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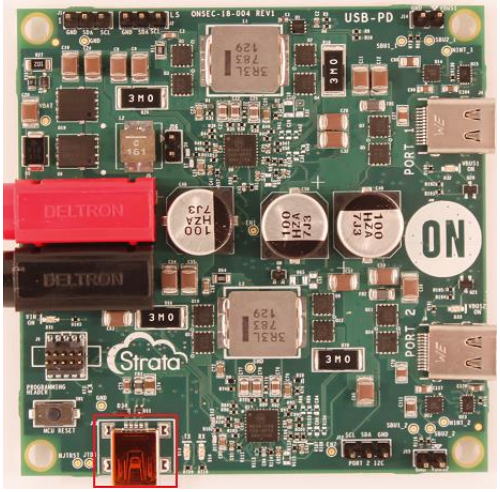
USB Type-C & PD Dual 100W User Guide

Startup Procedure

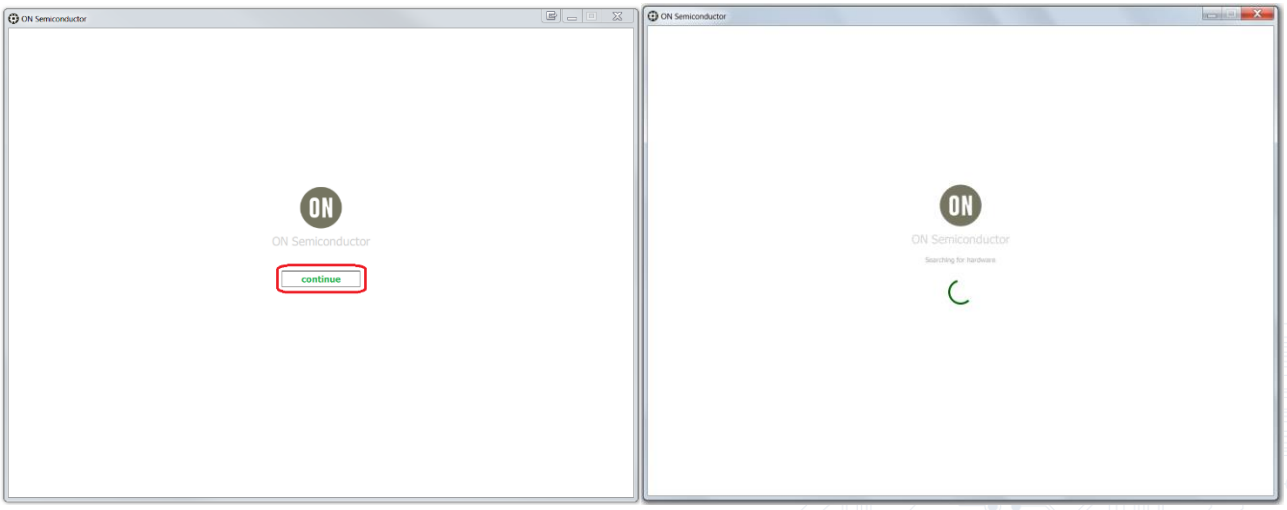
Note: Must have ‘ON_Semiconductor_Setup.exe’ installed, as well as an active internet connection to download USB Serial Port drivers if necessary.

Step 1: Apply 5V to 32V to the input Banana Connectors.

- Recommend > 200W input capability for max output testing



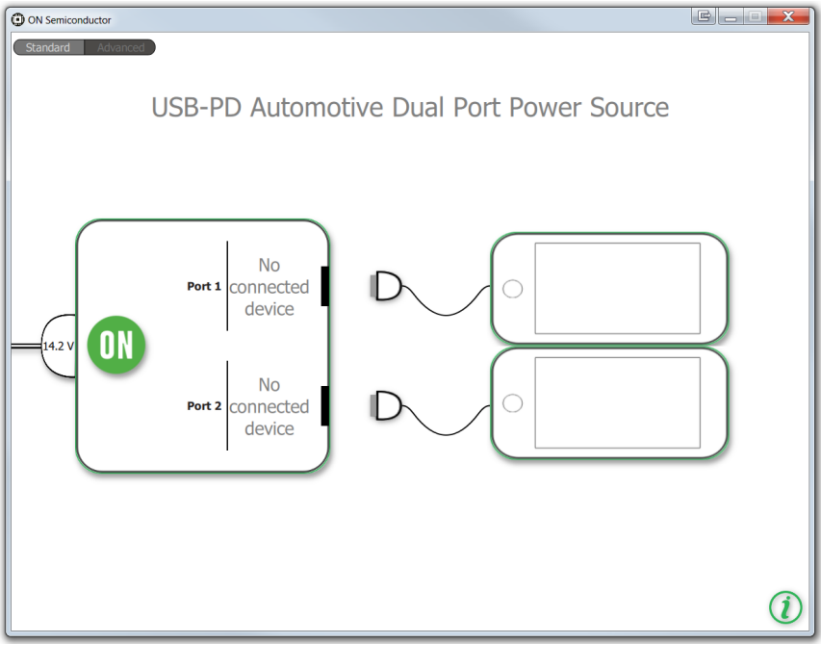
Step 2: Open ‘ON Semiconductor’ application and press ‘Continue’



Note: “Searching for hardware” will appear until hardware is connected. If this persists check your USB connection.

