

Infinitybox™ Express Road Race Car Kit Installation Guide

Table of Contents

Overview.....	2
Warnings.....	3
J1939 POWERCELL Technical Details.....	4
IOX Input/Output Module Technical Details.....	4
Kit Contents	5
Installation Steps	6
Mounting the POWERCELL.....	6
Mounting the J-CASE Fuse Holder.....	6
Supplying 12-volt Power	7
Plugging Output Harnesses into the POWERCELL.....	7
Wiring the Output Harnesses.....	7
Installing Fuses.....	8
Connecting Switch Panel to Infinitybox CAN Network.....	9
Connecting IOX to Infinitybox CAN Network.....	10
Wiring Switches to the IOX	10
Wiring Switch Indicators to the IOX	11
Setting the POWERCELL Address	12
Powering the System	13
Warranty Information.....	14
Contact Information	15

Overview

The Infinitybox Road Race Car Kit gets you a simple and powerful way to wire all of the electrical systems in your car. Using OEM-tested multiplexing technology and circuit protection technologies, you can streamline all of your wire harnesses.

The Infinitybox Road Race Car kit comes with everything that you'd need to wire a naturally aspirated car. It is pre-configured to control lighting, ignition system, starter solenoid, fuel pump, cooling fan, trans-brake, line-lock solenoid and two extra auxiliary functions. All of the wiring required to wire the car is included in the kit plus the primary fusing to protect the power feeds.

The outputs are controlled through the Infinitybox® POWERCELL. This is a solid-state power distribution module. It uses MOSFET technology to switch the high-current loads in the car. Since it doesn't use relays, there are no moving parts that can be impacted by vibration of high G-forces.

The primary functions are controlled by a CAN-based 8-pack of toggle switches. These are back-lit for easy viewing in the car. The entire pack of switches connects back to the POWERCELL through a small data cable. This makes routing harnesses in the car easy and reduces weight.

This kit uses the exclusive IOX input module. This is a small interface that lets you easily connect wired switches into your system. The IOX is small and easy to mount.

Warnings

THE POWERCELL IS A FUSED POWER DISTRIBUTION MODULE FOR VEHICLES. PROPER CARE MUST BE TAKEN TO FUSE THE INPUT FEEDS TO THE CELL AND THE OUTPUT FEEDS FROM THE CELL. IMPROPER FUSE SELECTION CAN CAUSE DAMAGE TO THE VEHICLE ELECTRICAL SYSTEM RESULTING IN FIRE.

PROPER CARE MUST BE TAKEN TO ENSURE THAT POWER IS CORRECTLY APPLIED TO THE INFINITYBOX HARDWARE. REVERSING POLARITY TO THE POWER AND GROUND FEEDS WILL CAUSE IRREPARABLE DAMAGE TO THE CELL AND WILL VOID THE WARRANTY.

THE INPUTS TO THE IOX ARE DESIGNED TO BE GROUND SWITCHED. APPLYING 12-VOLTS TO AN INPUT WILL DAMAGE THE IOX AND WILL VOID THE WARRANTY.

ADDING ANY ELECTRONICS MODULES TO A VEHICLE WILL INCREASE THE DEMAND ON THE BATTERY. CARE MUST BE TAKEN TO MAINTAIN A CHARGE ON THE BATTERY WHEN THE VEHICLE SITS IDLE FOR PERIODS OF TIME. THIS IS ESPECIALLY IMPORTANT WITH GEL-CELL AND AGM BATTERIES. WE STRONGLY RECOMMEND INSTALLING A DISCONNECT SWITCH THAT SEPARATES THE ELECTRICAL LOADS IN THE VEHICLE FROM THE BATTERY WHEN NOT IN USE.

J1939 POWERCELL Technical Details

System Operating Voltage: 7.0 to 17.0 VDC
Number of Outputs: 10
Output Type: High-Side Switched via MOSFETs
Maximum Current Rating per Output: 25-amps
Maximum Current Rating per POWERCELL: 125-amps
Internal Fusing: Standard Mini™ Fuse
Maximum Operating Temperature: 125 °C
Minimum Operating Temperature: -20 °C

IOX Input/Output Module Technical Details

System Operating Voltage: 7.0 to 17.0 VDC
Number of Inputs: 5
Input Type: Ground Switched
Number of Indicator Outputs: 5
Output Type: Low-Side Switched via MOSFETs
Maximum Current Rating per Output: 0.100-amps
Maximum Operating Temperature: 125 °C
Minimum Operating Temperature: -20 °C

