



# Electronic Switch Panel

**\$933.99**  
Panel Mount

**POWER DISTRIBUTION CTR - SAFETY SHUTOFF CONTROLLER - DATA ACQUISITION**



**Switch Panel**



**Main Control Unit**

Many high quality fuel injection, ignition, and data acquisitions systems are available for use in race vehicles today, but little development has been done in the area of vehicle control units. For this reason, Portatree and Moroso would like to introduce the Electronic Switch Panel, a vehicle control unit capable of monitoring and controlling up to 10 circuits in a race car. The system consists of the Switch Panel and Main Control Unit (MCU), which communicate through a single cable, thereby, eliminating the need for complicated wiring. Software is available for configuring and testing the Electronic Switch Panel; however, it is not necessary for basic device operation.

## FEATURES:

- Allows users to quickly adapt the unit to their needs without re-wiring.
- Improves over conventional panels by monitoring and recording the amperage draw of its circuits as well as the voltage, oil pressure, fuel pressure, and water temperature. Uses these values to make real-time decisions regarding vehicle operation.
- With the software, able to detect and respond to dangerous conditions before the user is even aware of the problem.
- Consists of 4 single-position and 2 dual-position switches that are factory programmed to operate the 10 circuits of the Main Control Unit.
- Bi-color LEDs display the system state to the user. Solid green indicates proper circuit operation, solid red and fast flashing red indicate that a circuit has been shut down due to a hardware failure or a short circuit, respectively. When a Master Kill Switch is pressed, all LEDs become solid red and all circuits are shut down. With software, additional LED warning modes can be enabled.
- MCU can be mounted up to 40 ft from the Switch Panel allowing optimal placement location for wiring.
- MCU contains bi-color LEDs to indicate the state of each circuit.
- Fuses and USB connector for the system are both accessible on the MCU board as well as an input terminal for RPM and sensor signals.
- Master Kill Switch, Data Acquisition Switch, Neutral Safety Switch, Transbrake/Two-Step, Wide Open Throttle Switch, and Idle Throttle Signal have input terminals on both the Switch Panel and the MCU for ease of wiring.
- With Level 1 registration, user can modify amperage warning levels for each circuit to better suit the vehicle. Also allows user to select which switch controls a particular circuit and enables live amperage test. Allows the user to monitor the current draw of each circuit.
- With Level 2 registration, enables circuit shut down features. This level causes the Electronic Switch Panel to monitor sensors and shut down selected circuits when sensors are out of tolerance.
- With Level 3 registration, Data acquisition capabilities are provided.

594 Blackstone Street -- P.O. Box 206 -- Uxbridge, MA 01569

Tel: 508-278-2499 Ext. 503 Fax: 508-278-5887 Email: [info@portatree.com](mailto:info@portatree.com) Web Site: [www.portatree.com](http://www.portatree.com)