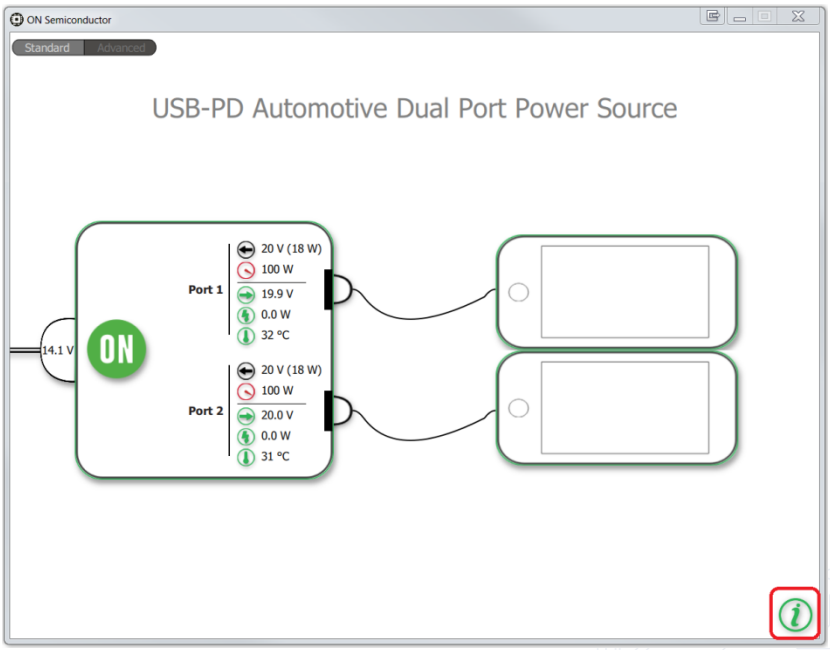
Step 3: Plug USB Mini-B into the board and PC.

- This should bring up the ‘Standard’ power telemetry interface
- Note: Step 2 and 3 are interchangeable.



Step 4: Connect USB-C device

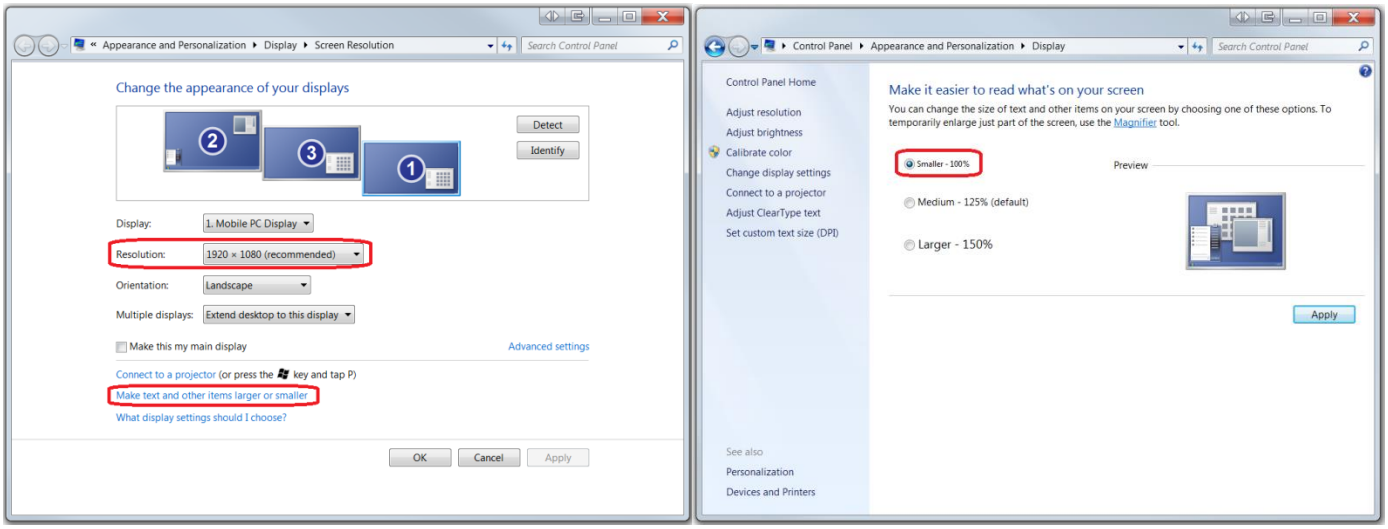
- There should be a connection within User Interface on the corresponding port
- User Interface will show PD contracts and VBUS voltage



Step 5: Verify / Adjust system display resolution

- The green “i” icon in the bottom right corner should be visible
- The green “i” icon provides access to view/export the system collateral.

