

## PL2303TB USB-to-Serial Bridge Controller Demo Board User Manual

### PL2303TB Demo Board Features

This document will describe how to use the PL2303TB demo board to test the main features. Please refer to the PL2303TB Datasheet for more information.



**PL2303TB Demo Board**

- Supports Twelve (12) General Purpose I/O (GPIO) pins configuration
- Supports 48/24/12/6/3/1.5 MHz clock output using GP0/GP1 pins
- Supports TXD-RXD Access LED display control using PI\_0/PI\_1 pins
- Supports Pulse-Width Modulation (PWM) output on DTR\_N, DCD\_N, DSR\_N, & CTS\_N pins with frequency around 370Hz to 47KHz and duty cycle from 1/256 to 255/256.
  - Breathing 4-LED Demo Application (using DTR, DSR, DCD, CTS pins)
- Scrolling (Marquee) 8-LED Demo Application (TXD, RI\_0, RXD, PI\_1, RTS, RI, GP1, GP0)

### PL2303TB GPIO Pin Configuration Options

Pin Name	Pin Number	General Purpose IO (GPIO)	Clock Output Select <sup>(1)</sup>	TXD/RXD Access LED <sup>(2)</sup>	PWM <sup>(3)</sup>
TXD	1	GPIO [9]			
DTR_N	2	GPIO [6] <sup>(4)</sup>			PWM_0 <sup>(4)</sup>
RTS_N	3	GPIO [7] <sup>(4)</sup>			
RXD	5	GPIO [8]			
RI_N	6	GPIO [0]			
DSR_N	9	GPIO [2]			PWM_2
DCD_N	10	GPIO [1]			PWM_1
CTS_N	11	GPIO [3]			PWM_3
GP0	22	GPIO [4]	Clock Out 0		
GP1	23	GPIO [5]	Clock Out 1		
PI_0	8	GPIO [10]		LED Out 0	
PI_1	24	GPIO [11]		LED Out 1	

(1) – Clock Output Select with choice of 48MHz, 24MHz, 12MHz, 6MHz, 3MHz, 1.5MHz clock output.

(2) – TXD, RXD, or both TXD/RXD access LED control (LED flashes during USB transmit/receive data).

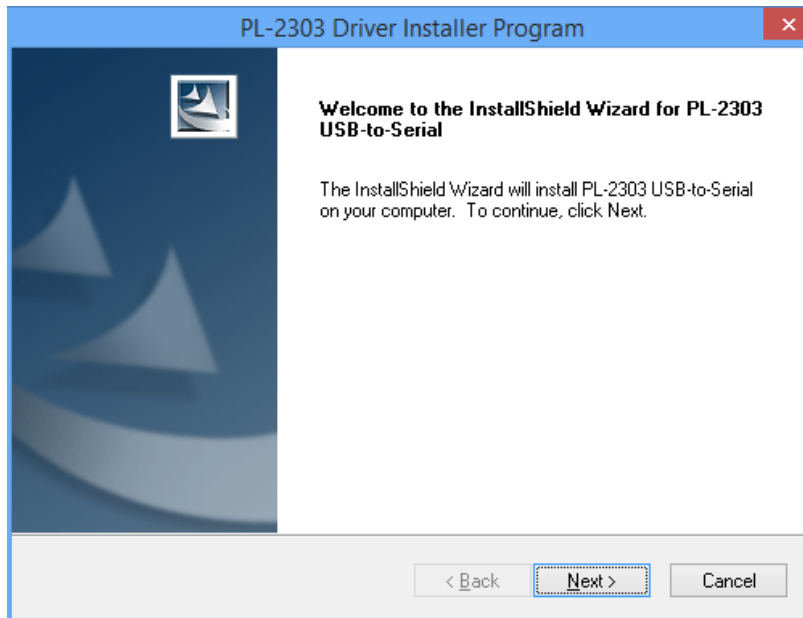
(3) – Frequency range is from 366.3Hz to 46.5KHz, and pulse high duty range is from 1/256 to 255/256 in each frequency.

(4) – If TXD and RXD pins are used as UART pins, DTR\_N and RTS\_N pins cannot be used as GPIO or PWN pins.

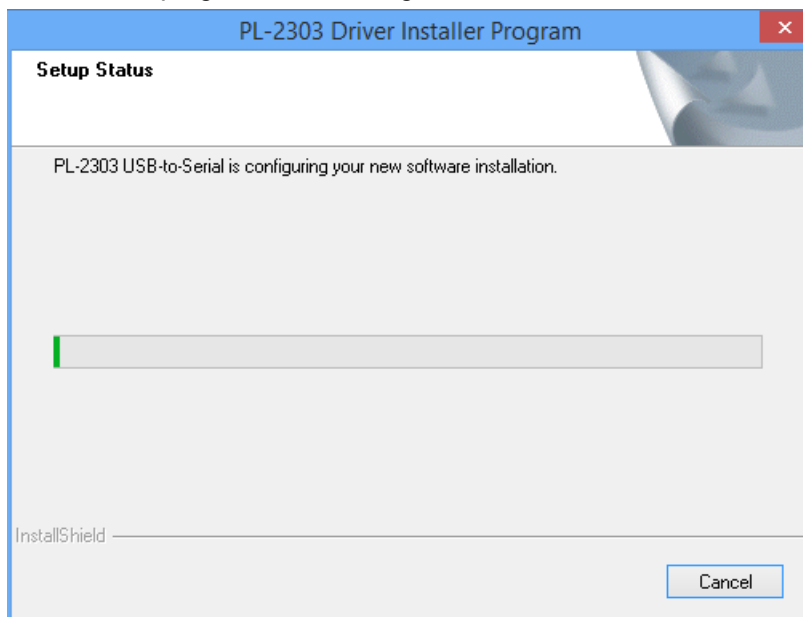
## Windows Driver Installation

This section quickly illustrates the Windows driver installation for the PL2303TB device. You can either install the driver by running the PL2303 Windows Driver Installer program or by downloading the driver automatically via Windows Update (Internet connection required) when you plug-in the device.

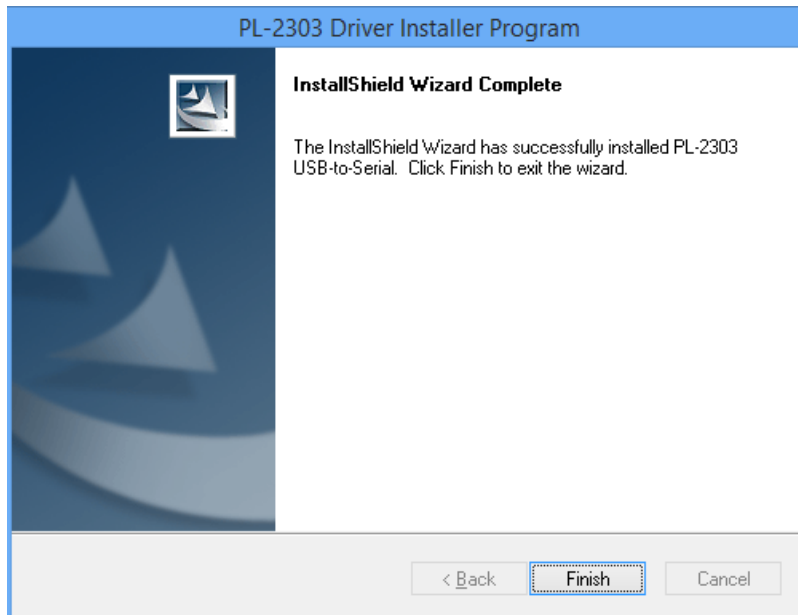
1. To install the driver manually, run the PL2303 Windows Driver Installer v1.7.0 or above that supports PL2303TB hardware ID. Click Next when the InstallShield Wizard appears.



