POWER USB

7/31/2012

Computer- Controlled Power Strip

USER MANUAL

Power USB

USER MANUAL

What to do if the PowerUSB application fails to execute?

Installing Redistributable Files

The first step is to install the PowerUSB. If the application fails to execute, you will get a message similar to the following: "Application has failed to start because its configuration is incorrect." If this happens, then run the program vcredist_x86.exe from the PowerUSB CD. This will reset your computer's PowerUSB application.

CAUTION

Please note that the PowerUSB is to be used for low to medium power devices and not for devices requiring more than a peak load of 16Amp. Recommended outlet usage is as follows (with units manufactured before July 2012 having a higher leakage current):

Outlet 1 (Modem): Max 4A (440Watt).
Low to Med loads. Light inductive loads. No Leakage current.
Outlet 2 (Monitor): Max 8A (880Watt).
High loads. High Inductance (Motor, Power Supply).
Leakage current of up to 3VAC due to snubber circuit.
Outlet 3 (Printer): Max 8A (880Watt).
High loads with medium inductance. Light Leakage current of up to 0.2VAC

The PowerUSB is protected from overloads with a reset switch for up to 8A.

CONTROLLED OUTLETS WILL BE SWITCHED OFF AND THE UNIT WILL GO INTO OVERLOAD MODE WITH FLASHING OUTLET LEDs
THE UNIT HAS TO BE POWERED DOWN, USB CABLE REMOVED AND RESET TO COME OUT OF OVERLOAD MODE.

Package Contents

Item	Quantity
PowerUSB Power Strip	1
Software CD	1
USB Cable	1

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Please refer to separate manuals for specific features of the Digital IO, Watchdog, and SMART models. These manuals are located under %AppData%\PowerUSB\directory (%AppData% directory is typically located in C:\Program Files (x86)\).

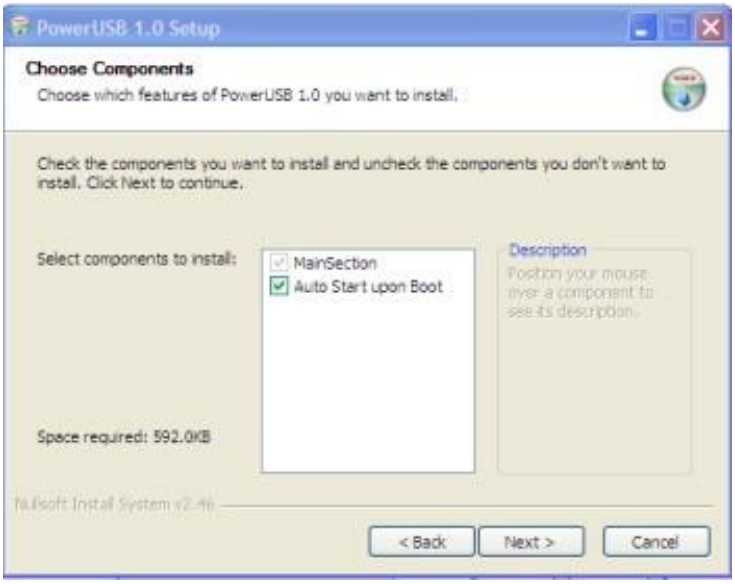
1. INSTALLATION

1.1 SOFTWARE SETUP

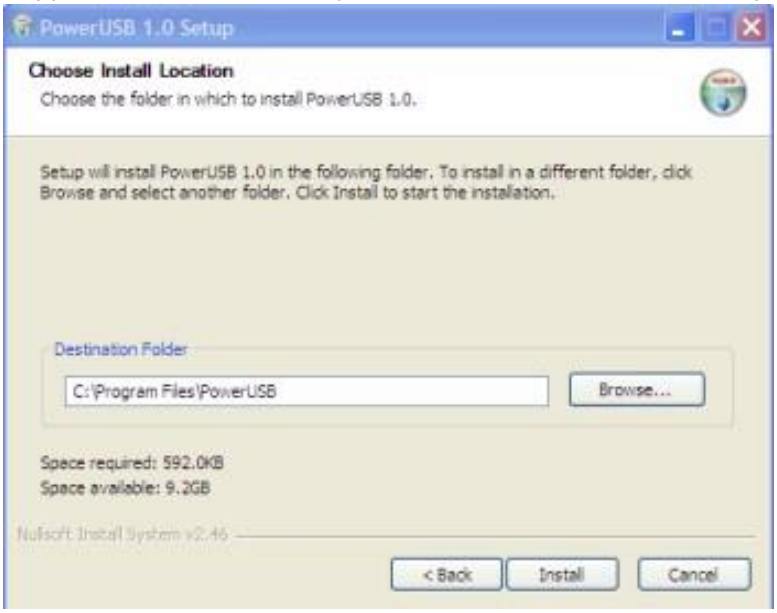
- Run Setup from the CD.

