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Strata Enabled NCV768X
Automotive LED Tail Lights

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Introduction

The Strata NVC768X Automotive LED Tail Lights evaluation board provides an easy to use platform within the Strata Development Studio for the NCV7684 and NCV7685. Strata gives the developer access to any collateral, including datasheets, BOMs and schematics, as well as providing a user interface for easily evaluating the features and changing relevant registers of the NCV7684 and NCV7685. This document will provide important measurements taken for the hardware on this evaluation board.

Device Features

- 12 Common Current Programmable Sources up to 60 mA
- Independent PWM Duty Cycle Control for each Channel (NCV7685 only)
- Common PWM Duty Cycle Control via I2C
- Several duty cycle options for each variant
- Open LED String Diagnostics
- Single Resistor for Current Set Point
- 8 Bits I2C Interface with CRC8 Error Detection
- OTP Bank for Stand−Alone Operation (2 Configurations)
- Detection and Protection Against Open Load and Under−Voltage
- Over Temperature Detection and Protection

Applications

- Dashboard Applications
- Rear Combination Lamps (RCL)
- Daytime Running Lights (DRL)
- Fog Lights
- Center High Mounted Stop Lamps (CHMSL) Arrays
- Turn Signal and Other Externally Modulated Applications

User Guide

This section will explain how to use the Strata Enabled STR-NCV7684-AUTO-LED-GEVB and STR-NCV7685-AUTO-LED-GEVB in a step-by-step manner and will cover both the hardware required as well as how to use the User Interface (UI) in Strata. Please ensure that the latest version of Strata is installed before connecting to the board. The latest version can be downloaded from the ON Semiconductor website.

Hardware Setup

There are three external input power supply options when using the STR-NCV768X-AUTO-LED-GEVB. The first hardware setup option is to use a mini USB connector (J33) on the bottom of the board. This USB connector will supply power to the LEDs as well as facilitate communication between Strata and the board. The other two hardware setup options are for users who wish to use an external supply for higher power applications the USB VBUS rail cannot provide. Use the banana plugs (J29 and J31) or the barrel connector (J30).
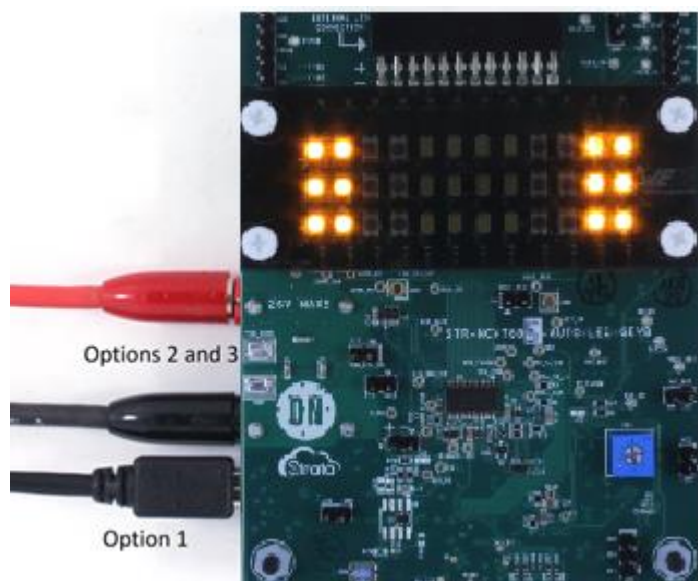
User Interface

The UI within the Strata app will allow the user to control and monitor the evaluation board without requiring other lab equipment or training. The steps below include the details on how to start the Strata application.

1. First, download and install the most recent version of Strata. It can be found here.
2. Open the Strata app. Login and the home screen will appear.
3. The app will automatically detect the device and will bring up the UI for the board that is plugged in.
4. The round button with a question mark in the top right corner is the Help button, and it will show the user what everything on the UI is doing. See the help messages for more in depth descriptions of all the UI elements.

