Cycling Power Profile (CPP)

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

- **Revision:** CPP.ICS.p7
- **Revision Date:** 2025-07-08
- **Prepared By:** BTI
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Contents

1 General principles

1.1 Implementation Under Test (IUT) identification

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

1.2 Enforcement of inter-layer dependencies

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

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

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

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

2 ICS declarations

2.1 Versions

Table 0: X.Y Versions

Item	Version	Reference	Status
1	CPP v1.0**	[1] CPP 1.0	Deprecated 2022-02-01. Withdrawn 2023-02-01.
2	CPP v1.1	[7] CPP 1.1	M

Table 0a: No longer used

Table 0b: X.Y.Z Versions

Item	Version	Reference	Status
1	CPP v1.1.1	[8]	C.1

C.1: Optional IF CPP 0/2 “CPP v1.1”, otherwise Excluded.

2.2 Roles

Table 1: Role Requirements

Item	Role	Reference	Status
1	CP Sensor	[1] 2.1	C.1
2	Collector	[1] 2.1	C.1
3	CP Observer	[1] 2.1	C.1, C.2
4	CP Broadcaster	[1] 2.1	C.3

C.1: Mandatory to support at least one.

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

C.3: Optional IF CPP 1/1 “CP Sensor” AND CPP 2/2 “Profile supported over LE”, otherwise Excluded.

2.3 Transports

Table 2: Transport Requirements

Item	Transport	Reference	Status
1	Profile supported over BR/EDR	[1] 2.5	C.1, C.3
2	Profile supported over LE	[1] 2.5	C.2, C.3

C.1: Excluded for this Profile IF CORE 41/2 “LE Core Configuration”.

C.2: Excluded for this Profile IF CORE 41/1 “BR/EDR Core Configuration”.

C.3: Mandatory to support at least one.

** Deprecated versions may not appear in the Bluetooth SIG qualification tool after the deprecation date. TCRLs published after this date will not allow the use of deprecated versions.

2.4 CP Sensor and CP Broadcaster roles

2.4.1 Services (CP Sensor and CP Broadcaster)

Table 3: Services (CP Sensor and CP Broadcaster)

Prerequisite: CPP 1/1 "CP Sensor"

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Cycling Power Service	[1] 3	M	[2] CPS
2	Cycling Power Service UUID in AD in GAP Discoverable Mode	[1] 3.1.1.1	C.1	N/A
3	Local Name in AD or Scan Response	[1] 3.1.1.2	C.1	N/A
4	Appearance in AD or Scan Response	[1] 3.1.1.4	C.1	N/A
5	Device Information Service	[1] 3	O	[5] DIS
6	Battery Service	[1] 3	O	[6] BAS
7	Cycling Power Measurement Broadcast Feature	[1] 5	C.2	[2] CPS 2/21

C.1: Optional IF CPP 2/2 "Profile supported over LE", otherwise Excluded.

C.2: Mandatory IF CPP 1/4 "CP Broadcaster", otherwise not defined.

2.4.2 GAP requirements (CP Sensor and CP Broadcaster)

Table 4: GAP Requirements (CP Sensor and CP Broadcaster)

Prerequisite: CPP 1/1 "CP Sensor"

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Peripheral	[1] 2.4	C.1	[4] GAP 5/3 OR GAP 38/3
2	LE security mode 1	[1] 8.1	C.1	[4] GAP 25/1
3	General discoverable mode (BR/EDR)	[1] 7.3.1	C.2	[4] GAP 1/3
4	Unauthenticated Pairing (LE security mode 1 level 2)	[1] 8.1	C.3	[4] GAP 25/8
5	Authenticated Pairing (LE security mode 1 level 3)	[1] 8.1	C.3	[4] GAP 25/7

C.1: Mandatory IF CPP 2/2 "Profile supported over LE", otherwise not defined.