Note: If the green ‘i’ is not visible as seen above then follow the instructions below to change your display resolution and/or Windows zoom settings so that the green ‘i’ is accessible.

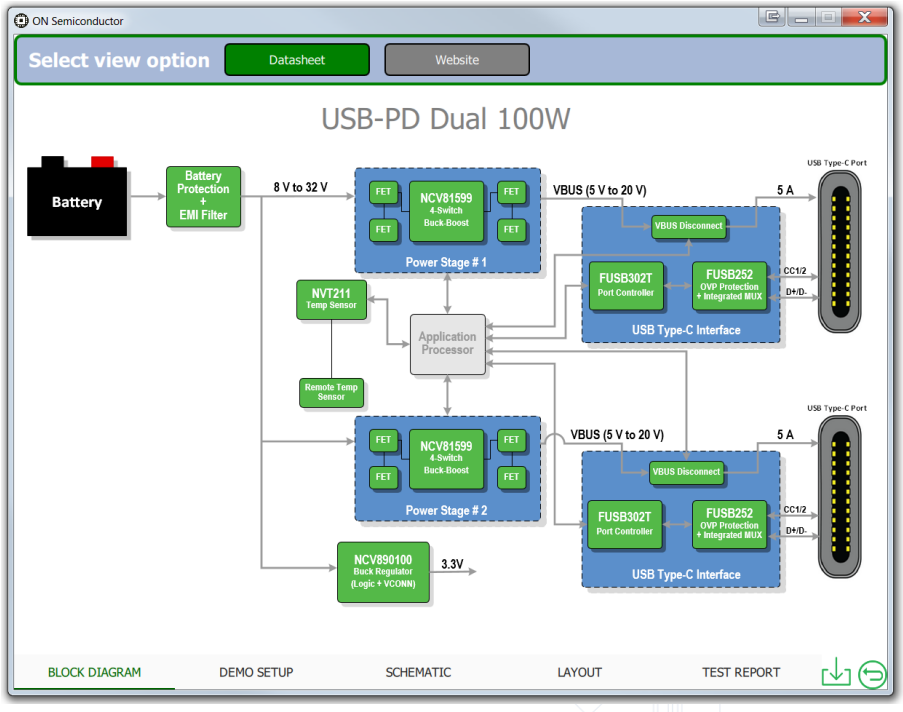


Ensure the screen on which you are using the software has a resolution greater than or equal to 1080 pixels. Additionally, clicking on, “Make text and other items larger or smaller” will open the Display Zoom settings. If you are unable to see the green ‘i’ then lower your Display Zoom setting to Smaller – 100%, which will correct the issue.

