Helen Project Service

Base UUID: 4F770000ED7D-11E4-840E-0002A5D5C51B

Service UUID: 0x0301

Abstract:

This service exposes measurement and control methods

Summary:

TODO

Service Dependencies:

This service is not dependent upon any other service.

GATT Requirements

Sub-Procedure	Server Requirement
Write Characteristic Value	Mandatory
Notifications	C1
Indications	Mandatory
Read Characteristic Descriptors	Mandatory
Write Characteristic Descriptors	Mandatory

C1: Mandatory if the Helen Measurement characteristic is supported, otherwise excluded for this service.

Transport Dependencies

Transport	Supported
Classic	false
Low Energy	true
High Speed	false

Error Codes

Name	Code	Description

Service Characteristics

<table>
<tr><th>Overview</th><th>Properties</th><th>Security</th><th>Descriptors</th></tr>
<tr>
<td>Name:
Helen Measurement
Requirement:
Optional</td>
<td>
<table>
<tr><th>Property</th><th>Requirement</th></tr>
<tr><td>Read</td><td>Excluded</td></tr>
<tr><td>Write</td><td>Excluded</td></tr>
<tr><td>WriteWithoutResponse</td><td>Excluded</td></tr>
<tr><td>SignedWrite</td><td>Excluded</td></tr>
<tr><td>Notify</td><td>Mandatory</td></tr>
<tr><td>Indicate</td><td>Excluded</td></tr>
<tr><td>WriteableAuxiliaries</td><td>Excluded</td></tr>
<tr><td>Broadcast</td><td>Excluded</td></tr>
<tr><td>ExtendedProperties</td><td></td></tr>
</table>
</td>
<td>None</td>
<td>
<table>
<tr><th>Overview</th><th>Permissions</th></tr>
<tr>
<td>Name:
Client Characteristic Configuration
Requirement:
Mandatory</td>
<td>
<table>
<tr><th>Perm.</th><th>Req.</th></tr>
<tr><td>Read</td><td>Mandatory</td></tr>
<tr><td>Write</td><td>Mandatory</td></tr>
</table>
</td>
</tr>
</table>
</td>
</tr>
<tr>
<td>Name:
Helen Feature
Requirement:
Mandatory</td>
<td>
<table>
<tr><th>Property</th><th>Requirement</th></tr>
<tr><td>Read</td><td>Mandatory</td></tr>
<tr><td>Write</td><td>Excluded</td></tr>
<tr><td>WriteWithoutResponse</td><td>Excluded</td></tr>
<tr><td>SignedWrite</td><td>Excluded</td></tr>
<tr><td>Notify</td><td>Excluded</td></tr>
<tr><td>Indicate</td><td>Excluded</td></tr>
<tr><td>WriteableAuxiliaries</td><td>Excluded</td></tr>
<tr><td>Broadcast</td><td>Excluded</td></tr>
<tr><td>ExtendedProperties</td><td></td></tr>
</table>
</td>
<td>None</td>
<td>None</td>
</tr>
<tr>
<td>Name:
Helen Modes
Requirement:
Mandatory</td>
<td>
<table>
<tr><th>Property</th><th>Requirement</th></tr>
<tr><td>Read</td><td>Mandatory</td></tr>
<tr><td>Write</td><td>Optional</td></tr>
<tr><td>WriteWithoutResponse</td><td>Excluded</td></tr>
<tr><td>SignedWrite</td><td>Excluded</td></tr>
<tr><td>Notify</td><td>Excluded</td></tr>
<tr><td>Indicate</td><td>Excluded</td></tr>
<tr><td>WriteableAuxiliaries</td><td>Excluded</td></tr>
<tr><td>Broadcast</td><td>Excluded</td></tr>
<tr><td>ExtendedProperties</td><td></td></tr>
</table>
</td>
<td>Optional for write property</td>
<td>None</td>
</tr>
</table>

