes the IUT to adjust its control loop so that it adjusts the appropriate settings.
  5. The Lower Tester waits until it receives an indication on the Cooking Zone Desired Cooking Conditions characteristic that adjusts the desired value in Table 4.9.
  6. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Actual Cooking Conditions characteristic with similar values to those received in Step 5.
  7. The Lower Tester performs a GATT Characteristic Value Write procedure for the Recipe Parameters characteristic with a value of 0x000000.
  8. The Lower Tester waits until it receives an indication on the Cooking Zone Desired Cooking Conditions characteristic with desired values set to zero.
  9. The Lower Tester performs a GATT Characteristic Value Write procedure for the Cooking Zone Actual Cooking Conditions characteristic with values received in Step 8.

Round	Flag
1	Power Level
2	Temperature
3	Humidity
4	Blower Fan

Table 4.9: Cooking Zone Desired Cooking Conditions, Indications rounds

- Expected Outcome

  Pass verdict

  The IUT sends an indication in Step 5 with the correct value for that round.

4.4.6 Cookware Sensor Data

CWS/SR/SCN/BV-01-C [Cookware Sensor Data Notifications, Writable Triggers]

- Test Purpose

  Verify that a Cookware Sensor Data characteristic sends a notification when its value changes when there is a connection when Triggers are configured by the client.

- Reference

  [3] 3.7.3.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).

- Test Procedure

  Repeat Steps 1–12 for each Cookware Sensor Data characteristic discovered:

  1. The Lower Tester configures the Cookware Sensor Data characteristic for Notifications.
  2. The Lower Tester performs a GATT Read Characteristic Descriptor procedure for the Cooking Sensor Info descriptor and Valid Range descriptors against the Cookware Sensor Data characteristic.
  3. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with an interval of 1–10 seconds.
  4. The Lower Tester waits 30 seconds while receiving Notifications from the targeted Cookware Sensor Data characteristic.
  5. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with an intervals value of zero.
  6. The Lower Tester waits 30 seconds.
  7. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with a Delta value set to the TSPX_DELTA_TRIGGER IXIT [5] value.
  8. The Upper Tester causes the measured value for this Cookware Sensor Data characteristic to change, exceeding the TSPX_DELTA_TRIGGER IXIT [5] value three times.
  9. The Lower Tester waits until it receives the three Notifications from the targeted Cookware Sensor Data characteristic.
  10. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with a Delta value of zero.
  11. The Lower Tester waits 30 seconds.
  12. The Lower Tester disables notifications for the Cookware Sensor Data characteristic.

- Expected Outcome

  Pass verdict

  The IUT sends notifications in Step 4 at the interval written in Step 3.

  The IUT does not send any notifications in Steps 6 and 11.

  The IUT sends notifications in Step 9 that show a change in the measured value that exceeds the TSPX_DELTA_TRIGGER IXIT [5] value.

  If the Valid Range descriptor exists, then the values reported are within the values received in each indication.

  The IUT exposes only the Cooking Sensor Info and Cooking Trigger Settings Info descriptor for each Cookware Sensor Data characteristic.

4.4.7 Cookware Sensor Data Notifications, Autonomous

- Test Purpose

  Verify that a Cookware Sensor Data characteristic sends a notification when its value changes during a connection where Triggers are configured by the server.

- Reference

  [3] 3.7.3.2

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The IUT has its Cooking Trigger Settings descriptor values set to reasonable Interval or Delta values.

- Test Case Configuration

Test Case	Trigger
CWS/SR/SCN/BV-02-C [Cookware Sensor Data Notifications, Autonomous, Interval]	Interval
CWS/SR/SCN/BV-05-C [Cookware Sensor Data Notifications, Autonomous, Delta]	Delta

Table 4.10: Cookware Sensor Data Notifications, Autonomous test cases

- Test Procedure

  Repeat Steps 1–5 for each Cookware Sensor Data characteristic discovered:

  1. The Lower Tester configures the Cookware Sensor Data characteristic for Notifications.
  2. The Lower Tester performs a GATT Read Characteristic Descriptor procedure for the Cooking Sensor Info, Trigger Settings Info, and Valid Range descriptors against the Cookware Sensor Data characteristic.
  3. If the IUT is configured for Delta Triggers, then the Upper Tester causes the measured value to exceed the Cooking Trigger Settings Delta field value three times.