5. The first view that appears is the Car Demo Mode. The demo mode features buttons which control the LEDs similarly to the tail lights and headlights of a car. Some EVB models also have a light sensor installed to detect the ambient light, which will change the background light as well as enable the brake lights and headlights in dim lighting. For EVBs without the light sensor, the moon and sun buttons can be used to change the background lighting.

    a.
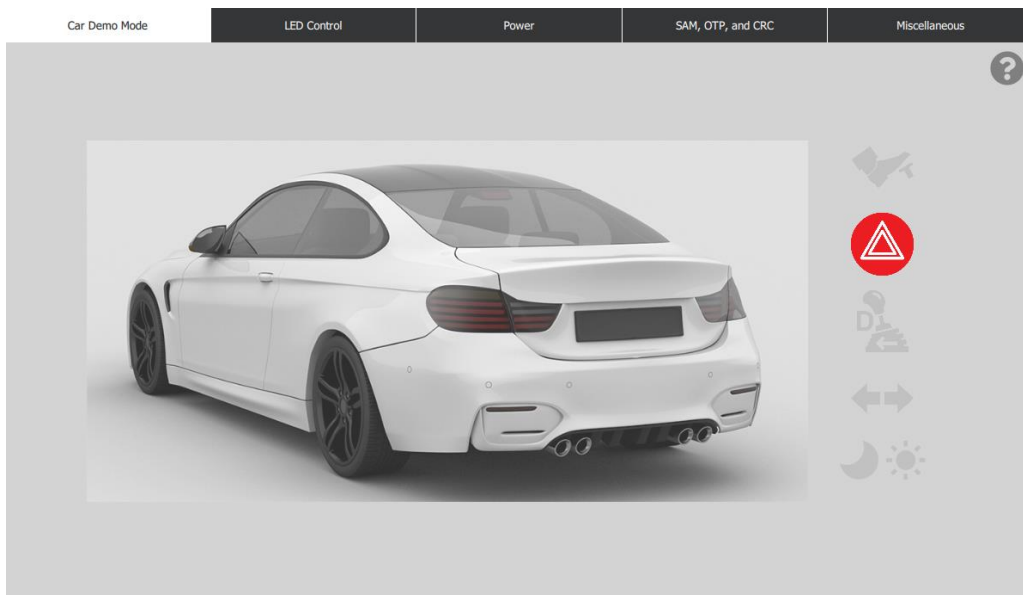
6. The "LED Control" view allows the user to control the LEDs in a more detailed manner. This view offers individual LED string control such as toggling the enable, toggling on-board switches, toggling PWM, and changing the PWM duty cycle. This view also offers global control of ISET current, PWM enable, linear/log PWM, PWM frequency, and locking PWM EN and PWM Duty cycle for all channels together. This view also allows the user to change the diagnostic mode. (**Note:** The NCV7684 and NCV7685 offer some differing control features on this page.) See help messages for more details.

