Scope

This document describes how to test USB OTG HID mouse example.

Preparation

Host

A personal computer, which is running Windows Xp or Windows 7.

Device

- Two boards, i.e. two tower systems with twrk22f120m, which are running otg_hid_mouse example.
- An Usb mouse device (i.e. a Mitsumi USB mouse device)
- Jumper setting for Tower serial board is as following:
    - J10: Jumper is on 1-2.
    - J11: Jumper is on 5-6.
    - J16: Jumper is on 5-6.
- Jumper setting for TWR platforms
    - Twrk20d72m
        - J16, Jumper is on 5-6.
    - Twrk21d50m
        - J11, Jumper is on 5-6.
    - Twrk21f120m
        - J11, Jumper is on 5-6.
        - J24, Jumper is on 2-3.
    - Twrk22fn512r
        - J35, Jumper is on 1-2.
        - J3, Jumper is on 5-6.
    - Twrk24f120m
        - J26, Jumper is on 2-3.
        - J28, Jumper is on 1-2, 5-6.
    - Twrk64f120m
        - J19, Jumper is on 1-2.
        - J3, Jumper is on 5-6.
    - Twrk40x256
        - J3, Jumper is on 1-2.
    - Twrk40d100m
        - J2, Jumper is on 1-2.
    - Twrk53n512

        - J18, Jumper is on 1-2.
    - Twrk60n512
        - J1, Jumper is on 1-2.
    - Twrk60d100m
        - J4, Jumper is on 1-2.
    - Twrk60f120m
        - J1, Jumper is on 1-2.
    - Twrk70f120m
        - J1: Jumper is on 1-2.
- With platform have micro USB port; contribute vbus to micro USB port of TWR platforms (plug micro USB port of TWR platforms to the PC host).

Steps

Follow the steps to run the otg_hid_mouse demo.

1. Connect the two com ports of the two boards to two com ports of the PC.
2. Open the com ports in a terminal tool, i.e. Tera Term.
3. Power on the two boards.
4. Plug one board to the pc. The pc recognizes it as an USB mouse device and the mouse moves around the screen; the device function of the USB OTG HID has been tested, disconnect the board from the pc.
5. Plug the USB mouse device to one board, by an USB connector type A, the board now acts as an USB host mouse and it recognizes the USB mouse device.
6. Moves the USB mouse device, the terminal displays the mouse is moving; the host function of the USB OTG HID has been tested, disconnect the USB mouse device from the board.
7. Connect two boards together with an USB-OTG cable (this cable on one side has a Mini A plug and the other side has a Mini B plug).
8. The board that connects to A terminal of the cable (called the A device) acts as an USB mouse host and the board that connects to B terminal of the cable (called the B device) acts as an USB mouse device; the A device displays the mouse is moving on the the terminal tool.

- On the com port of the A device displays

```
>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized. USB HID Mouse

Waiting for USB Mouse to be attached...
```

```
----- Attach Event -----
State = 0 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2
Mouse device attached
----- Interfaced Event -----
get report descriptor done
Mouse interfaced, setting protocol...
setting protocol done
                    Right
                    Right
                    Right
                    Right
                    Right
```

- On the com port of the B device displays

```
>B: OTG state change to B peripheral.
>B: USB peripheral stack initialized.
 OTG App User Input Menu
    2. B bus request (HNP start)
begin to test mouse
```

9. On the com port of the B device, press ‘‘2” key, the B device requests the bus and would like to become host, the host and device functions are swapped between A and B device. A device now becomes A_PERIPHERAL and B device becomes B_HOST.

- On the com port of the B device displays

```
2
B bus request
>B: OTG is ready to initialize HNP.
>B: OTG has initialized the HNP to request the bus from Host
```

```
>B: OTG is in the Host state

>B: USB host stack initialized.USB HID Mouse

Waiting for USB Mouse to be attached...

----- Attach Event -----

State = 0 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

Mouse device attached

----- Interfaced Event -----

get report descriptor done

Mouse interfaced, setting protocol...

setting protocol done

                        Right

                        Right
```

- On the com port of the A device displays

```
>A: OTG_A_B_HNP_REQ

>A: OTG state change to A_SUSPEND

----- Detach Event -----

State = 7 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

>A: OTG state change to A_PERIPHERAL

>A: USB peripheral stack initialized.

 OTG App User Input Menu

    4. A bus request

    6. A set a bus drop true (session end)
```

10. On the com port of the B device, press ‘’3” key, the B device releases the Bus and becomes B_PERIPHERAL and A device becomes A_HOST.