Collateral Viewing

Click the green “i” icon to change to/from the collateral view

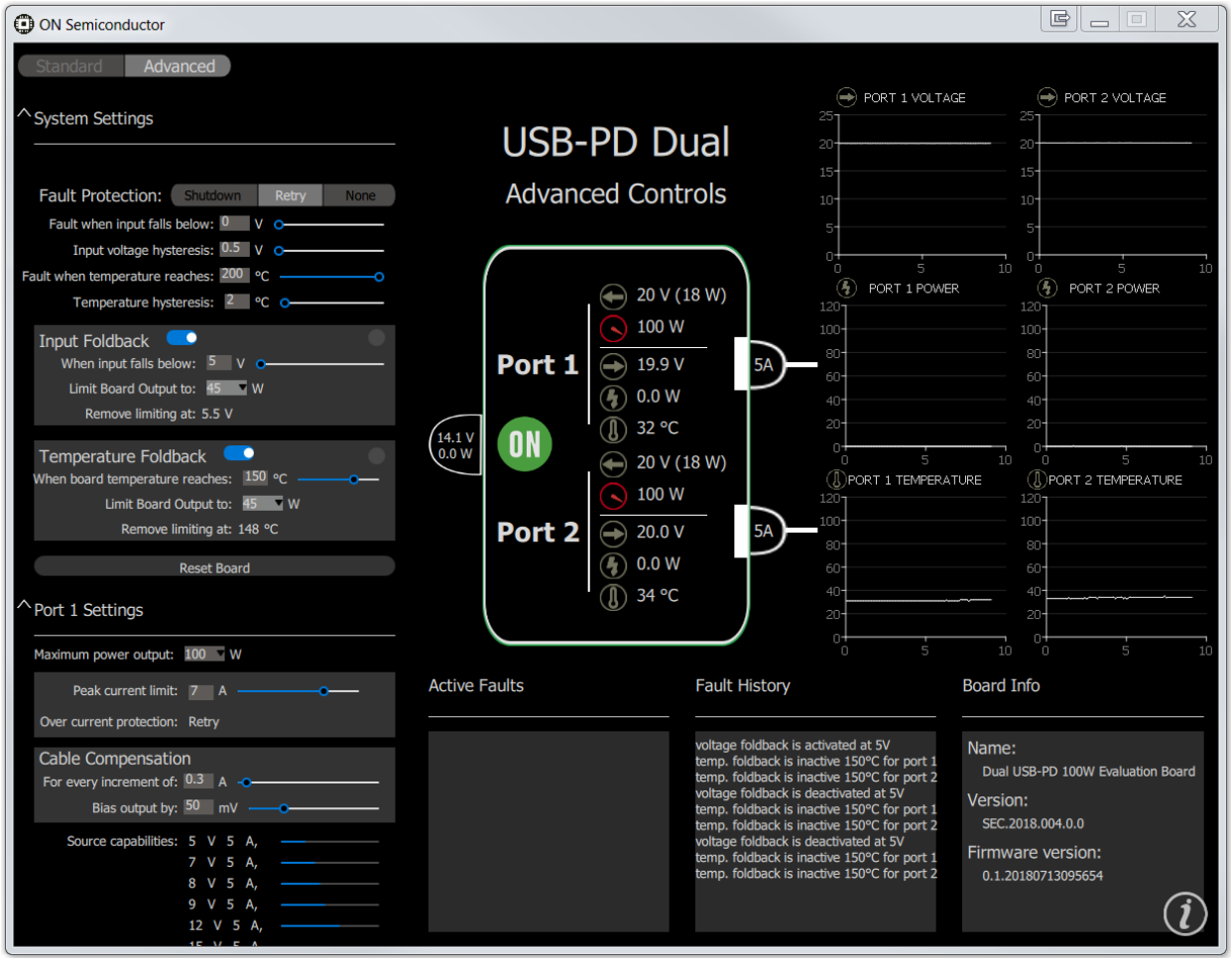
- Internet connection needed to view links/PDFs from Block Diagram



Advanced Control

Provides advanced systems controls, telemetry and operation modes for in-depth evaluation of the system capabilities.

Click the ‘Advanced’ button to bring up the Advanced Control Interface. See explanation of ‘Protection’ features, below.



USB-PD Dual Port 100W Power Management

Available Power Levels

- 100W if a 5A capable cable is attached
- 60W if a standard type-C cable is attached (3A max)
- May be limited by user adjustable thresholds/limits
    - Host/user power limit setting
    - Over temperature
    - Input under voltage
    - Output over current conditions (foldback)

Available Voltages for each Power Level

These voltages and currents are offered to the sink device via the ***Source Capabilities*** message.

100W = 5V, 7V, 8V, 9V, 12V, 15V or 20V @ 5A

60W = 5V, 7V, 8V, 9V, 12V, 15V or 20V @ 3A

45W = 5V, 7V, 8V, 9V, 12V or 15V @ 3A

36W = 5V, 7V, 8V, 9V or 12V @ 3A

27W = 5V, 7V, 8V or 9V @ 3A

15W = 5V @ 3A

Protection Features

- Temperature foldback
  - If PCB temp > user set limit, the board will limit its output capability to the user set value.
- Temperature fault
  - If PCB temp > user set limit, the board will perform the user set protection action = Shutdown, Retry, or No Action.
- Input voltage foldback
  - If input voltage drops < set limit, the board will limit its output capability to the user set value.
- Input voltage fault
  - If input voltage < user set limit, the board will perform the user set protection action = Shutdown, Retry, or No Action.

Power Variables (Fusb302 class)

- *m_commanded_max_power* – the maximum power set by the host
  - configured via 'Pmax' on the Advanced Controls tab
- *m_default_max_power* – the maximum power setting unconstrained by foldback settings
  - Default Limited to 60W if a 3 amp cable is attached, or 100W if a 5 amp cable is attached.
- *m_current_max_power* – the current maximum power setting constrained by cable-type, foldback, or overcurrent settings.
- *m_cable_max_current* – the maximum current in amps allowed by the cable type

Power Rules

m_commmanded_max_power >= *m_default_max_power* >= *m_current_max_power*

When '*m_current_max_power*' changes, a USB-PD negotiation is performed between the USB-PD-100W board and the attached sink device.

References

1. Universal Serial Bus Power Delivery Specification, Revision 3.0
2. Universal Serial Bus 3.2 Specification