Thomas Research Products

LED Driver Programming Guide

Date	Software Version	Revision Notes
11/19/2015	1.6	Release

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3. Introduction

The Thomas Research Products (TRP) Programming Software is a configuration tool for Thomas Research Products programmable LED drivers. A simple connection using a special USB cord allows programming with a PC based graphical user interface (GUI). The user can set and store the operating parameters of a TRP programmable LED Driver.

TRP Programming Cord (PG1-C3):
The custom programming cord connects the USB port of a computer and the LED driver being programmed. This unit also provides all power required to the LED driver during programming. The driver input power leads do not require connection to an AC power source when programming the LED driver.

TRP Programming Software (PG1-SW):
The programming software is a Windows based GUI that allows driver features to be configured and stored for later use. LED driver output current can be set within its specified range. It also provides the ability to control features like dimming curve type, minimum and maximum current output and NTC thermal protection. The user can then save the profile to a computer disk-drive and recall as needed. Programming each driver simply requires a click of the mouse to program in a single step.

The user can also assign custom part numbers and save profiles in an excel file with .xls formatting only. See section 7. Definition of the Custom Model Matrix.xls for more information. The TRP Programmer software supports bar code scanners. The barcode scanner can be used to automate the programming of the attached LED driver. Use a separate bar code generator of your own choice to code the custom part number to label drivers or for production instructions. Then scan the bar code to quickly retrieve saved settings. This barcode scanner interface also provides an option to either enable or disable logging of the parameters to an excel file.

3.1   Compatible Thomas Research Products LED Drivers

The following table lists compatible Thomas Research Products LED drivers that can be programmed using the TRP Programming Software. TRPID is a pre-programmed Thomas Research Products ID number for the respective driver. The TRPID is not user changeable.

TRPID	Thomas Research Products Part Number	Programmable Notes
93057418	LED55W PG1-055-C1500-D2	Fully GUI Programmable or RSET for Iout

3.2   Computer Requirements

Minimum recommended computer requirements are:

- 1GHz processor
- 512MB RAM
- 1 USB Port (v2.0)
- Microsoft Windows XP or higher®
- [.NET framework version 2.0 or higher](#)*
- CH341 USB-I2C Driver*
- [Adobe Reader](#)9.5* or higher
- Microsoft Excel 2000 or higher (required for use and logging feature)

** All drivers and TRP Programmer software & manuals are available for download here under downloads section on the right side of the webpage. http://www.trpssl.com

3.3   Hardware Requirements

PG1-C3   TRP Programming Cord (TRP custom USB cable is required. Standard USB cables will not work) PG1-C3 cord connections are USB Type A (at computer) and USB Mini Type B (at LED driver). A standard USB extension cable with male/female Type A plug and receptacle can be used to lengthen the TRP programming cord as needed. Do not use extension cables with USB Mini Type B connections.

(Optional)   Bar Code Scanner (Code128 or similar)

4. Installing the TRP Programmer Software

4.1 Download required files

Step 1: Download the TRP Programmer software package which includes everything needed and save the file into a known location.

**Step 2**: Unzip the file into a know location. Folder name will be **"TRP_Programming_Tool_Installer"**

4.2 Installing the CH341 USB-I2C Drivers for Windows

Step 1: Open the **"TRP_Programming_Tool_Installer"** folder where you saved the TRP programmer Files. Open the sub-folder **"TRP_USB_Driver"** and Right click on the **" Thomas Research Products USB driver.EXE"** setup file to Run as administrator/ Install (Depending upon the Windows operating system) & click it.
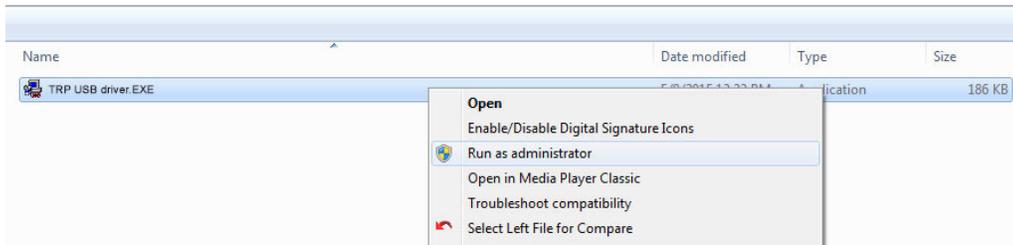
Note 1: During some installation instances on Windows XP or Windows Vista there might be some additional windows pop-up messages depending upon the User accessibility settings. Please select the appropriate options depending upon user preferences.
User Account Control message for driver installation on a Windows Vista & Later operating system. (Not if you follow instructions above and use Run as administrator" you will bypass this message)
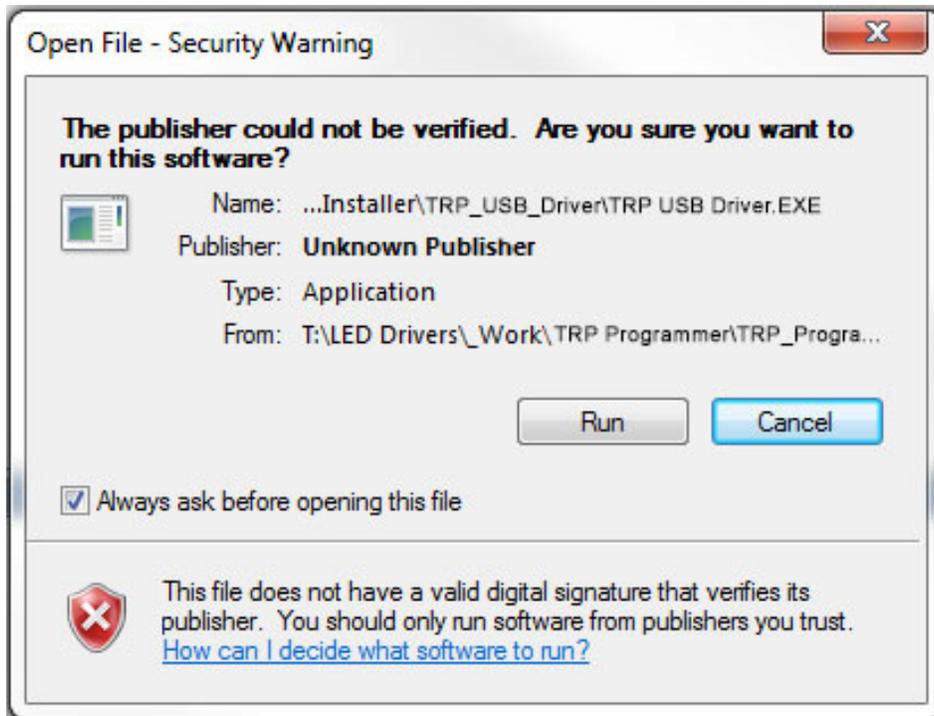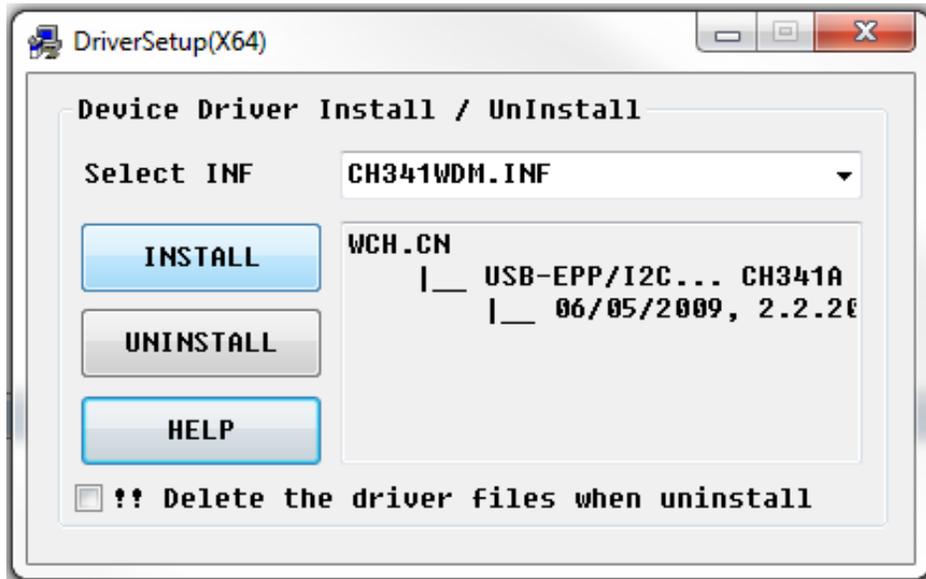
Note1 Continued:

