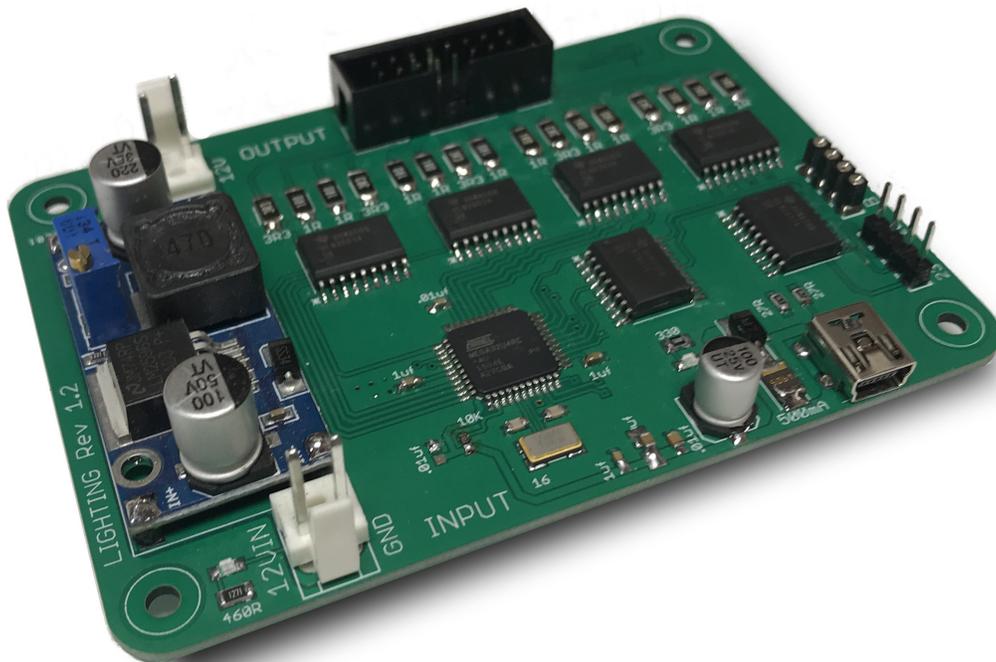




23port LIGHTING BOARD INSTALLATION & USE





BEFORE YOU BEGIN

Working with electricity comes with huge risks that should never be taken lightly, safety should always come first.

To avoid personal injury, possible damage to equipment or danger of fire, all work on electronic equipment should be conducted following these safety procedures.

General Safety

Before working on any electronics, consider following these basic safety precautions to help reduce any hazards.

- Remove any electronic equipment you're testing or working on from the power source.
- Never assume the power circuit is off. Test and test again with a voltmeter to confirm.
- Remove fuses and replace them only after the power to the circuit is disconnected.
- Don't connect power to a circuit until you're done working on it and rechecked the work.
- Always ensure that all electronics equipment is properly grounded
- If it's damaged, replace it. For instance, replace cables instead of repairing with insulating tape.
- Always use the right electronics repair and maintenance tools.
- Always return covers after removing them to reduce the risk of electric shock.
- Make sure your circuit is not overloaded.
- Always have safety equipment like a fire extinguisher, a basic first aid kit and a mobile phone nearby.

Personal Safety

Here are some personal safety precautions to keep in mind:

- Always keep your work area dry.
- Always work in a well-ventilated area.
- Don't wear flapping or loose clothing when working.
- Don't work with metallic jewelry on your hands like watches, rings and bracelets.
- Always wear non-conductive shoes.
- Always remove power to a circuit before connecting alligator clips.
- Always wear safety goggles.
- Be careful when handling large capacitors as they can still hold high voltage even after you've disconnected the circuit from power.

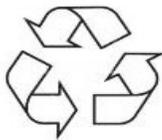
Static Damage Prevention

Static electricity can damage electronic devices and your system. To avoid damage, keep static-sensitive devices in their static-protective bags until you are ready to install them.