- Close any background applications and click Next.

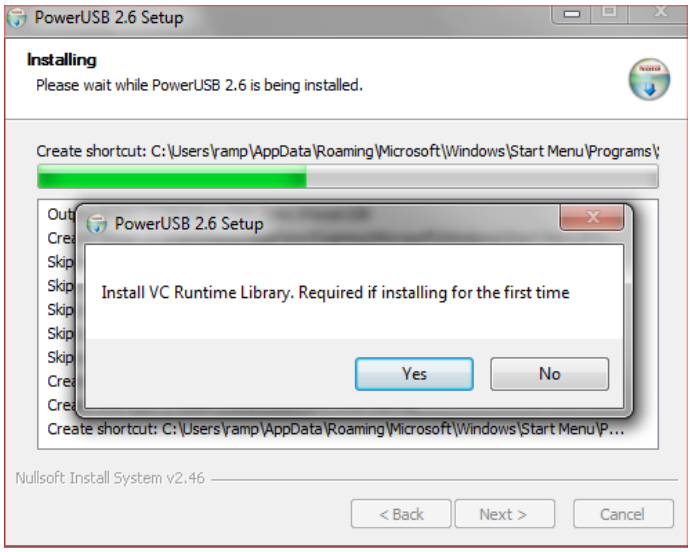
- Read and Accept the License Agreement.



- MainSection (software application) will be installed by default. Select “Auto Start upon Boot” if you want the PowerUSB application to automatically start each time Windows starts up.



- PowerUSB will be installed by default in the C drive Programs Directory. If you prefer another location, select the preferred directory through the Browse button. Click on Install to begin the installation process.
-



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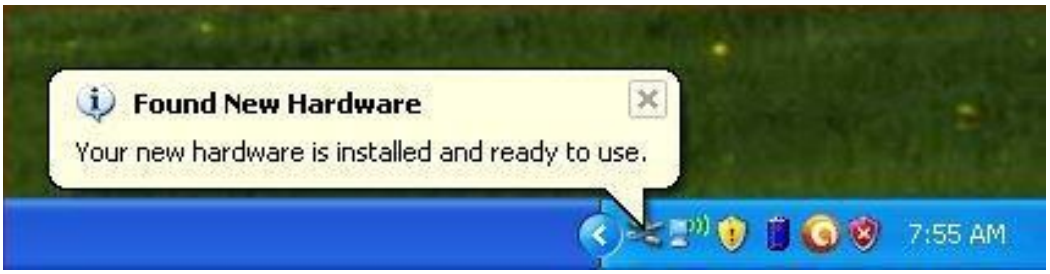
- The PowerUSB application requires VisualStudio r e distributables. Many computers already have these files. In the above dialog box, click Yes to install the distributables. If you select No here, you can always install these files later by running the vcredistx86.exe file from the CD (if the PowerUSB application does not run).

- If you want to run the application upon finishing setup, check the Run PowerUSB 1.0 box. Checking Show Readme will open the User Manual after you click the Finish button.

1.2 DRIVER INSTALLATION

The PowerUSB uses a Plug and Play HID (Human Interface Driver) supported by Windows and many other operating systems. When you plug the PowerUSB in the computer's USB port for the first time, Windows will automatically install the driver. You should see a message similar to the screenshots below in the Windows system tray (in the bottom right corner of your screen).



The installation of the PowerUSB HID driver can be confirmed by checking in the Device Manager,

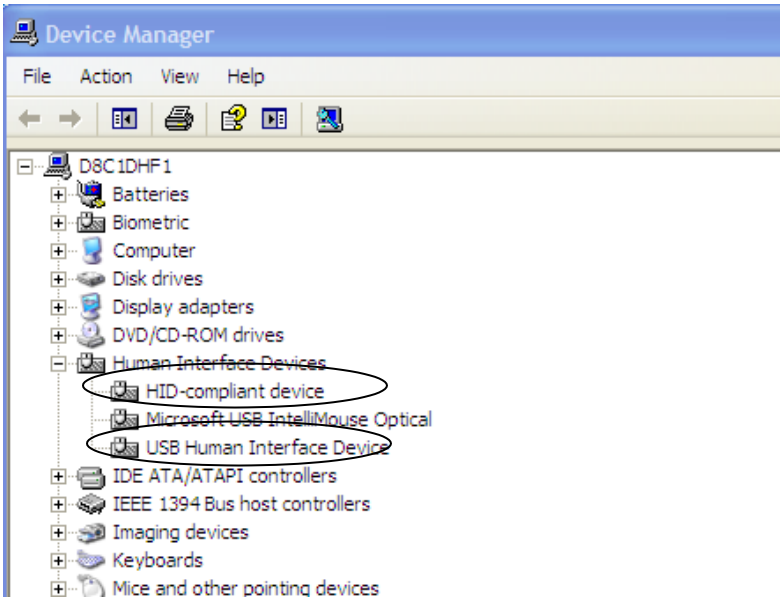
which can be opened in two ways:

Control Panel -> System -> Hardware Tab -> Device Manager

Or:

Windows Start -> Run -> type “start devmgmt.msc”

In the Device Manager you should see “HID-compliant device” and “USB Human Interface Device” as shown below:



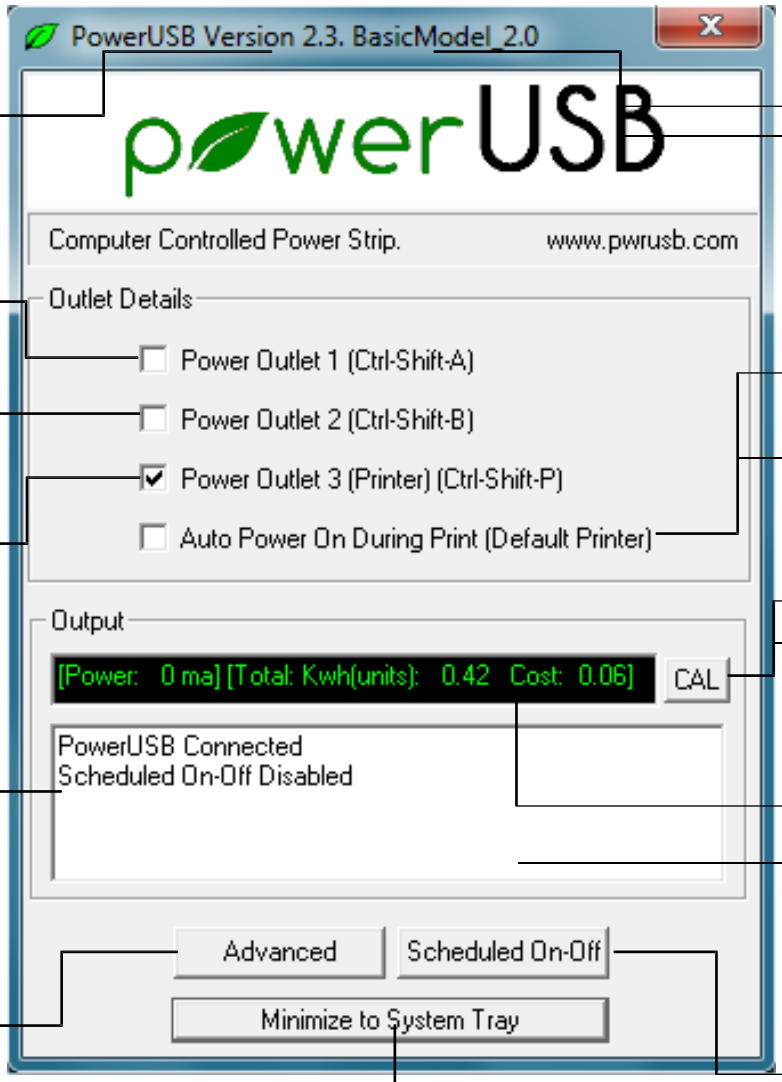
2. USING THE SOFTWARE

2.1 START APPLICATION

Run the software by double clicking the PowerUSB icon on your desktop or from the Windows Start menu under the Power USB group.

Power USB Icon

2.2 SOFTWARE INTERFACE



Software Version

PowerUSB model and firmware revision

Switch Port 1 on/off (SSD max 2Amp)

Switch Port 2 on/off (EMR 4Amp)

Switch Port 3 on/off (EMR 4Amp—used for Printer auto on)

Auto switch on printer while printing

Zero calibrates the current measurement when no load is present

Status messages from PowerUSB, such as that the device is connected, scheduled times, etc.

Current Power Consumption: Current reading in milliamps (ma), cumulative reading in Kwh(units), and total cost of consumption

Advanced Options: For default state, network ping, etc.

system tray

Scheduled On-Off will enable predetermined on-off times for each outlet

Minimize puts the application into the

2.3 CONTROLLING OUTLETS

The outlets can be powered on by selecting the check box for 'Power Outlet 1', 'Power Outlet 2', and 'Power Outlet 3'. This on-off function can also be toggled (on to off or vice versa) by shortcut keys. The shortcut keys for toggling the outlets on and off are as follows:

Outlet 1: Simultaneously press Control—Shift and the A key.
Outlet 2: Simultaneously press Control—Shift and the B key.
Outlet 3: Simultaneously press Control—Shift and the P key.