Installation of the CH341 USB-I2C driver on a Windows XP operating system may pop-up messages as below. Select the appropriate user account and uncheck the box circled in **RED** to continue with the installation.

Step 2: Click the "INSTALL" button to begin the installation of the CH341 USB-I2C driver.

Step 3: Click "OK" button to complete installation. Then close Device Driver Install / Uninstall window.
After completing the Driver Setup you are now ready to install the TRP Programmer Software Tool.
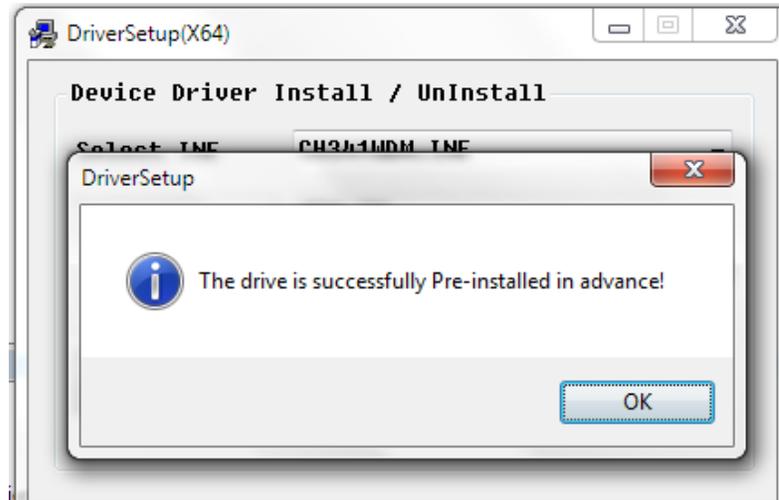

4.3   Installing the TRP Programmer Software Tool

Step1: Open the folder where the TRP Programmer Software was saved.
Double left click the **"TRPProgrammingTool.msi"** setup file to Run it or right click and select install.
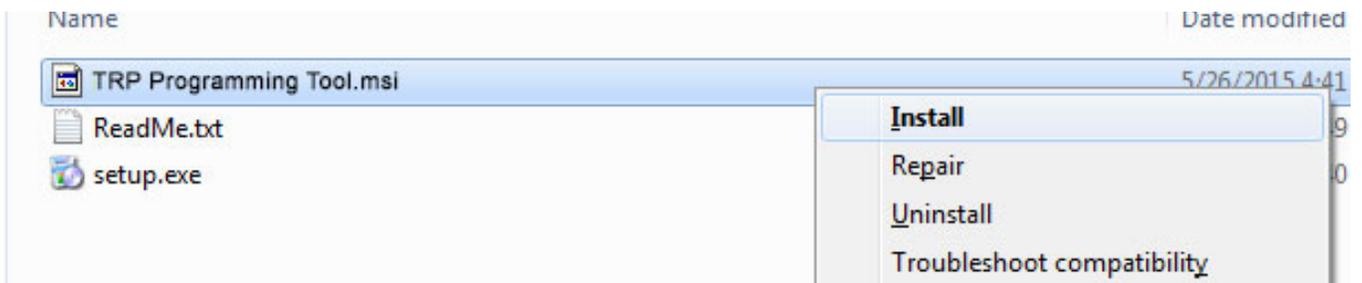
Note: Some TRP Programmer installation instances on different Windows Operating systems might result in additional pop-up window messages depending upon the User's account accessibility. To continue and allow installation of the TRP Programmer Application select "Yes" or select "Allow Access" in the access control prompt window.
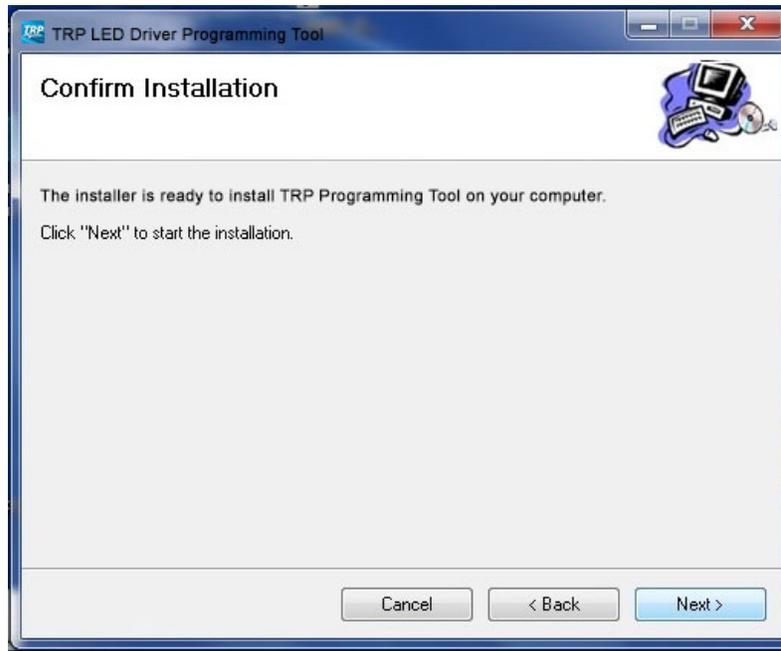
Step 2: Thomas Research Products Programming Tool Setup Window will be displayed, click **"Next"** to continue.
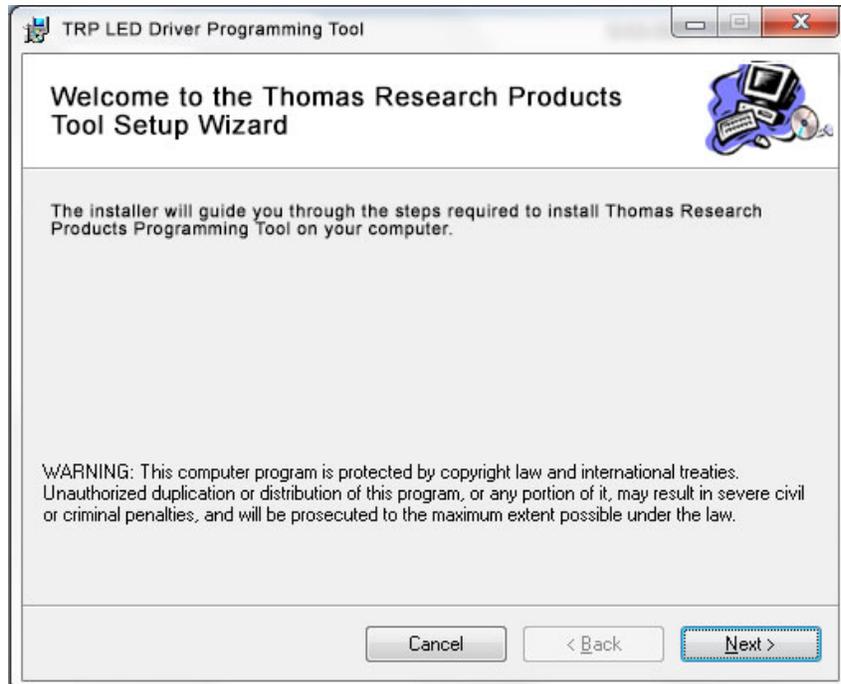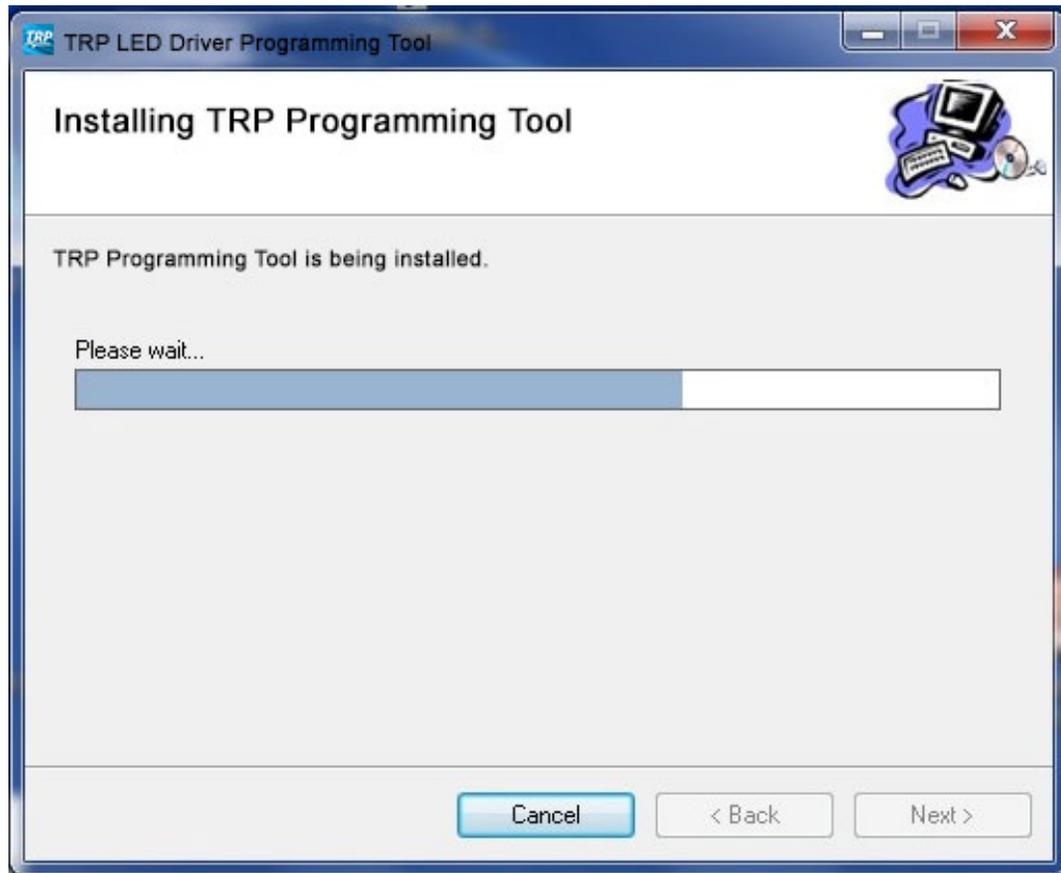