To reduce the possibility of electrostatic discharge, observe the following precautions:

- Limit your movement. Movement can cause static electricity to build up around you.
- Handle the device carefully, holding it by its edges or frame.
- Do not touch solder joints, pins, or exposed printed circuitry.
- Do not leave the device where others can handle and possibly damage the device.
- While the device is still in its antistatic bag, touch it to an unpainted metal part of the system unit for at least 2 seconds. (This action removes static electricity from the package and from your body).
- Remove the device from its package and install it directly into your system, without putting it down. If it is necessary to put the device down, place it onto its static-protective bag. (If your device is an adapter, place it component-side up.) Do not place the device onto the cover of the system or onto a metal table.
- Take additional care when you handle devices during cold weather. Indoor humidity tends to decrease in cold weather, causing an increase in static electricity.

Disposal



Observe the approved methods and ordinances of your locality with regard to proper disposal of used electronic appliances.

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Included in kit

1pc Lighting Output Board
1pc LED Connection Board
1pc 36" 16p Ribbon Cable
1pc 36" 2p Connection Cable
1pc 12" 2p Power Cable
1pc USB 2.0 MiniB Cable

Theory of Operation

The 23port Lighting Board is both a controller board and output board in one unit.

The controller section is fully supported by the Grander Unified R3++ build of the Direct Output Framework (DOF) and can be used with LEDBlinky by replacing the Ledwiz.dll file in the build with a custom built Ledwiz.dll file. The controller section is capable of pwm control of all 23 outputs operating on a scale of 0 to 49 to maintain compatibility with any pre-existing LEDwiz devices that may currently be installed in the system.

Identification of the 23port Lighting Board within the system is achieved through the same device numbering format as an actual LEDwiz which allows the output board to run side by side with any pre-existing LEDwiz devices that may already be present in the system.

While every effort has been made to maintain compatibility with an actual LEDwiz device, the hardware and firmware in the board has absolutely no relation to the original LEDwiz product.

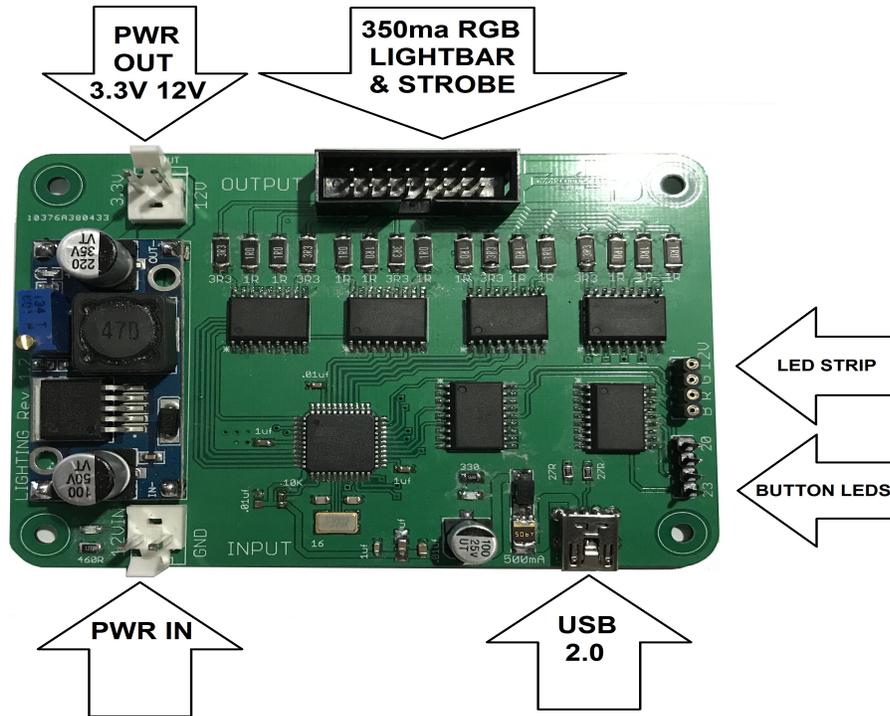
The board comes equipped with an onboard limiting resistors and a DC-DC buck converter for reducing the 12v input to the 3.4v required to power 5x 350ma RGB LEDs (not included). Output of the 16 signals to the leds and strobes is accomplished through a convenient 16pin ribbon cable / 2pin power harness connection to the LED Connection Board, greatly reducing the amount of wiring needed to make the necessary connections.