<table>
<tr>
<td>Name:
Helen Control Point
Requirement:
Mandatory</td>
<td>
<table>
<tr><th>Property</th><th>Requirement</th></tr>
<tr><td>Read</td><td>Excluded</td></tr>
<tr><td>Write</td><td>Mandatory</td></tr>
<tr><td>WriteWithoutResponse</td><td>Excluded</td></tr>
<tr><td>SignedWrite</td><td>Excluded</td></tr>
<tr><td>Notify</td><td>Excluded</td></tr>
<tr><td>Indicate</td><td>Mandatory</td></tr>
<tr><td>WriteableAuxiliaries</td><td>Excluded</td></tr>
<tr><td>Broadcast</td><td>Excluded</td></tr>
<tr><td>ExtendedProperties</td><td></td></tr>
</table>
</td>
<td>Optional</td>
<td>
<table>
<tr><th>Overview</th><th>Permissions</th></tr>
<tr><td>Name:
Client Characteristic Configuration
Requirement:
Mandatory</td><td>
<table>
<tr><th>Perm.</th><th>Req.</th></tr>
<tr><td>Read</td><td>Mandatory</td></tr>
<tr><td>Write</td><td>Mandatory</td></tr>
</table>
</td></tr>
</table>
</td>
</tr>
<tr>
<td>Name:
Helen Support
Requirement:
Mandatory</td>
<td>
<table>
<tr><th>Property</th><th>Requirement</th></tr>
<tr><td>Read</td><td>Excluded</td></tr>
<tr><td>Write</td><td>Excluded</td></tr>
<tr><td>WriteWithoutResponse</td><td>Excluded</td></tr>
<tr><td>SignedWrite</td><td>Excluded</td></tr>
<tr><td>Notify</td><td>Mandatory</td></tr>
<tr><td>Indicate</td><td>Excluded</td></tr>
<tr><td>WriteableAuxiliaries</td><td>Excluded</td></tr>
<tr><td>Broadcast</td><td>Excluded</td></tr>
<tr><td>ExtendedProperties</td><td></td></tr>
</table>
</td>
<td>Optional</td>
<td>
<table>
<tr><th>Overview</th><th>Permissions</th></tr>
<tr><td>Name:
Client Characteristic Configuration
Requirement:
Mandatory</td><td>
<table>
<tr><th>Perm.</th><th>Req.</th></tr>
<tr><td>Read</td><td>Mandatory</td></tr>
<tr><td>Write</td><td>Mandatory</td></tr>
</table>
</td></tr>
</table>
</td>
</tr>
</table>

Helen Measurement

Characteristic UUID: 0x0302

Summary:

The Helen Measurement characteristic is a variable length structure containing a Flags field and, based on the contents of the Flags field, may contain one or more additional fields as shown in the table below.

Value Fields

<table>
<tr><th>Names</th><th>Field Req.</th><th>Format</th><th>Additional Information</th></tr>
<tr><td>tbd.</td><td>Mandatory</td><td>8bit</td><td>set to 0 until defined</td></tr>
<tr><td>Flags</td><td>Mandatory</td><td>8bit</td><td>Bit Field
<table>
<tr><th>Bit</th><th>Size</th><th>Name</th><th>Definition</th></tr>
<tr><td>0</td><td>1</td><td>output power present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>1</td><td>1</td><td>temperature present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>2</td><td>1</td><td>input voltage present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>3</td><td>1</td><td>SOC present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>4</td><td>4</td><td>reserved for future use</td><td></td></tr>
</table></td></tr>
<tr><td>Mode</td><td>Mandatory</td><td>8bit</td><td>OFF: 255;
SOS: 254;
ON: 0..n₋₁</td></tr>
<tr><td>Output Power
Information:
Unit is in watts with a resolution of 1/1000.
Unit:
org.bluetooth.unit.power.watt
Exponent: Decimal, -3</td><td>Optional</td><td>uint16</td><td></td></tr>
<tr><td>Temperature
Information:
Unit is in degree Cesius with a resolution of 1..
Unit:
org.bluetooth.unit.thermodynamic_temperature.degree_celcius
Exponent: Decimal, 0</td><td>Optional</td><td>int8</td><td></td></tr>
</table>

Input Voltage **Information:** Unit is in volts with a resolution of 1/1000. **Unit:** org.bluetooth.unit.electric_potential_difference.volt **Exponent:** Decimal, -3	Optional	uint16	
State of charge **Information:** Unit is in percent with a resolution of 0.5 **Unit:** org.bluetooth.unit.percentage **Exponent:** Binary, -1	Optional	uint8	

Helen Feature

Characteristic UUID: 0x0303

Summary:

The Helen Feature characteristic is used to report a list of features supported by the device.