Step 3: TRP Programmer Installation window will pop-up. Select installation location or use default. Select user access control radio button for everyone or just yourself. Click **"Next"** to proceed.
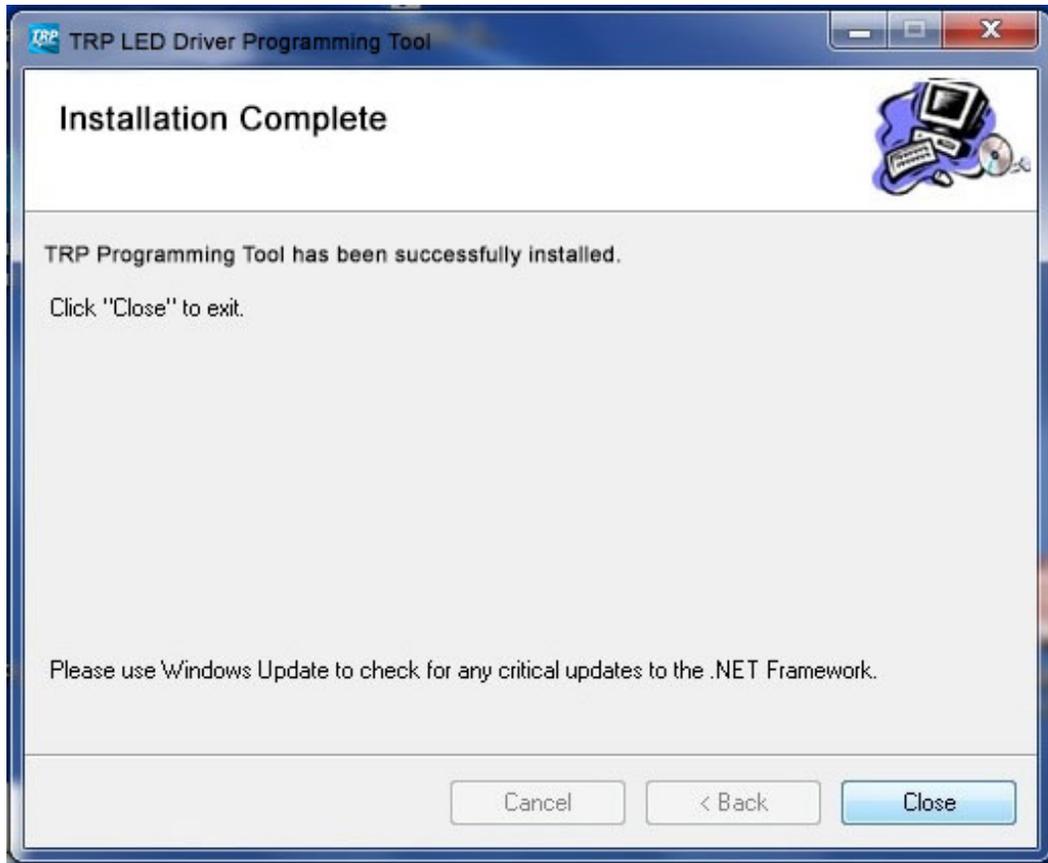
Step 4: Confirm installation by clicking "Next".

Step 5: Installation will begin and you will see the progress window. Wait for this installation process to complete. It may take a several minutes.

