Lights Controller

Model 105 and 106 Installation, Operation, Specifications Manual

Microflex Labs

RideLightSolution.com

Description

The model 105 and 106 lights controllers provide a complete control solution for your ride's signal lights. The controller will auto-cancel turn signals using 3D gyroscopes and accelerometers that determine vehicle turn velocity. No mechanical connection to the steering shaft or steering column linkage is needed. This allows the lights controller to be used on a wide range of vehicles. It can also control your hazards lights and brake lights. No external relays, flashers, load equalizers, or bulb combiners needed. Just add your lights and switches.

The model 105 lights controller includes a connector to simplify harness wiring and servicing. The connector allows for OEM integration and adapter harnesses.

The model 106 lights controller is hermetically sealed by epoxy potting with wire leads for maximum ruggedness and weatherproofing.

The model 105 and 106 share all the same control functions.

Model 105 Controller with connector harness

Features

- ***Auto-Cancels Turn Signals***
  Uses motion sensors to measure vehicle angular velocity. Does not use steering wheel position or a timer to cancel turn signals
- ***Combines Turn and Brake Lights***
  Eliminates bulb combiners for common light systems
- ***Hazards Lights Control***
  Eliminates a separate hazards flasher
- ***High Power Solid-State Light Drivers***
  No Relays with moving parts and switch contacts
- ***Precision Blink Rate***
  Not Load Dependant, same blink rate with any light
- ***Brake Light Flasher***
  Brake lights flash a couple times when brakes are first applied for Increased safety
- ***Universal Fitment***
  Small size, wide operating range, flexible installation
- ***Momentary turn buttons or switches preferred***
  but can be used with OEM style steering column turn signal switches
- ***Wide operating voltage range***
  can be used on 6V, 12V, and 24V systems

Model 106 Controller environmentally sealed

Safety

- *Read and understand this manual before starting the installation.*
- *Installation and wiring should be performed by someone with knowledge of automotive electrical systems and techniques.*
- *Disconnect the battery before starting any work on the vehicles electrical system.*
- *The controller does not have an internal fuse. Power must be from a fused circuit to prevent possible fire or system damage. Refer to the wiring diagram in this manual for details.*
- *The lights controller is not rated for under-hood conditions. Do not install where the controller could be exposed to excessive heat.*

Operation

Turn Signal

Momentarily press the left or right turn button to start a turn signal sequence. With the left or right side lights blinking, the vehicle turn velocity is monitored to determine when the vehicle is making the turn in the indicated direction. When the turn velocity returns to zero, at the end of the turn, the signal is canceled.

Manual Cancel

To manually cancel a turn signal, simply press either turn signal direction button.

Lane Change

A slight turn may not produce the required angular velocity for the auto-cancel sensors to cancel. A lane change turn can be signaled by holding either turn signal button for a long press, about 3 blinks or more. When the button is released the turn signal will cancel.

Combined Turn and Brake Lights

Connecting the brakes switch to the controller will combine the brake lights and turn signals functions. If your vehicle tail light combines turn signals and brakes into a single light, this will eliminate the need for a 2-bulb to 1-bulb combiner.

Brake Light Flash

For added safety, when the brake is first pressed the rear lights will fast-flash a couple times - then turn on solid until the brake pedal is released. This increases your visibility when you first apply brakes to help prevent rear-end collisions. The brake light flash will not occur if a turn signal is active.

Precision Blink Rate

Turn signal and hazards blink rates are microprocessor controlled and not load dependent. Lights can be LED or incandescent without any effect to the blink rate. Do not add external flashers.

Lights Drivers

The four signal lights are controlled by solid-state switches and can drive up to 2-amps per light. No mechanical relays are used.

Hazards Lights

The controller can blink all four lights when the hazards switch is on. If the switch is wired to an always on power source, you will be able to turn on the hazards lights even if the key is off. If the switch is wired to a key-on power source, the key must be on to use the hazards lights. The flasher for the hazards lights is included in the controller. Do not add external flashers.

NOTE: A latching **hazards switch** will carry the full load of all four lights plus the controller's power. It must be rated higher than the maximum full load current (controller plus all four lights).

Motorcycle Parade Mode

If your vehicle uses two separate buttons for the turn signals, you can turn on the hazards lights by holding down both direction buttons for about 5 seconds - until the lights begin blinking. Holding down both buttons again, or cycling power, will turn off the hazards lights. This feature can eliminate the need for a separate hazards switch.

Turn Signal Buttons

The Lights Controller requires, but does not include, left and right turn buttons. The buttons or switches are not carrying the full load of the lights so low current buttons or switches can be used. Maximum button or switch current is less than 0.005 amps.

Momentary Buttons (preferred)

Momentary buttons allow the controller to auto-cancel using motion sensors after the turn is complete. This manual refers to left and right turn signal buttons but any SPDT (center off) momentary toggle switch or other momentary type switch could be used. Microflex Labs offers the model 104 steering column mounted switches.

