KD2 Control Service

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

Service UUID: 0x0501

Abstract:

This service exposes board specific 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	Excluded
Indications	Mandatory
Read Characteristic Descriptors	Mandatory
Write Characteristic Descriptors	Mandatory

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:
KD2 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:
KD2 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>
</table>

KD2 Feature

Characteristic UUID: 0x0502

Summary:

The KD2 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>Configuration Features</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>channel configuration 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>com pin mode 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>internal compensation 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>external (Helena driver board) compensation 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>4</td><td>reserved for future use</td><td></td></tr>
</table></td></tr>
<tr><td>Channel Features</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>adaptive channel 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>7</td><td>reserved for future use</td><td></td></tr>
</table></td></tr>
</table>

KD2 Control Point

Characteristic UUID: 0x0503

Summary:

The KD2 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 channel configuration</td><td>Request a channel configuration. The desired channel is sent as an uint8 with preceding Op Code 0x01. The response is Op Code 0x20 followed by the channel configuration.
See Table 1: channel configuration for configuration definition</td></tr>
<tr><td>2</td><td>set channel configurations</td><td>Initiate the procedure to configure a channel. The new channel configuration is with preceding Op Code 0x02 operand. The response to this control point is Op Code 0x20.
See Table 1: channel configuration for configuration definition</td></tr>
<tr><td>3</td><td>request Com pin configuration</td><td>Request the current Com pin configuration setup. The response is Op Code 0x20 followed by the current configuration.
See Table 2: com pin enumeration for com pin definitions.</td></tr>
<tr><td>4</td><td>set Com pin configuration</td><td>Initiate the procedure to change the Com pin configuration. The new configuration is sent with preceding Op Code 0x08. The response to this control point is Op Code 0x20.
See Table 2: com pin enumeration for com pin definitions.</td></tr>
</table></td></tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td></td>
<td>
<table>
<tr><td>5</td><td>request internal compensation</td><td>Request the internal compensation values. The response is Op Code 0x20 followed by compensation values.
See Table 3: internal compensation for internal compensation value definitions.</td></tr>
<tr><td>6</td><td>set internal compensation</td><td>Initiate the procedure to set the internal compensation values. The new compensation values are sent with preceding Op Code 0x0A. The response to this control point is 0x20.
See Table 3: internal compensation for internal compensation value definitions.</td></tr>
<tr><td>7</td><td>request external (Helena driver board) compensation</td><td>Request the compensation values of connected Helena driver board. The response is Op Code 0x20 followed by compensation values.
See Table 4: Helena driver board compensation for external compensation value definitions.</td></tr>
<tr><td>8</td><td>set external (Helena driver board) compensation values</td><td>Initiate the procedure to set the internal compensation values. The new compensation values are sent with preceding Op Code 0x0A. The response to this control point is 0x20.
See Table 4: Helena driver board compensation for external compensation value definitions</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>0-0</td><td>Reserved for future use</td><td></td></tr>
<tr><td>13-31</td><td>Reserved for future use</td><td></td></tr>
<tr><td>33-255</td><td>Reserved for future use</td><td></td></tr>
</table>
</td>
</tr>
<tr><td>Parameter Value</td><td>Optional</td><td>variable</td><td>Refer to the Op Code table above for additional information on the possible values for this filed</td></tr>
<tr><td>Request Op Code
Information:
The Request Op Code is a sub field of the Parameter Value for "Response Code" Op Code.
C1: This Field is Mandatory for "Response Code" Op Code, otherwise this field is Excluded.</td><td>C1</td><td>uint8</td><td>Refer to the Op Code table above for additional information on the possible values for this filed</td></tr>
</table>

<table>
<tr>
<td>Response Value
Information:
The Request Op Code is a sub field of the Parameter Value for "Response Code" Op Code.
C1: This Field is Mandatory for "Response Code" Op Code, otherwise this field is Excluded.</td>
<td>C1</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>Response Parameter
Information:
The Response Parameter is a sub field of the Parameter Value for "Response Code" Op Code.
C2:This Field is Optional for "Response Code" Op Code, otherwise this field is Excluded.</td>
<td>C2</td>
<td>variable</td>
<td>Note: The Response Parameter Value of the response to the Control Point is a variable length field to allow a list of different values defined by the Service Specification</td>
</tr>
</table>

<table>
<tr><th>Name</th><th>Format</th><th>Additional Information</th></tr>
<tr><td>Full Output Power
Information:
Unit is in watts with a resolution of 1/1000.
Unit:
org.bluetooth.unit.power.watt
Exponent: Decimal, -3</td><td>uint16</td><td>valid range: 0 .. 40W</td></tr>
<tr><td>Output Limit
Information:
Unit is is in percentage with a resolution of 1, in relation to maximum output power.
Unit:
org.bluetooth.unit.percentage
Exponent: Decimal, 0</td><td>uint8</td><td>valid range: 0..100%</td></tr>
<tr><td>Optic Type
Information:
Unit-less with a resolution of 1/128
Exponent: Binary, -7</td><td>uint8</td><td>enumeration:<table><tr><th>Key</th><th>Name</th><th>Additional Information</th></tr><tr><td>0</td><td>non-applicable</td><td>to use if channel is not equipped with an optic</td></tr><tr><td>1</td><td>15° optic</td><td></td></tr><tr><td>2</td><td>22° optic</td><td></td></tr><tr><td>3</td><td>30° optic</td><td></td></tr><tr><td>4-255</td><td>Reserved for future use</td><td></td></tr></table></td></tr>
<tr><td>Optic Offset
Information:
Unit is in degree with a resolution of 1/100.
Unit:
org.bluetooth.unit.plane_angle.degree
Exponent: Decimal, -2</td><td>int16</td><td>valid range: -180..180°</td></tr>
</table>

Table 1: channel configuration

Key	Name	Additional Information
0	not used	com pin not used
1	com	com pin used for communication
2	button	com pin used as external button
3	pwm	com pin used as active low open drain PWM signal
4-255	Reserved for future use	

Table 2: com pin enumeration

Name	Format	Additional Information
voltage gain factor	uint16	not used yet
voltage offset	int16	not used yet
current gain factor **Information:** Unit-less with a resolution of 1/32768 **Exponent:** Binary, -15	uint16	
current offset	int16	not used yet
temperature gain factor	uint16	not used yet
temperature offset **Information:** Unit is in degree Celcius with a resolution of 1/128 Unit: org.bluetooth.unit.thermodynamic_temperature.degree_celsius **Exponent:** Binary, -7	int16	

Table 3: internal compensation

Name	Format	Additional Information
temperature offset **Information:** Unit is in degree Celcius with a resolution of 1/4 Unit: org.bluetooth.unit.thermodynamic_temperature.degree_celsius **Exponent:** Binary, -2	int16	
left side current gain factor **Information:** Unit-less with a resolution of 1/128 **Exponent:** Binary, -7	uint8	
right side current gain factor **Information:** Unit-less with a resolution of 1/128 **Exponent:** Binary, -7	uint8	

Table 4: Helena driver board compensation