    a.
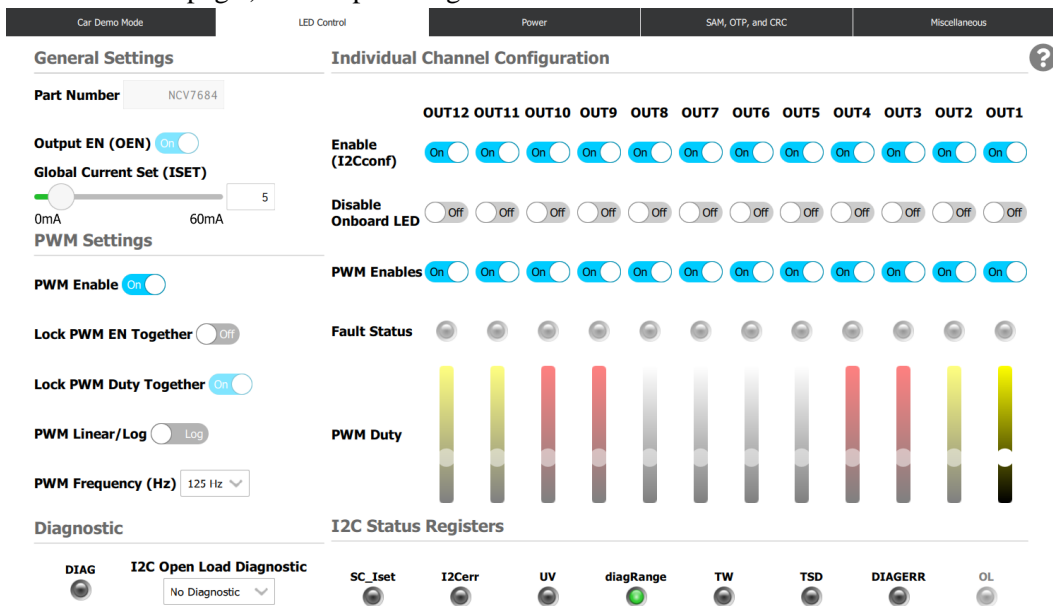
7. The "Power" view allows the user to control the VLED supply as well as displays relevant telemetry associated with the operation of the EVB. The "VLED Input Voltage Type" dropdown has options for "Boost", "Buck", and "Bypass" supply types. Changing the supply type will change the voltage slider according to the possible output voltages for that particular supply. If there is a fault on the VLED rail, such as a power supply going into OCP, then the user will have to use the "Reset VLED" button after fixing the setting that caused the OCP. See help messages for more information about the power supply options on this board.
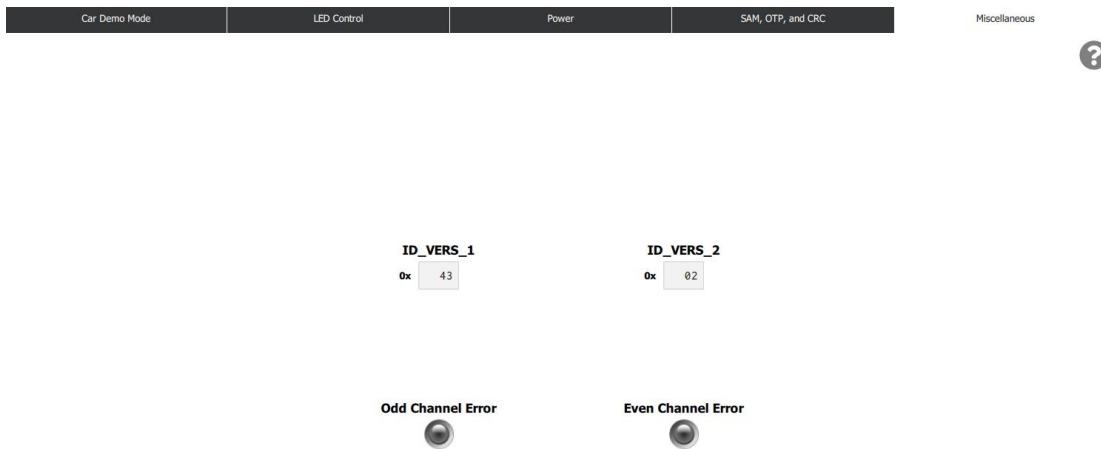