Kit Contents

Item	Quantity	Checked
1	J1939 POWERCELL	
2	8-AWG POWERCELL Input Harnesses	
2	8-AWG 1/4" Ring Terminals	
1	4-foot length of 4-AWG battery cable	
2	4-AWG 5/16 Ring Terminals	
1	POWERCELL A Output Harness	
1	POWERCELL B Output Harness	
1	2-Way JCASE Holder	
2	60-Amp JCASE Fuses	
1	POWERCELL Input Sealing Plug	
1	Bag of assorted Mini Fuses	
1	IOX OC 5-Channel Input Module	
1	In-Line Mini Fuse holder with 5-amp fuse	
1	8-Position HMI J1939 Switch Panel	
1	CAN Terminator Plug	
1	CAN Pig-Tail Harnesses	

Installation Steps

Mounting the POWERCELL

Mount the POWERCELL on a suitable flat surface in the vehicle. Use the 4 mounting points in the corners of the cell and 1/4 -inch hardware. The recommended method to mount the POWERCELL is to use 1/4-inch X 5/8-inch shoulder screws. If not using shoulder screws, take care as to not crush the mounting points by over tightening the screws.

In applications where the steady-state current draw out of the POWERCELL exceeds 90-amps, mount the POWERCELL in an area with adequate ventilation and with the fins of the heat sink running vertically.

The POWERCELL should be located in the car where it is close to the electrical functions. This reduces the overall length of wire in the car.

The POWERCELL acts as the fuse box for the car. You should be able to access the POWERCELL in case a fuse blows.

Mounting the J-CASE Fuse Holder

Mount the JCASE holder as close to the battery as possible. This fuse holder is designed to protect the power feeds to the POWERCELL in case they get damaged and contact ground. The fuses in the holder will open up to protect the cables. Mounting the fuse holder as close to the battery as possible reduces the length of un-protected cable in the car.

Connect the included 4-AWG cable from the large M8 stud on the J-CASE holder to the battery. Ideally, this should connect to the output stud on the battery disconnect.

Connect the included 8-AWG power feeds to the two smaller M6 studs on the J-CASE holder and run these cables to the POWERCELL.

Supplying 12-volt Power

The POWERCELL gets its 12-volt power from the 3 circular Maxi-style connectors on the edge of the cell. Each of these connectors can accept up to 60-amps. Plug the black, circular connectors from the 8-AWG harnesses into 2 of the 3 power input ports on the POWERCELL. The three power ports are electrically identical. You can use any 2 of the 3. Insert the POWERCELL Input Sealing Plug into the unused port on the POWERCELL.

The 8-AWG harness comes as a single 20-foot length of cable with a POWERCELL input plug on both ends. Cut the cable to length to create 2 power feeds to the POWERCELL.

Plugging Output Harnesses into the POWERCELL

Plug the A & B harnesses into the POWERCELL. See Figure 1 for proper location of the A & B connectors.

Wiring the Output Harnesses

Each output harness has one ground wire and 5 output wires. The ground wires should be 14-AWG and should be connected to the vehicle ground. It is important that the POWERCELL is grounded to the chassis through a metal-to-metal connection. Make sure to remove all paint, powder coating, dirt and grease from the contact area.

The configuration sheet that came with the kit is the road-map to wire the car. It identifies the input, switch and POWERCELL output by function. The configuration sheet that came with your kit supersedes any other configuration that may be found on the Infinitybox website or any other application notes. It is specific to your system. Contact Infinitybox technical support if you do not have the configuration sheet that came with your kit.

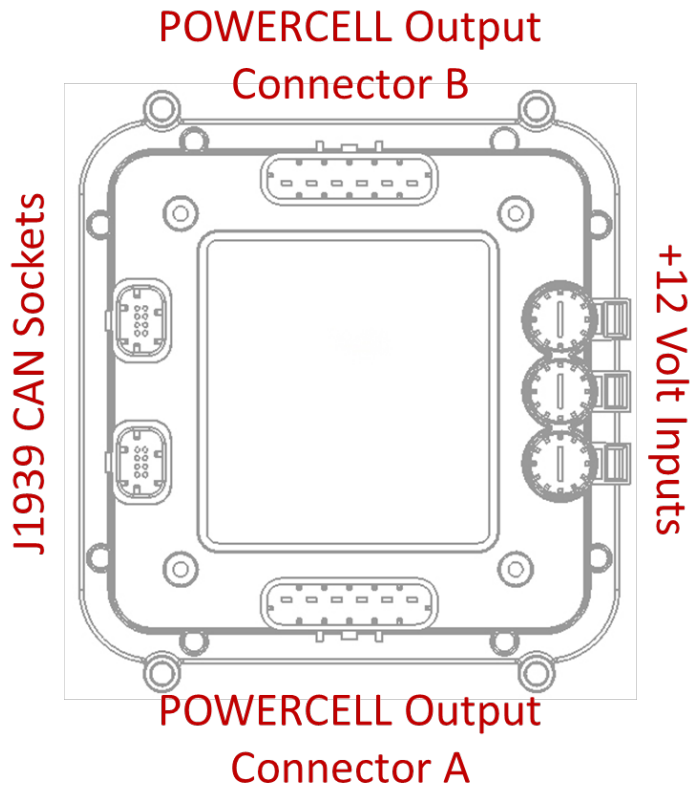


Figure 1: Socket Identification for J1939 POWERCELL.

