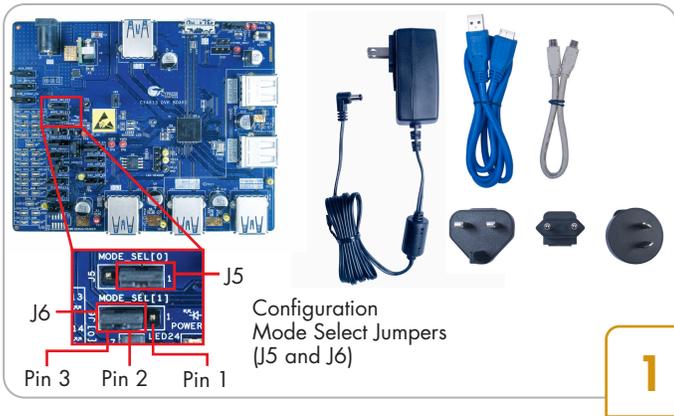
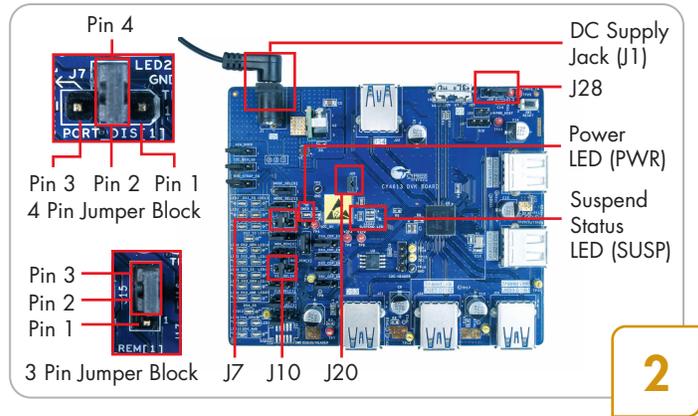


# HX3 USB 3.0 SHARED LINK™ HUB DEVELOPMENT KIT



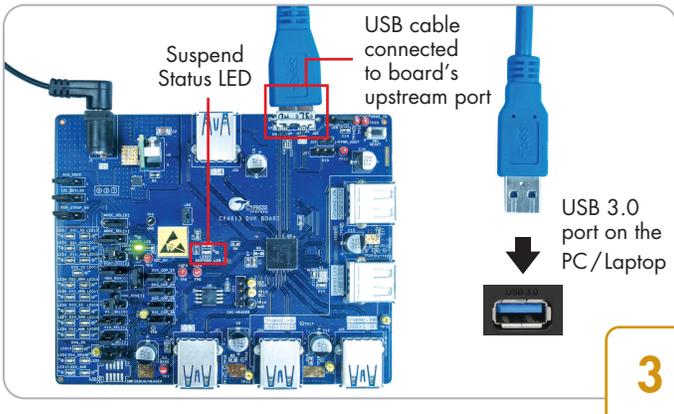
## Step 1: Configuring the HX3 Board

- Unpack the kit contents which include the DVK board, 12-V/3-A AC-DC adapter with four types of plugs, USB 3.0 'A to micro-B' cable, USB 2.0 'micro-B to micro-B cable' and jumpers
- Ensure that the Configuration Mode Select Jumpers (J5 and J6) are set for default operation as shown above. Ensure that pins 2 and 3 are shorted on all the 3-pin jumper blocks except J28 as shown in step 2 image. Ensure that pins 2 and 4 are shorted on both the 4-pin jumper blocks (J7 and J10). Also short pins 1 and 2 on J28 and J20



## Step 2: Powering the HX3 Board

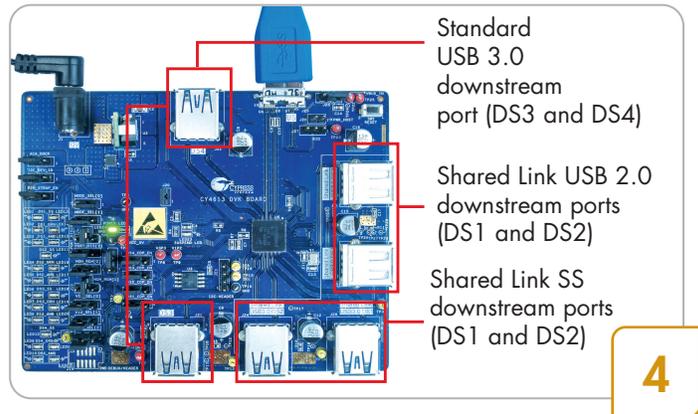
- Plug the AC-DC adapter into an AC wall power receptacle. Connect the power supply plug to the board's DC supply jack (J1)
- The Power LED (PWR) glows green to indicate that the board is powered and the Suspend Status LED (SUSP) glows amber to indicate that the hub is in Suspend State