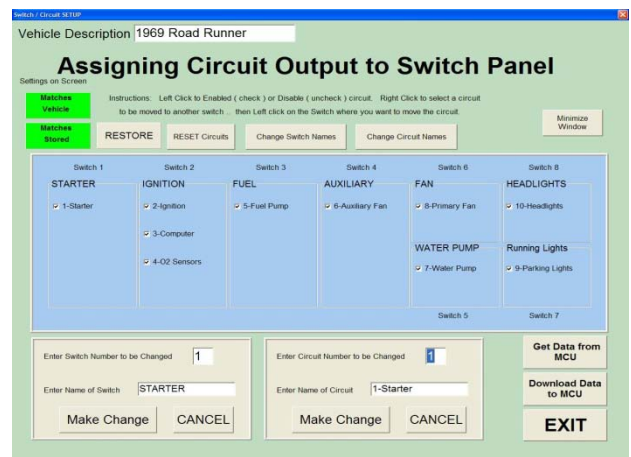


Figure 1: Software Screens (a) Main Screen (b) Switch to Circuit Selector

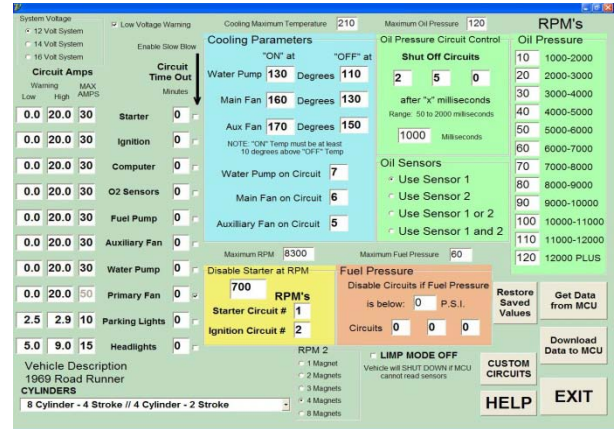
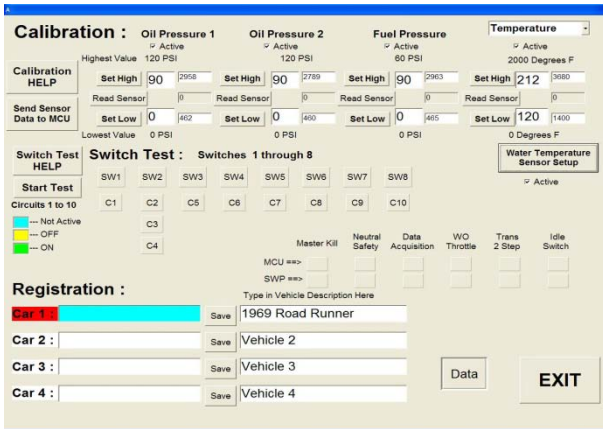


Figure 2: Software Screens (a) Sensor Calibration Screen (b) Parameter Setup Screen

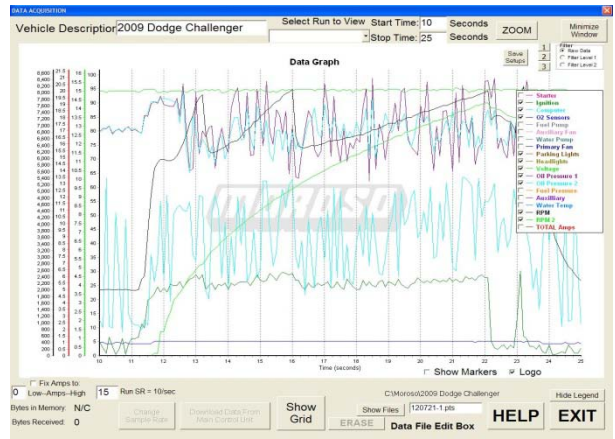


Figure 3: Data Acquisition Software Screens

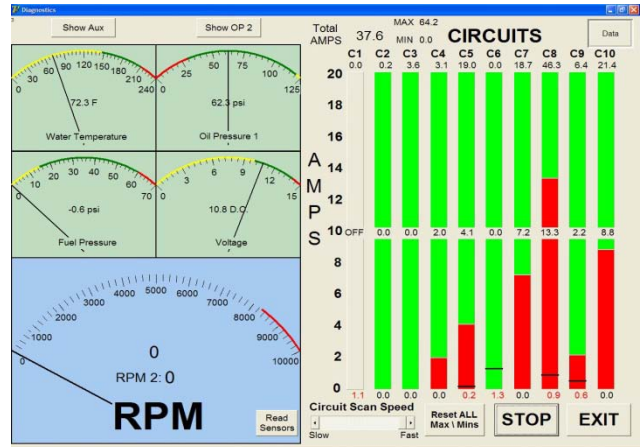


Figure 4: Software Data Screens (a) Data Acquisition Screen (b) Live Amperage Test Screen