Installing Fuses

The POWERCELL has internal fuse holders to protect the output wires from short circuits and low-overloads. The holders are designed for a standard Mini™ automotive fuse. Never use a fuse rated at higher than 25-amps to protect a POWERCELL output. Table 1 gives recommendations on fuse ratings for the different functions in the car.

Table 1: Maximum Fuse Ratings for Different Wire Gauges.

Function	Recommended Fuse (Amps)
Lights	15
Water Pump	25
Ignition	20
Starter	25
Trans Brake	15
Cooling Fan	25
Fuel Pump	25
Line Lock	15

Use only OEM approved Mini™ fuses to protect the POWERCELL outputs. There are numerous grey-market manufacturers of fuses that are unsafe and unreliable. Recommended manufacturers for these fuses are Littelfuse, Inc, Busmann and Pacific Engineering.

Connecting Switch Panel to Infinitybox CAN Network

The CAN sockets on the POWERCELLs connect the switch panel to the Infinitybox network. These sockets provide 12-volt power for the input device and the CAN HI & LOW connection for the J1939 network.

Connect the 4 wires on the switch panel to the wires on the CAN input harness. Table 2 shows the function, cavity identification and wire colors for the CAN connector. Connect the corresponding wires from the switch panel to these cavities in the connector.

The function names on the switch panel correspond to the outputs defined on the configuration sheet that came with your kit.

Table 2: CAN Connector Wiring Details.

Cavity ID	Function	Standard Wire Color
5	Ground	Black
6	CAN LOW	Green
7	CAN HIGH	Yellow
8	+12 Volt Power	Red

Connecting IOX to Infinitybox CAN Network

The CAN sockets on the POWERCELLs connect the IOX to the Infinitybox network. These sockets provide 12-volt power for the input device and the CAN HI & LOW connection for the J1939 network.

Connect the Black, Green, Yellow and Red wires on the IOX to the wires on the CAN input harness. The included Mini-Fuse holder with the 5-amp fuse must be installed in-line with the CAN connector and the red wire on the IOX. Table 2 shows the function, cavity identification and wire colors for the CAN connector. Connect the corresponding wires from the switch panel to these cavities in the connector.

Wiring Switches to the IOX

The IOX is designed to take in 5 wired switches to control outputs on the Infinitybox system. These switches are designed to be grounded to activate them.

NOTE: THE IOX INPUTS ARE DESIGNED TO BE GROUND SWITCHED. APPLYING 12-VOLTS TO THE INPUTS COULD DAMAGE THE INPUTS AND WILL VOID THE SYSTEM WARRANTY.

To use an input, connect it to one terminal of the switch. The second terminal of the switch should be connected to ground. When the switch is closed, there should be continuity between the two terminals. This connects the input to ground. When the input is grounded, the IOX module sends a command to the POWERCELL to turn outputs on and off.

The configuration sheet that came with the kit will define which wire colors control the different functions on the POWERCELL.

Wiring Switch Indicators to the IOX

The IOX is designed to control 5 low-current indicators on your switches. It is programmed to turn on the indicator output that corresponds to the input switch, when the output is on.

The indicator outputs are low-side switched. That means that you need to connect 12-volts to your light, then connect the other side of the light to the indicator output wire on the IOX. When the IOX turns on the indicator, it connects the output wire to ground internally, which turns on the light.

NOTE: DO NOT EXCEED 100 mA OF CURRENT DRAW ON EACH INDICATOR OUTPUT ON THE IOX.

When using LED indicators, the polarity of the light is important for proper functionality. See the instructions that came with your switches for wiring with the proper polarity.

The configuration sheet that came with the kit will define which wire colors for the different indicator outputs on the IOX.

Setting the POWERCELL Address

The address on the POWERCELL must be set to match the address defined in your configuration sheet. In most cases, the POWERCELL address must be set as 1. Check your configuration sheet and follow Figures 2 & 3 to set the address jumpers.