Value Fields

<table>
<tr><th>Names</th><th>Field Req.</th><th>Format</th><th>Additional Information</th></tr>
<tr><td>Mode Count</td><td>Mandatory</td><td>8bit</td><td>the number of available modes</td></tr>
<tr><td>Channel Count</td><td>Mandatory</td><td>8bit</td><td>the number of available channels</td></tr>
<tr><td>Channel Size</td><td>Mandatory if Channel Count > 0, otherwise excluded</td><td>16bit</td><td>this field is present as array, one for each channel
Bit Field
<table>
<tr><th>Bit</th><th>Size</th><th>Name</th><th>Definition</th></tr>
<tr><td>0</td><td>8</td><td>channel bitsize</td><td>the total size in bits of the Channels Configuration Field for this channel</td></tr>
<tr><td>8</td><td>4</td><td>special feature bitsize</td><td>the number of bits used for special feature</td></tr>
<tr><td>12</td><td>4</td><td>channel description</td><td>
<table>
<tr><th>Key</th><th>Name</th><th>Additional Information</th></tr>
<tr><td>0</td><td>User</td><td>user specific channel</td></tr>
<tr><td>1</td><td>Current</td><td>current regulated channel</td></tr>
<tr><td>2</td><td>Voltage</td><td>voltage regulated channel</td></tr>
<tr><td>3</td><td>PWM</td><td>PWM channel</td></tr>
<tr><td>4</td><td>Switch</td><td>on/off channel</td></tr>
<tr><td>5-15</td><td>reserved for future use</td><td></td></tr>
</table>
</td></tr>
</table>
</td></tr>
<tr><td>Features</td><td>Mandatory</td><td>16bit</td><td>Bit Field
<table>
<tr><th>Bit</th><th>Size</th><th>Name</th><th>Definition</th></tr>
<tr><td>0</td><td>1</td><td>mode set supported</td><td>
<table>
<tr><td>0</td><td>False</td></tr>
<tr><td>1</td><td>True</td></tr>
</table>
</td></tr>
<tr><td>1</td><td>1</td><td>search request supported</td><td>
<table>
<tr><td>0</td><td>False</td></tr>
<tr><td>1</td><td>True</td></tr>
</table>
</td></tr>
<tr><td>2</td><td>1</td><td>factory reset supported</td><td>
<table>
<tr><td>0</td><td>False</td></tr>
<tr><td>1</td><td>True</td></tr>
</table>
</td></tr>
<tr><td>3</td><td>1</td><td>mode override supported</td><td>
<table>
<tr><td>0</td><td>False</td></tr>
<tr><td>1</td><td>True</td></tr>
</table>
</td></tr>
<tr><td>4</td><td>12</td><td>reserved for future use</td><td></td></tr>
</table>
</td></tr>
</table>

Helen Modes

Characteristic UUID: 0x0304

Summary:

The Helen Modes characteristic is used to modify the modes of the device.

Value Fields

<table>
<tr><th>Names</th><th>Field Req.</th><th>Format</th><th>Additional Information</th></tr>
<tr><td>Mode Configuration</td><td>Mandatory</td><td>16bit</td><td>This field is present as array, one field for each mode

Bit Field
<table>
<tr><th>Bit</th><th>Size</th><th>Name</th><th>Definition</th></tr>
<tr><td>0</td><td>1</td><td>ignore</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>1</td><td>1</td><td>First_In_Group</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>2</td><td>1</td><td>Last_In_Group</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>3</td><td>1</td><td>Is_Preferred_Mode</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>4</td><td>1</td><td>Is_Temporary_Mode</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>5</td><td>1</td><td>Is_Off_Mode</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>6</td><td>10</td><td>reserved for future use</td><td></td></tr>
</table>
</td></tr>
</table>

<table>
<tr>
<td>Channels Configuration</td>
<td>Optional</td>
<td>Variable</td>
<td>This field is present as two-dimensional array, one for each channel and mode.

[channel 0][mode 0]
[channel 0][mode 1]
[channel 0][mode 2]
…
[channel 1][mode 0]
[channel 1][mode 1]
[channel 1][mode 2]
…
[channel 2][mode 0]
[channel 2][mode 1]
[channel 2][mode 2]
…
…

Bit Field
<table>
<tr><th>Bit</th><th>Size</th><th>Name</th></tr>
<tr><td>0</td><td>channel bitsize – special feature bitsize</td><td>intensity</td></tr>
<tr><td>channel bitsize – special feature bitsize</td><td>special feature bitsize</td><td>modus</td></tr>
</table>
</td>
</tr>
</table>

Helen Control Point

Characteristic UUID: 0x0305

Summary:

The Helen Control Point characteristic is used to request a specific function to be executed on the receiving device.

