



## CSR Synergy Bluetooth 18.2.0

HIDD

### Demo Description

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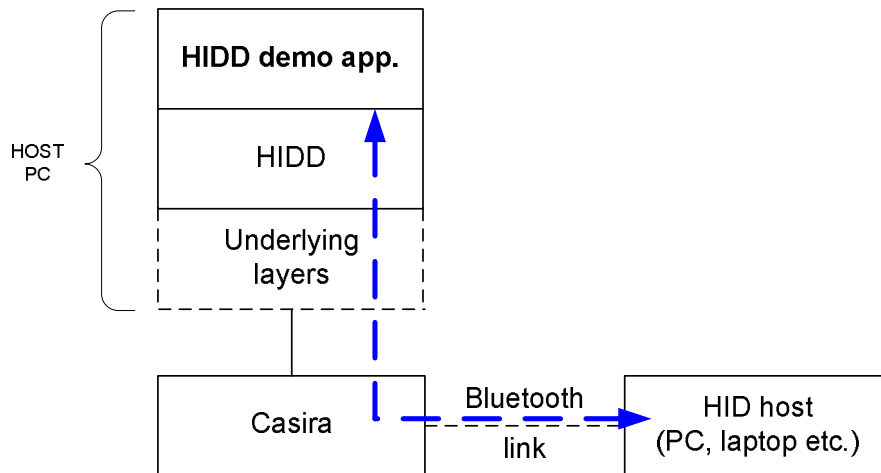
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# 1 Human Interface Device Profile for Device part (HIDD)

## 1.1 Generally

The HIDD demo application can be used for establishing a HID connection with a HID host, e.g. a PC or a laptop. The purpose of the demo application is to show that the HID device profile (HIDD) developed by CSR is compliant with other HID hosts and the specification proposed by the Bluetooth SIG. Furthermore, the demo application can be considered as an example of how to utilize the HIDD API.



The figure above shows the physical setup of the demo application scenario. The HID host is connected to via a Casira Bluetooth development kit to a host PC running the host stack and the HIDD demo application.

The application has been made to run on Windows and Linux and may be connected to the Casira using either a serial connection using BCSP (`rfc_hidd_demo_app.exe`), a serial connection using H4DS (`rfc_hidd_demo_app_h4ds.exe`) or an USB connection (`rfc_hidd_demo_app_usb.exe`).

The HIDD demo application and the underlying layers are all running in the same process. The HIDD signalling consists of:

- 1) Activation/Deactivation/Unplug signals
- 2) Low Power signals
- 3) Data and Control signals

### Use of Program `hci_hidd_demo_app.exe`

**NOTE:** This description is for CSR Synergy Bluetooth HCI using BCSP over UART as host transport. The functionality of the application is independent from the used host; the only difference is the naming of the application. Note, that HIDD cannot be used with RFCOMM-builds due to limitations in handling the large SDP records used by typical HID devices.

#### Start the program `hci_hidd_demo_app.exe`:

The `hci_hidd_demo_app.exe` program must be executed using certain execution parameters. This can be done using e.g. a 'command prompt'. The following parameters must be specified:

- B <baudrate> specifies the baud rate for the COM port connected to the Casira. If no parameter is given, the default value of 115200 baud will be used.
- C <COM port> specifies the COM port number connected to the Casira. If no parameter is specified, com1 will be used as default value.
- A <BD addr.> specifies the Bluetooth address of the remote device used for the default connection. This parameter is optional.