## Step 3: Connecting the HX3 Board to a USB 3.0 PC / Laptop

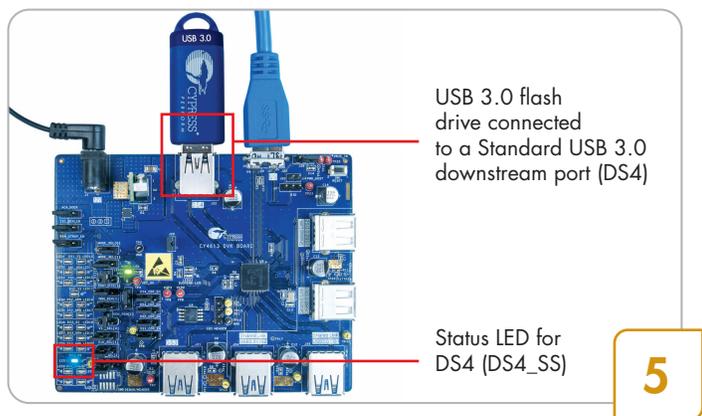
- Connect the micro-B end of the USB 3.0 cable to the board's upstream port; connect the other end to the USB 3.0 receptacle on a PC / laptop. The Suspend Status LED (SUSP) turns off (on a PC / laptop running Windows 7)

Note: The behavior of the SUSP LED varies across operating systems. For example, in Windows 8, the SUSP LED turns off momentarily and turns on again when there is no further USB activity on the board



## Step 4: Identifying Standard and Shared Link™ ports

- Identify the three types of downstream ports on the board:
  1. Standard USB 3.0 downstream ports (DS3 and DS4)
  2. Shared Link™ USB 2.0 downstream ports (DS1 and DS2)
  3. Shared Link SS (SuperSpeed) downstream ports (DS1 and DS2)



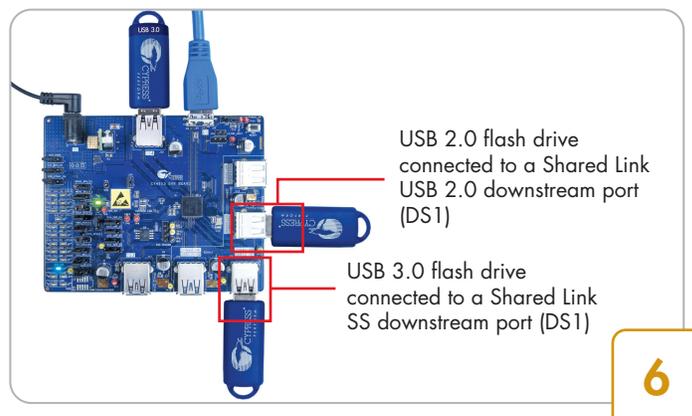
USB 3.0 flash drive connected to a Standard USB 3.0 downstream port (DS4)

Status LED for DS4 (DS4\_SS)

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## Step 5: Demonstrating USB 3.0 Data Transfer on a Standard USB 3.0 port

- Get a USB 3.0-certified flash drive and store a 2 GB file on it. Connect the flash drive to one of the two Standard USB 3.0 downstream ports (DS3 / DS4). The Status LED associated with that downstream port glows blue. Copy the 2-GB file from the flash drive to the PC / laptop to transfer data in USB 3.0 mode



USB 2.0 flash drive connected to a Shared Link USB 2.0 downstream port (DS1)

USB 3.0 flash drive connected to a Shared Link SS downstream port (DS2)

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## Step 6: Demonstrating SS and USB 2.0 Data Transfer on the Shared Link ports