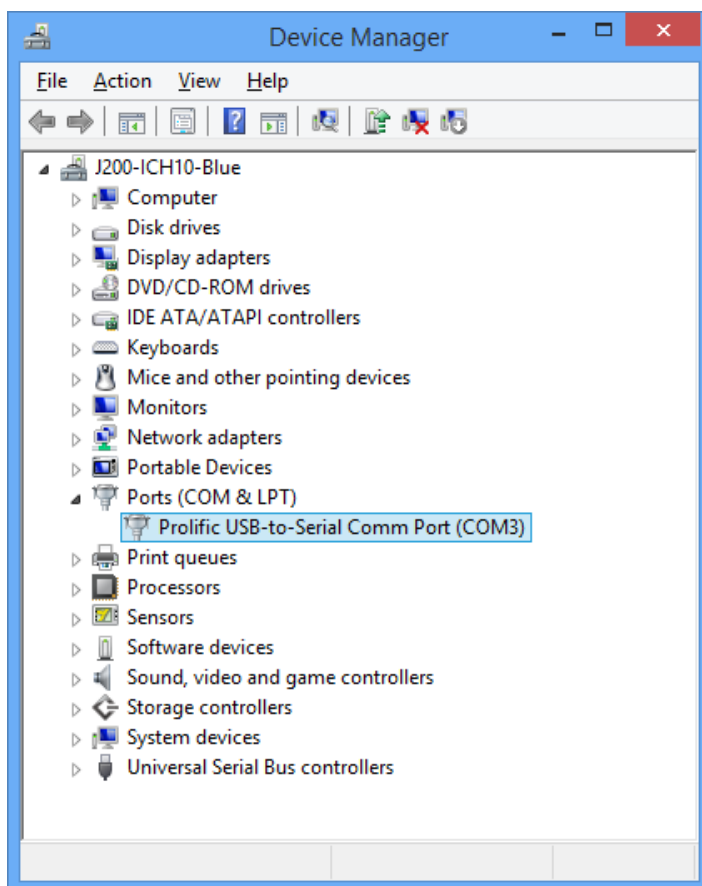
2. The installer program will then begin to install the driver.



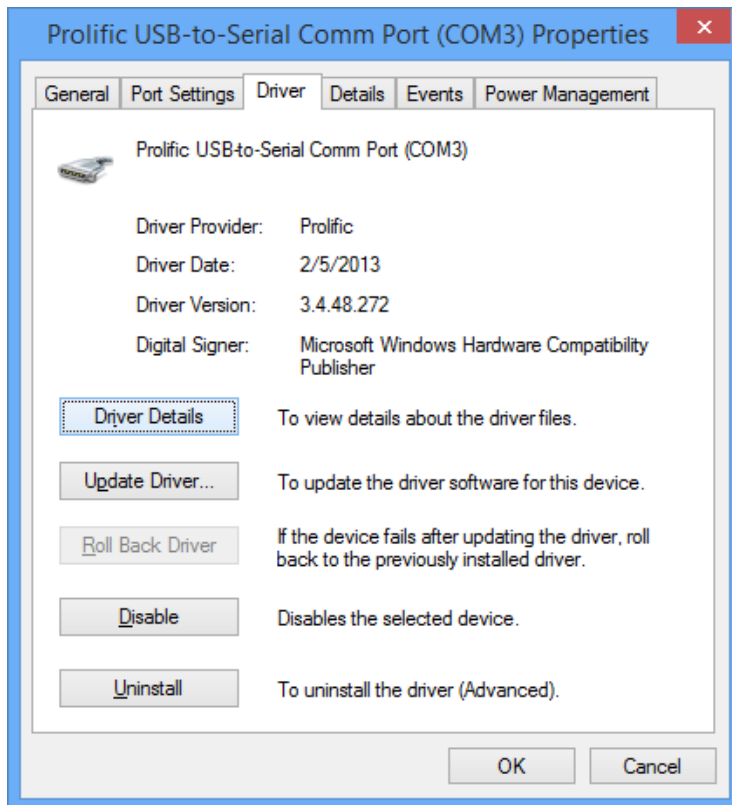
3. When the InstallShield Wizard driver installation is complete, click Finish to end.



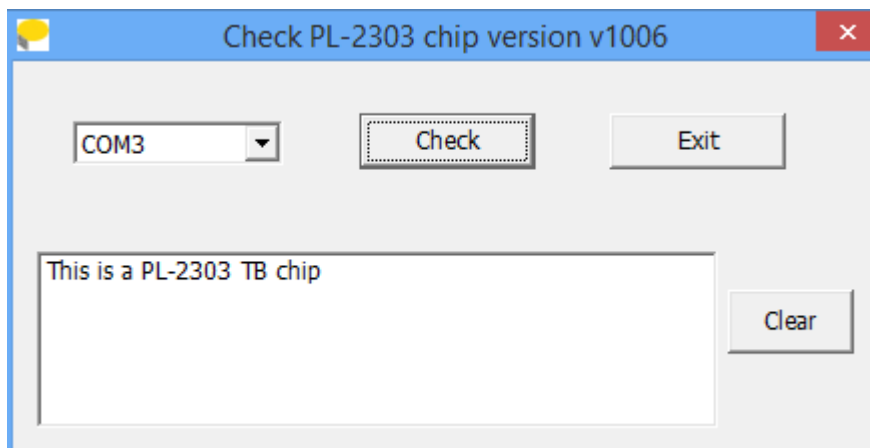
4. Plug in the PL2303TB Demo Board and go to Device Manager to check if “Prolific USB-to-Serial Comm Port (COMx)” is detected and properly configured.