These shortcut keys will work even when the application is minimized and running in the background

Advances users can change the hot key characters (A, B, P) in the registry setting. The values for 'out1Hot', 'out2Hot', and 'out3Hot' under HKEY_CURRENT_USER/Software/PowerUSB/SystemOptions can be changed to any letter from A to Z. Both lower and upper case characters corresponding to the hotkey letter will automatically be used as hot keys. Leaving the values of 'out1Hot', 'out2Hot', and 'out3Hot' empty will disable the hot key feature.

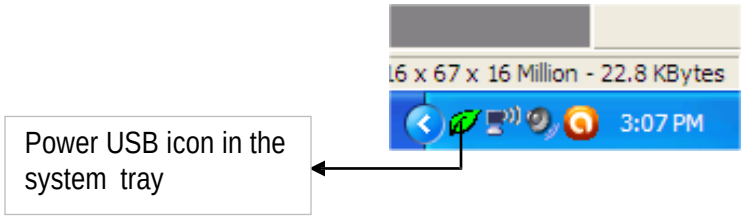
2.4 AUTO POWER-ON PRINTER FEATURE

When the 'Auto Power On During Print' check box is selected, outlet 3 will be kept in an off state. It will be switched on only when a document is printed to the system's default printer. The PowerUSB software senses the printed document in printer's queue and switches on outlet3 (the printer). If the printer is idle for 10 minutes after printing, outlet 3 (the printer) is switched off. An advanced user can change this 10 minute standby by changing this registry value to the desired time in minutes in the registry setting under `HKEY_CURRENT_USER/Software/PowerUSB/SystemOptions/printIdleTime`

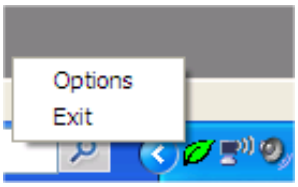
Once 'Auto Power On During Print' is selected, this setting is remembered each time the PowerUSB runs (including reboot startup) until manually changed by the user.

2.5 RUNNING THE APPLICATION IN THE BACKGROUND

When the minimize button is clicked, the application will be running in the background and will be shown in the Windows system tray located in the bottom right corner of the screen.



To bring the application to the front, right click on the leaf in the icon tray and select 'Options'. Selecting 'Exit' will quit the application.



2.5 ADVANCED OPTIONS

Clicking the 'Advanced' button will open the 'Advanced Options' dialog. The options in this dialog are enabled only after 'OK' is clicked.

2.5.1 Default Power-up State

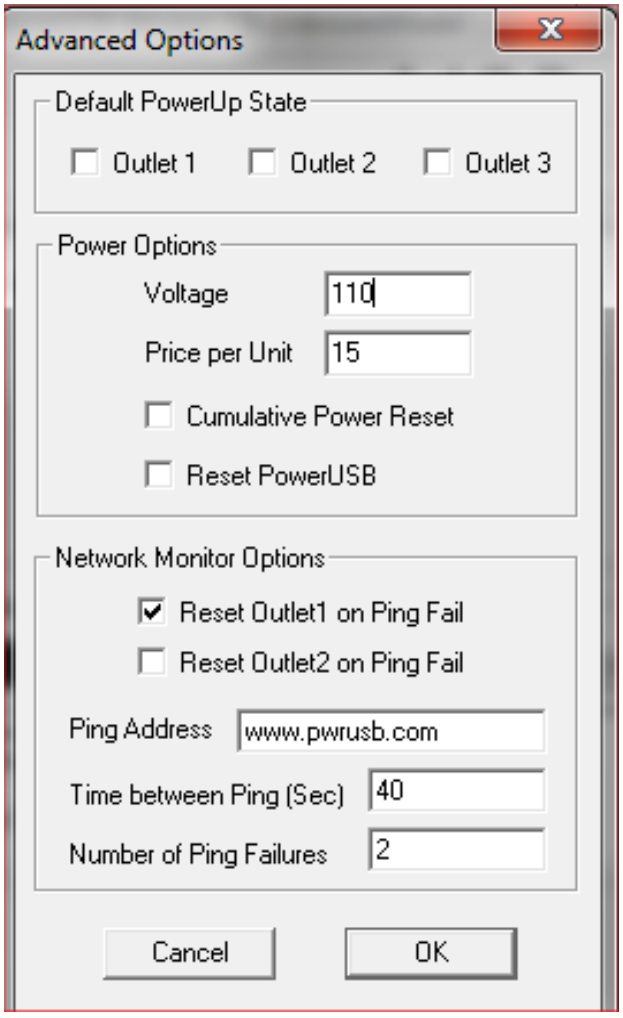
The Outlet 1, 2, and 3 default states will be set when the PowerUSB is connected to a powered up computer (even without the PowerUSB control software running). When set to 'On', the outlets will turn on when connected to a powered up computer and will turn off when disconnected from the computer.