Step 6: Once installation has successfully completed the "Installation Complete" window will pop-up. Select "Close" to proceed.


The TRP Programming Software for Thomas Research Products Programmable LED drivers has now been successfully installed and is ready to use.

You will find a new Desktop Icon "TRP Programming" on your desktop. The program can be run from desktop icon or from Start Menu by choosing " All Programs", "TRP Programming Tool" and then "TRP Programming."

Users Manual will also be accessible from this same Start menu folder.

5. Connecting TRP Programmer Hardware

5.1 Connecting the USB Cable
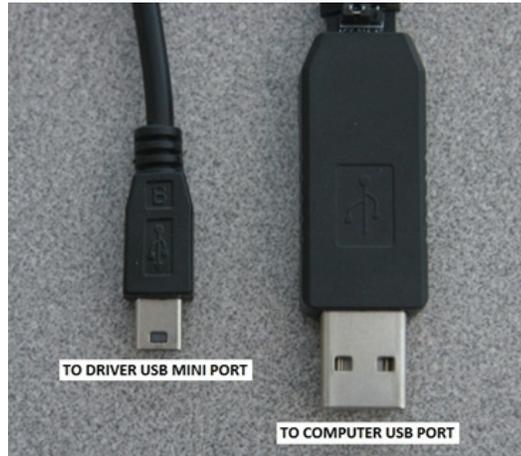
Step 1: Locate the USB cord (PG1-C3). Connect USB cable connector to any available USB 2.0 port on your computer. Connect USB mini connector to the "USB MINI" port on the TRP Programmable Driver.
WARNING: Standard USB cables will not work. Custom TRP cord must be used.

# 6. Using the TRP Programmer Software Tool

6.1   Initial Main Screen

If this is the first time using the TRP Programming Tool, a Custom Model Matrix.xls file must be created or open an existing file you may have. The Custom Model Matrix.xls file must be kept in the main TRP Programmer directory. If you place a previous version into this directory you will not get this "creation" dialog.

Select "Search" to navigate to any location you may have saved previous version to, select it, then this file will be copied to proper directory for use.

-OR-

Click "Create" to create this required file.
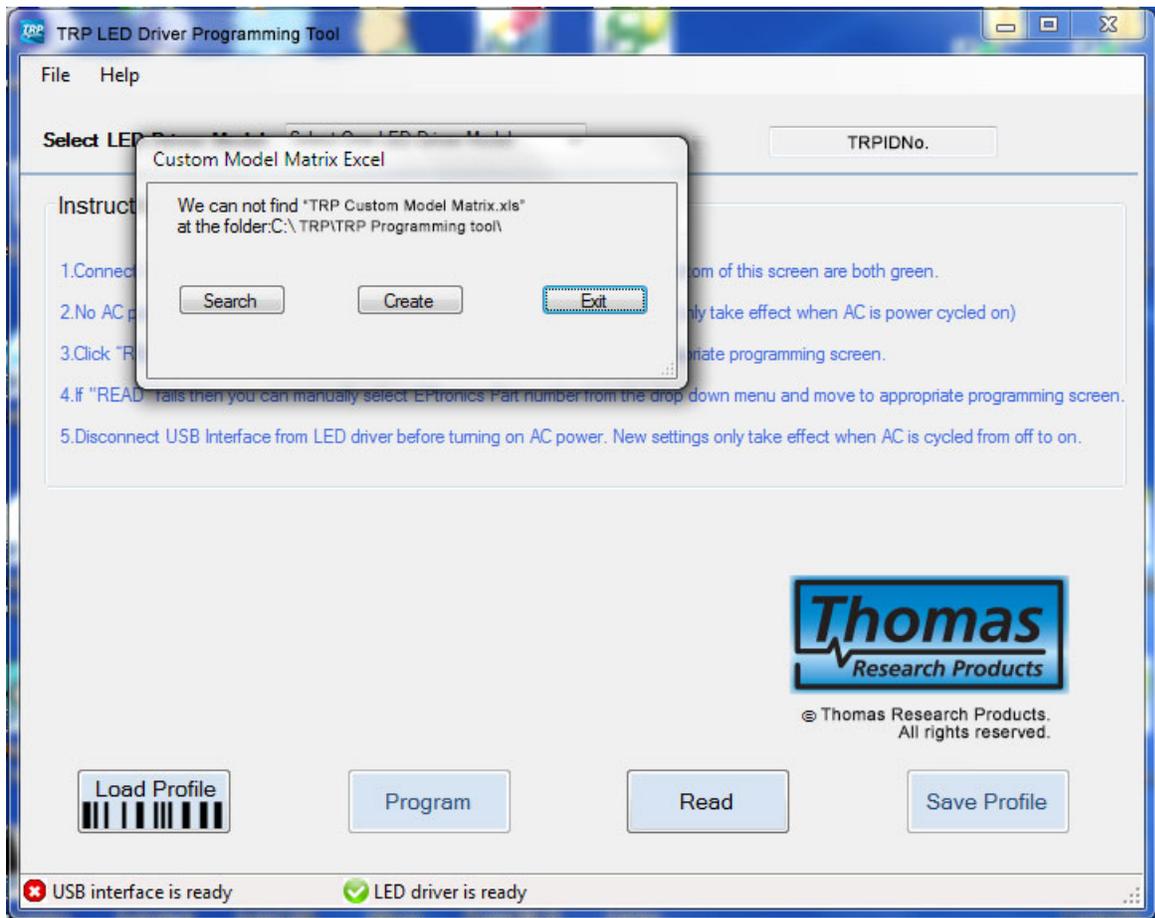
The main screen below will appear allowing you to select a model from the drop down menu or if a Thomas Research Products compatible LED driver is connected simply click the "Read" Button.