5. You can right-click Properties on the device and click the Driver tab to view the driver version.




6. Run the latest CheckChipVersion tool to confirm the chip version.

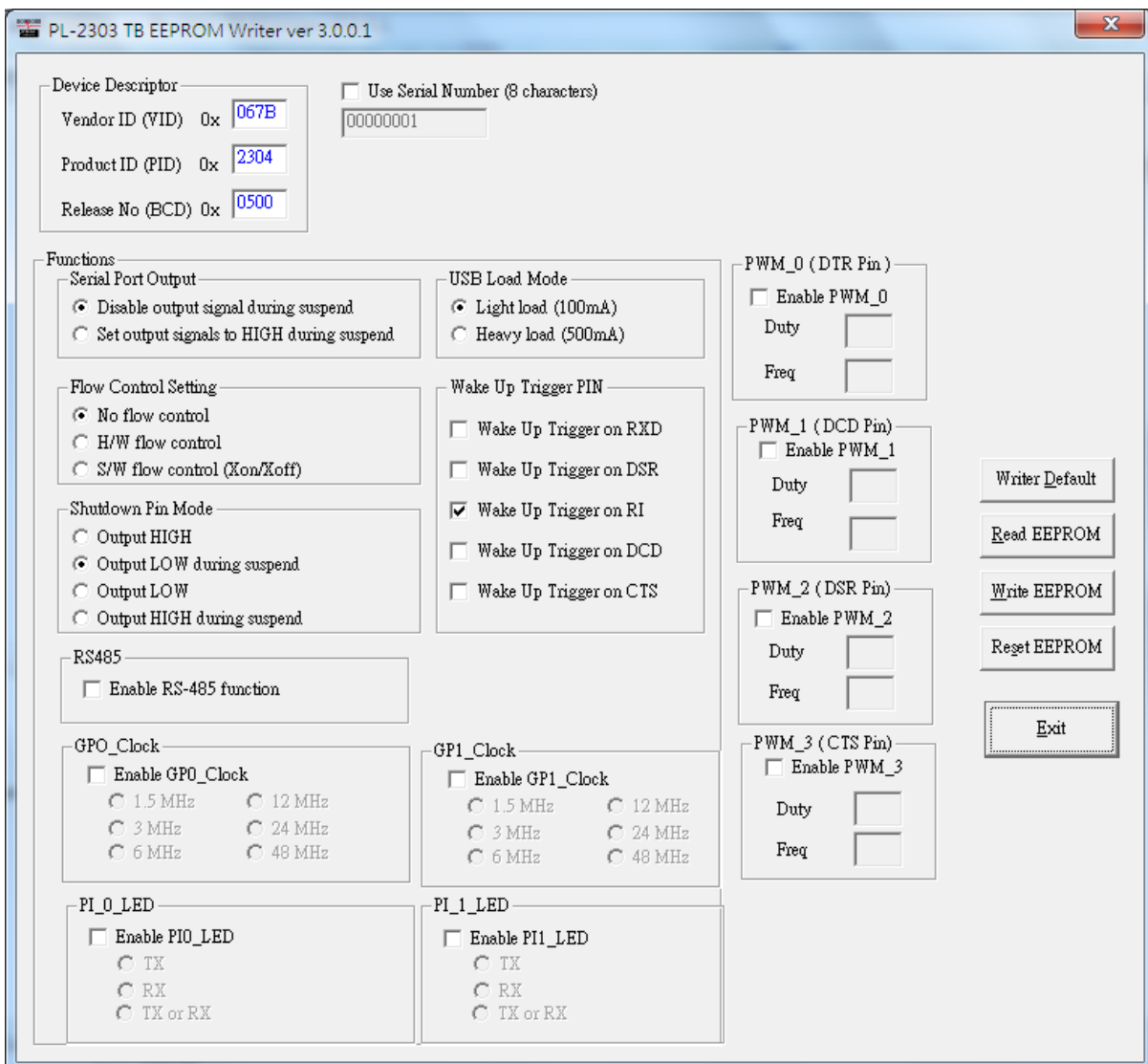


## PL2303TB EEPROM Writer

You can use the PL2303TB EEPROM Writer program to write and save the settings in EEPROM even if you unplug and replug the USB device.

 PL-2303 TB EEWriter v3.0.0.1.exe 2012/6/8

Aside from the basic USB device descriptor and chip function settings, the PL2303TB EEPROM Writer program also includes the settings for the PWM (DTR, DCD, DSR, CTS), Clock Output (GP0, GP1), and Access LED (PI\_0, PI\_1) pins.



PL-2303 TB EEPROM Writer ver 3.0.0.1

Device Descriptor

Vendor ID (VID) 0x  ☐ Use Serial Number (8 characters)

Product ID (PID) 0x

Release No (BCD) 0x

Functions

Serial Port Output

☒ Disable output signal during suspend

☐ Set output signals to HIGH during suspend

Flow Control Setting

☒ No flow control

☐ H/W flow control

☐ S/W flow control (Xon/Xoff)

Shutdown Pin Mode

☐ Output HIGH

☒ Output LOW during suspend

☐ Output LOW

☐ Output HIGH during suspend

RS485

☐ Enable RS-485 function

GPO\_Clock

☐ Enable GPO\_Clock

☐ 1.5 MHz ☐ 12 MHz

☐ 3 MHz ☐ 24 MHz

☐ 6 MHz ☐ 48 MHz

GP1\_Clock

☐ Enable GP1\_Clock

☐ 1.5 MHz ☐ 12 MHz

☐ 3 MHz ☐ 24 MHz

☐ 6 MHz ☐ 48 MHz

PI\_0\_LED

☐ Enable PIO\_LED

☐ TX

☐ RX

☐ TX or RX

PI\_1\_LED

☐ Enable PI1\_LED

☐ TX

☐ RX

☐ TX or RX

USB Load Mode

☒ Light load (100mA)

☐ Heavy load (500mA)

Wake Up Trigger PIN

☐ Wake Up Trigger on RXD

☐ Wake Up Trigger on DSR

☒ Wake Up Trigger on RI

☐ Wake Up Trigger on DCD

☐ Wake Up Trigger on CTS

PWM\_0 (DTR Pin)

☐ Enable PWM\_0

Duty

Freq

PWM\_1 (DCD Pin)

☐ Enable PWM\_1

Duty

Freq

PWM\_2 (DSR Pin)

☐ Enable PWM\_2

Duty

Freq

PWM\_3 (CTS Pin)

☐ Enable PWM\_3

Duty

Freq

Writer Default

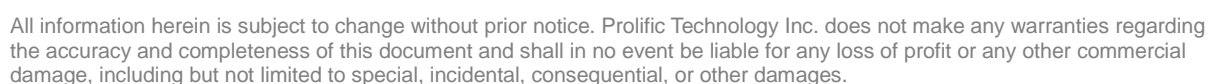
Read EEPROM

Write EEPROM

Reset EEPROM

Exit

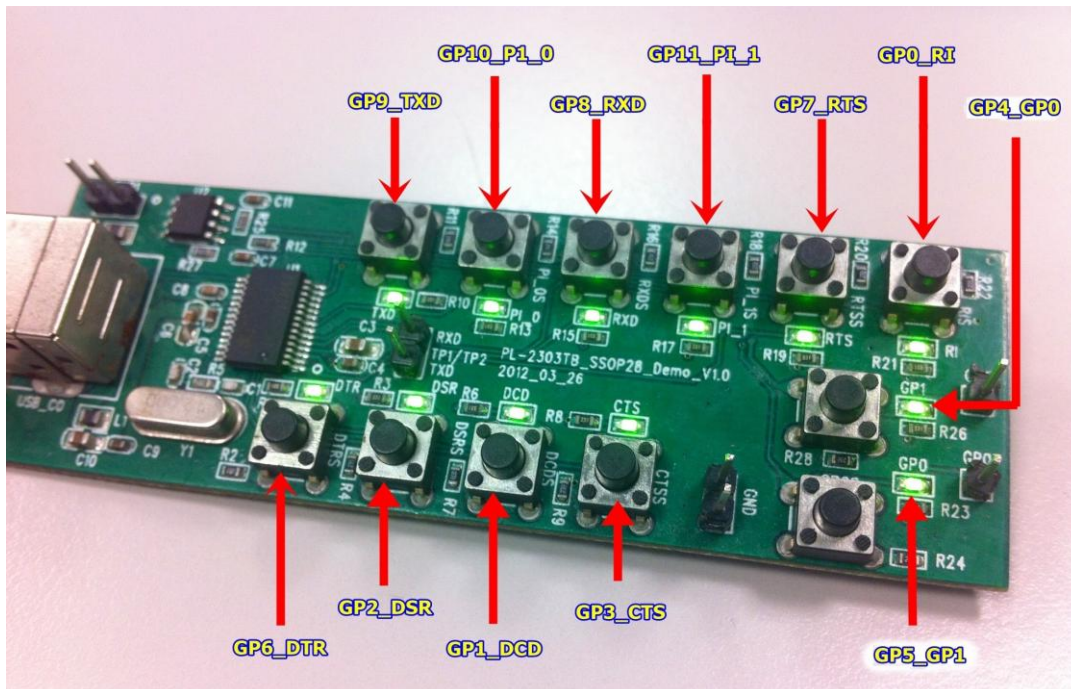
Prolific also provides the PL2303TB Demo AP test program for setting and demonstrating the 12 GPIO, Clock Output (GP0/GP1), Access LED (PI\_0/PI\_1), and PWM feature (Breathe LED) using the PL2303TB Demo Board. The Demo AP also includes Breathe LED, Scroll LED, and TX/RX Loopback application test. All settings will return to the chip default internal settings whenever the USB device is unplug or reset. Please contact Prolific for the Demo AP Source Code and API Manual for your programming reference.