2.5.2 Power Options

The first two entries in 'Power Options' sets the default voltage (110 for US) and price per unit of power consumed ($0.15 average in the US). These values can be changed in the dialog boxes. Changed values are stored in the registry.

The next entry, 'Cumulative Power Reset', will reset the accumulated power reading in the PowerUSB to zero.

The last entry, 'Reset PowerUSB', resets the PowerUSB if in a hung state (where the program is not running).



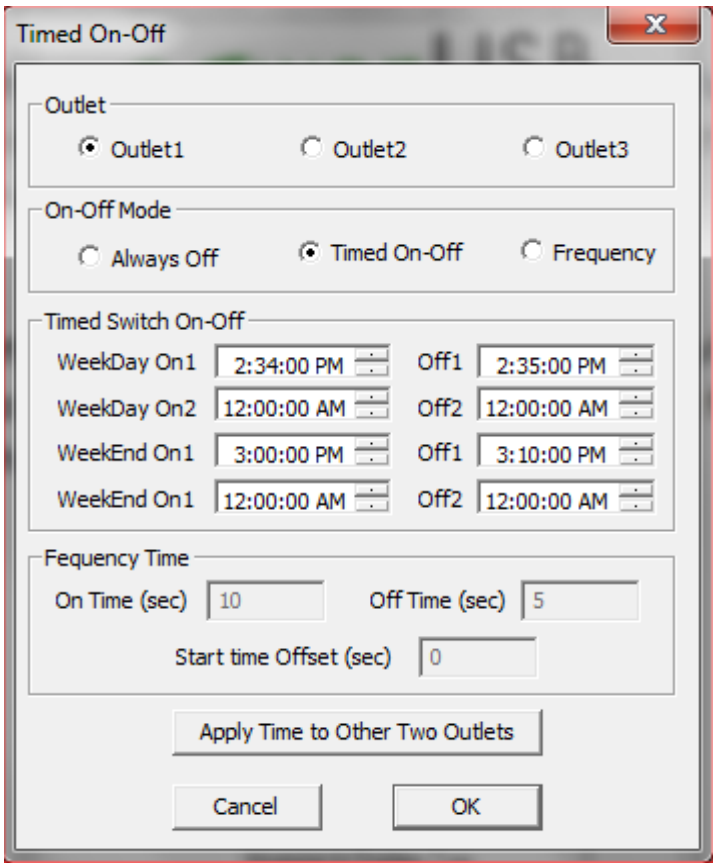
2.5.2 Network Monitoring Options

If one of the 'Network Monitor Outlet' options ('Reset Outlet1 on Ping Fail' or 'Reset Outlet2 on Ping Fail') are enabled, the application will check the network connection by pinging to the 'Ping Address' (default is www.pwrusb.com). If the network connection fails, the system will power reset the modem connected to the corresponding outlet. The URL address can be changed to an address different than the original default. The system will ping the given URL with the frequency given in the 'Time between Ping' field. If the ping fails for number of times given in the 'Number of Ping Failures' field, the corresponding outlet will be switched off for 15 seconds and then switched back on. Once switched on, the software waits for 90 seconds and checks for network connectivity. If network connectivity is found, it will resume network monitoring. If no network connectivity found, the software will wait for 30 minutes and will try to check again for network connectivity. Advanced users can adjust this 30 minute default time by changing the registry setting given below. The value should be in minutes and given in decimal form. The PowerUSB application should be restarted after changing the registry under HKEY_CURRENT_USER/Software/PowerUSB/SystemOptions/pingPauseNetFail

The modem should be connected to the appropriately selected outlet, 1 or 2, for this feature to function. All values given for network monitoring are saved in the registry and used the next time. If the software is started in system startup, monitoring will continue if it had been previously enabled.

2.6 SCHEDULED ON-OFF

Clicking on the 'Scheduled On-Off' button will open the 'Timed On-Off' dialog box. In this dialog box, the user can set the outlets to switch on or off at predetermined times for weekdays and weekend days. The user also can set the frequency of time at which the outlets will switch on and off.