Value Fields

<table>
<tr><th>Names</th><th>Field Req.</th><th>Format</th><th>Additional Information</th></tr>
<tr><td>Op codes</td><td>Mandatory</td><td>uint8</td><td>Enumerations
<table>
<tr><th>Key</th><th>Value</th><th>Description</th></tr>
<tr><td>1</td><td>request mode</td><td>Request the current mode. The response to this control point is Op Code 0x20 followed by the current mode</td></tr>
<tr><td>2</td><td>set mode</td><td>Set mode command. The response to this control point is Op Code 0x20</td></tr>
<tr><td>3</td><td>request search</td><td>Initiate the procedure to start the search for a remote or other compatible light. The response to this control point is Op Code 0x20.</td></tr>
<tr><td>5</td><td>factory reset</td><td>Initiate the procedure to perform a factory reset The response to this control point is Op Code 0x20. If the current connection is bonded, the device will disconnect.</td></tr>
<tr><td>8</td><td>override mode</td><td>Temporary override the channel configuration for the current mode with the given one.</td></tr>
<tr><td>32</td><td>Response Code</td><td>The response code is followed by the requested Op Code, the response value and optionally the response parameter</td></tr>
<tr><td>0, 4, 7, 9-31, 33-255</td><td>Reserved for future use</td><td></td></tr>
</table></td></tr>
<tr><td>mode</td><td>Mandatory for “set mode” Op code, otherwise excluded</td><td>uint8_t</td><td></td></tr>
<tr><td>channel configuration</td><td>Mandatory for “override mode” Op code, otherwise excluded</td><td>Variable</td><td>A list of channel configurations for each channel</td></tr>
</table>

<table>
<tr><td>Request Op Code</td><td>Mandatory for "Response Code" Op Code, otherwise this field is Excluded.</td><td>uint8</td><td>Refer to the Op Code table above for additional information on the possible values for this filed</td></tr>
<tr><td>Response Value</td><td>Mandatory for "Response Code" Op Code, otherwise this field is Excluded.</td><td>uint8</td><td>Enumerations<table><tr><th>Key</th><th>Value</th><th>Description</th></tr><tr><td>1</td><td>Success</td><td>Response for successful operation.</td></tr><tr><td>2</td><td>Op Code not supported</td><td>Response if unsupported Op Code is received.</td></tr><tr><td>3</td><td>Invalid Parameter</td><td>Response if Parameter received does not meet the requirements of the service or is outside of the supported range</td></tr><tr><td>4</td><td>Operation Failed</td><td>Response if the requested procedure failed</td></tr><tr><td>0-0</td><td>Reserved for future use</td><td></td></tr><tr><td>5-255</td><td>Reserved for future use</td><td></td></tr></table></td></tr>
<tr><td>mode</td><td>Mandatory for "Response Code" Op Code with “request mode” Request Op Code, otherwise this field is Excluded.</td><td>uint8_t</td><td></td></tr>
</table>

Helen Support

Characteristic UUID: 0x0306

Summary:

The Helen Support characteristic is a variable length structure containing a Flags field and, based on the contents of the Flags field, may contain one or more additional fields as shown in the table below.

Value Fields

<table>
<tr><th>Names</th><th>Field Req.</th><th>Format</th><th>Additional Information</th></tr>
<tr><td>Flags</td><td>Mandatory</td><td>16bit</td><td>Bit Field
<table>
<tr><th>Bit</th><th>Size</th><th>Name</th><th>Definition</th></tr>
<tr><td>0</td><td>1</td><td>time reference present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>1</td><td>1</td><td>brake indication timestamp present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>2</td><td>1</td><td>left indicator timestamp present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>3</td><td>1</td><td>right indicator timestamp present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>4</td><td>1</td><td>inclination present</td><td><table><tr><td>0</td><td>False</td></tr><tr><td>1</td><td>True</td></tr></table></td></tr>
<tr><td>5</td><td>11</td><td>reserved for future use</td><td></td></tr>
</table></td></tr>
<tr><td>Time reference
Information:
Unit is in seconds with a resolution of 1/1024.
Unit:
org.bluetooth.unit.time.second
Exponent: Binary, -10</td><td>Mandatory if brake indication, left indicator or right indicator timestamp is present, otherwise optional for central, excluded for peripherals</td><td>uint16</td><td>This represents the local timestamp at the server side.

A Central shall send their reference to connected peripherals. A connected peripheral shall synchronize their local timestamp to the received timestamp.

When sending a brake, left or right indicator stop timestamp, the server shall also include their timestamp so that the client is able to determine the duration of the indication.</td></tr>
<tr><td>Brake Indication Stop timestamp
Information:
Unit is in seconds with a resolution of 1/1024.
Unit:
org.bluetooth.unit.time.second
Exponent: Binary, -10</td><td>Optional</td><td>uint16</td><td>tbd.</td></tr>
</table>

Left Indicator Stop Timestamp **Information:** Unit is in seconds with a resolution of 1/1024. **Unit:** org.bluetooth.unit.time.second **Exponent:** Binary, -10	Optional	uint16	tbd.
Right Indicator Stop Timestamp **Information:** Unit is in seconds with a resolution of 1/1024. **Unit:** org.bluetooth.unit.time.second **Exponent:** Binary, -10	Optional	uint16	tbd.
Inclination **Information:** Unit is in degree with a resolution of 1/100. **Unit:** org.bluetooth.unit.plane_angle.degree **Exponent:** Decimal, -2	Optional	int16	tbd.