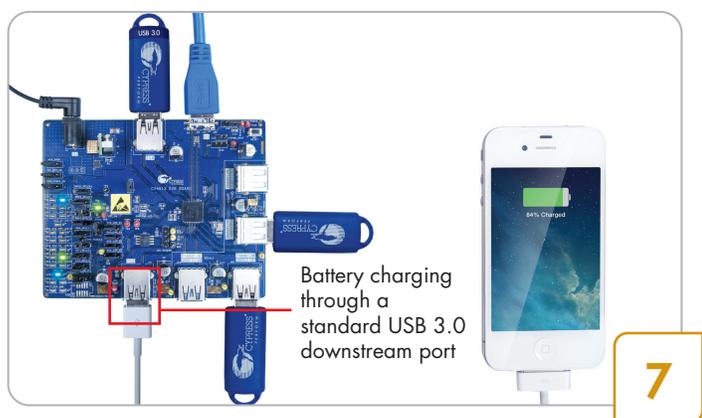
- Power off the board by disconnecting the AC-DC adapter. Connect a USB 3.0 certified flash drive to a Shared Link SS downstream port (DS1 / DS2). Power on the board. Connect a USB 2.0 certified flash drive to a Shared Link USB 2.0 downstream port (DS1 / DS2)

Note 1: The board needs to be in powered off state while connecting a device to any of the Shared Link SS downstream ports as they are non-removable ports

Note 2: Status LED is not supported for the two Shared Link USB 2.0 downstream ports

Note 3: USB 2.0 devices are not supported on Shared Link SS downstream ports

- Copy a 2-GB file from the PC / laptop to both flash drives. SS and USB 2.0 data transfer happen simultaneously on the Shared Link downstream ports



Battery charging through a standard USB 3.0 downstream port

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## Step 7: Demonstrating Battery Charging

- Connect an Apple device or a USB battery charging v1.2 compliant device to a Standard USB 3.0 downstream port or a Shared Link USB 2.0 port to charge the device.

Note: Battery charging is not supported on the Shared Link SS downstream ports

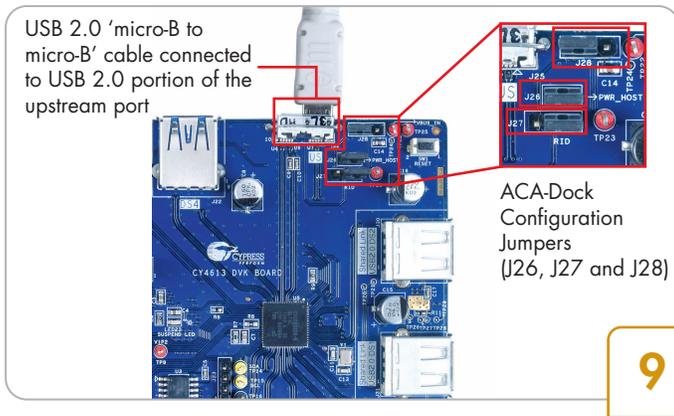


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## Step 8: Demonstrating Ghost Charging

- Disconnect the USB cable from the upstream port to detach the board from the PC / laptop. The device connected to the downstream port continues to be charged using the Ghost Charging™ feature

Note: When the USB cable is detached from the upstream port, charging of the device stops momentarily and resumes in 1-2 seconds



## Step 9: Configuring the HX3 Board for ACA-Dock

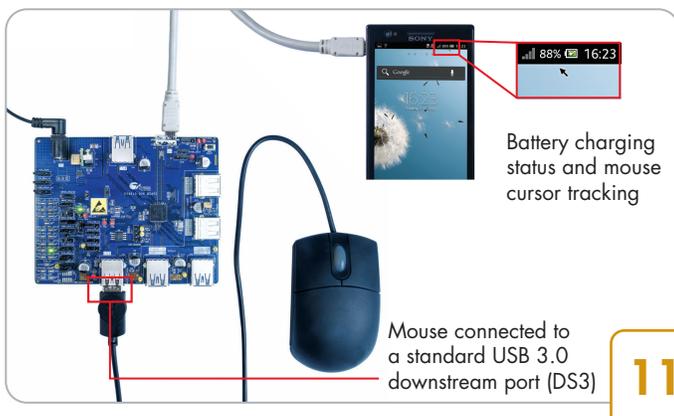
- Power Off the HX3 board and remove the USB 3.0 'A to micro-B' cable. Remove the devices connected on the downstream ports
- Install jumper on pins 2 and 3 of J28. Also install jumpers on pins 1 and 2 of J26 (PWR\_HOST) and J27 (RID). Note: The ACA-Dock feature is disabled by default on CY4613 board while shipping from factory. It has to be enabled using the above jumper settings
- Get a BC v1.2 compliant phone with OTG feature (Host and Device functionality) such as Sony Xperia (S/P/neo V). Connect one end of the USB 2.0 'micro-B to micro-B' cable to HX3 board's USB 2.0 portion of the upstream port as shown above