- On the com port of the B device displays

```
3
```

```
B bus release

>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.

 OTG App User Input Menu

     2. B bus request (HNP start)

 tr cancel

 ----- Detach Event -----

 State = 6  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol =
2

 begin to test mouse
```

- On the com port of the A device displays

```
>A: OTG_A_BIDL_ADIS_TMOUT

>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized. USB HID Mouse

Waiting for USB Mouse to be attached...

----- Attach Event -----

State = 0 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

Mouse device attached

----- Interfaced Event -----

get report descriptor done

Mouse interfaced, setting protocol...

setting protocol done

                        Right

                        Right

                        Right
```

11. On the com port of the B device, press ‘’2” key again, the host and device functions are swapped between A and B device; A device becomes A_PERIPHERAL and B device becomes B_HOST. In the com port of the A device, press ‘’4” key, the A device requests the bus and would like to become host, the host and device functions are swapped between A and B device; A device becomes A_HOST and B device becomes B_PERIPHERAL. HNP function of the USB OTG HID has been tested.

- On the com port of the A device displays

```
>A: USB peripheral stack initialized.

 OTG App User Input Menu

    4. A bus request

    6. A set a bus drop true (session end)

 begin to test mouse

 4

A bus request

>A: OTG_A_BIDL_ADIS_TMOUT

>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized.USB HID Mouse

Waiting for USB Mouse to be attached...

----- Attach Event -----

State = 0 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

Mouse device attached

----- Interfaced Event -----

get report descriptor done

Mouse interfaced, setting protocol...

setting protocol done

                          Right
```

```
                    Right

                    Right
```

- On the com port of the B device displays

```
                    Right

                    Right

>B: OTG_B_A_HNP_REQ

>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.

 OTG App User Input Menu

    2. B bus request (HNP start)

 tr cancel

 ----- Detach Event -----

 State = 6  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol = 2

 begin to test mouse
```

12. On the com port of the A device, press ‘’6” key, V bus is dropped; A device becomes A_IDLE and B device become B_IDLE.

- On the com port of the A device displays

```
6

A set a bus drop true

>A: OTG state change to OTG_A_WAIT_VFALL

 tr cancel

 ----- Detach Event -----

 State = 6  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol = 2

>A: OTG state change to A_IDLE
```

- On the com port of the B device displays

```
>B: OTG is ready to initialize HNP.

>B: OTG state change to B idle

>B: OTG is ready to initialize SRP
```

13. On the com port of the A device, press ‘‘7” key, V bus is controlled by A device; A device becomes A_HOST and B device becomes B_PERIPHERAL.

- On the com port of the A device displays

```
7

A set a bus drop false

>A: OTG state change to A_WAIT_VRISE

>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized. USB HID Mouse

Waiting for USB Mouse to be attached...

----- Attach Event -----

State = 0 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

Mouse device attached

----- Interfaced Event -----

get report descriptor done

Mouse interfaced, setting protocol...

setting protocol done

                        Left

                        Left
```

- On the com port of the B device displays

```
>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.
```

```
 OTG App User Input Menu

    2. B bus request (HNP start)

begin to test mouse
```

14. On the com port of the A device, press ‘‘5” key, the A device release the bus; A device becomes A_IDLE and B device become B_IDLE.

- On the com port of the A device displays

```
5

A bus release

>A: OTG state change to A_SUSPEND

 tr cancel

 ----- Detach Event -----

 State = 6  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol =
2

>A: OTG_A_AIDL_BDIS_TMOUT

>A: OTG state change to OTG_A_WAIT_VFALL

>A: OTG state change to A_IDLE
```

- On the com port of the B device displays

```
>B: OTG is ready to initialize HNP.

>B: OTG state change to B idle

>B: OTG is ready to initialize SRP
```

15. On the com port of the A device, press ‘‘4” key, the A device request the bus; A device becomes A_HOST and B device become B_PERIPHERAL

- On the com port of the A device displays

```
4

A bus request

>A: OTG state change to A_WAIT_VRISE
```

```
>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized.

 USB HID Mouse

 Waiting for USB Mouse to be attached...

 ----- Attach Event -----

 State = 0  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol =
2

 Mouse device attached

 ----- Interfaced Event -----

 get report descriptor done

 Mouse interfaced, setting protocol...

 setting protocol done

 setting idle done
```

- On the com port of the B device displays

```
>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.

 OTG App User Input Menu

     2. B bus request (HNP start)

 begin to test mouse
```

16. On the com port of the A device, press ‘‘5” key, the A device release the bus; A device becomes A_IDLE and B device become B_IDLE. On the com port of the B device, press ‘‘1” key, the B device request a session; A device becomes A_ HOST and B device become B_ PERIPHERAL.