LOCATING THE ADDRESS

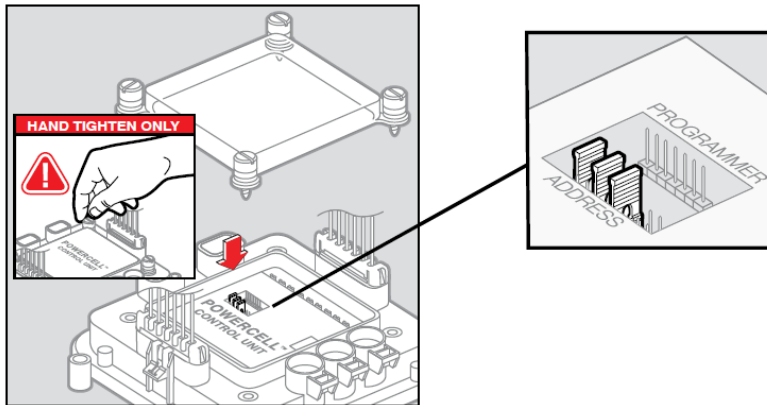


Figure 2: Location of the Address Headers on the J1939 POWERCELL.

Figure 3 shows how to properly orient the jumpers on the headers to set the cell address.

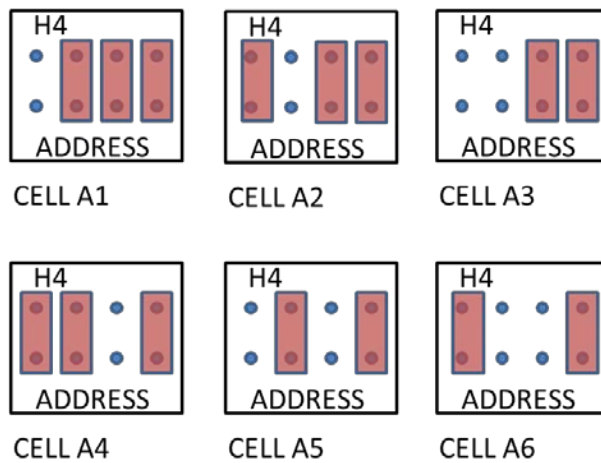


Figure 3: Correct Orientation of the Address Headers.

Powering the System

Once the hardware is properly set up, connect the network to +12 volts through the input harnesses to the POWERCELL. After 3 seconds, the system will be communicating with the switch panel and IOX input devices.

There is a blue LED located towards the center of the POWERCELL under the clear cover. This light indicates the status of the communication on the network. When the system is properly connected and communicating, the light should blink approximately once per second. The light will also flash when it receives a switch command from one of the J1939 input devices on the network.

If the blue LED turns on and stays on after power is applied to the system, check the connectors in the J1939 network or check to make sure that the 120-Ohm terminator resistor is properly installed in the network. A steady blue light indicates that the POWERCELL processor is operating but there is no communication on the J1939 network.

If the blue LED does not illuminate at all, check to make sure that you are getting power to the POWERCELL.

Warranty Information

Infinitybox, LLC (“Infinitybox”) warrants against any defects in materials and workmanship to the Product’s Infinitybox™ modules, wiring harnesses and accessory modules for a period of one (1) year from the first date of purchase. Subject to the terms of this warranty described below, Infinitybox will replace any such defective Product that is returned to Infinitybox within the one (1) year period from initial purchase. Replacement of any defective part or Product will not extend the applicable warranty period.

The warranty does not apply to: (i) any Product that is not installed in compliance with the applicable Product documentation; (ii) any defect in, or failure of, the Product resulting from an accident, shock, negligence, water immersion or misuse; (iii) any Product that has been modified, adjusted, repaired, or disassembled by any party other than Infinitybox; or (iv) any defect other than in materials and workmanship.

This warranty covers only the original purchaser of Product purchased from an Infinitybox authorized dealer in the United States. In order to receive warranty service, purchaser must provide Infinitybox with a copy of the receipt stating the dealer name, product purchased and date of purchase. Products found to be defective during the warranty period will be replaced (with a product deemed to be equivalent or better) at the discretion of Infinitybox.

Infinitybox’s sole liability for any defective Product is limited solely to the replacement of Product pursuant to this warranty. Infinitybox reserves the right to replace any repairable parts with new or refurbished parts.

INFINITYBOX DISCLAIMS ALL OTHER WARRANTIES, WHETHER EXPRESS, IMPLIED OR STATUTORY, SUCH AS WARRANTIES OF MERCHANTABILITY AND FITNESS FOR PURPOSE. IN NO EVENT SHALL INFINITYBOX BE LIABLE FOR ANY PUNITIVE, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES, INCLUDING WITHOUT LIMITATION, LIABILITY FOR LOSS OF USE, LOSS OF PROFITS, LOSS OF PRODUCT OR BUSINESS INTERRUPTION HOWEVER THE SAME MAY BE CAUSED, INCLUDING NEGLIGENCE.



INFINITYBOX, LLC
1410 Brummel Street
Elk Grove Village, Illinois 60007
www.infinitybox.com

Contact Information

The Infinitybox Express Track Car Kit is a product of
Infinitybox, LLC
1-847-232-1991
sales@infinitybox.com
www.infinitybox.com