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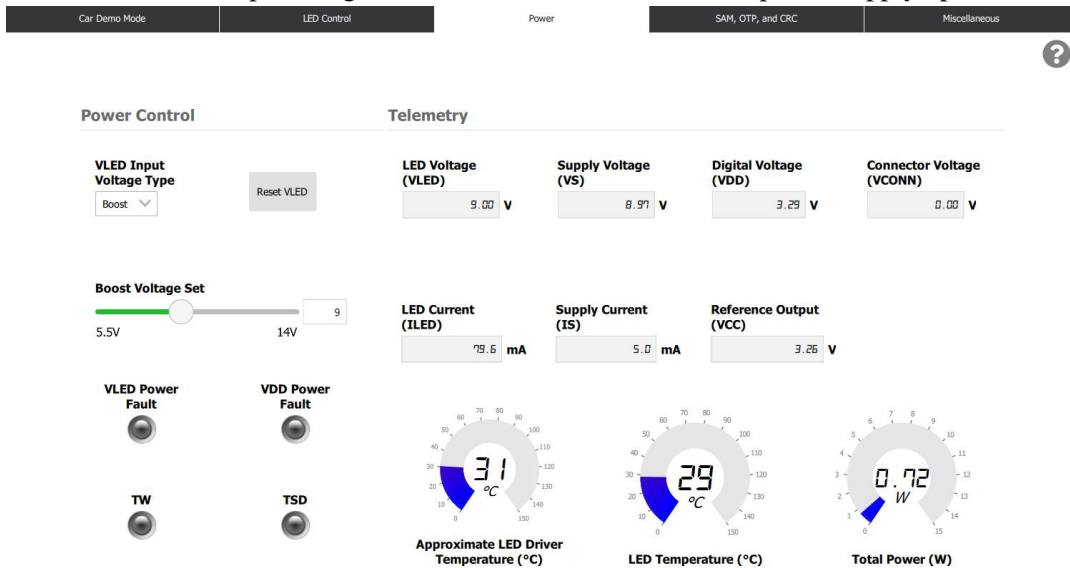
8. The "SAM, OTP, and CRC" view offers configuration of which I2C address to communicate with, configuration of the Stand Alone Mode (SAM) settings, and allows the user to One Time Program (OTP) the device. See the help messages for a more detailed description of these registers
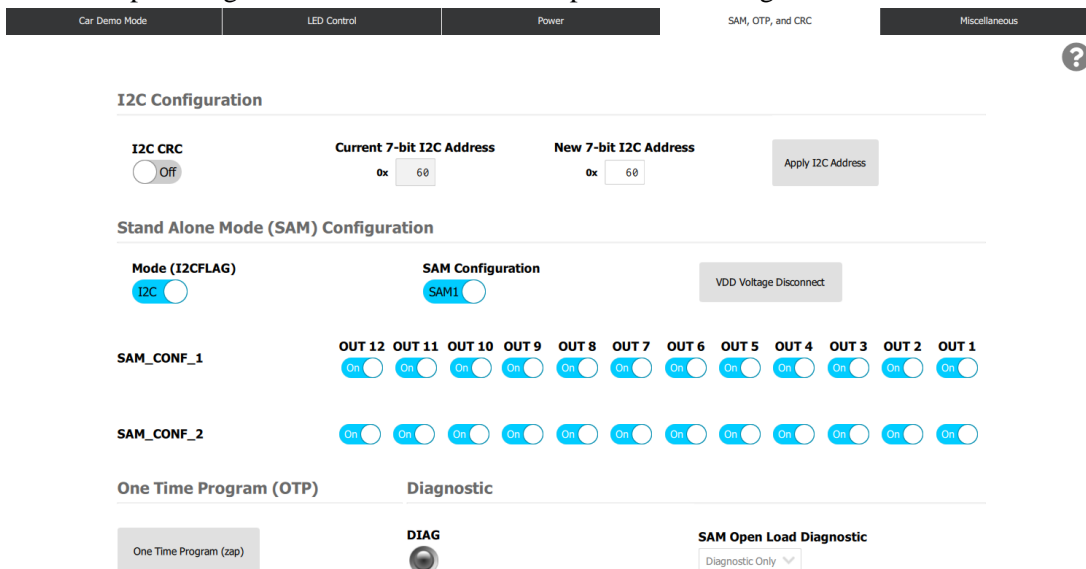
a.

9. The "Miscellaneous" tab offers information about the identifiers for the LED driver installed on the EVB, as well as indicators about errors on odd/even LED channels.

| Car Demo Mode | LED Control | Power | SAM, OTP, and CRC | Miscellaneous |

ID_VERS_1

0x   43

ID_VERS_2

0x   02

Odd Channel Error

Even Channel Error

a.

Miscellaneous

VS and VDD lost

In the event of losing both VS and VDD, the registers in the NCV7684/5 will be reset. This reset will cause the UI to be out of sync with the LED driver. Remove all power from the board including the USB cable to reset

Simultaneous external and on-board LEDs

The external LED connector is always connected to VLED, meaning external LEDs can be used in parallel with the on-board LEDs. This configuration will work depending the external LEDs that are connected but it is not recommended.

Daisy Chain

This board includes two on-board headers for use with the daisy chain feature of the NCV7684/5 to daisy chain multiple NCV768X. This interface has not been tested and is not recommended for use.