If an LED driver that is compatible with this programming tool is connected, then once you click the "Read" Button you will automatically see the "Main TRP Programmer Settings Screen" as shown in 6.3 below. The program checks for a connected Thomas Research Products compatible LED driver and will read its parameters and then display the appropriate screen.
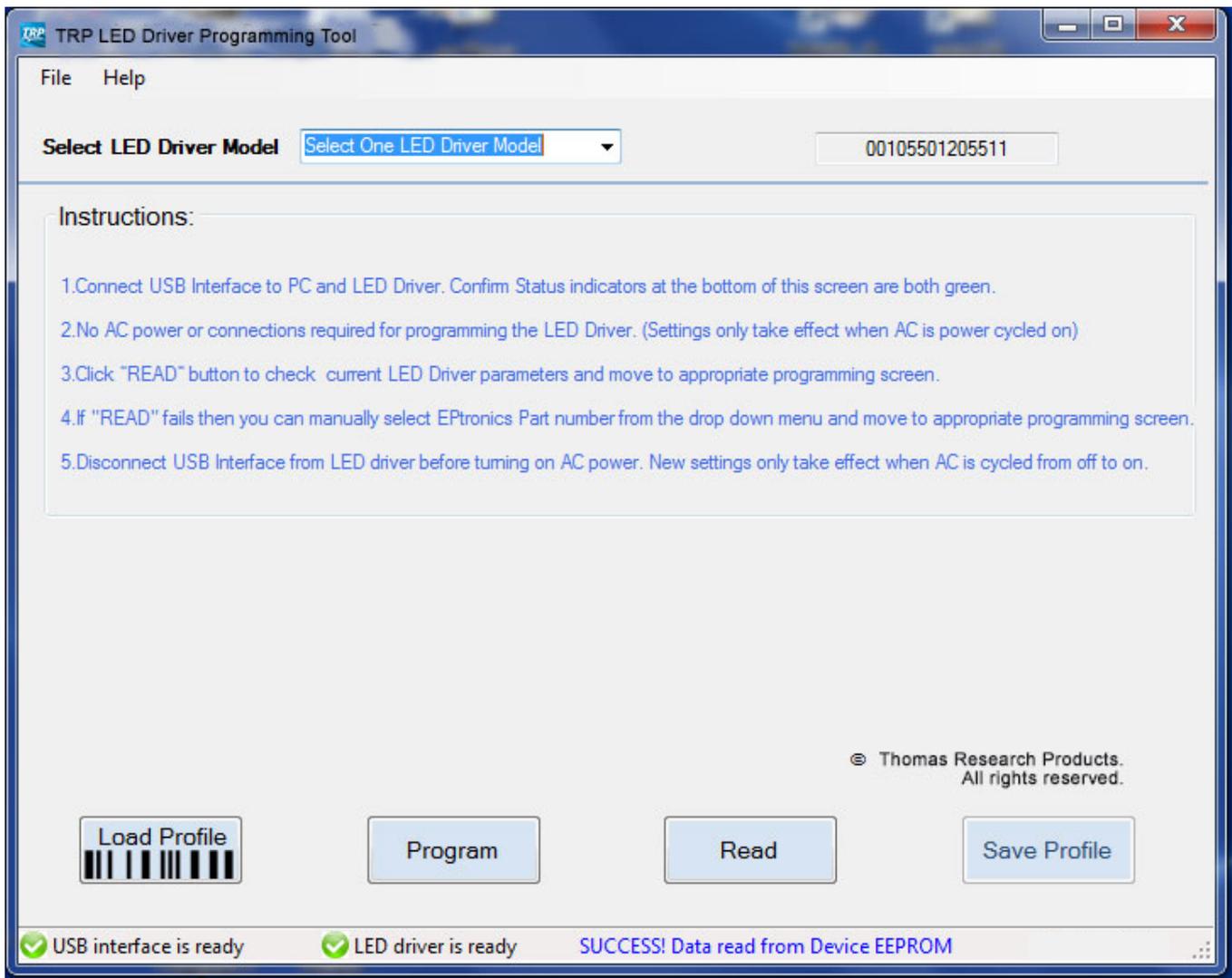
Navigating
The GUI
Programming Screen

OUTPUT CURRENT
Minimum output current limit is driver dependent (Read Only)

Maximum output current limit is driver dependent (Read Only)

Set the output current
(Any value equal to or between minumum or maximum limits)

Check New Set Custom current checkbox to overwrite existing "current set" value.
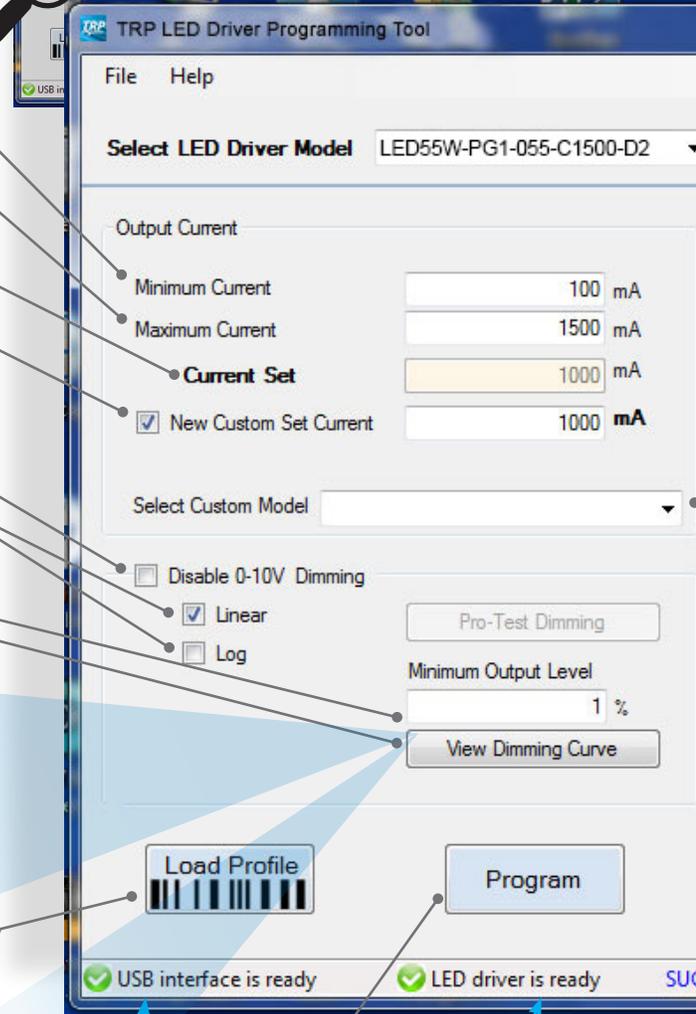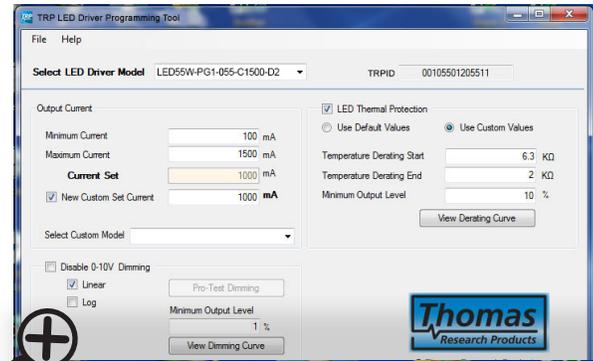*(Uncheck box to keep existing value.)*

DIMMING
Check this box to disable dimming function

Check one box to select a linear or logarithmic dimming curve

Set the lowest level for dimming. Below 2%, current output dims to OFF

Click button to display the Dimming Curve Graph (see plots)
(Linear or logarithmic curve will appear depending on which is selected)
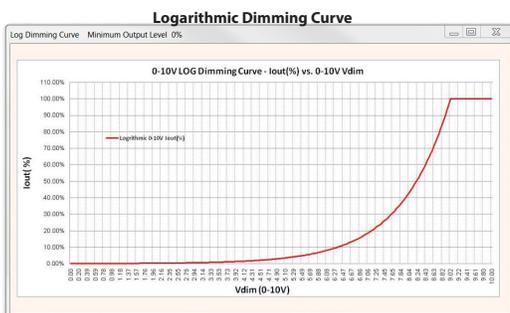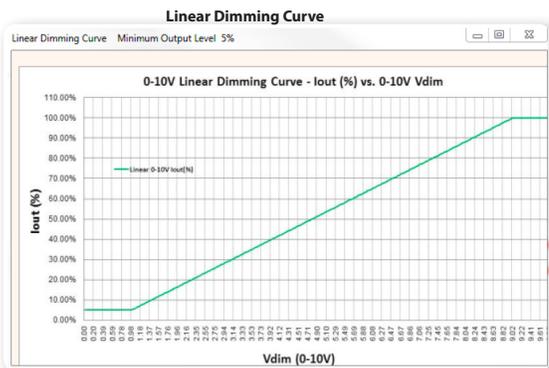
The Load Profile window allows the user to select a saved profile name by using a barcode scanner