4. The Lower Tester waits until it receives three Notifications of the targeted Cookware Sensor Data characteristic.
5. The Lower Tester disables Notifications for the Cookware Sensor Data characteristic.

- Expected Outcome

  Pass verdict

  The IUT sends at least three notifications in Step 4 that are for the Interval value read in Step 2 or a change in the measured value that exceeds the Delta value read in Step 2.

  If the Valid Range descriptor exists, then the values reported are within the values received in Step 4.

CWS/SR/SCN/BV-03-C [Aggregate Notifications, Writable Triggers]

- Test Purpose

  Verify that a Cookware Sensor Aggregate characteristic sends a notification when its value changes during a connection where Triggers are configured by the client.

- Reference

  [3] 3.8

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).

- Test Procedure

  1. The Lower Tester configures the Cookware Sensor Aggregate characteristic for Notifications.

  Repeat Steps 2–14 for each Cookware Sensor Data characteristic discovered:

  2. The Lower Tester performs a GATT Read Characteristic Descriptor procedure for the Cooking Sensor Info descriptor and Valid Range descriptors against the Cookware Sensor Data characteristic.
  3. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with an interval of 1–10 seconds.
  4. The Lower Tester waits 30 seconds while receiving Notifications from the Cookware Sensor Aggregate characteristic.
  5. The Lower Tester performs a GATT Read Characteristic Value procedure for the targeted Cookware Sensor Data characteristic.
  6. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with an intervals value of zero.
  7. The Lower Tester waits 30 seconds.
  8. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with a Delta value set to the TSPX_DELTA_TRIGGER IXIT [5] value.
  9. The Upper Tester causes the measured value for this Cookware Sensor Data characteristic to change, exceeding the TSPX_DELTA_TRIGGER IXIT [5] value three times.

10. The Lower Tester waits until it receives the three Notifications from the Cookware Sensor Aggregate characteristic.
11. The Lower Tester performs a GATT Read Characteristic Value procedure for the targeted Cookware Sensor Data characteristic.
12. The Lower Tester performs a GATT Write Characteristic Descriptor procedure for the Cooking Trigger Settings Info descriptor against the Cookware Sensor Data characteristic with a Delta value of zero.
13. The Lower Tester waits 30 seconds.
14. The Lower Tester disables notifications for the Cookware Sensor Data characteristic.

- Expected Outcome

  Pass verdict

  The IUT sends notifications in Step 4 at the interval written in Step 3.

  The IUT does not send any notifications in Steps 7 and 13.

  The IUT sends notifications in Step 10 that show a change in the measured value that exceeds the TSPX_DELTA_TRIGGER IXIT [5] value.

  If the Valid Range descriptor exists, then the values reported are within the values received in each indication.

  Cookware Sensor Aggregate Notifications sent by the IUT update the appropriate range specified by the Aggregate Offset value received in Step 3 and match the value read in Steps 5 and 11.

CWS/SR/SCN/BV-04-C [Aggregate Notifications, Autonomous]

- Test Purpose

  Verify that a Cookware Sensor Aggregate characteristic sends a notification when its value changes when there is a connection when Triggers are configured by the server.

- Reference

  [3] 3.8

- Initial Condition

  - A bearer connection between the Lower Tester and the IUT is established as described in Section 4.2.1 if using ATT over an LE transport or Section 4.2.2 if using ATT over a BR/EDR transport.
  - The Lower Tester has discovered and cached the CWS service and characteristic handles (e.g., by running the test procedure in Section 4.3).
  - The IUT has its Cooking Trigger Settings descriptor values set to reasonable Interval or Delta values.

- Test Procedure

  1. The Lower Tester configures the Cookware Sensor Aggregate characteristic for Notifications if supported by the IUT.

  Repeat Steps 2–6 for each Cookware Sensor Data characteristic discovered:

  2. The Lower Tester performs a GATT Read Characteristic Descriptor procedure for the Cooking Sensor Info, Trigger Settings Info, and Valid Range descriptors against the Cookware Sensor Data characteristic.