C.2: Mandatory IF CPP 2/1 "Profile supported over BR/EDR", otherwise not defined.

C.3: Optional IF CPP 2/2 "Profile supported over LE", otherwise not defined.

Table 5: No longer used

2.5 Collector role

2.5.1 Service Support (Collector)

Table 6: Service Support (Collector)

Prerequisite: CPP 1/2 "Collector"

Item	Capability	Reference	Status
1	Cycling Power Service	[1] 4	M
2	Device Information Service	[1] 4	O
3	Battery Service	[1] 4	O

2.5.2 Discover Services and Characteristics (Collector)

Table 7: Discover Cycling Power Service and Characteristics (Collector)

Prerequisite: CPP 1/2 "Collector"

Item	Capability	Reference	Status
1	Discover Cycling Power Service	[1] 4.2	M
2	Discover Cycling Power Feature Characteristic	[1] 4.3.1	M
2a	Discover Cycling Power Feature - Client Characteristic Configuration Descriptor	[8] 4.4	C.4
3	Discover Cycling Power Measurement Characteristic	[1] 4.3.1	M
4	Discover Cycling Power Measurement - Client Characteristic Configuration Descriptor	[1] 4.3.1	M
5	Discover Cycling Power Measurement - Server Characteristic Configuration Descriptor	[1] 4.3.1	C.1
6	Discover Sensor Location Characteristic	[1] 4.3.1	M
7	Discover Cycling Power Control Point Characteristic	[1] 4.3.1	M
8	Discover Cycling Power Control Point - Client Characteristic Configuration Descriptor	[1] 4.3.1	M
9	Discover Cycling Power Vector Characteristic	[1] 4.3.1	C.3
10	Discover Cycling Power Vector - Client Characteristic Configuration Descriptor	[1] 4.3.1	C.2

C.1: Optional IF CPP 2/2 "Profile supported over LE", otherwise Excluded.

C.2: Mandatory IF CPP 7/9 "Discover Cycling Power Vector Characteristic", otherwise Excluded.

C.3: Mandatory IF CPP 10/22 "Receive the Cycling Power Vector characteristic", otherwise Optional.

C.4: Optional IF CPP 0/2 "CPP v1.1" AND NOT CPP 0b/1 "CPP v1.1.1", otherwise Mandatory.

Table 8: Discover DIS Service (Collector)

Prerequisite: CPP 1/2 "Collector"

Item	Capability	Reference	Status
1	Discover Device Information Service	[1] 4.2	O

Table 9: Discover BAS Service (Collector)

Prerequisite: CPP 1/2 "Collector"

Item	Capability	Reference	Status
1	Discover Battery Service	[1] 4.2	O

2.5.3 Features (Collector)

Table 10: Feature Requirements (Collector)

Prerequisite: CPP 1/2 "Collector"

Item	Capability	Reference	Status
1	Support for Force-based System	[1] 4.5, 4.7, 4.8	M
2	Support for Torque-based System	[1] 4.5, 4.7, 4.8	M
3	Support for Distributed Power Sensor System	[1] 4.4, 4.5	M
4	Support for Distributed Power Sensor System – Calculates the Total Instantaneous Power	[1] 4.5	O
5	Support for Distributed Power Sensor System – Calculates the Pedal Power Balance	[1] 4.5	O
6	Set Cumulative Value – Set to zero	[1] 4.7.1	O
7	Set Cumulative Value – Set to non-zero	[1] 4.7.1	O
8	Update Sensor Location	[1] 4.7.1	M
9	Request Supported Sensor Locations	[1] 4.7.1	M
10	Calculates or Displays Accumulated Torque	[1] 4.5	O
11	Calculates Instantaneous Speed	[1] 4.5	O
12	Calculates Instantaneous Cadence	[1] 4.5	O
13	Calculates or Displays Accumulated Energy	[1] 4.5	O
14	Set Crank Length	[1] 4.7.1	M
15	Request Crank Length	[1] 4.7.1	O
16	Set Chain Length	[1] 4.7.1	M
17	Request Chain Length	[1] 4.7.1	O
18	Set Chain Weight	[1] 4.7.1	M
19	Request Chain Weight	[1] 4.7.1	O
20	Set Span Length	[1] 4.7.1	M
21	Request Span Length	[1] 4.7.1	O
22	Receive the Cycling Power Vector characteristic	[1] 4.7.1	O
23	Start Offset Compensation	[1] 4.7.1	O
24	Mask Cycling Power Measurement Characteristic Content	[1] 4.7.1	O
25	Request Sampling Rate	[1] 4.7.1	C.1
26	Request Factory Calibration Date	[1] 4.7.1	O
27	Enable Cycling Power Measurement Broadcast	[1] 4.5	O
28	Enhanced Offset Compensation	[7] 4.7.1	O