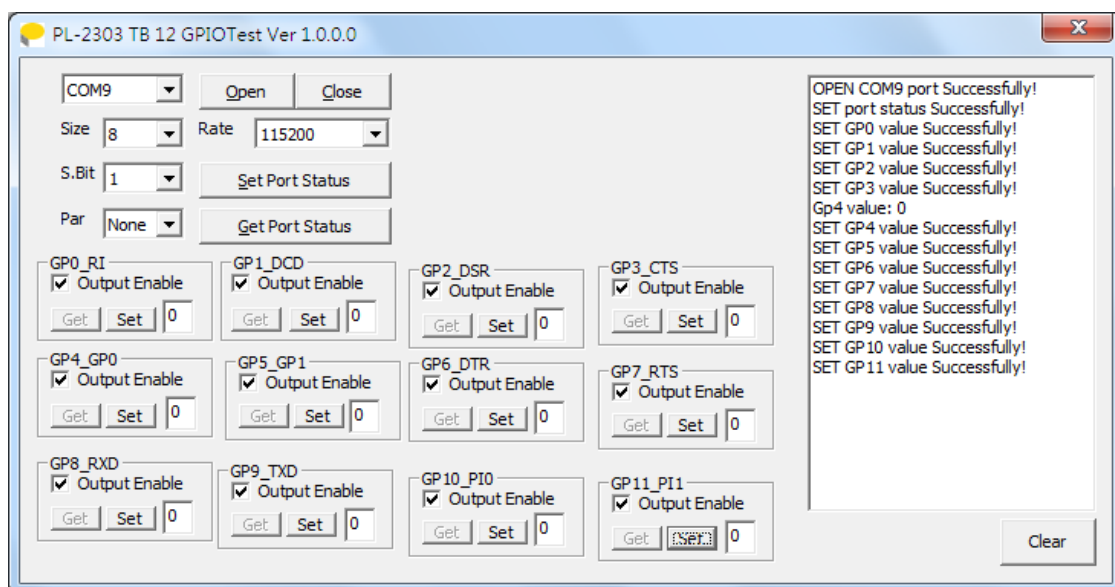
## 12 GPIO Pins (LED Control)

This section describes how to set the 12 GPIO pins of the PL2303TB Demo Board.

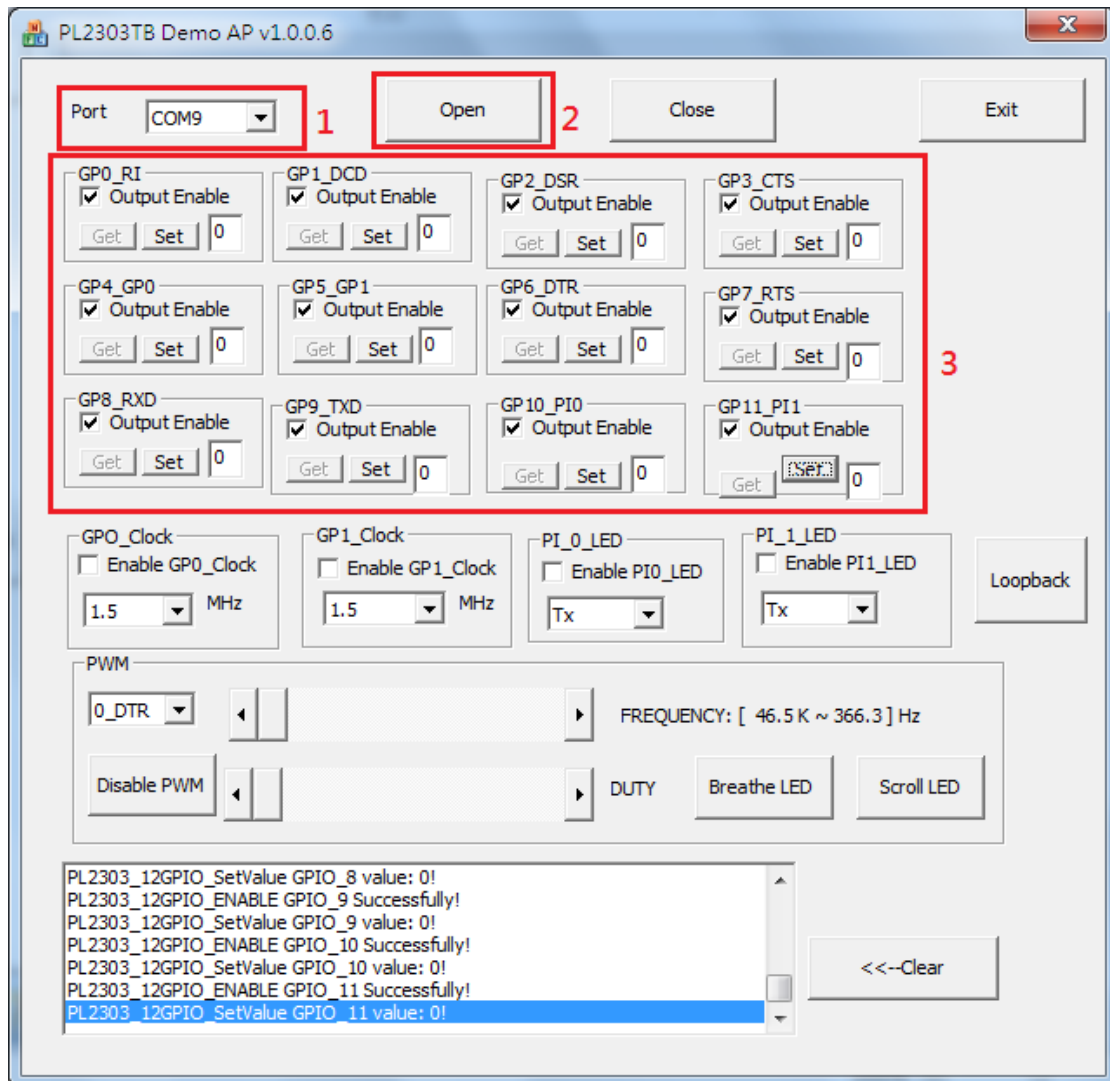


**NOTE:** The PL2303TB Demo Board has incorrectly printed the GP1 and GP0. GP1 should be GP0 while GP0 should be GP1.

1. You can use the PL2303TB 12 GPIOTest program to set/control the 12 GPIO LED of the demo board. Set the COM port, click Open, click Output Enable and set value 0 for GPO to GP11 pins. The LEDs for each GPIO will then turn on.



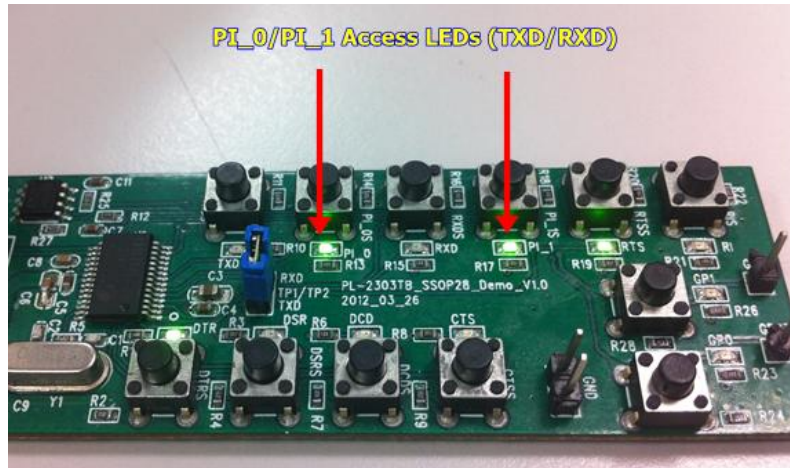
- You can also use the PL2303TB Demo AP to set the 12 GPIO to turn on the LEDs of the demo board. Set the COM port, click Open, click Output Enable and set value 0 for GPO to GP11 pins. The LEDs for each GPIO will then turn on.