The board also has a 4pin header for 12v ledstrip (RGB) connection for undercab lighting and a 4pin header for button lighting connections.

All Outputs are (-) polarity.

Connection for power and control signal consist of 1x 12v / GND connection to a suitable 12v power supply (10A or higher) and a USB cable connection to a USB2.0 port or hub on the computer.

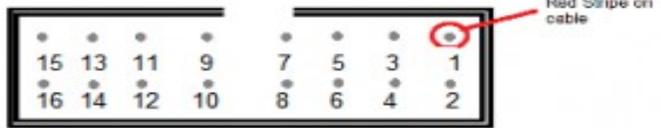
Connections



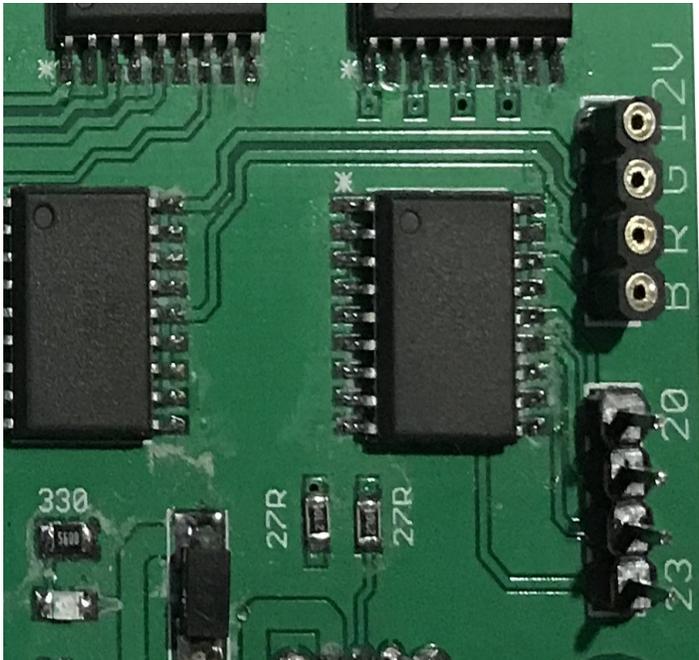
- PWR IN 12V and GND from power supply
- PWR OUT 3.3V and 12V to LED Connection Board
- RIBBON 15X Current Limited (-) Outputs to LED Connection Board (RGB FLASHER LEDs)
 1X Current Limited (-) Output to LED Connection Board (Strobes)
- LEDSTRIP 12V and RGB (-) Outputs to 12V LEDstrips (eg: undercab lighting)
- BUTTON 4X (-) Outputs (eg: button lighting)

Ribbon Connector

- 1 R Left Flasher Outer
- 2 G Left Flasher Outer
- 3 B Left Flasher Outer
- 4 R Left Flasher Inner
- 5 G Left Flasher Inner
- 6 B Left Flasher Inner
- 7 R Center Flasher
- 8 G Center Flasher
- 9 B Center Flasher
- 10 R Right Flasher Inner
- 11 G Right Flasher Inner
- 12 B Right Flasher Inner
- 13 R Right Flasher Outer
- 14 G Right Flasher Outer
- 15 B Right Flasher Outer
- 16 - Strobe