Shows interface status

Shows driver status

Load the profile settings into the driver memory

Thermal Derating Curve

%Output Current vs. NTC Resistors (kOhms)

NTC Resistor (kOhms)

LED THERMAL PROTECTION

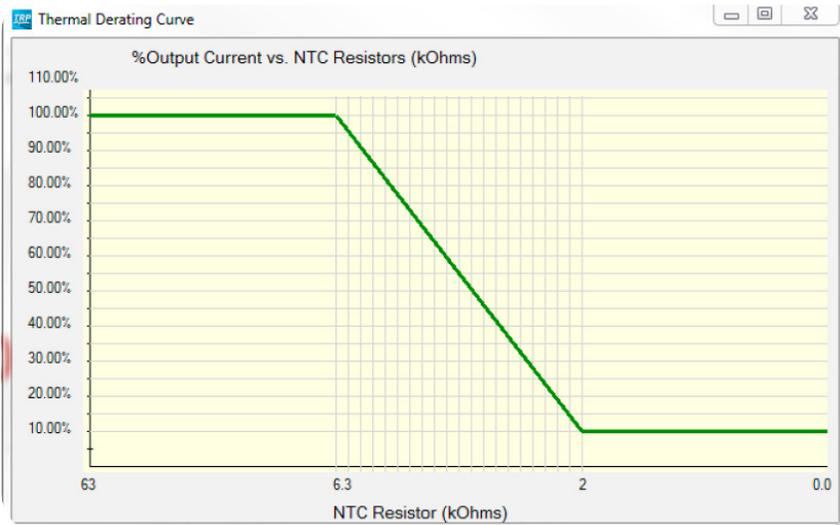Select one button to choose default or custom NTC thermal protection parameters Default values are 6.3 KΩ 45ºC (100%) and 2 KΩ at 80ºC (10%) *(refer to VISHAY NTC0805E3153GMT Specifications for details of output current to NTC relationship)*

Set the point where output current starts decrease and protect the LED load. Typically 45°C=6.3KΩ *(custom value)*

Set the minimum steady output level *(refer to NTC specifications) (custom value)*

Set the minimum output level. *(custom value)* Must be <90% to allow thermal protection

Click button to display the Derating Curve Graph (see plot)

SELECT CUSTOM MODEL

Select custom profile (filename): Use dropdown menu of saved files

Save Profile: Overwrite or create a custom model profile with the desired parameters for future use.

TRPID   00105501205511

LED Thermal Protection

○ Use Default Values   ◉ Use Custom Values

Temperature Derating Start   6.3 KΩ
Temperature Derating End   2 KΩ
Minimum Output Level   10 %

View Derating Curve

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Read   Save Profile

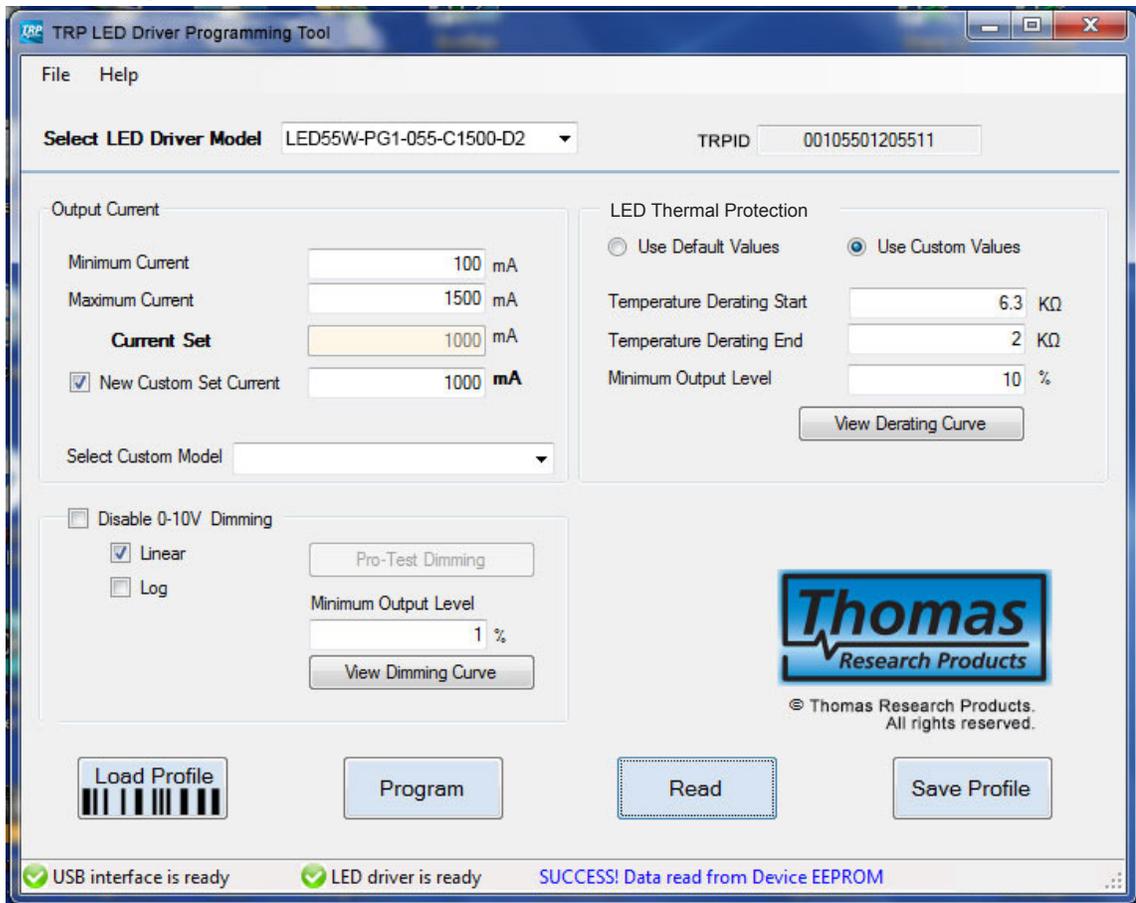CCESS! Data read from Device EEPROM

GUI feedback

Read Button retrieves the last saved profile from the driver memory

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6.2   Manually Select Part Number
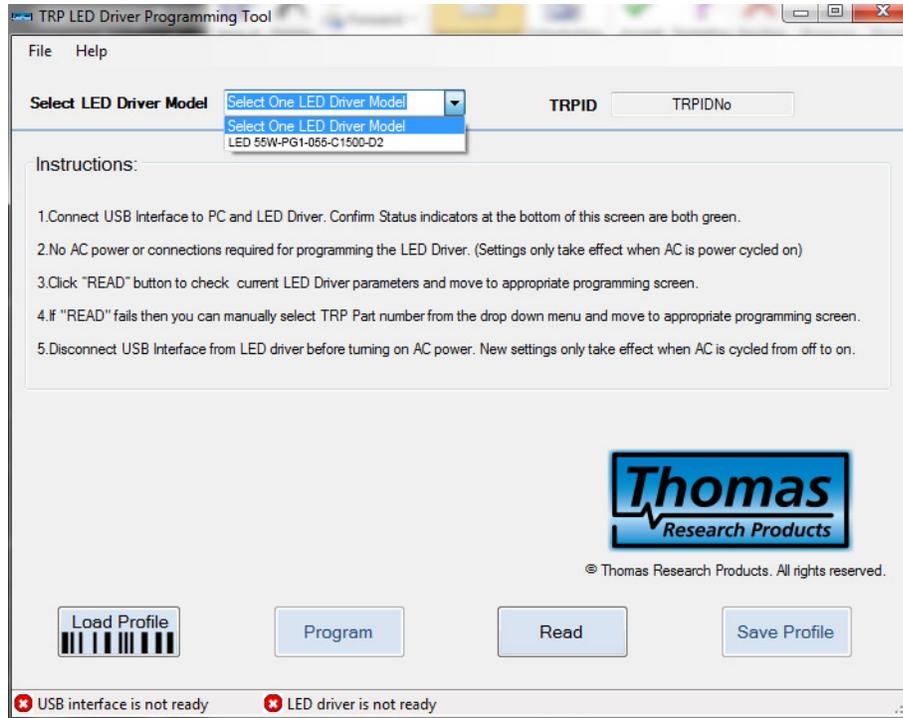
6.3   Main Screen after selection of part number