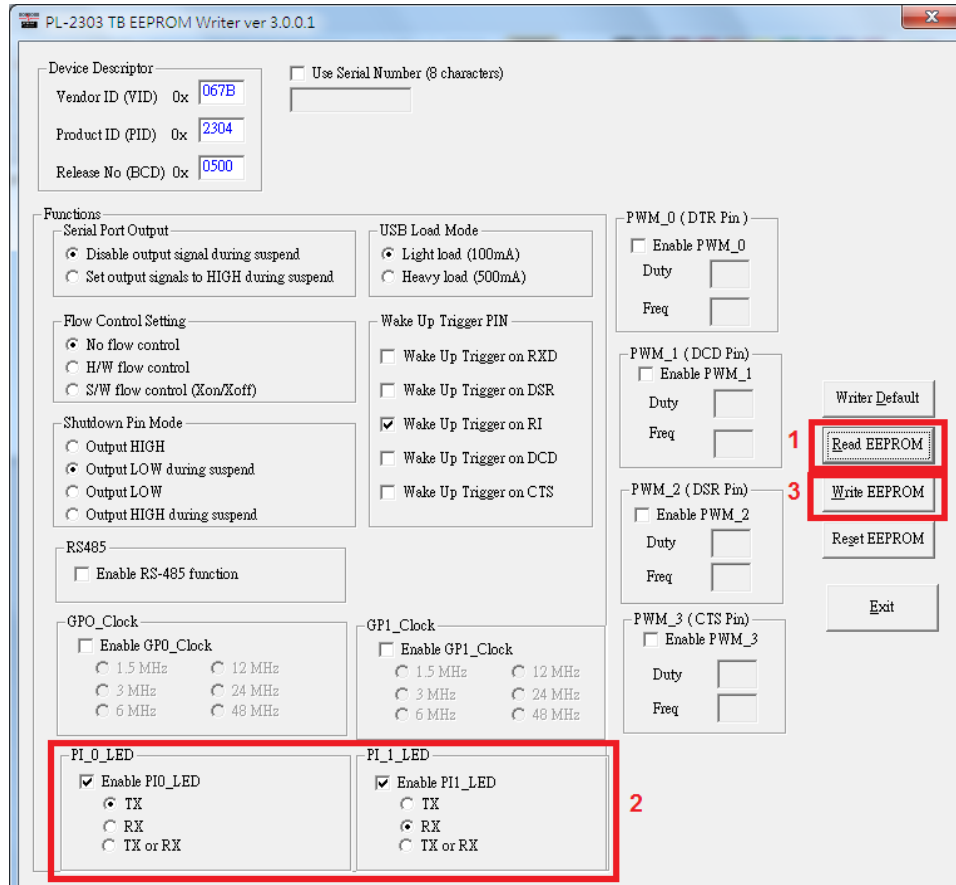


## TXD/RXD Access LED (PI\_0 & PI\_1)

This section describes how to set the PI\_O and PI\_1 pins as TXD/RXD Access LEDs. You can use one of these pins or both to work as blinking access LEDs when TXD and RXD pins are active.



1. The PL2303TB EEPROM Writer provides the settings for the PI\_0 and PI\_1 LEDs. Click Read EEPROM, enable and set PI\_0/PI\_1 LED, and click Write EEPROM. Unplug and replug the PL2303TB USB device.

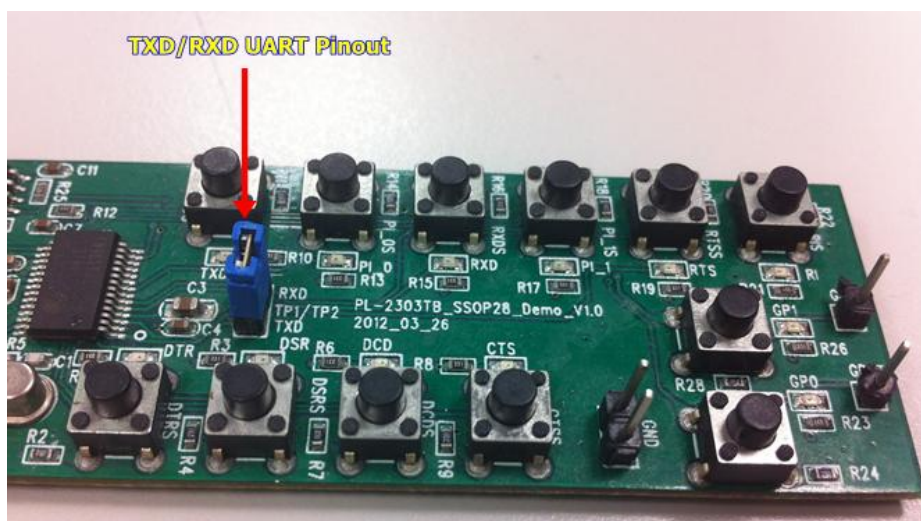


- Both PI\_0\_LED and PI\_1\_LED can be set to work as either a TX Access LED, or a RX Access LED, or both (TX or RX). If you only want to use one LED (PI\_0 or PI\_1) as Access LED for both TXD/RXD, then you select "TX or RX". Here, we will choose to use PI\_0\_LED as TX Access LED, and PI\_1\_LED as RX Access LED.

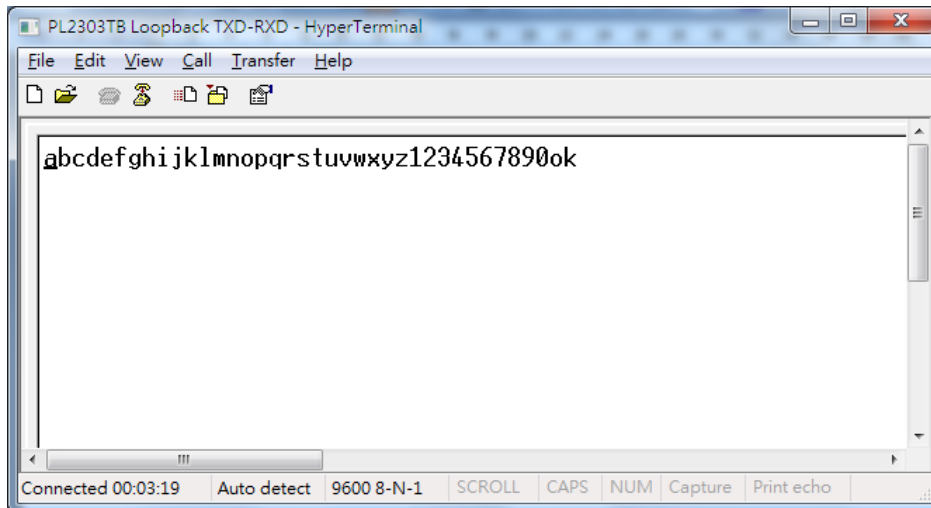
PI_0_LED	PI_1_LED
<input checked="" type="checkbox"/> Enable PIO_LED <input checked="" type="radio"/> TX <input type="radio"/> RX <input type="radio"/> TX or RX	<input checked="" type="checkbox"/> Enable PI1_LED <input type="radio"/> TX <input checked="" type="radio"/> RX <input type="radio"/> TX or RX

Device Descriptor	Default Value	Description
PI_0 LED	Disable	This option allows configuring and enabling the PI_0 pin as Access LED for active TXD, RXD, or both. LED connected to this pin will flash (period is 0.3s) during USB transmission. NOTE: The PI_0 pin can also be configured as GPIO pin if Access LED is not enabled.
PI_1 LED	Disable	This option allows configuring and enabling the PI_1 pin as Access LED for active TXD, RXD, or both. LED connected to this pin will flash (period is 0.3s) during USB transmission. NOTE: The PI_1 pin can also be configured as GPIO pin if Access LED is not enabled.