C.1: Mandatory IF CPP 10/22 "Receive the Cycling Power Vector characteristic", otherwise Excluded.

Table 11: Procedure Requirements (Collector)

Prerequisite: CPP 1/2 "Collector"

Item	Capability	Reference	Status
1	Read Cycling Power Feature characteristic	[1] 4.4	M
2	Configure Cycling Power Measurement characteristic for notifications	[1] 4.5	M
3	Receive Cycling Power Measurement characteristic notifications	[1] 4.5	M
4	Configure Cycling Power Measurement characteristic for broadcast	[1] 4.5	O
5	Read Sensor Location Characteristic	[1] 4.6	M
6	Configure Cycling Power Control Point characteristic for indications	[1] 4.7	M
7	Receive Cycling Power Control Point characteristic indications	[1] 4.7.2, 4.7.3	M
8	Write to Cycling Power Control Point Characteristic	[1] 4.7	O
9	Cycling Power Control Point Characteristic - Set Cumulative Value Op Code	[1] 4.7.2.1	C.1
10	Cycling Power Control Point Characteristic - Update Sensor Location Op Code	[1] 4.7.2.2	M
11	Cycling Power Control Point Characteristic - Request Supported Sensor Locations Op Code	[1] 4.7.2.3	M
12	Cycling Power Control Point Characteristic – Set Crank Length Op Code	[1] 4.7.2.4	M
13	Cycling Power Control Point Characteristic – Request Crank Length Op Code	[1] 4.7.2.5	C.2
14	Cycling Power Control Point Characteristic – Set Chain Length Op Code	[1] 4.7.2.6	M
15	Cycling Power Control Point Characteristic – Request Chain Length Op Code	[1] 4.7.2.7	C.3
16	Cycling Power Control Point Characteristic – Set Chain Weight Op Code	[1] 4.7.2.8	M
17	Cycling Power Control Point Characteristic – Request Chain Weight Op Code	[1] 4.7.2.9	C.4
18	Cycling Power Control Point Characteristic – Set Span Length Op Code	[1] 4.7.2.10	M
19	Cycling Power Control Point Characteristic – Request Span Length Op Code	[1] 4.7.2.11	C.5
20	Cycling Power Control Point Characteristic – Start Offset Compensation Op Code	[1] 4.7.2.12	C.7
21	Cycling Power Control Point Characteristic – Mask Cycling Power Measurement Characteristic Content Op Code	[1] 4.7.2.13	C.8
22	Cycling Power Control Point Characteristic – Request Sampling Rate Op Code	[1] 4.7.2.14	C.9

Item	Capability	Reference	Status
23	Cycling Power Control Point Characteristic – Request Factory Calibration Date Op Code	[1] 4.7.2.15	C.10
24	Cycling Power Control Point Characteristic – Procedure Time Out	[1] 4.7.4	M
25	Configure Cycling Power Vector characteristic for notifications	[1] 4.8	C.6
26	Receive Cycling Power Vector characteristic notifications	[1] 4.8	C.6
27	Verify Bond Status on Reconnection	[1] 7.2.2	C.11
28	Enhanced Offset Compensation	[7] 4.7.1	O
29	Configure characteristic for indications to determine supported features	[8] 4.4	C.12

C.1: Mandatory IF CPP 10/6 “Set Cumulative Value – Set to zero” OR CPP 10/7 “Set Cumulative Value – Set to non-zero”, otherwise Excluded.