- On the com port of the B device displays

```
1

SRP request
```

```
>B: OTG has initialized SRP

>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.

 OTG App User Input Menu

     2. B bus request (HNP start)

begin to test mouse
```

- On the com port of the A device displays

```
>A: OTG state change to A_WAIT_VRISE

>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized.

 USB HID Mouse

 Waiting for USB Mouse to be attached...

 ----- Attach Event -----

 State = 0  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol =
2

 Mouse device attached



 ----- Interfaced Event -----

 get report descriptor done

 Mouse interfaced, setting protocol...

 setting protocol done

 setting idle done
```

17. Unplug the USB cable at B device side, wait until A device becomes A_IDLE and B device becomes B_IDLE.

- On the com port of the A device displays

```
----- Detach Event -----

State = 7 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

Going to idle state

>A: OTG state change to A_WAIT_BCON

>A: OTG_A_WAIT_BCON_TMOUT

>A: OTG state change to OTG_A_WAIT_VFALL

>A: OTG state change to A_IDLE
```

- On the com port of the B device displays

```
>B: OTG is ready to initialize HNP.

>B: OTG state change to B idle

>B: OTG is ready to initialize SRP
```

18. Plug the USB cable at B device side, on the com port of the B device, press ‘’1” key, the B device requests a session; A device becomes A_HOST and B device becomes B_PERIPHERAL. SRP function of the USB OTG HID has been tested.

- On the com port of the B device displays

```
1

SRP request

>B: OTG has initialized SRP

>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.

 OTG App User Input Menu

    2. B Bus request (HNP start)

begin to test mouse
```

- On the com port of the A device displays

```
>A: OTG state change to A_WAIT_VRISE
```

```
>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized.USB HID Mouse

Waiting for USB Mouse to be attached...

----- Attach Event -----

State = 0 Interface Number = 0 Alternate Setting = 0 Class = 3 SubClass = 1 Protocol = 2

Mouse device attached

----- Interfaced Event -----

get report descriptor done

Mouse interfaced, setting protocol...

setting protocol done

                        Right
```

19. Unplug the USB cable at B device side, wait until A device becomes A_IDLE and B device becomes B_IDLE. Plug the USB calbe at B device side, on the com port of the A device, press ‘’4” key, the A device requests the bus; A device becomes A_HOST and B device becomes B_PERIPHERAL.

- On the com port of the A device displays

```
4

A bus request

>A: OTG state change to A_WAIT_VRISE

>A: OTG state change to A_WAIT_BCON

>A: OTG state change to OTG_A_HOST

>A: USB host stack initialized.

 USB HID Mouse

 Waiting for USB Mouse to be attached...

 ----- Attach Event -----
```

```
State = 0  Interface Number = 0  Alternate Setting = 0  Class = 3  SubClass = 1  Protocol = 2

Mouse device attached

----- Interfaced Event -----

get report descriptor done

Mouse interfaced, setting protocol...

setting protocol done

setting idle done
```

- On the com port of the B device displays

```
>B: OTG state change to B peripheral.

>B: USB peripheral stack initialized.

 OTG App User Input Menu

    2. B Bus request (HNP start)

begin to test mouse
```

Note:

- On the com port of the A or B device, press “P” key to print the menu. The user can choose what key to press next to control the devices.

Known issue:

- Some platforms can’t perform SRP because the Vreg-in of these platforms is contributed by USB0_VBUS on TWR serial board; In A-idle state, the A device turns off vbus on USB port of TWR serial board, so the B device doesn’t have USB0_VBUS to perform SRP.

- List of platforms that can’t run SRP:

    - Twrk40x256
    - Twrk40d100m
    - Twrk53n512
    - Twrk60n512
    - Twrk60d100m
    - Twrk60f120m
    - Twrk70f120m