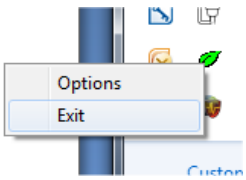
The procedure below must be followed to schedule on-off times

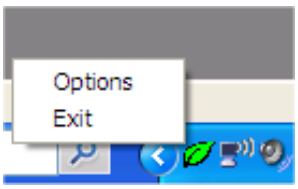
- Select the outlet to be programmed.
- Select one of the On-Off modes: 'Always Off', 'Timed On-Off', or 'Frequency'. When 'Timed On-Off' is selected, timed options will be enabled. When the 'Frequency' mode is selected, frequency options will be enabled.
- If the 'Timed On-Off' mode is selected:
    - Enter the on times (maximum 2) for weekdays and corresponding off times
    - Enter the on times (maximum 2) for weekends and corresponding off times
    - Please note:
        - The off times should be always higher than the on times, and the second on-off time should be higher than the first on-off times.
        - To disable the on-off times, you can enter 12:00:00 AM for both on and off times.
- If 'Frequency' mode is selected:
    - Enter the 'On Time' and the 'Off Time' in seconds
    - Enter the 'Start time Offset' in seconds. The frequency on-off function will start after this delay in the beginning. This feature can be used to offset on-off times between 2 outlets
- If the 'Always Off' mode is selected, the outlet will remain off.
- If these settings need to be applied to the other two outlets, you can click on 'Apply Time to Other two Outlets'.
- Repeat the above steps for each of the outlets to be programmed.
- Click 'OK' to close the dialog box and schedule the programmed on-off operation.

The time-based on-off calendar file is saved in a file called "PwrUSBOnOffTimes.bin" under the '%AppData%/PowerUSB' directory.

2.7 EXITING THE APPLICATION

The application can be exited only from the system tray. When minimized or closed (by clicking on "x" in the title bar), it will be running in the background as seen on the system tray. Right click on the PowerUSB leaf icon in the system tray and select 'Exit'. Once quit, the power outlets will be in their default state.





2.8 LOG FILE

The PowerUSB application stores all events including periodic power consumption readings in a log file in the application data directory. This directory can be accessed by typing '%AppData%/PowerUSB' in the file explorer bar. The name of the log file is called: PwrUSBLog.log. The file is a text file and can be opened with notepad or any text editor.

3. COMMAND-LINE APPLICATION

The command-line application provides an option to switch the outlets on and off, measures power consumed, and has options for the Watchdog and Digital IO models (please refer to Watchdog and Digital IO manuals for details of these models.) The command-line tool is provided as a multi-platform application supporting similar functionality in Windows, Linux, and Mac. Optionally, the command-line application source code is provided for developers as an example to use the PowerUSB API. The developer API, related DLLs, and source code can be downloaded from http://pwrusb.com/downloads.html.

The application pwrusbcmd.exe (pwrusbcmd in linux/mac) has to be run in DOS Shell (command prompt in linux/mac). The application file is installed in the default installation directory ('\Program Files (x86)\PowerUSB' typically in Windows). The application must be run with some of the several provided options. The application will display the below message and quit if ran without options or ran with mismatched or incorrect options:

```
Usage: pwrusbcmd [0,1] [0,1] [0,1] p c (0 for off and 1 for on)
   Up to 15 outlets. Must be multiple of 3 for up to 5 PowerUSBs\r\n
   \'p\' for pause at the end of command
   \'c\' for power consumed in primary PowerUSB unit\r\n
Eg. pwrusbcmd 1 0 0 (will switch on outlet1 and switch off outlet2 & 3)
Eg. pwrusbcmd 1 1 1 c (will siwtch-on all outlets and report power consumption
pwrusbcmd s [1-5] [1-3] [0,1] (Single port on-off. [Unit] [Port] [On-Off])
Eg. pwrusbcmd s 2 2 1 (will switch on the outlet 2 in PowerUSB unit 2)
WATCHDOG: pwrusbcmd w [x] [y] [z] (Will not work with other parameters)
   x=Time between heartbeats(hb), y:Number of hb misses. z:cpu reset time(sec)
   Starts watchdog and start sending hb. Esc to stop monitor and quit
Eg. pwrusbcmd w 60 3 20. (Send hb every 60sec. Reset for 20 sec if 3 hb fail
DIGITAL IO PLC Controller Options
Output: pwrusbcmd o [0,1] [0,1] [0,1].(Sets the 3 Digial Output States)
Input : pwrusbcmd i. (Returns the status of 4 digital inputs. 0 or 1)
Trig  : pwrusbcmd t [0 or 1-4] [0,1] [-3-32000]..(6 time) [2222]..(6 time)
   Sets trigger actions. Cannot use with other params. See manual for details
   First Param: 0-Clear Table, -1-OffPLC, -2-OnPLC, 1-4: Input Port Action
   Action: -3-noAction -2-toggle -1-on 0-off 1-32K-secs on
   Addional Condition [2222] 2-dont care, 1-has to be on, 0-has to be off
Eg. pwrusbcmd o 1 0 1. (Sets outlet 1 & 3 on and outlet 2 to off
Eg. pwrusbdmd i (Will return 1 1 0 0, if outlet 1 & 2 are on and 3 & 4 are off
Enter to continue
```