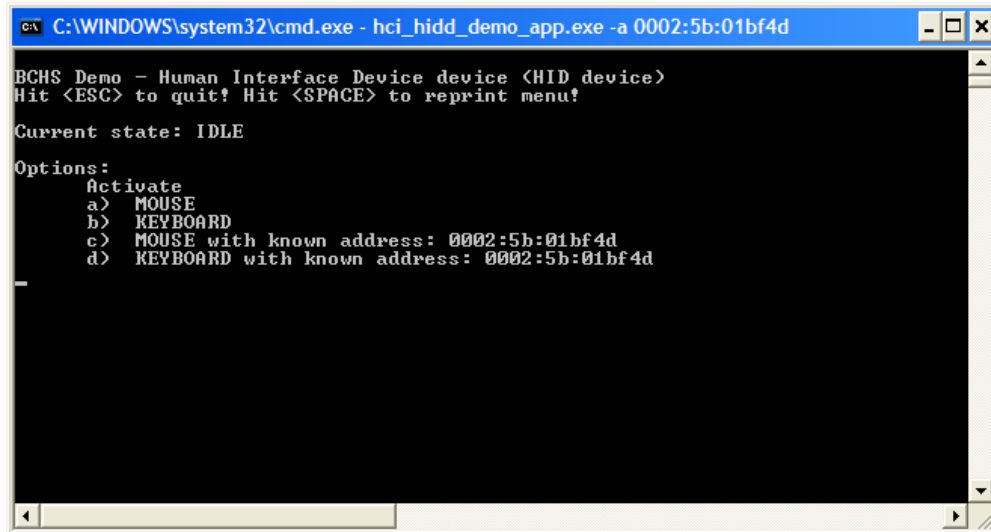
An example of the program execution using com6 with baud rate 921600 is given below:

```
hci_HIDD_demo_app.exe -B 921600 -C com6
```

**NOTE:** If USB is used for host transport, the application (hci\_hidd\_demo\_app\_usb.exe) should be started without any parameters, except the optional '-A' parameter.

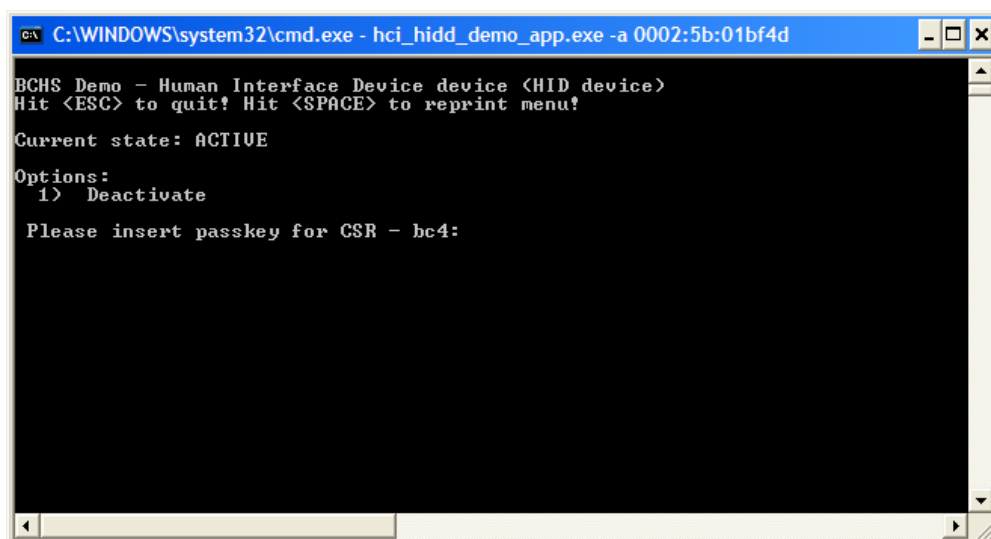
Using the HIDD demo application:

Once the application is started the following screen appears, when started with the optional Bluetooth address:



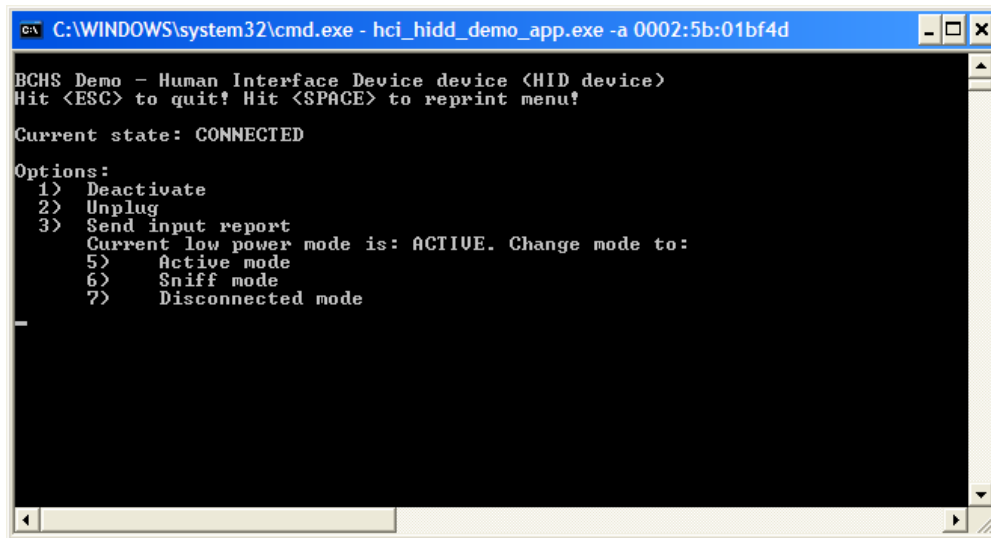
A valid use of the demo application follows the below procedure:

- Activation of a HID mouse device simulation. The mouse service record registers and activates to accept connections from a host.
- Activation of a HID keyboard device simulation. The Keyboard service record registers and activates to accept connections from a host.
- Activation of HID Mouse device with known address. Dependent on the HID flags in the service record the device will either connect to the known host or act as case a).
- Activation of HID Keyboard device with known address. Dependent on the HID flags in the service record the device will either connect to the known host or act as case b).



If a passkey is requested, enter the code entered on the host. A passkey is only required if the HID device requires it and the devices have not previously bonded. Entering the passkey will enable encryption of the Bluetooth connection.

When connected the following screen appears:



```

C:\WINDOWS\system32\cmd.exe - hci_hidd_demo_app.exe -a 0002:5b:01bf4d

BCHS Demo - Human Interface Device device (HID device)
Hit <ESC> to quit! Hit <SPACE> to reprint menu!

Current state: CONNECTED

Options:
1) Deactivate
2) Unplug
3) Send input report
   Current low power mode is: ACTIVE. Change mode to:
   5) Active mode
   6) Sniff mode
   7) Disconnected mode
  
```

The user options when connected are as follows:

- 1) Deactivate the HID device service.
- 2) Unplug the device connected to, i.e. the device disconnects and unregisters the service.
- 3) Send an input report to the host, this displays a screen with report options, see below.

The next three options are to control low power mode:

- 5) Request Activate mode on the link.
- 6) Request Sniff mode on the link.
- 7) Request the link to be disconnected. A new screen appears when disconnected, see below.

When selected to send an input report to the host, the following screen is displayed for HID Keyboard device:



```

C:\WINDOWS\system32\cmd.exe - hci_hidd_demo_app.exe -a 0002:5b:01bf4d
BCHS Demo - Human Interface Device device <HID device>
Hit <ESC> to quit! Hit <SPACE> to reprint menu!

Current state: CONNECTED
x) Empty
z) c
s) s
r) r
q) SHIFT
w) CTRL
e) ALT
t) BACKSPACE
y) SPACE
u) Arrow UP

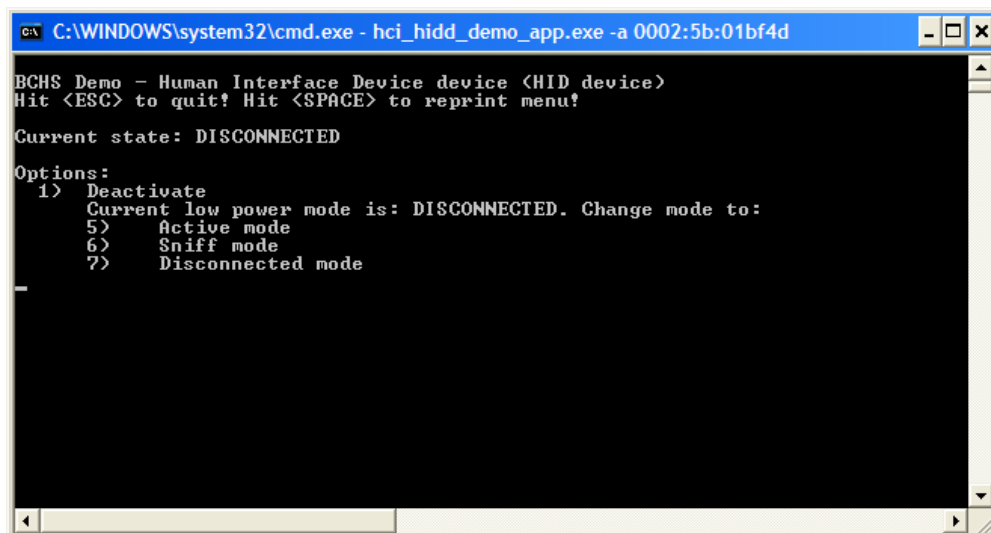
HIDD_DATA_CFM
HIDD_DATA_CFM
HIDD_DATA_CFM
HIDD_DATA_CFM
HIDD_DATA_CFM
HIDD_DATA_CFM
HIDD_DATA_CFM