3. If the IUT is configured for Delta Triggers, then the Upper Tester causes the measured value to exceed the Cooking Trigger Settings Delta field value three times.
4. The Lower Tester waits until it receives three Notifications of the Cookware Sensor Aggregate characteristic.
5. The Lower Tester performs a GATT Read Characteristic Value procedure for the targeted Cookware Sensor Data characteristic.
6. The Lower Tester disables notifications for the Cookware Sensor Data characteristic.

- Expected Outcome

  Pass verdict

  The IUT sends three notifications in Step 4 that are for the Interval value read in Step 2 or a change in the measured value that exceeds the Delta value read in Step 3.

  If the Valid Range descriptor exists, then the values reported are within the values received in Step 4.

  Cookware Sensor Aggregate Notifications sent by the IUT use the Aggregate Offset value received in Step 3 and match the value read in Step 5.

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 Cookware Service [3].

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 [2].

For the purpose and structure of the ICS/IXIT, refer to [2].

Item	Feature	Test Case(s)
CWS 2/1 OR CWS 2/2	Cookware Service	CWS/SR/SGGIT/SER/BV-01-C
CWS 2/1	SDP Record	CWS/SR/SGGIT/SDP/BV-01-C
CWS 4/1 AND NOT CWS 4/2	Cookware Description	CWS/SR/SGGIT/CHA/BV-01-C
CWS 4/2	Cookware Description, Indicate	CWS/SR/SGGIT/CHA/BV-02-C CWS/SR/SCR/BV-03-C CWS/SR/SCI/BV-01-C
CWS 4/3	Recipe Parameters	CWS/SR/SGGIT/CHA/BV-03-C CWS/SR/SCW/BI-01-C CWS/SR/SCW/BI-02-C CWS/SR/SCW/BI-03-C CWS/SR/SCW/BI-04-C CWS/SR/SCW/BI-05-C CWS/SR/SCW/BI-06-C
CWS 4/4	Recipe Control	CWS/SR/SGGIT/CHA/BV-04-C CWS/SR/RCP/BV-01-C CWS/SR/SCW/BI-07-C
CWS 4/5	Cooking Step Status	CWS/SR/SGGIT/CHA/BV-05-C CWS/SR/SCR/BV-04-C CWS/SR/SCR/BV-05-C
CWS 4/6	Cooking Zone Capabilities	CWS/SR/SGGIT/CHA/BV-06-C
CWS 4/7	Cooking Zone Desired Cooking Conditions	CWS/SR/SGGIT/CHA/BV-07-C
CWS 4/8	Cooking Zone Actual Cooking Conditions	CWS/SR/SGGIT/CHA/BV-08-C
CWS 4/9	Cookware Sensor Data	CWS/SR/SGGIT/CHA/BV-09-C CWS/SR/SCN/BV-02-C CWS/SR/SCN/BV-05-C
CWS 4/10	Cookware Sensor Aggregate	CWS/SR/SGGIT/CHA/BV-10-C CWS/SR/SCN/BV-04-C

Item	Feature	Test Case(s)
CWS 4/1 AND CWS 4/3	Cookware Description, Vessel Type	CWS/SR/SCR/BV-01-C CWS/SR/SCR/BV-02-C
CWS 4/7 AND CWS 4/8	Cooking Zone Cooking Conditions	CWS/SR/SCI/BV-02-C
CWS 4/9 AND CWS 5/3	Cookware Sensor Data Notifications, Writable Triggers	CWS/SR/SCN/BV-01-C
CWS 4/10 AND CWS 5/3	Aggregate Notifications, Writable Triggers	CWS/SR/SCN/BV-03-C

Table 5.1: Test case mapping

6 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	p0	2025-11-04	Approved by BTI on 2025-10-02. CWS v1.0 adopted by the BoD on 2025-11-03. Prepared for initial publication.

Acknowledgments

Name	Company
Charlie Lenahan	Bluetooth SIG, Inc.