As seen from the top of connector



LEDSTRIP 2A per OUTPUT

12V OUT

GREEN (-) OUT

RED (-) OUT

BLUE (-) OUT

BUTTON LIGHTING 500ma per OUTPUT

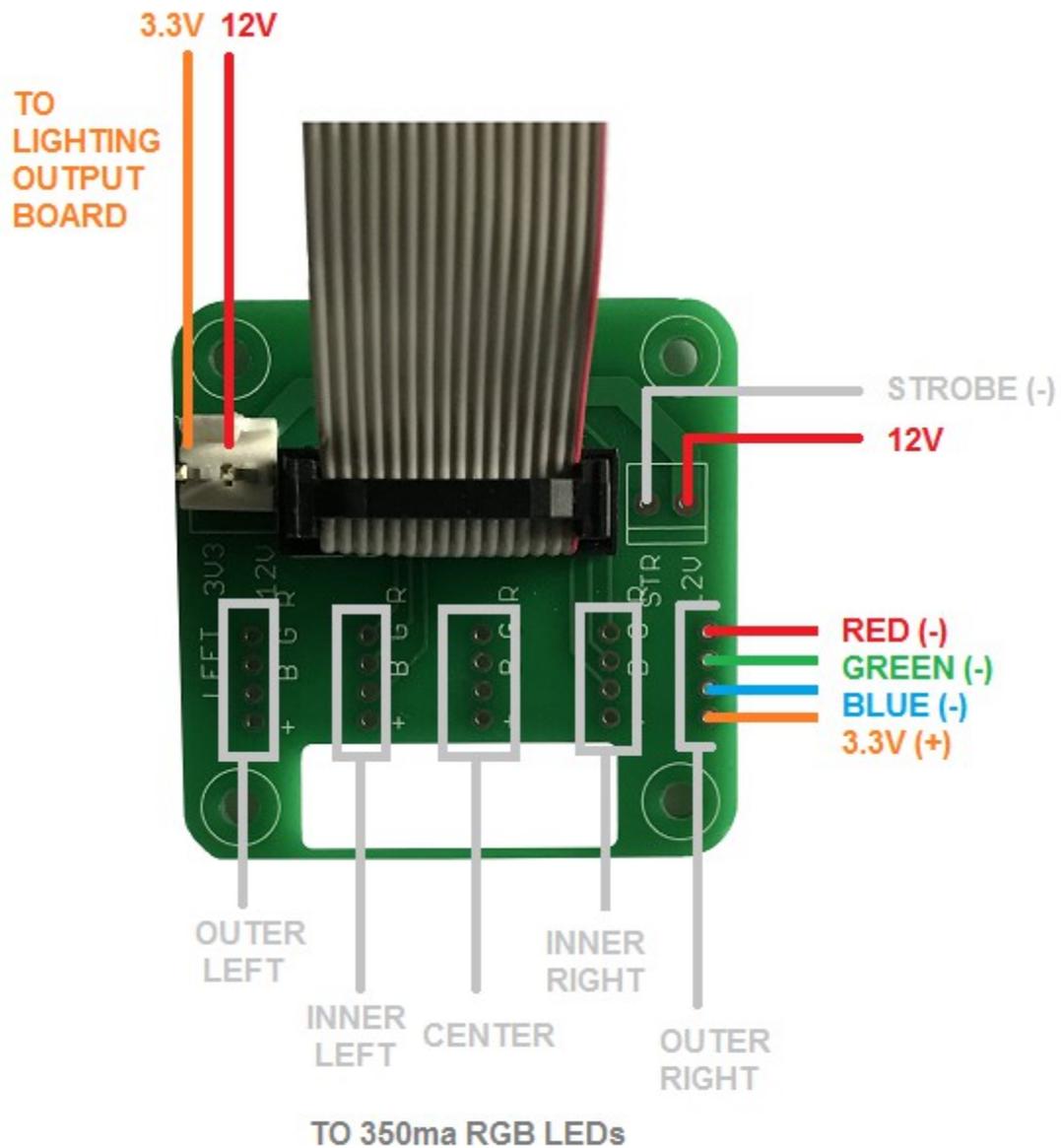
BUTTON 1

BUTTON 2

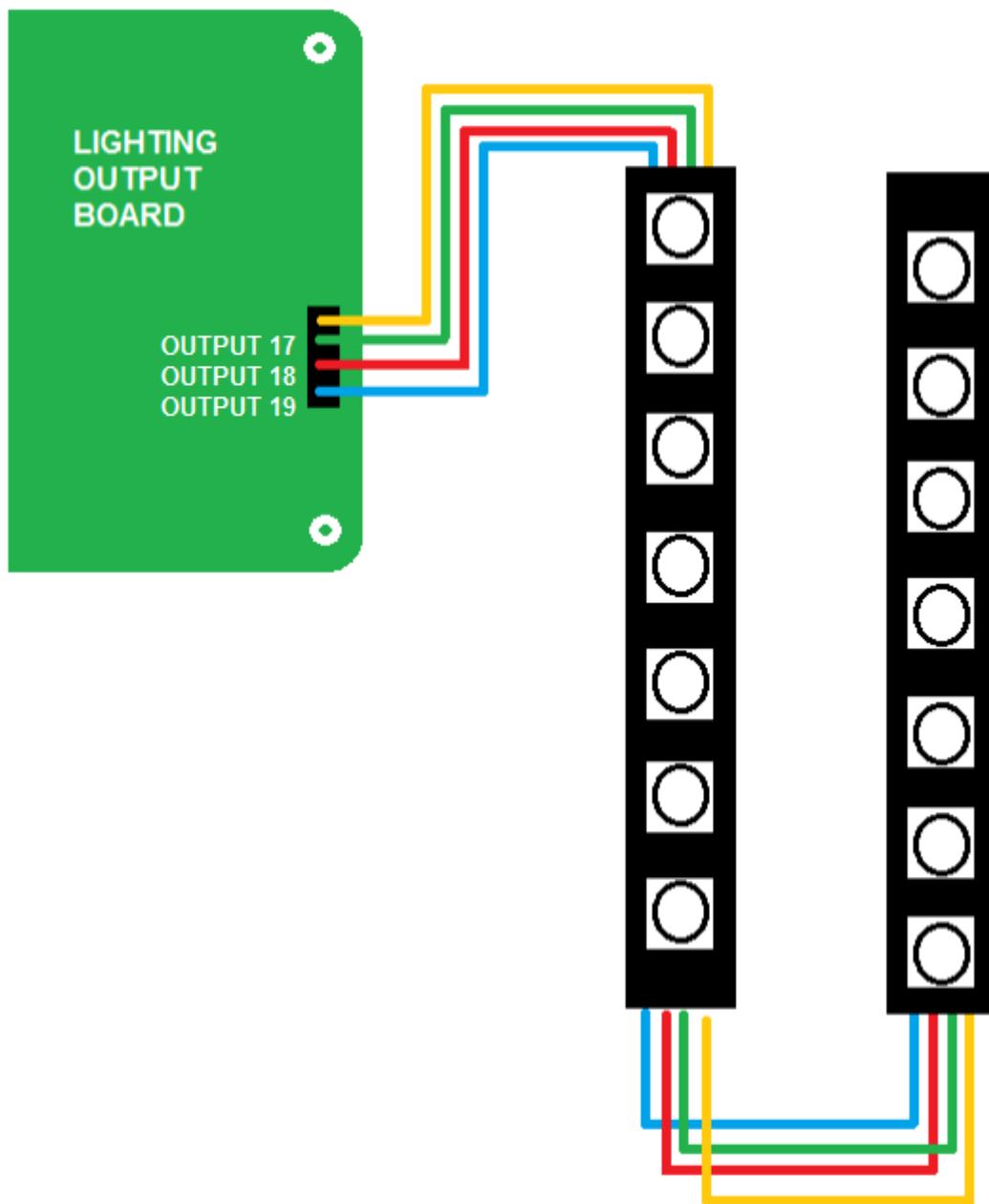
BUTTON 3

BUTTON 4

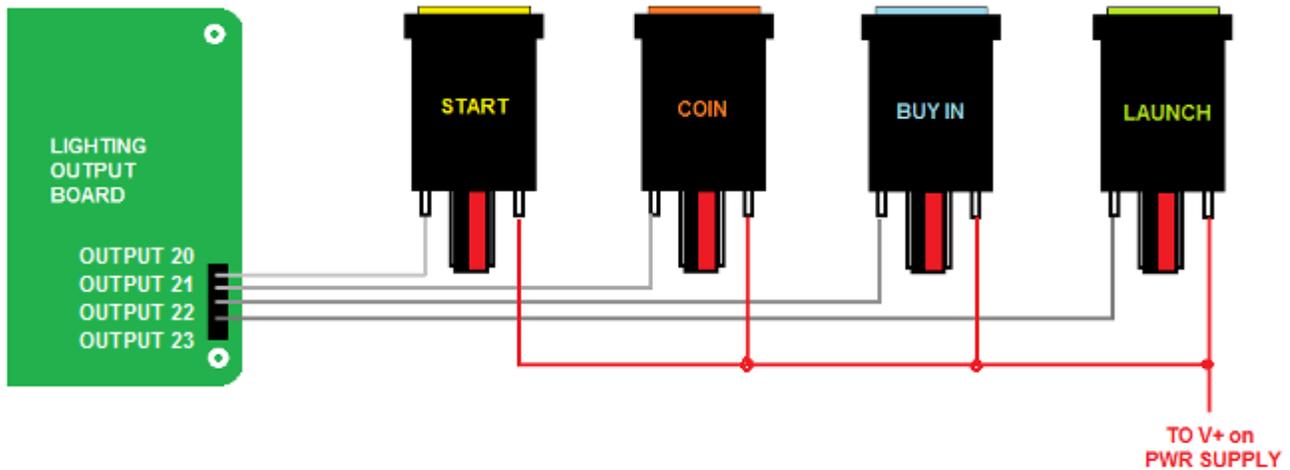
LED CONNECTION BOARD



TYPICAL LEDSTRIP CONNECTION - Undercab



TYPICAL BUTTON LIGHTING CONNECTION



Notes on Installation

Only use flasher bar leds that are 350ma maximum, higher draw leds will damage the resistors on the board.

Strobe lights should be led based and have a maximum draw of 800ma per pair.

Ledstrip lighting should be kept to 2A per channel maximum. The boards have been successfully tested to a maximum length of 5m.

LED Lighting is relatively low voltage and low current and doesn't need overly heavy gauge wiring. Wire in the range of 20AWG – 22AWG is all that is necessary.

When soldering the flasher led wiring to the LED Connection Board, best practice is to twist the wire slightly before inserting it into the connection hole and to solder the connection from the backside of the board.

SOFTWARE INSTALLATION

Kits shipping after October 1st, 2018 use the new ZB controller. Physical installation and mounting of the kit remains the same as the V2 R1 kit and the software config is as follows.