Note: To use ACA-Dock feature with Samsung Galaxy Note 3, S3 and S4 devices, install jumper on pins 2 and 3 of J27



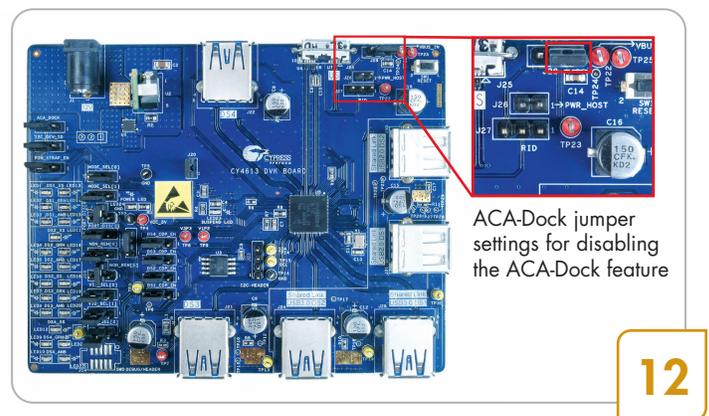
## Step 10: Demonstrating Battery Charging on Upstream Port

- Power the HX3 board by connecting the power supply plug to the board's DC supply jack  
CAUTION: Make sure the phone is compliant to BC v1.2 specification before using with the HX3 board. Connecting a non-BC v1.2-compliant phone to the board can damage or affect the phone functionality as the board supplies VBUS on the upstream port
- Connect the other end of USB 2.0 'micro-B to micro-B' cable to the phone as shown above
- The phone is charged by the upstream port using HX3's ACA-Dock feature



## Step 11: Demonstrating Usage of Downstream Device with Phone

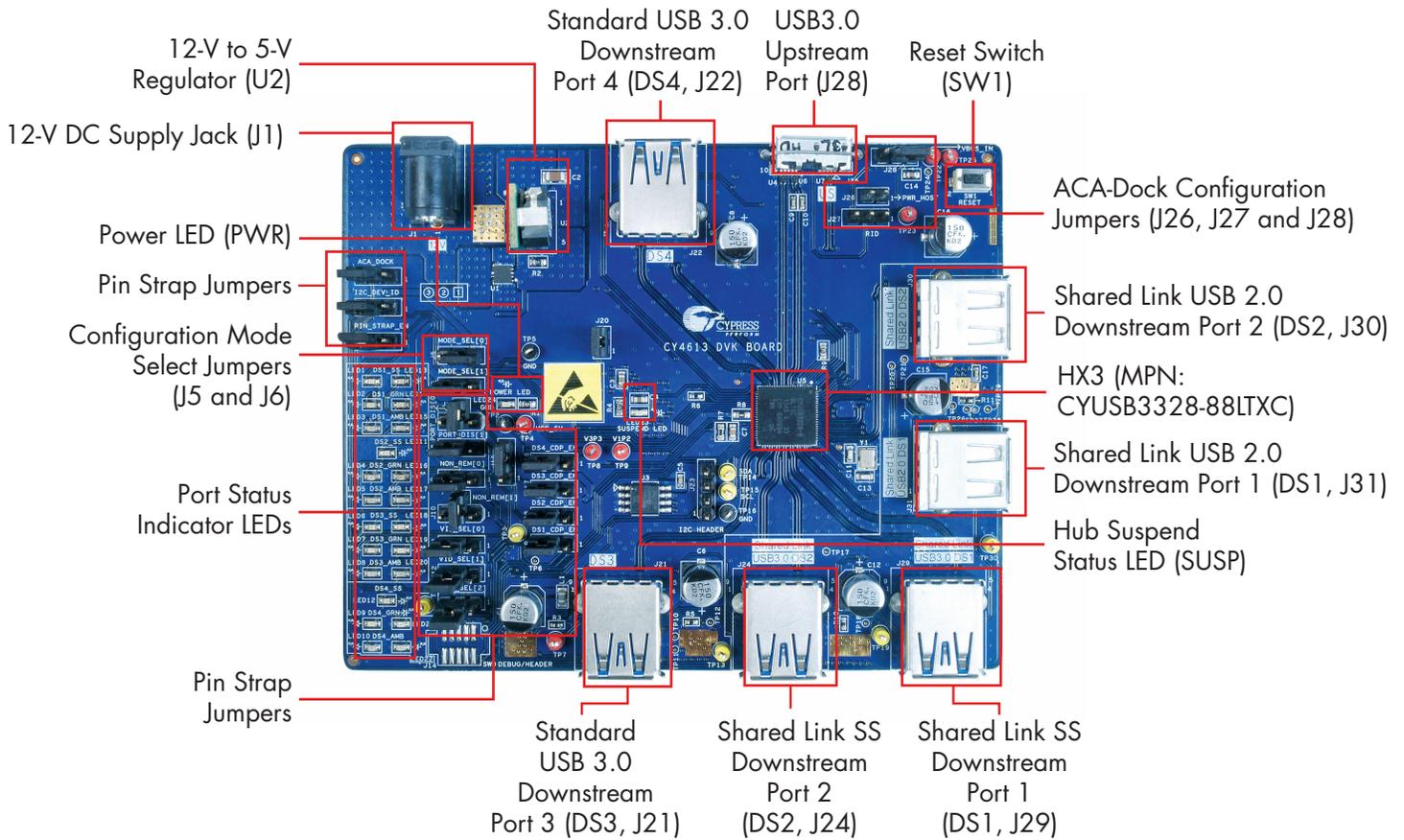
- Connect a mouse to a Shared Link USB 2.0 downstream port (DS1 or DS2) or to a Standard USB 3.0 downstream port (DS3 or DS4)
- The mouse is enumerated on the phone and the on-screen cursor can be tracked using the mouse. At the same time, the phone continues to get charged by the board's upstream port