# Electronic Switch Panel - Hardware Specifications

- System consists of 2 modules: Switch Panel and Main Control Unit (MCU)
- System voltage: 12 to 16 volts (22 volt absolute maximum)
- Switch Panel and MCU communicate via CAN Bus
  - CAN bus terminated with standard 9-pin DSUB connectors
  - Maximum cable length of 40 ft
- MCU communicates with a PC via USB
  - Connects to PC with a standard Type A to Type B USB cable
  - USB drivers provided with software
- 10 MCU Circuits
  - 30 amp maximum throughput per circuit
  - 120 amp maximum continuous throughput per board
  - Standard wide blade automotive grade fuses
  - Amperage monitoring
  - Heat, short circuit, and over voltage protection
- MCU housed in a black anodized extruded aluminum case with transparent cover
  - Includes mounting brackets
  - Dimensions: 8.5" x 6" x 2"
- Switch Panel has 4 single-position switches and 2 dual-position switches (8 total switches)
- Switch Panel comes in Panel Mount or Roll Bar Mount
  - Panel Mount Dimensions: 8" x 4" x 2"
  - Roll Bar Mount Dimensions (approx): 8" x 3" x 3"
- MCU Only Inputs
  - 2 Oil Pressure
  - 1 Fuel Pressure
  - 1 Water Temperature
  - 1 Auxiliary Sensor
  - 2 RPM Inputs
- MCU and Switch Panel Inputs
  - Master Kill Switch
  - Data Acquisition Switch
  - Neutral Safety Switch
  - Transbrake/Two-Step Connection
  - Wide Open Throttle Switch
  - Idle Throttle Signal
- 6 bi-color LEDs on the switch panel and 10 bi-color LEDs on the MCU
  - Solid Green – Circuit operating properly
  - Slow Flashing Green – Circuit amperage below warning level
  - Choppy Green – Circuit has been turned on due to a sensor
  - Fast Flashing Green – Circuit amperage exceeds warning level
  - Solid Red – Circuit hardware problem (call factory)
  - Slow Flashing Red – Circuit amperage exceeds
  - Choppy Red – Circuit has been turned off due to a sensor
  - Fast Flashing Red – Circuit has been turned off due to a short circuit
  - Ignition Switch solid red with green flashing slow – Low voltage warning
  - All Switch Panel LEDs solid red (MCU LEDs off)
    - Master Kill Switch pressed, all circuits shut down OR
    - Switches on during startup, safety feature OR
    - Race Vehicle did not return to "Closed Throttle" during a run, all circuits shut down
  - All Switch Panel LEDs solid red (half MCU LEDs red) –
    - Left half of MCU LEDs red – Current draw on left half of board exceeded 60 amps
    - Right half of MCU LEDs red – Current draw on right half of board exceeded 60 amps
  - All Switch Panel LEDs slow flashing red (MCU LEDs unaffected) – Oil Pressure shut down
  - All Switch Panel LEDs solid green with red flashing fast – Oil Pressure warning
  - All Switch Panel and MCU LEDs fast flashing red – Hardware problem (call factory)
  - All Switch Panel LEDs alternating green/red and MCU LEDs cycling red – Low voltage shutdown