For existing DOF installations:

1. Download the ledwiz.dll file

[click HERE to download](#)

2. Extract the dll file and right click on the the extracted file in the folder it created.

3. Left click on the properties selection in the menu that pops up.

4. At the bottom of the properties window that opens, tick the box that unblocks the file if necessary.

5. Close the window and replace the ledwiz.dll in the directoutput folder on your computer with the unblocked one from the extraction folder.

For Installation of DOF from scratch:

Download and run the installer from either the link below or directly from the source mjrnet.org/pinscape/dll-updates.html . This will install mjr's Grander Unified R3++ build of DOF. All ZB contoller boards are natively supported by this build and will be auto-detected.

[Click HERE to download](#)

DOF Configuration

Open an account here at <http://configtool.vpuniverse.com/login.php>

Create an account and set the number of LEDWiz Devices to 1.

Set the Port assignments for LEDwiz Device 1 to match this ...

The screenshot shows the DOF CONFIG TOOL interface. At the top, there's a navigation bar with links: Home, Port Assignments, Table Configs, Version History, My Account, Stats, Combine Toys, Logout. Below this, the device is identified as 'Ledwiz 1 - directoutputconfigini'. There are buttons for 'Save Config', 'Generate Config', and 'Clear Fields'. The main configuration area includes sections for Shaker Motor, Fan, Custom Brightness, Contactor variables, Targets, and Ledstrip variables. On the left, a list of ports (Port 1 to Port 32) is shown with dropdown menus for their assignments. The assignments are: Port 1-3: 5 Flasher Outside Left; Port 4-6: 5 Flasher Left; Port 7-9: 5 Flasher Center; Port 10-12: 5 Flasher Right; Port 13-15: 5 Flasher Outside Right; Port 16: Strobe; Port 17-19: RGB Undercab Complex; Port 20-23: Optional Assignments.

Port Assignments:

Port 1 – 3	5 Flasher Outside Left	Port 16	Strobe
Port 4 – 6	5 Flasher Left	Port 17 – 19	RGB Undercab Complex
Port 7 – 9	5 Flasher Center	Port 20 – 23	Optional Assignments
Port 10 – 12	5 Flasher Right		
Port 13 – 15	5 Flasher Outside Right		

Click on Save Config button and then on Generate Config button – a directoutputconfig zip file will be automatically downloaded. Unzip the files and put the Tablemappings.xml file in your tables folder in visual pinball and the rest of the files in the directoutput/config folder in your c: drive.

TROUBLESHOOTING

Download the Troubleshooting guide from the zebsboards.com/forums

[Click HERE to download](#)