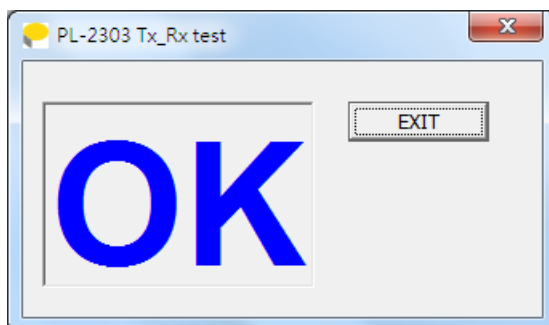
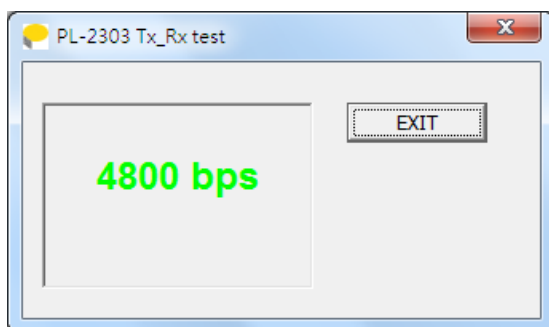
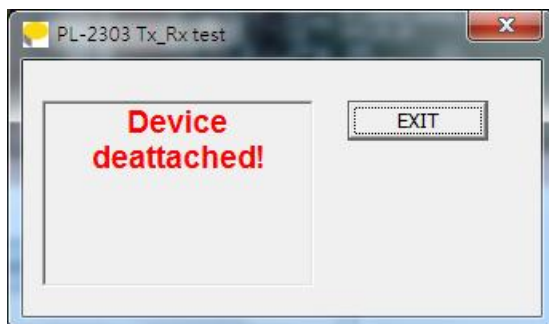
- To test, look for the TXD/RXD pins on the demo board and put a 2-pin jumper connector to short TXD and RXD.



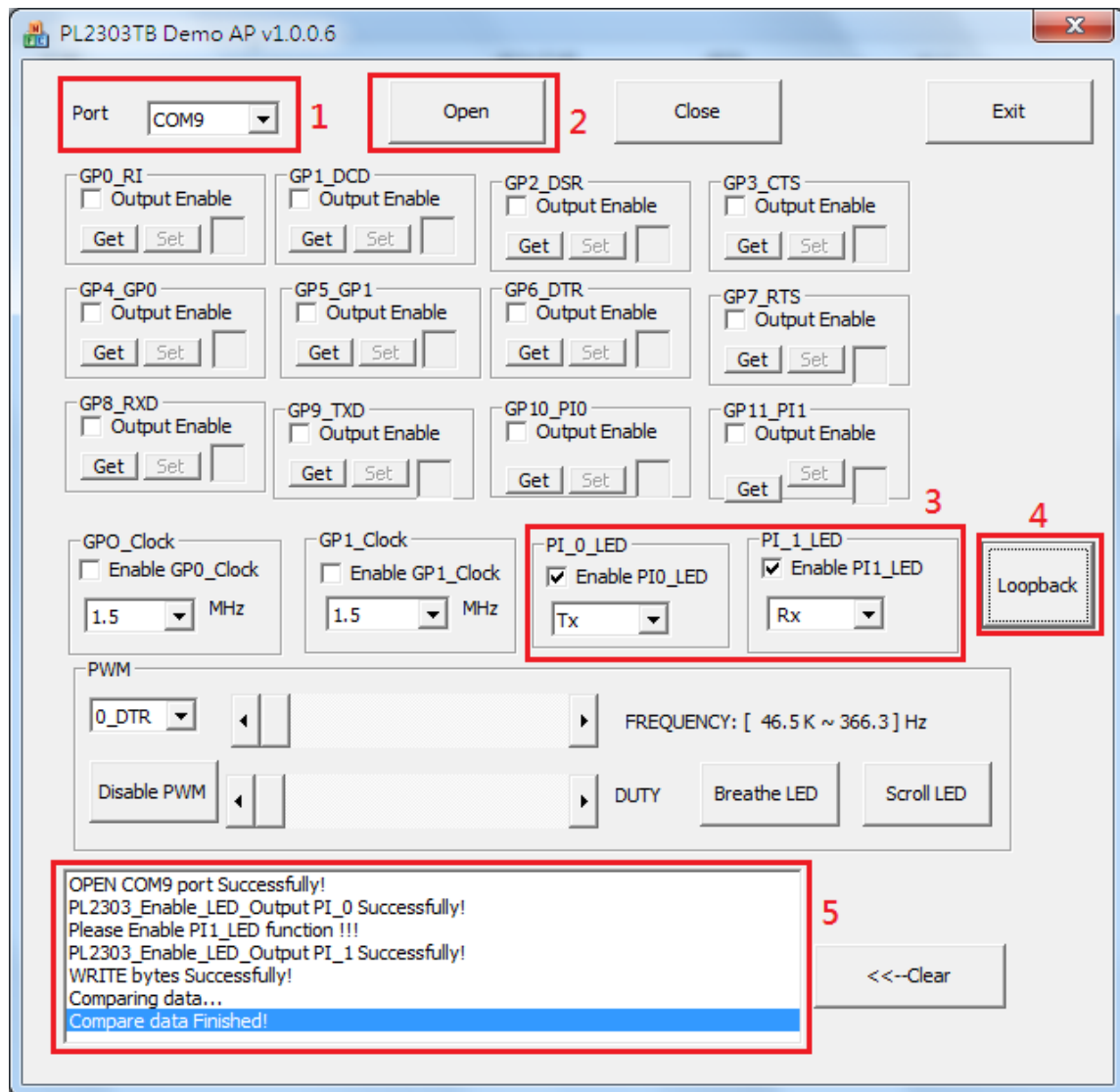
- Run HyperTerminal program or any serial port communication program (Putty, TeraTerm). Set the assigned COM port of the PL2303TB device and open connection. Press the keyboard to send and receive characters back. You should see the received characters on the display.



5. You can also run the PL-2303 Tx\_Rx loopback test program. Open the program and plug-in the PL2303TB demo board to attached and test.

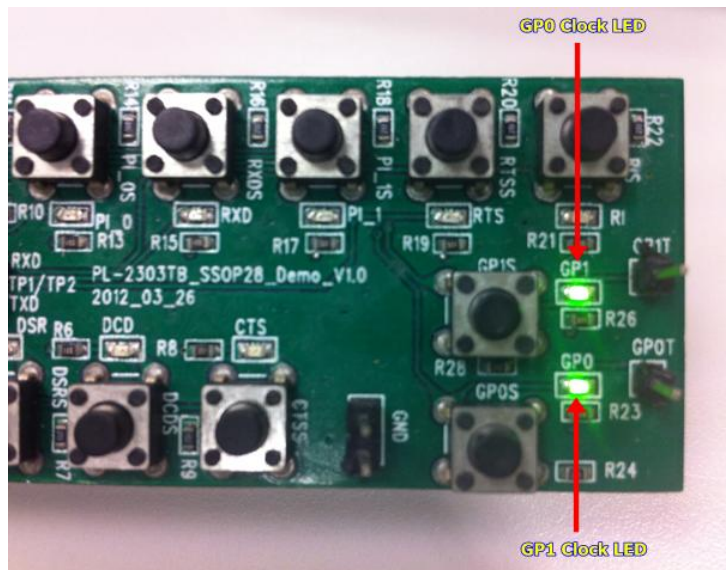


6. You can also use the PL2303TB Demo AP which includes a Loopback test. Select the COM Port, click OPEN, enable/set PI\_0/PI\_1 LED, and click the Loopback button. Check if Write bytes and Compare (Read) data is successful.