# Electronic Switch Panel - Software Specifications

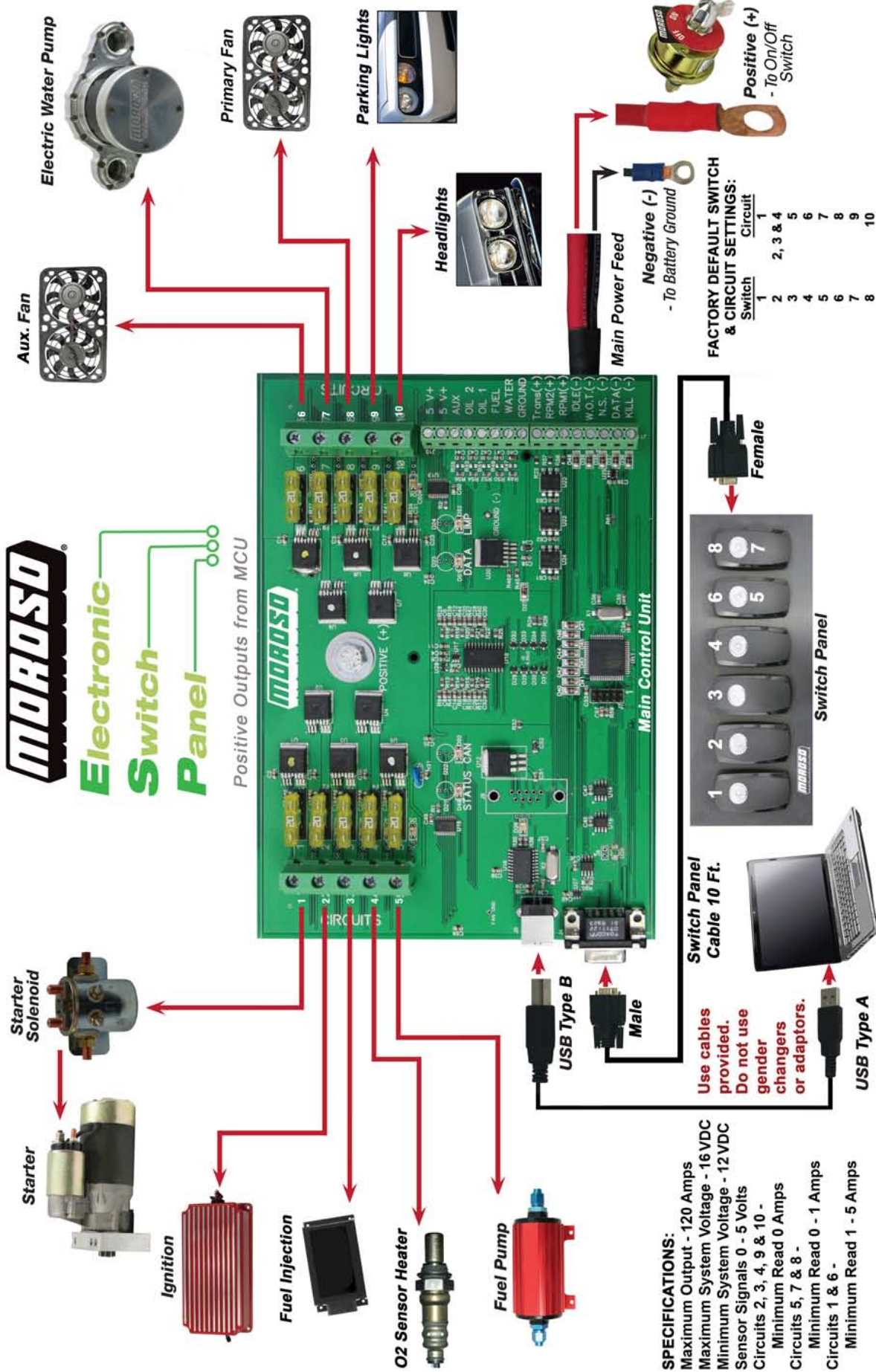
- Software available in 3 Levels
  - Level 1: Assign circuits to switches, configure amperage warnings, connectivity test, live amperage test to monitor current usage on each circuit
  - Level 2: Enable and calibrate external sensors, enable circuit shut down features
  - Level 3: Data acquisition
- Automatically detects the vehicle connected to the software
  - Remembers up to 4 vehicles
  - Populates the vehicle's parameters throughout the software screens
- Configure the system to provide warnings or to shut down circuits when parameters are met
- Circuit Selector Page:
  - Select the switch that controls a particular circuit
  - Switch 1 to 4 can control up to 4 circuits each
  - Switch 5 to 8 can control up to 2 circuits each
- Limits Parameters Page:
  - Set amperage warning values and shut down values for each circuit
  - Set time out values for each circuit
  - Shut down circuits based on water temperature, oil pressure, or fuel pressure values
  - Turn on circuits based on water temperature values
  - Disable the starter when the car is running
- Calibration, Diagnostics, Registration Page:
  - Enable and calibrate external sensors
  - Perform a switch test to ensure the switches are controlling the correct circuits
- Amperage Test or Live Connection Page:
  - Monitor amperage draw of each circuit while car is off or running
  - Monitor sensors, system voltage, and RPM
  - Records the maximum and minimum current levels of each circuit
- Data Acquisition Page:
  - Record data while the car is running or in Amperage Test
  - Select among 3 sample rates
    - 10 samples/second (~3.4 minutes of data storage capacity)
    - 20 samples/second (~1.7 minutes of data storage capacity)
    - 50 samples/second (~40.96 seconds of data storage capacity)
  - Acquired data automatically saved by date
  - Shows data in tabular or graphical form