C.2: Mandatory IF CPP 10/15 “Request Crank Length”, otherwise Excluded.

C.3: Mandatory IF CPP 10/17 “Request Chain Length”, otherwise Excluded.

C.4: Mandatory IF CPP 10/19 “Request Chain Weight”, otherwise Excluded.

C.5: Mandatory IF CPP 10/21 “Request Span Length”, otherwise Excluded.

C.6: Mandatory IF CPP 10/22 “Receive the Cycling Power Vector characteristic”, otherwise Excluded.

C.7: Mandatory IF CPP 10/23 “Start Offset Compensation”, otherwise Excluded.

C.8: Mandatory IF CPP 10/24 “Mask Cycling Power Measurement Characteristic Content”, otherwise Excluded.

C.9: Mandatory IF CPP 10/25 “Request Sampling Rate”, otherwise Excluded.

C.10: Mandatory IF CPP 10/26 “Request Factory Calibration Date”, otherwise Excluded.

C.11: Mandatory IF CPP 13/3 “Bondable mode (LE)”, otherwise Excluded.

C.12: Optional IF CPP 0/2 “CPP v1.1” AND NOT CPP 0b/1 “CPP v1.1.1”, otherwise Mandatory.

Table 11a: Determining Supported Features – Configure Characteristic for Indications

Prerequisite: CPP 11/29 “Configure characteristic for indications to determine supported features”

Item	Capability	Reference	Status
1	Configure and receive Cycling Power Feature characteristic indications	[8] 4.4	C.1
2	Read Cycling Power Feature characteristic on reconnection	[8] 4.4	C.1

C.1: Mandatory to support at least one IF CPP 13/3 “Bondable mode (LE)” OR CPP 13/6 “Bondable mode (BR/EDR)”, otherwise Excluded.

2.5.4 GATT requirements (Collector)

Table 12: GATT Requirements (Collector)

Prerequisite: CPP 1/2 “Collector”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	No longer used	N/A	N/A	N/A

Item	Capability	Reference	Status	Inter-Layer Dependency
2	GATT Client over BR/EDR	[1] 4.2	C.1	[3] GATT 1a/2
3	GATT Client over LE	[1] 4.2	C.2	[3] GATT 1a/1
4	Discover All Primary Services	[1] 4.2	C.3	[3] GATT 3/2
5	Discover Primary Services by Service UUID	[1] 4.2	C.3	[3] GATT 3/3
6	Discover All Characteristics of a Service	[1] 4.3.1	C.4	[3] GATT 3/5
7	Discover Characteristics by UUID	[1] 4.3.1	C.4	[3] GATT 3/6
8	Discover All Characteristic Descriptors	[1] 4.3.1	M	[3] GATT 3/7
9	Read Characteristic Value	[1] 4.1	M	[3] GATT 3/8
10	Single Notification	[1] 4.1, 4.5, 4.8, 5.2.1	M	[3] GATT 3/17
11	Write Characteristic Value	[1] 4.1, 4.7.2	M	[3] GATT 3/14
12	Read Characteristic Descriptors	[1] 4.1	M	[3] GATT 3/19
13	Write Characteristic Descriptors	[1] 4.1	M	[3] GATT 3/21

C.1: Mandatory IF CPP 2/1 “Profile supported over BR/EDR”, otherwise not defined.

C.2: Mandatory IF CPP 2/2 “Profile supported over LE”, otherwise not defined.

C.3: Mandatory to support at least one.