*Main TRP Programmer Settings Screen*

From the Main settings screen you can set the values for all programmable variables within specification limits. From the Initial Screen or Main setting screen you can load change or save custom profiles you define and have saved. These custom profiles can then be used in production programming mode to program multiple drivers to the same settings. This is done by clicking the "Load Profile" Button and filling in the unique name for the Custom Profile you defined earlier or you can use a bar code scanner to scan a profile name into this field. Once filled in, if the profile exits in the "Custom Model Matrix.xls" file, you can simply press the "Program" button to program a connected compatible LED Driver.
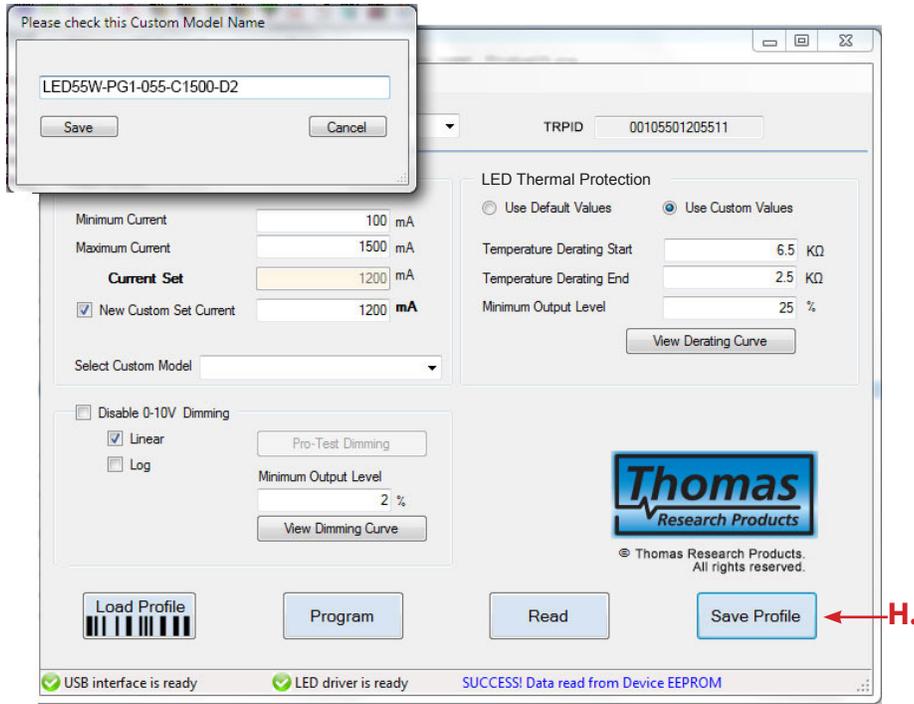
6.4   Define & Save Custom Profiles
In this example we are programming a custom profile for:

A. Iout: 1200mA
B. Dimming: Enabled
C. Dim Type: Linear
D. Min Dim: 2%
E. Temperature Derating Start: 6.5K Ohm
F. Temperature Derating End: 2.5K Ohm
G. Minimum Output Level: 25%
H. We will name this example custom profile: LP55W-55-CS1200-02-2.5-6.5-25

Step1: Set all values as required. In this example we are using defined values above.
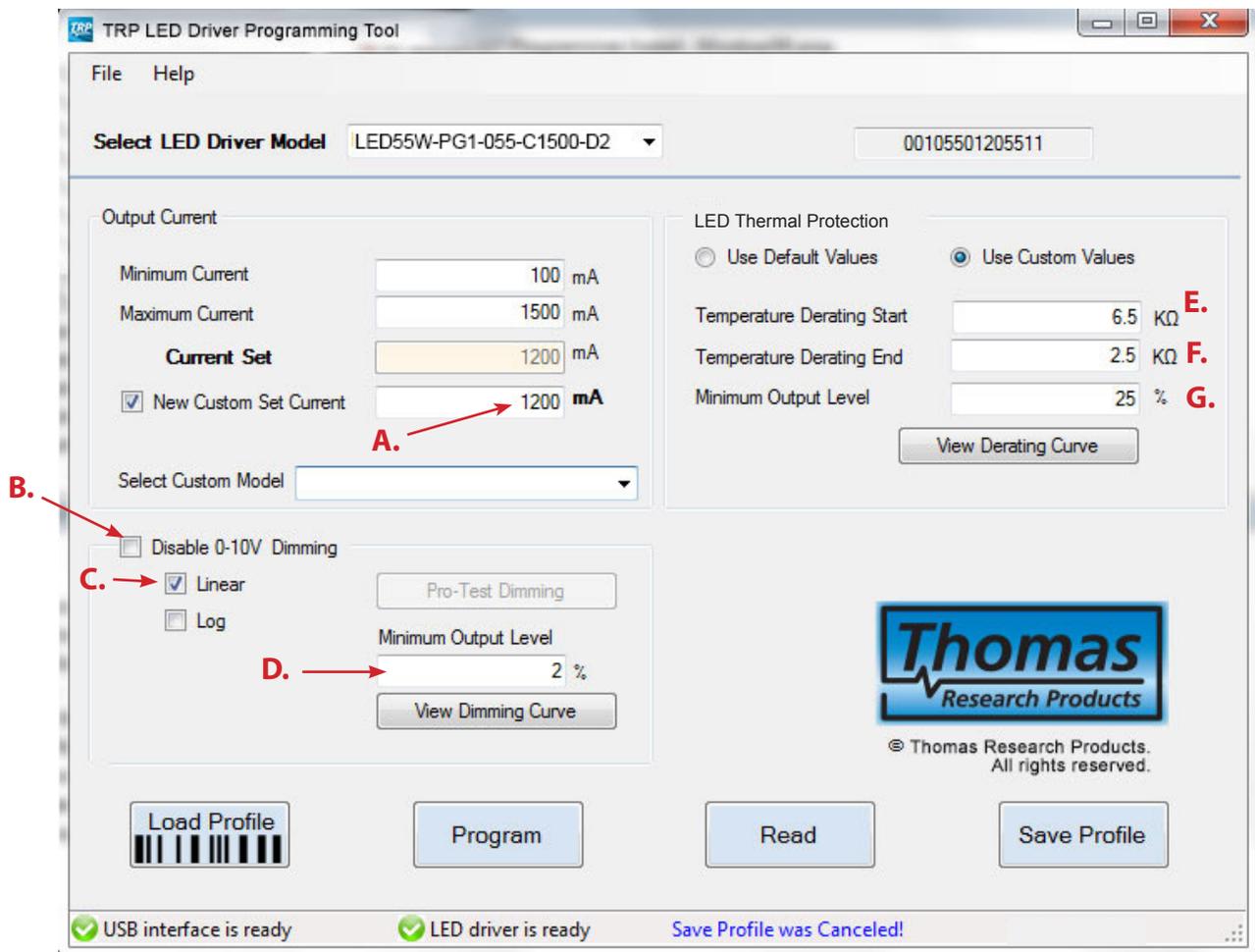
Step2: Select "Save Profile" button. Enter name you want to save as then Press "Save" button
In this example we are naming our custom profile: LP55W-55-CS1200-02-2.5-6.5-25

Now that you have saved a profile you can load any custom defined profile from Main settings screen or from the Load Profile screen.