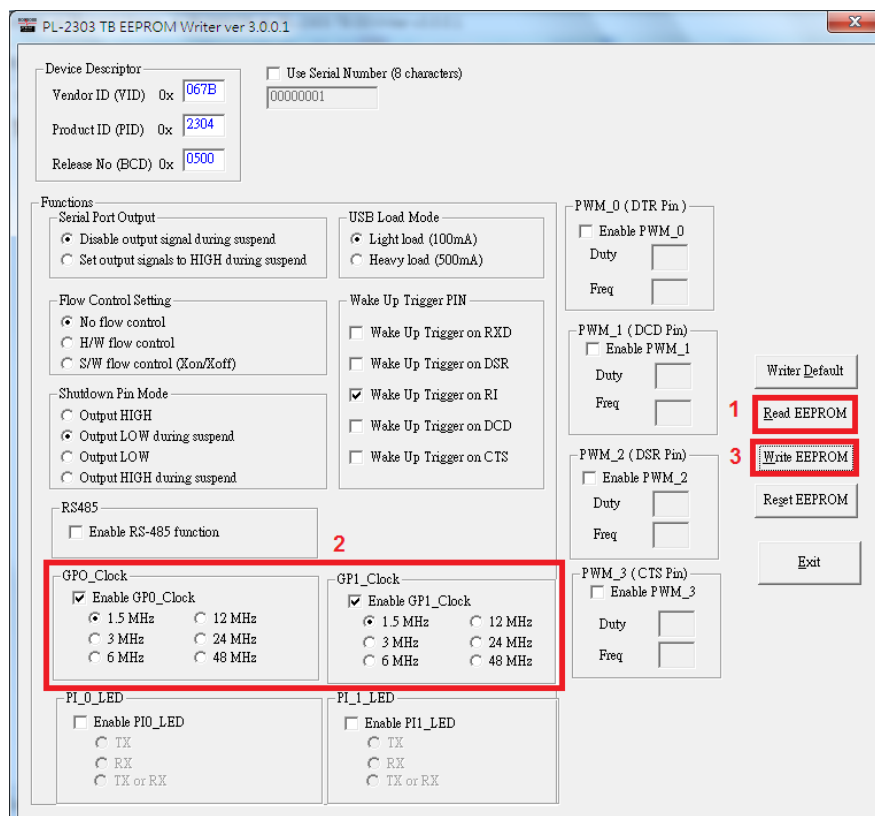
## GP0/GP1 Multiple Clock Output

This section describes how to set the GP0 and GP1 Clock Output pins.



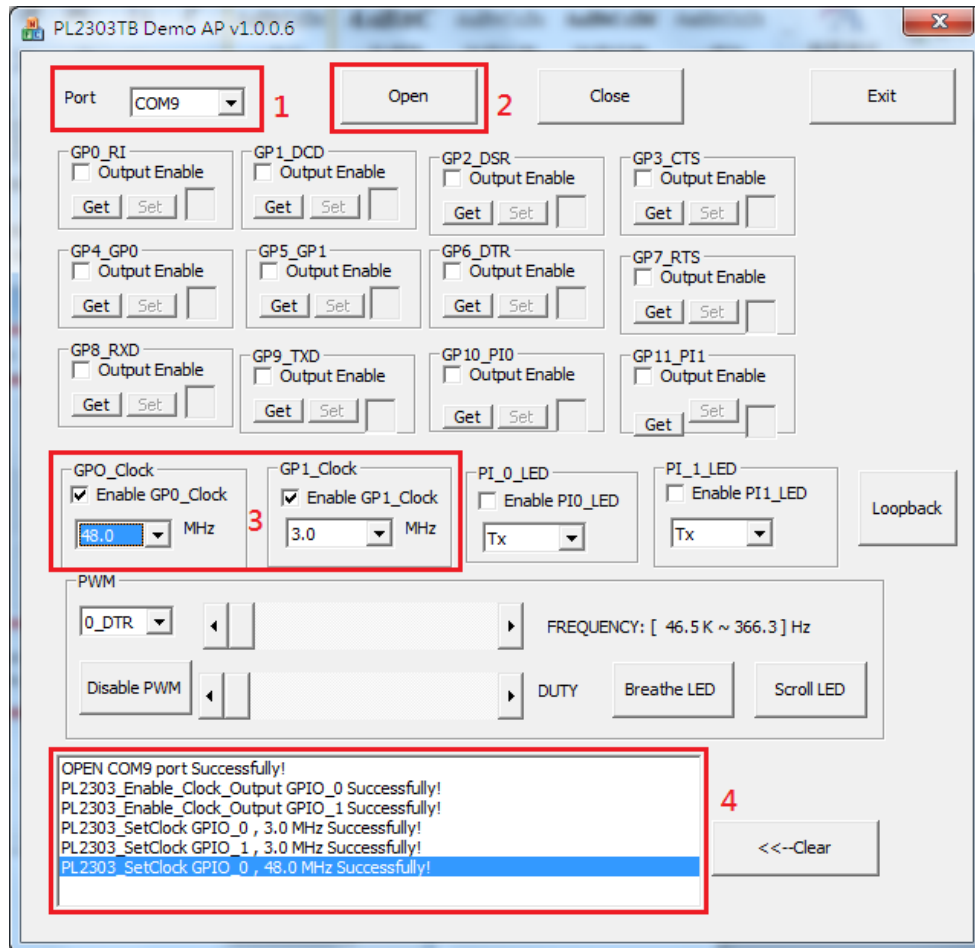
**NOTE:** The PL2303TB Demo Board has incorrectly printed the GP1 and GP0. GP1 should be GP0 while GP0 should be GP1.

1. Use the PL2303TB EEPROM Writer to enable and save the GP0 and GP1 clock output pin. Read EEPROM, enable/set GP0 and GP1 Clock, and click Write EEPROM.

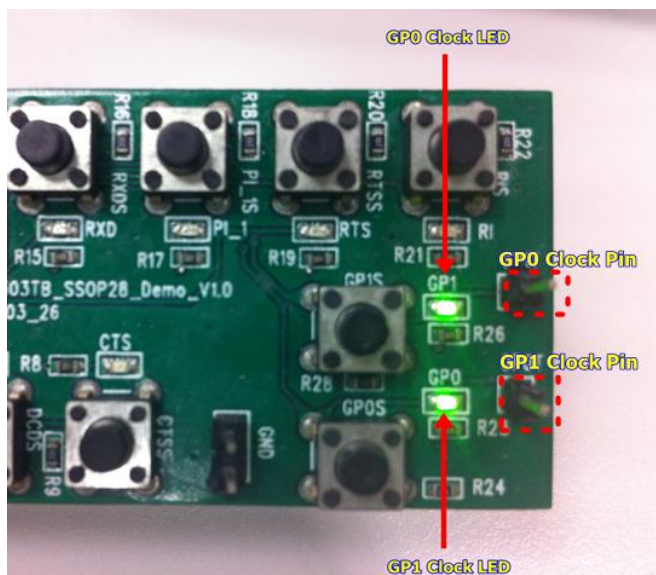




2. Use the PL2303TB Demo AP to enable and save the GP0 and GP1 clock output pin. Set COM Port, enable GP0 and GP1 Clock, and set desired frequency. Observe LED behavior.