C.4: Mandatory to support at least one.

2.5.5 GAP requirements (Collector)

Table 13: GAP Requirements (Collector)

Prerequisite: CPP 1/2 “Collector”

Item	Capability	Reference	Status	Inter-Layer Dependency
1	Central	[1] 2.4	C.1	[4] GAP 5/4 OR GAP 38/4
2	LE security mode 1	[1] 8.2	C.1	[4] GAP 35/1
3	Bondable mode (LE)	[1] 7.2	O	[4] GAP 34/2
4	Unauthenticated Pairing (LE security mode 1 level 2)	[1] 8.2	C.1	[4] GAP 35/8
5	Authenticated Pairing (LE security mode 1 level 3)	[1] 8.2	C.1	[4] GAP 35/7
6	Bondable mode (BR/EDR)	[1] 7.2	O	[4] GAP 1/7

C.1: Mandatory IF CPP 2/2 “Profile supported over LE”, otherwise not defined.

Table 14: No longer used

2.6 CP Observer role

2.6.1 Feature (CP Observer)

Table 15: Feature Requirements (CP Observer)

Prerequisite: CPP 1/3 "CP Observer"

Item	Capability	Reference	Status
1	Receive Cycling Power Measurement characteristic broadcast	[1] 6	M
2	Distributed Cycling Power System supported	[1] 6	O
3	Support for Distributed Power Sensor System – Calculates the Total Instantaneous Power	[1] 4.5	C.1
4	Support for Distributed Power Sensor System – Calculates the Pedal Power Balance	[1] 4.5	C.1
5	Calculates or Displays Accumulated Torque	[1] 4.5	O
6	Calculates Instantaneous Speed	[1] 4.5	O
7	Calculates Instantaneous Cadence	[1] 4.5	O
8	Calculates or Displays Accumulated Energy	[1] 4.5	O

C.1: Optional IF CPP 15/2 "Distributed Cycling Power System supported", otherwise Excluded.

3 References

[1] Cycling Power Profile Specification, Version 1.0 or later

[2] ICS Proforma for Cycling Power Service (CPS)

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

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

[5] ICS Proforma for Device Information Service (DIS)

[6] ICS Proforma for Battery Service (BAS)

[7] Cycling Power Profile Specification, Version 1.1 or later

[8] Cycling Power Profile Specification, Version 1.1.1

4 Revision history and acknowledgments

Revision History

Publication Number	Revision Number	Date	Comments
0	1.0.0	2013-04-30	Release for publication.
	1.0.1r01	2014-09-05	TSE 5640: Removed references to CSA in the Core Specification Version table (0a) and Core Specification Reference [6].
1	1.0.1	2014-12-05	Prepared for TCRL 2014-2 publication
	1.0.2r00	2015-05-10	TSE 6379: Added items 3-8 for Observer requirements to Table 15
	1.0.2r01	2015-06-04	Deleted Section 1.2 (Global Statement of Conformance) per current ICS template standards.
2	1.0.2	2015-07-14	Prepared for TCRL 2015-1 publication
	1.0.3r00	2015-10-01	TSE 6499: Added item 13/3 for Bondable Mode in Table 13 and made item 11/27 in Table 11 dependent on it.
3	1.0.3	2015-12-22	Prepared for TCRL 2015-2 publication.
	1.1.0r00-r03	2016-01-04	Merged changes for Cycling Power Profile 1.1 into latest version and converted to a current template. Draft changes from 2015-11-02 to 2015-11-11 are listed here: Table added with prerequisite set to support CPP v1.1 with all features related to CPP v1.1 moved to this new table. Following table renumbered. Moved ‘Enhanced Offset Compensation’ item from table 10 to table 12; Fixed C.x condition for table 10 Added condition C.12 description under table 11
	1.1.0r00-r04	2016-02-03	Updated Table 11: Procedure Requirement capability of Collector was incorrect; it was listing Feature Requirement instead of Capability Minor editorial change (formatting, spelling and punctuation) Added “Enhance Offset Compensation” to Feature Requirements – Collector Role (Table 10) and “Procedure Rquirement” Collector Role (Table 11). Deleted “Enhanced Offset Compensation” from Distributed System Requirements – Collector Role (Table 12)
	1.1.0r00-r05	2016-04-04	Addressed BTI review comments: moved Enhanced Offset Compensation back to table 12 and removed other items from table 12 (which are now handled in the Test Case Mapping Table of CPS.TS).
	1.1.0r00-r06	2016-04-04	Removed table 12, removed unused Conditional statements.
	1.1.0r00-r07	2016-04-04	Updated all references to table 12 to 15
	1.1.0r00-r08	2016-04-06	Fixed table references