6.5   Load a Custom profile from the Main Setting Screen:
From the Main settings screen you can select you custom defined profile from the drop down menu.
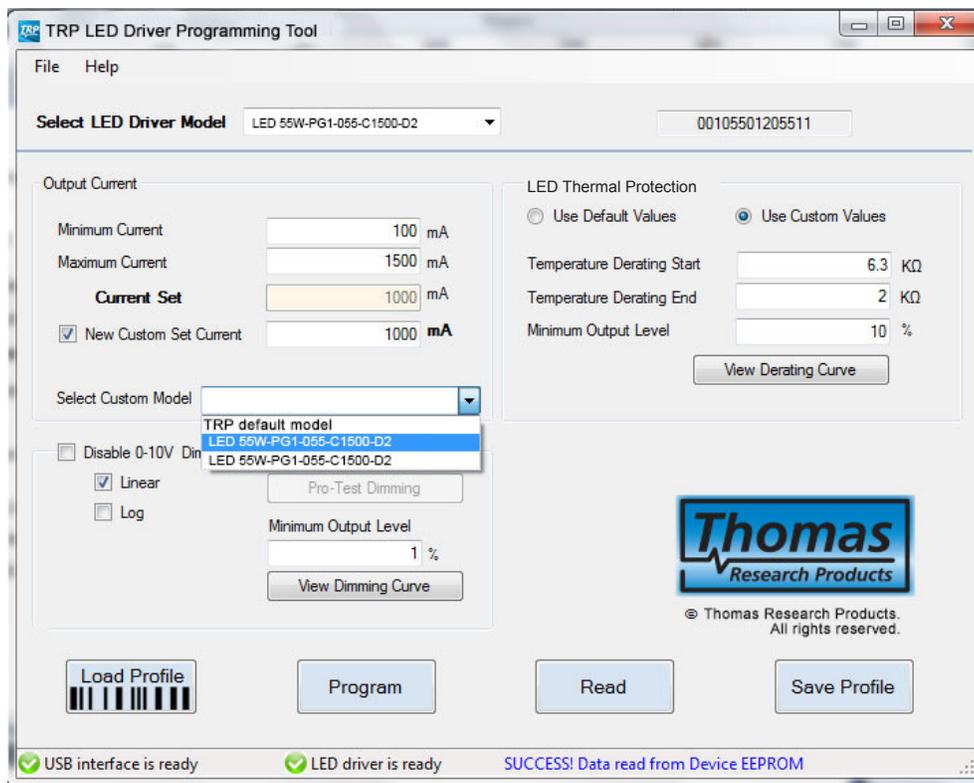
6.6 Load a Custom profile from the Load Profile Screen:

From the Load Profile Screen you can scan in the name of the custom profile or enter it.
Once filled in, if the profile exits in the "Custom Model Matrix.xls" file, you can simply press the "Program" button to program a connected compatible LED Driver. This can be done repeatedly by changing drivers allowing the user to program multiple drivers.
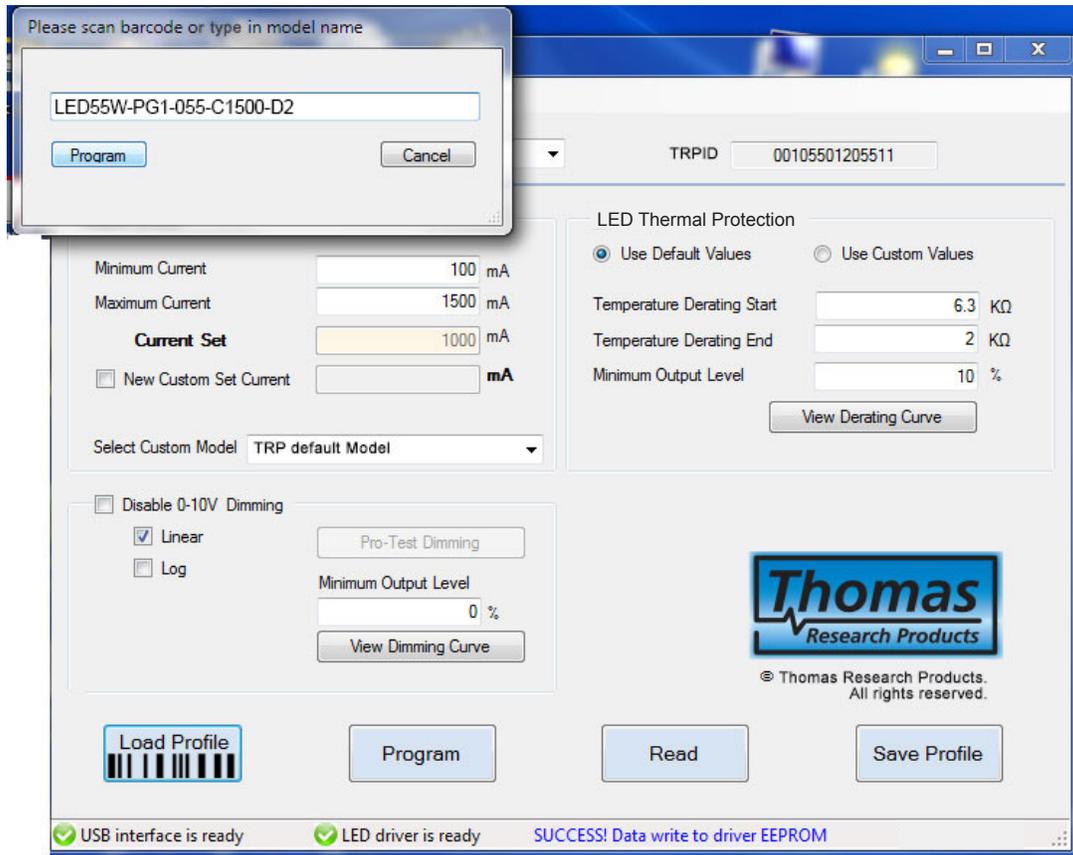
7. Definition of the Custom Model Matrix.xls File

The custom model matrix file is an Excel .xls only format file. (Will not recognize .xlsx)
For advanced users you can directly enter values into the Custom Model Matrix File.xls
If you open the file you will see column definitions and written definitions of the coding structure used. We suggest you create one from the instructions given above using the Main Settings Screen so you can better understand the data storage structure.

Critical Note: User cannot change or control the TRPID number. This is a permanently programmed value.
Entry in the Custom Model Matrix File of an invalid TRPID number will result in that item being ignored.
Always use proper TRPID number.