**BLE** **Unit Communication Specifications**

**1. Overview**

The BLE unit enables wireless communication between weighing instruments (balances/scales) and PC/smartphones (Android / iOS) via BLE.

Two options are available: proprietary profile and HOGP (HID over GATT Profile).

The proprietary profile allows bidirectional communication between devices (one-to-one communication).

HOGP sends the weighing data to the connection destination as keyboard input (Input Report).

\* SH-AWP-BT / SJ-AWP-BT cannot use HOGP.

**2. Specifications**

　The specifications of the BLE unit installed in the weighing instrument are shown below.

|  |  |
| --- | --- |
| Standard | Bluetooth 5.0 (Bluetooth Low Energy) |
| Core | nRF52832 (Nordic) |
| Role | Peripheral |
| Security Level | LE Security Mode 1, Level 2 |

**BLE Profile Setting**

Profile is toggled by a switch on the BLE unit.

**Proprietary Profile**

|  |  |  |
| --- | --- | --- |
| (1) | Private Service UUID (16 Bytes) | GATT data transmission service UUID |
|  | 5699d362-0c53-11e7-93ae-92361f002671 |  |
|  |  |  |
| (2) | Private Characteristic UUID (16 Bytes) | UUID for data communication 1 (Peripheral→Central) |
|  | 5699d646-0c53-11e7-93ae-92361f002671 |  |
|  |  |  |
| (3) | Private Characteristic UUID (16 Bytes) | UUID for data communication 1 (Central→Peripheral) |
|  | 5699d772-0c53-11e7-93ae-92361f002671 |  |

**HOGP**

|  |  |  |
| --- | --- | --- |
| (1) | Human Interface Device Service |  |
|  | 0x1812 |  |
| (2) | Device Information Service |  |
|  | 0x180A |  |
| (3) | Battery Service | Battery Level is always set to 100%. |
|  | 0x180F |  |

**3. Operation**

**Advertising**

When the weighing instrument is turned on, the BLE unit (Peripheral) starts Advertising.

Advertising continues until power is turned off. No timeout.

\* For SH-AWP-BT / SJ-AWP-BT, 2 minutes ON→2 minutes OFF→15 seconds ON→2 minutes OFF→15 seconds ON… …

Thereafter, 2 minutes OFF, 15 seconds ON repeatedly.

Advertising Interval: 20 ms

Advertising Data:

  
 v: Firmware Version (last two figures)

a: BD Address (last six figures)

s: Product S/N

\*1: Flags

\*2: LE Limited Discoverable Mode, BR/EDR Not Supported

\*3: Complete Local Name

\*4: When product S/N is obtained \*5: When product S/N cannot be obtained

AD Data and Length in AD Structure 2 vary depending on Firmware Version and product.

**Local Name**

Name displayed when scanned by Central

When filtering by Local Name, prefix search with "A&D\_BT" or "A&D\_HID" is recommended.

|  |  |  |
| --- | --- | --- |
| Profile | Local Name | Remarks |
| Proprietary Profile | A&D\_BT\_sssssssss  or  A&D\_BT\_vvaaaaaa | After “A&D\_BT”, Local Name with product S/N appended,  or if the product S/N cannot be obtained,  Local Name with BD Address appended |
|  | A&D\_BT | Older Versions  Note that the link may be disconnected from the smartphone side after a certain period of time (about 90 seconds) after the connection is made. |
| HOGP | A&D\_HID\_sssssssss  or  A&D\_HID\_vvaaaaaa | After “A&D\_HID”, Local Name with product S/N appended,  or if the product S/N cannot be obtained,  Local Name with BD Address appended |
|  | A&D\_HID\_sssssssss  or  A&D\_HID | Older Versions  After “A&D\_HID”, Local Name with product S/N appended, or if the product S/N cannot be obtained, Local Name on the lower side |

v: Firmware Version (last two figures)

a: BD Address (last six figures)

s: Product S/N

**Connection/Pairing**

The Central detects the specified Local Name by Scan and establishes a connection.

When there is more than one weighing instrument with BLE unit (Peripheral),

* If the last connected Device UUID or BD Address can be identified

→ Connects to the target device.

* If the last connected Device UUID or BD Address cannot be identified

　　→ Turn off all non-target devices and perform Scan again.

The Central initiates pairing within 40 seconds upon the initial connection or upon reconnection after deregistering the pairing.

The Peripheral shifts to the communication mode upon completion of pairing.

The status is reset after 40 seconds without a pairing request occurring. The pairing registration information is deleted and Advertising is started again.

　The status is reset immediately when pairing fails. The pairing registration information is deleted and Advertising is started again. For older versions, the deletion of pairing registration information does not occur when pairing fails.

　Depending on the version, Advertising is stopped if pairing failure continues.

Any Profile change when requested is executed after the previous pairing registration information is deleted on the Central side.

After the Profile is changed, the previous Local Name may be displayed in Scan by the Central, but it is updated after the connection is made.

**Communication**

If the link is disconnected, the Peripheral automatically resets the status and starts Advertising again.

**Proprietary Profile**

The output data of the Peripheral is stored in the Characteristic Value in (2).

　Each command data of the Central is written to the Characteristic Value in (3).

Refer to the instruction manual of each weighing instrument for the data format and supported commands.

　Select a data output mode of the weighing instrument other than the stream mode.

**HOGP**

　Weighing data in A&D standard format is sent one character at a time as an Input Report.

　Transmission interval 50 ms (default setting). 200 ms for Tab (\t) and Enter (\r\n).

(The interval between key press and key release is 1/2 of the transmission interval.)

The data to be sent is only numbers, signs (minus), and decimal points, and does not include headers or units of measure (default setting).

　Note that if the keyboard setting on the Central side is a language other than English (e.g., Japanese full-width characters), data may not be received properly.



50 ms

Key Press

Key Press

Key Press

Key Release

Key Release

Key Release

|  |  |  |
| --- | --- | --- |
| Offset (byte) | Value |  |
| 0 | Modifier keys |  |
| 1 | Reserved | 0x00 |
| 2 | Keycode 1 | Key code corresponding to the weighing value |
| 3 | Keycode 2 | Unused (0x00) |
| 4 | Keycode 3 | Unused (0x00) |
| 5 | Keycode 4 | Unused (0x00) |
| 6 | Keycode 5 | Unused (0x00) |
| 7 | Keycode 6 | Unused (0x00) |

**Revision History**

|  |  |
| --- | --- |
| Ver | Change Description |
| A | - Added the HOGP function. |
| B | - Added BD Address to Local Name for Proprietary Profile.  - Added note that for older versions, connection with a smartphone is disconnected after a certain period of time. |
| C | - Changed the Local Name for the Proprietary Profile to align with the HOGP specification.  The product S/N is appended to the Local Name when it can be obtained.  - Deleted the Module model name.  - Added a note about SH-AWP-BT / SJ-AWP-BT. |
| D | - Added the operation at the time of pairing.  - Added the revision history. |

以上