```

The options are as follows for HID Keyboard device:

- x) An empty report is sent to the host, normally this is sent after each other normal key press.
- z) A capitalised 'C' key press report.
- s) A capitalised 'S' key press report.
- r) A capitalised 'R' key press report.
- q) A 'shift' key press report.
- w) A 'ctrl' key press report.
- e) A 'alt' key press report.
- t) A 'backspace' key press report.
- y) A 'space' key press report.
- u) An 'arrow up' key press report

The report is sent to the host and a CSR\_BT\_HIDD\_DATA\_CFM is received before the next report can be sent. When low power mode option DISCONNECT is selected, the following screen is displayed:



```

C:\WINDOWS\system32\cmd.exe - hci_hidd_demo_app.exe -a 0002:5b:01bf4d
BCHS Demo - Human Interface Device device <HID device>
Hit <ESC> to quit! Hit <SPACE> to reprint menu!

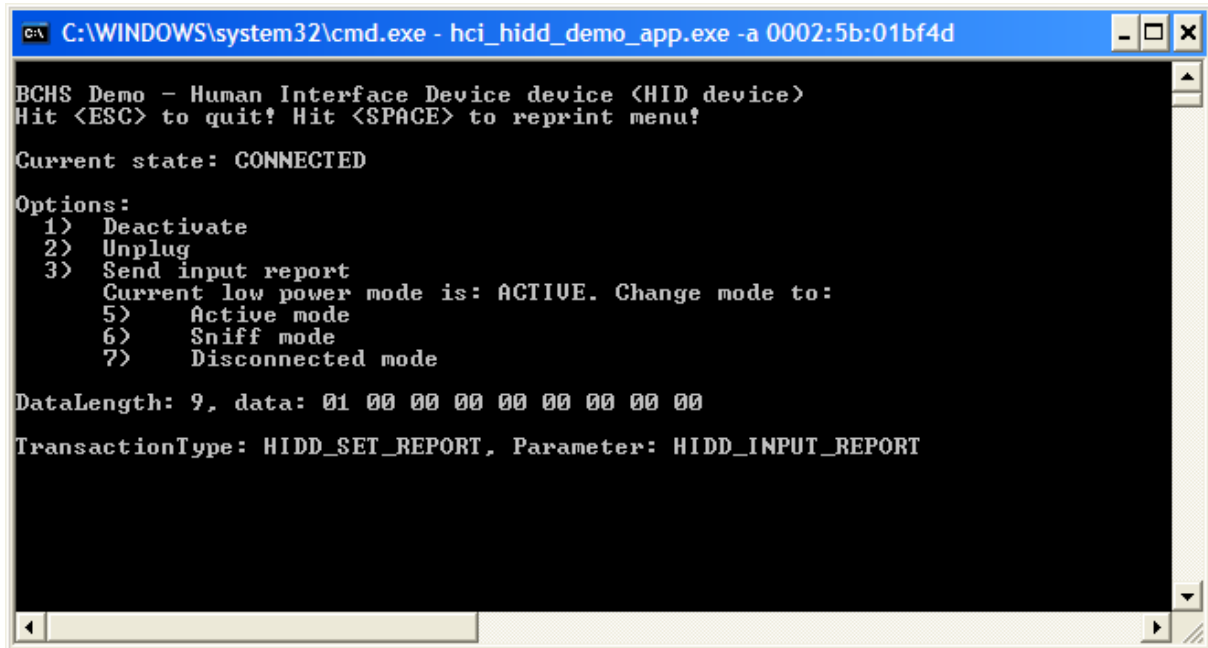
Current state: DISCONNECTED

Options:
1) Deactivate
   Current low power mode is: DISCONNECTED. Change mode to:
5) Active mode
6) Sniff mode
7) Disconnected mode

```

The only options are to deactivate or change the low power mode back into Active or Sniff.