3.1 BASIC MODEL AND COMMON OPTIONS

3.1.1 Outlet Control Commands

The options for outlet control commands are each 3 to 15 digits of 0s or 1s, representing 1 digit for each outlet. 0 is for off and 1 is for on. Giving 3 digits of 0s or 1s will change 3 outlets in the first PowerUSB. Giving 15 digits of 0s or 1s will change 15 outlets in 5 connected PowerUSB units. Other command combinations are available for maximum programming flexibility, as follows:

pwrusbcmd 1 1 1: Switch on all 3 outlets in the first connected PowerUSB.
pwrusbcmd 0 0 1: Switch off outlets 1 and 2; switch on outlet 3.
pwrusbcmd 0 0 0 1 1 1: Switch off all outlets in PowerUSB 1 and switch on all outlets in PowerUSB 2 (when

two PowerUSB units are connected to the computer)
pwrusbcmd 1 0 0 0 0 0 0 0 0 1 1 1: Switch on outlet 1 and switch off outlets 2 and 3 in PowerUSB 1; switch off all outlets in PowerUSBs 2 and 3; and switch on all outlets in PowerUSB 4.
pwrusbcmd 1 0 0 0 0 0 0 0 0 1 1 1 1 1 1: Switch on outlet 1 and switch off outlets 2 and 3 in PowerUSB 1; switch off all outlets in PowerUSBs 2 and 3; and switch on all outlets in PowerUSBs 4 and 5.

3.1.2 Single Outlet Control

Option 's' will change a single outlet in one of the 5 connected PowerUSB units. This option takes on 3 parameters: Unit number, outlet port number, and outlet state. This command cannot be used with other commands.

Pwrusbcmd [unit number] [outlet port] [on-off state]

Unit Number: Power USB unit number 1 to 5; the outlet will be turned on or off in this unit.
Outlet Port: Outlet port number 1 to 3, affecting one of the 3 outlets in the selected unit.
On-off state: 0 = off, 1 = on.

Examples:
pwrusbcmd s 2 2 1: Switches on outlet 2 in second connected PowerUSB unit.
pwrusbcmd s 1 1 0: Switches off outlet 1 in first connected PowerUSB unit.
pwrusbcmd s 4 3 1: Switches on outlet 3 in the fourth connected PowerUSB unit.

3.1.3 Power Measurement

Option 'c' will measure power consumption. The present power consumed and cumulative power consumption are reported. The present power consumed is reported as current consumption in milliamps. The cumulative power is reported as kilowatts per hour.

pwrusbcmd c : will report
"Power Consumed now(ma):300. Total Power Consumed(kwh)(120VAC): 42.3"
For example, 'pwrusbcmd 1 1 0 c' will switch on outlets 1 and 2 and report the power consumption.

3.1.4 Pause Option

Option 'p' will pause the application until the enter key is pressed. By default, the application quits after displaying a pause message.

For example, 'pwrusbcmd 1 1 1 p' adds a pause after switching the outlets.

3.2 WATCHDOG COMMAND OPTIONS

3.2.1 Start or Stop Watchdog

Option 'w' with 3 parameters will start the watchdog function in the PowerUSB and start sending heartbeats to the PowerUSB watchdog. This option takes on 3 parameters mentioned below. Giving one parameter with 0 as a value will stop the watchdog function in the PowerUSB.

pwrusbcmd [heartbeat time] [number of heartbeat misses] [reset time]

heartbeat time: Time between heartbeats in seconds. The watchdog will expect heartbeats within this frequency.
heartbeat misses: Number of heartbeats to miss. If the watchdog misses this many heartbeats in succession, it will initiate the power reset.

reset time: The amount of time in seconds to keep the computer off during a power reset.

For example, ‘pwrusbcmd w 60 3 15’ starts watchdog with a heartbeat monitor time of 60 seconds, an allowance of 3 heartbeat misses, and a 15-second reset time. The application will also start expecting heartbeats every 60 seconds.
‘Pwrusbcmd 0 0 0’ stops the watchdog timer.

This application will continue sending heartbeats without quitting. To quit the application press the Esc key. The application will then stop the watchdog timer, stop sending heartbeats, and quit.

3.3 DIGITAL IO PLC CONTROLLER OPTIONS

3.3.1 Set Outputs

Option 'o' will set the status of 3 digital outputs. It will take on 3 digit parameters. 0 is for off and 1 is for on.

pwrusbcmd o 1 0 1: Sets outputs 1 and 3 to on and output 2 to off.
pwrusbcmd o 0 0 0: Sets all 3 outputs to off.

3.3.2 Report Digital Input Status

Option 'i' will read the status of 4 digital inputs. 0 is for off and 1 is for on.