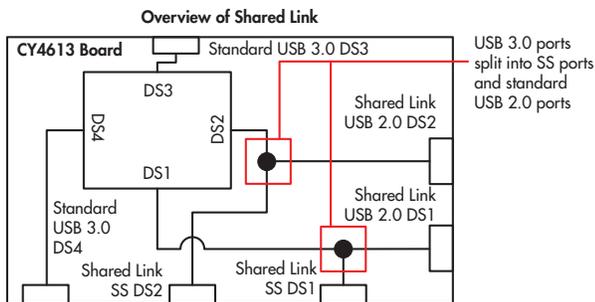
## Step 12: Disabling the ACA-Dock Feature

- Power off the HX3 board. Disconnect the phone by detaching the 'micro-B to micro-B' cable
- Install a jumper between pins 1 and 2 of J28. Remove the jumpers on J26 (PWR\_HOST) and J27 (RID)

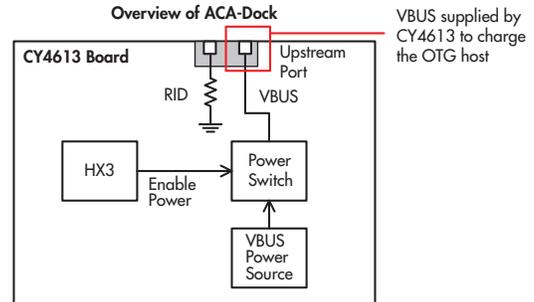
# HX3 USB 3.0 SHARED LINK™ HUB DEVELOPMENT KIT



Kit Operation: CY4613 is the development kit (DVK) for CYUSB3328-88LTXC, an advanced 4-port USB 3.0 Hub Controller from Cypress supporting Shared Link and ACA-Dock features



The Shared Link feature allows each downstream USB 3.0 port to be split into a SS port and a Standard USB 2.0 port. CY4613 implements the Shared Link feature on two of the four Standard USB 3.0 ports to support a total of six ports (Two Standard USB 3.0 ports, two Shared Link SS ports and two Shared Link USB 2.0 ports)



HX3's ACA-Dock feature enables charging of a BC v1.2-compliant OTG host connected to the upstream port. HX3 on the CY4613 board controls the external power switch to drive VBUS on the upstream port.

Operation of the DVK can be configured using a PC-based tool named BlasterPlus. More details about Shared Link, ACA-Dock and the BlasterPlus tool can be found in the DVK user guide. To access the DVK user guide and the hardware design files, download the 'CY4613HX3DVKSetup.exe' file from [www.cypress.com/go/CY4613](http://www.cypress.com/go/CY4613). Launch the 'CY4613HX3DVKSetup.exe' file and follow the steps in the installer window.