Publication Number	Revision Number	Date	Comments
4	1.1.0	2016-05-09	Prepared for publication
	1.1.0 edition 2r00	2018-11-21	Editorial changes only. Template updated. Revision History and Contributors tables moved to the end of the document.
	1.1.0 edition 2	2019-11-12	Updated copyright page and confidentiality markings to support new Documentation Marking Requirements, performed minor formatting updates, and accepted all tracked changes to prepare for edition 2 publication.
	1.1.0ed3 r00–r02	2021-03-23 – 2021-05-23	TSE 16009 (rating 1): Added deprecation and withdrawal information to Table 0, removed Table 0a, and added Inter-Layer Dependency columns to Tables 3, 4, 5, 12, 13, and 14. Editorials to align with latest ICS template. Added a Publication Number column and assigned publication number 4 to the previous v1.1.0. Consistency checker fixes.
	1.1.0 edition 3	2021-05-26	Approved by BTI 2021-05-06. Prepared for edition 3 publication.
	p5r00–r02	2022-03-17 – 2022-04-21	TSE 18617 (rating 2): Updated references throughout ICS to align with “or later” convention now used. Updated the status in 4/1 and 13/1 per consistency checker. TSE 18710 (rating 1): Editorials to align the document with the latest ICS template in anticipation of a future .Z release. Aligned copyright page with v2 of the DNMD. Consistency checker update.
5	p5	2022-06-28	Approved by BTI on 2022-05-31. Prepared for TCRL 2022-1 publication.
	p6r00–r04	2023-08-30 – 2023-09-25	TSE 17222 (rating 4): Per E16588, added conditional C.1 in Table 0, added Table 0b and item 1 for CPP v1.1.1, added new ICS items CPP 7/2, CPP 11/29, CPP 13/6, and added Table 11a for E16588. Added a reference for Cycling Power Profile Specification v1.1.1. TSE 23350 (rating 2): Updated C.1 for Tables 0, 1, and 2. Added Items 4 and 5 and C.3 to Table 4. Marked Tables 5 and 14 (SM requirements) as no longer used. Resolved GATT inter-layer dependencies with updates to Items 1–3 in Table 12. Added Items 4 and 5 to Table 13. Updated the references. Editorials to align the document with the latest ICS template. Removed D&W language and cleaned up conditionals in Tables 0 and 0a. Updated the Status value for Item 0a/1. Renumbered Table 0a to Table 0b because “0a” was used previously.
6	p6	2024-07-01	Approved by BTI on 2024-04-21. Prepared for TCRL 2024-1 publication.

Publication Number	Revision Number	Date	Comments
	p7r00–r02	2025-04-29 – 2025-05-09	TSE 27367 (rating 1): In Table 2, updated the Status value for CPP 2/1 and CPP 2/2, added conditions C.1 and C.2, and renumbered C.1 as C.3. Incorporated editorials to align the document with the latest ICS template, including updates to Section 1 and the addition of a section heading for the ICS declarations section.
7	p7	2025-07-08	Approved by BTI on 2025-06-15. Prepared for TCRL pkg100 publication.

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