'Pwrusbcmd i' reports the status of inputs in the format displayed below (if only input 1 is on):

```
Input States:1 0 0 0
```

3.3.3 PLC Controller Input-Based Trigger Option

The PowerUSB Digital IO model can work as a stand-alone PLC controller. The unit can be programmed to switch on/off outlets or digital outputs when the digital inputs condition changes from lo->hi or hi->lo. The outlets/outputs can be programmed to go-off, go-on, or toggle for a duration of up to 32000 seconds (8.8 hours). The controller can be programmed to start the PLC or stop the PLC by using currently stored trigger data. This input-based trigger information and the PLC on-off state is stored in the flash memory of the controller and will be enabled every time the unit is powered on. Please see the Digital IO model manual for more details about the PLC and other features of the controller.

The option 't' will be used for trigger parameters.

Pwrusbcmd t [input] [lo->hi] [trigger action 6 parameters] [optional condition for action 6 parameters]

input: 1 to 4 = Inputs 1 to 4.
0 = Clears the trigger table to -3 and disable all trigger actions.
-1 = Turns off the PLC controller.
-2 = Turns on the PLC controller.
Trigger events will work only when the PLC controller is on.

lo->hi: 1 = low to high signal (0 to 5/12V change). 0 = high to low signal (5/12V to 0V change).

trigger action: 6 Parameters have to be given for 3 outlets and 3 outputs. The first 3 are for outlets 1-3 and next 3 are for outputs 1-3. Each parameter states the action to be taken: -3 = no action, -2 = toggle, -1 = switch on, 0 = switch off, and 1-32000 = seconds to switch on the outlets/outputs.

optional condition: An optional 6 more parameters specify additional conditions to be met before taking action. Each parameter is a 4-character string that specifies the state of all the inputs before taking trigger action. By default this parameter is 2222, indicating 'don't care' for all 4 inputs. The rest of the characters create parameters for action as follows: 2 = don't care, 1 = on, and 0 = off. If taking action for input 1, the first character (input 1) will be ignored.

Typical sequencing in setting the trigger table with example trigger points is illustrated below:

pwrusbcmd t -1: Switches the PLC controller off before we start the trigger table.

pwrusbcmd t 0: Clears the table to no action for all trigger points.

pwrusbcmd t 1 1 -1 -3 -3 -3 -3 -3: When input 1 changes from lo->hi, switches on outlet 1. No action for other outlets.

pwrusbcmd t 1 0 0 -3 -3 -3 -3 -3: When input 1 changes from hi->lo, switches off outlet 1. No action for other outlets.

pwrusbcmd t 2 1 -3 -3 -2 -3 -1 -3: When input 2 changes from lo->hi, toggles outlet 3. Output 2 will be switched on.

pwrusbcmd t 3 1 -1 -3 -3 -3 -3 -3 2221 2222 2222 2222 2222 2222: When input 1 changes from lo->hi and input 4 is in on state, switches on outlet 1.

pwrusbcmd t -2: Switches on the PLC controller using the current trigger table settings.

4. TROUBLESHOOTING

If there is no power coming into the outlets, follow these troubleshooting tips. If the PowerUSB is still not functioning after trying these steps below, please send an email to support@pwrusb.com with details of the problem. Our support team will get back to you as soon as possible.

4.1 NO POWER IN ANY OUTLETS

- Ensure that the power cable plug is properly inserted into the wall outlet.
- Ensure that the power switch (on the PowerUSB unit) is switched on with an actively lit power indicator light.
    - If power-on switch is not lit, then the switch is not functioning. Please contact PowerUSB support.

4.2 NO POWER IN THE 'COMPUTER CONTROLLED OUTLETS' WITH POWER ON IN THE 'ALWAYS ON OUTLET'

- Ensure that the USB cable is connected to the computer.
- PowerUSB software should be started and showing "PowerUSB Connected" in the output box.
- Ensure that the appropriate outlet (1, 2, or 3) is checked in the software dialog box.
- Check and make sure the appropriate Port 1, Port 2, or Port3 LED is lit on the power strip.
    - If the LED is not lit please contact PowerUSB support.

4.3 POWER STRIP IS NOT RECOGNZED BY THE COMPUTER

- Ensure that the USB cable is fully inserted into the computer USB port. Try using an alternate USB port in the computer.
- Go to Device Manager with custom options by running the program 'DevMgrHidden' from the 'Program Files\PowerUSB\' directory. Device Manager can also be brought up through the control panel.
- You should see 'HID-compliant Device' in the Device Manager. If the driver is seen and device is still not recognized, then try the following:
    - Make sure you disconnect all other USB cables (non-PowerUSB units)
    - Right click on 'HID-Compliant Device' and select 'Uninstall'
    - Take out the PowerUSB USB cable and re-insert it into the computer
    - The computer should re-install the HID driver for the PowerUSB unit
- If the PowerUSB is still not recognized, try it in another computer (if available).
- Please contact PowerUSB support by sending an email to support@pwrusb.com if the above steps fail.