3. The PL2303TB demo board also provides GP0 and GP1 output pin for scope measurement use.

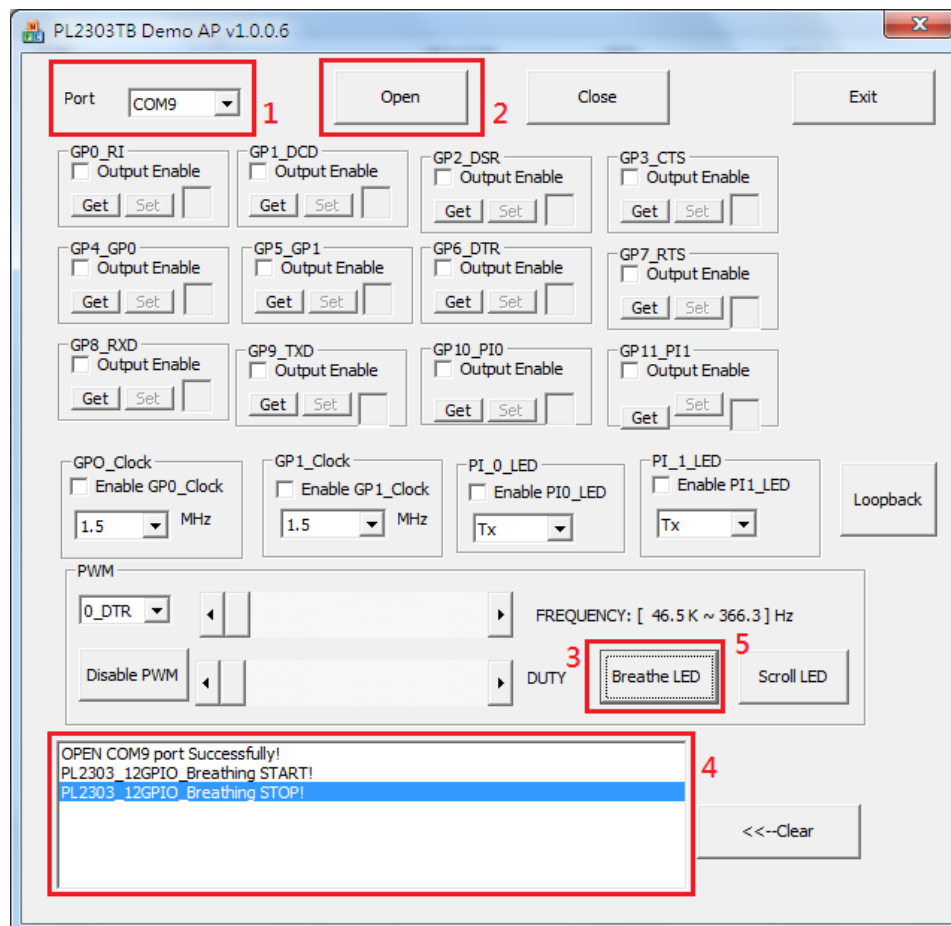


## Breathe LED Application (PWM Pins)

This section describes how to configure the PWM function of the PL2303TB demo board.

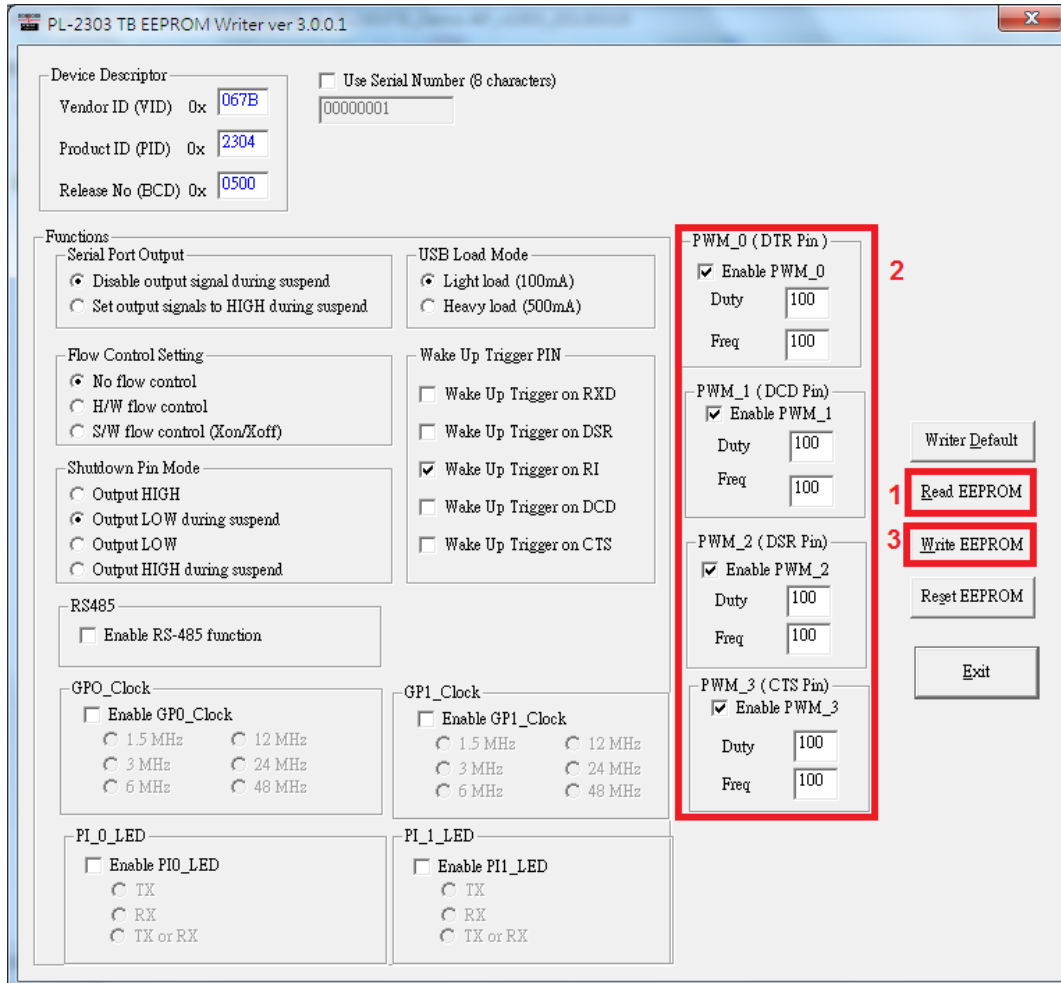


1. You can use the PL2303TB Demo AP to set PWM pins (DTR, DCD, DSR, CTS) frequency and duty. The demo AP also includes a Breathe LED application to demonstrate the PWM feature. Set COM port, click Open, and click Breathe LED. The four LEDs (DTR, DCD, DSR, CTS) will start breathing. Click the Breathe LED button again to stop.





- You can also use the PL2303TB EEPROM Writer to set PWM pins (DTR, DCD, DSR, CTS) frequency and duty. Click Read EEPROM, enable and set the PWM pins, enter Duty and Freq, and click Write EEPROM.



PL-2303 TB EEPROM Writer ver 3.0.0.1

Device Descriptor

Vendor ID (VID) 0x  ☐ Use Serial Number (8 characters)

Product ID (PID) 0x

Release No (BCD) 0x

Functions

Serial Port Output

☒ Disable output signal during suspend

☐ Set output signals to HIGH during suspend

Flow Control Setting

☒ No flow control

☐ H/W flow control

☐ S/W flow control (Xon/Xoff)

Shutdown Pin Mode

☐ Output HIGH

☒ Output LOW during suspend

☐ Output LOW

☐ Output HIGH during suspend

RS485

☐ Enable RS-485 function

GPO\_Clock

☐ Enable GPO\_Clock

☐ 1.5 MHz ☐ 12 MHz

☐ 3 MHz ☐ 24 MHz

☐ 6 MHz ☐ 48 MHz

GP1\_Clock

☐ Enable GP1\_Clock

☐ 1.5 MHz ☐ 12 MHz

☐ 3 MHz ☐ 24 MHz

☐ 6 MHz ☐ 48 MHz

PI\_0\_LED

☐ Enable PI0\_LED

☐ TX

☐ RX

☐ TX or RX

PI\_1\_LED

☐ Enable PI1\_LED

☐ TX

☐ RX

☐ TX or RX

PWM\_0 (DTR Pin)

☒ Enable PWM\_0

Duty

Freq

PWM\_1 (DCD Pin)

☒ Enable PWM\_1

Duty

Freq

PWM\_2 (DSR Pin)

☒ Enable PWM\_2

Duty

Freq

PWM\_3 (CTS Pin)

☒ Enable PWM\_3

Duty

Freq

Writer Default

1 Read EEPROM

3 Write EEPROM

Reset EEPROM

Exit

## Scrolling (Marquee) LED Application

This section describes how to run the Scrolling LED application using the PL2303TB demo board.



1. Open the PL2303TB Demo AP. Set the COM port, click Open, and click Scroll LED button. Observe the LEDs (TXD, RI\_0, RXD, PI\_1, RTS, RI, GP1, GP0) will start scrolling. Click Scroll LED button again to stop scrolling.