# Electronic Switch Panel

Positive Outputs from MCU



### SPECIFICATIONS:

- Maximum Output - 120 Amps
- Maximum System Voltage - 16 VDC
- Minimum System Voltage - 12 VDC
- Sensor Signals 0 - 5 Volts
- Circuits 2, 3, 4, 9 & 10 - Minimum Read 0 Amps
- Circuits 5, 7 & 8 - Minimum Read 0 - 1 Amps
- Circuits 1 & 6 - Minimum Read 1 - 5 Amps

Use cables provided. Do not use gender changers or adaptors.



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## P.C. or Laptop Not Required -- Ready to Use with Factory Settings

### **76000/76025 Electronic Switch Panel – Panel Mount**

**Price: \$933.99**

- **Includes:** Moroso Part# 76000 – Main Control Unit (MCU) (Retail: \$699.00)
  - **Free** Level 1 Software CD (Includes instructional videos)
  - Serial DB9 Male to Female Cable, 10 Foot
  - USB 2.0 Cable, A Male to B Male, 10 Foot
  - Printed Instructions
- **Includes:** Moroso Part# 76025 – Switch Panel / Panel Mount (Retail: \$234.99)

### **76000/76050 Electronic Switch Panel – Roll Bar Mount**

**Price: \$1008.17**

- **Includes:** Moroso Part# 76000 – Main Control Unit (MCU) (Retail: \$699.00)
  - **Free** Level 1 software CD (Includes instructional videos)
  - Serial DB9 Male to Female Cable, 10 Foot
  - USB 2.0 Cable, A Male to B Male, 10 Foot
  - Printed Instructions
- **Includes:** Moroso Part# 76050 – Switch Panel / Roll Bar Mount (Retail: \$309.17)
  - Includes powder coated case and Roll Bar mounting bracket (assembled)

**76100 Level 2 Software Upgrade for Electronic Switch Panel**

**\$250.00**

**76125 Level 3 Software Upgrade for Electronic Switch Panel**

**\$250.00**

## Electronic Switch Panel – Software Features

### **Level 1 – Included Free with Main Control Unit (MCU)**

- Allows user to assign any circuit to any switch
- Amperage – User Programmable
  - Low & Hi Amperage warnings
  - Max Amperage shutdown
- Time outs – User Programmable for each circuit
- Starter Disable at User Programmable RPM
- Safety shutdown Based on User Programmable Elapsed Time and vehicle at idle (contacting idle switch)
- Live Amperage test screen with vehicle running or not running
- Switch test
  - Verifies circuit activation by each switch
  - Verifies external inputs

### **Level 2 – Software Upgrade**

- Oil pressure shutdown (variable-.05 to 2 sec delay) monitors 1 or 2 sensors throughout RPM range
- Fuel pressure shutdown
- Water temperature activation of up to 3 circuits “ON & OFF” at User Programmable temperature settings
- Limp Mode Active / Non Active
- Nitrous circuit Shutdown – Monitors up to 4 circuits - if one goes out of User Programmable Amp range - will shut down all 4 circuits – 1 Switch arms up to 4 circuits – Wide Open Throttle switch activates the circuits
- Sensor Calibration allows user to set sensor readings to match gauges in vehicle or to a known value.

### **Level 3 – Software Upgrade**

- Data Acquisition (adjustable 10, 20, 50 samples per second) Monitors:
  - RPM & Drive Shaft RPM
  - All 10 circuit Amperage levels & Max Amperage
  - Oil 1, Oil 2, Fuel, Auxiliary, and Water temperature values
  - Monitor Circuit On & Off
  - Monitor Optional 6 inputs On & Off
  - 3 User Definable Saved viewing options
  - View Data Grid – Shows time of sample and all sample data in grid - Scrollable