When connected the controls sent from the host are printed on the screen, with data length, data sequence, transaction type and parameter.



```

C:\WINDOWS\system32\cmd.exe - hci_hidd_demo_app.exe -a 0002:5b:01bf4d

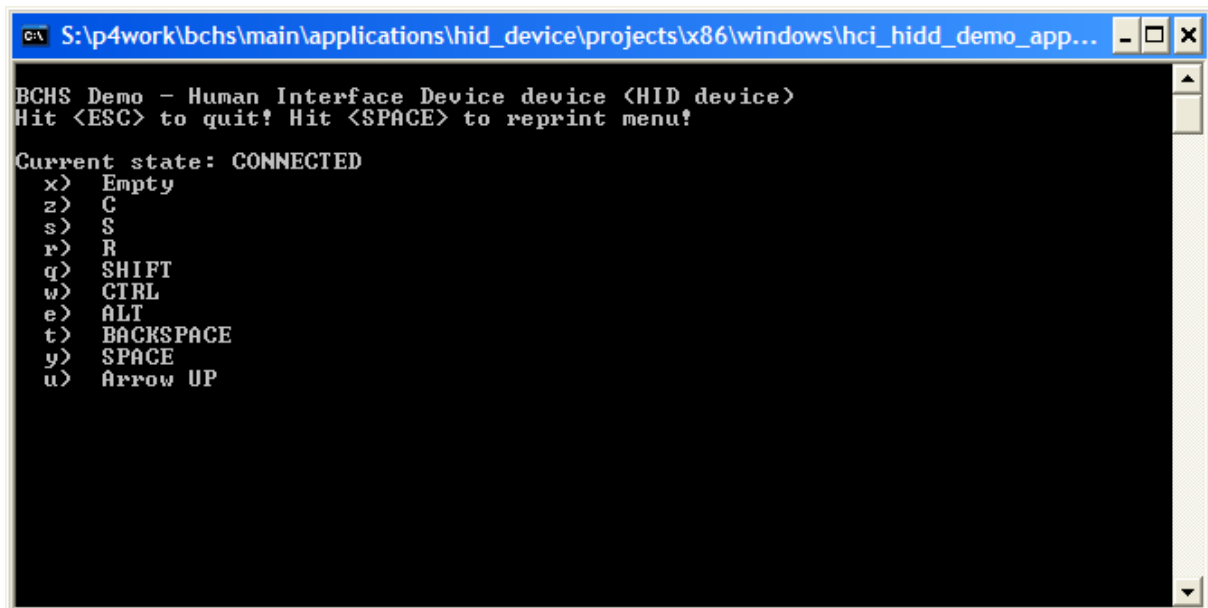
BCHS Demo - Human Interface Device device <HID device>
Hit <ESC> to quit! Hit <SPACE> to reprint menu!

Current state: CONNECTED

Options:
1> Deactivate
2> Unplug
3> Send input report
   Current low power mode is: ACTIVE. Change mode to:
5> Active mode
6> Sniff mode
7> Disconnected mode

DataLength: 9, data: 01 00 00 00 00 00 00 00 00
TransactionType: HIDD_SET_REPORT, Parameter: HIDD_INPUT_REPORT
  
```

When the host requests GET\_REPORT, the following screen displays the options of which report to respond with:



```

S:\p4work\bchs\main\applications\hid_device\projects\x86\windows\hci_hidd_demo_app...

BCHS Demo - Human Interface Device device <HID device>
Hit <ESC> to quit! Hit <SPACE> to reprint menu!

Current state: CONNECTED

x> Empty
z> C
s> S
r> R
q> SHIFT
w> CTRL
e> ALT
t> BACKSPACE
y> SPACE
u> Arrow UP
  
```

The screen can be cleared and the main menu reprinted by pressing '<space>'.

## 2 Linux

This section describes how to build and run the HIDD demo application on Linux.

The basic HIDD demo application (pure user space), located in `./applications/hid_device`, may be compiled on Linux by means of:

```
> make clean all TARGET_ARCH=Linux-2.6-x86
```

This will output three files: `hci_hidd_demo_app`, `hci_hidd_demo_app_h4ds` and `hci_hidd_demo_app_usb`, for serial and USB communication respectively.

The demo applications are used like described above for Windows.



## Terms and Definitions

BlueCore®	Group term for CSR's range of Bluetooth wireless technology chips
Bluetooth®	Set of technologies providing audio and data transfer over short-range radio connections
CSR	Cambridge Silicon Radio
UniFi™	Group term for CSR's range of chips designed to meet IEEE 802.11 standards

## Document History

Revision	Date	History
1	26 SEP 11	Ready for release 18.2.0

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