Latching Switches

If latching switches are used, the controller will not be able to auto-cancel the switch. In this case, auto-cancel is handled by the switch mechanism in the steering column. The controller will use its *Lane Change* mode to cancel the sequence when the turn switch opens. The turn switch must be closed for more than 3 blinks for the controller to enter *Lane Change* mode.

Specifications

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Supply Power
- Minimum..... 5 Volts
- Max ..... 30 Volts
- Key Off ..... 0 Amps
- Key On, All Lights Off .... 0.006 Amps Typical at 12V

Lights Drivers
- Maximum Current..... 2 Amps per Light
- Light On Min..... Supply - 0.5 Volts
- Light Off Max..... +0.5 Volts

Blink Rate ..... 90 per Minute (1.5 Second)

Turn Buttons Current - The left and right turn buttons provide battery voltage to the controller input to start a turn sequence. Maximum current is less than 0.005 amps (5mA).

Hazards Switch Current - The hazards switch must be capable of switched power for all four lights plus the controller's power.

Brakes Switch Current - When the brakes are pressed, battery voltage is applied to the controller. Maximum current is less than .005 amps (5mA).

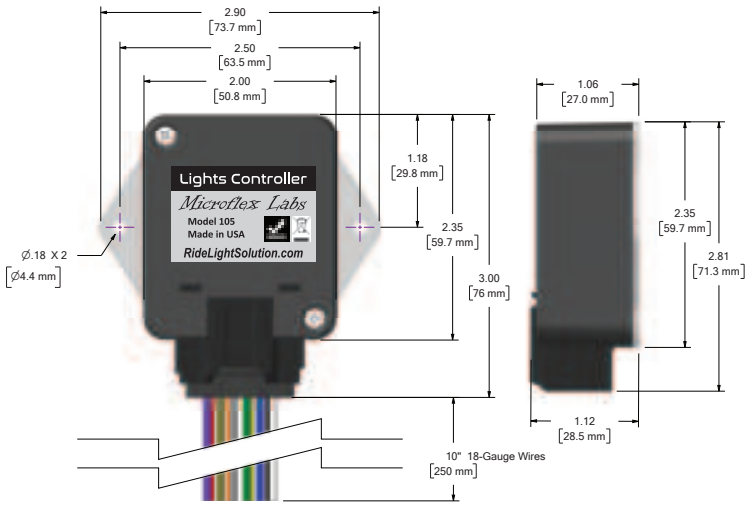
Fuses
Controller power and Hazards power must be fused. The fuse should be cable of supplying power to all lights and the controller, typically 3 to 10 amps, depending on the lights used.

Model 105

Enclosure
- Cover..... ASA Plastic
- Mounting Plate .....6061-T6 Aluminum
- Screws ..... Stainless Steel
- Weight ..... 1.8oz [52g]
- IP Rating 40

Connector .....Includes Mating Plug with 10" Wires
- Controller Side ..... Molex PN: 346960100
- Harness Side..... Molex PN 313721000
- Wires ..... 18-Gauge Stranded x 10" [250 mm]

Environmental
- Operating Temp..... -22°F to 122°F [-30°C to 50°C]
- Storage Temp..... -40°F to 158°F [-40°C to 70°C]
- Humidity .....0 to 99% (non-condensing)

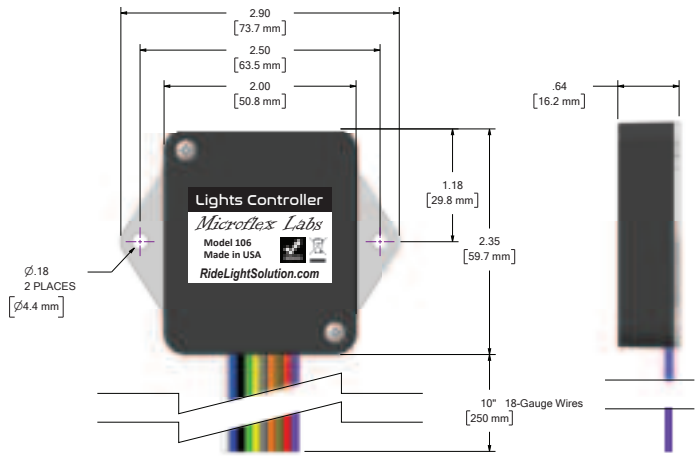


Model 106

Enclosure
- Cover..... ASA/ABS Molded Plastic
- Mounting Plate .....6061-T6 Aluminum
- Screws ..... Stainless Steel
- Weight ..... 3oz [84g]
- IP Rating 67

Wires ..... 18-Gauge Stranded x 10" [250 mm]

Environmental
- Operating Temp..... -22°F to 122°F [-30°C to 50°C]
- Storage Temp..... -40°F to 158°F [-40°C to 70°C]
- Seal .....Epoxy Potting



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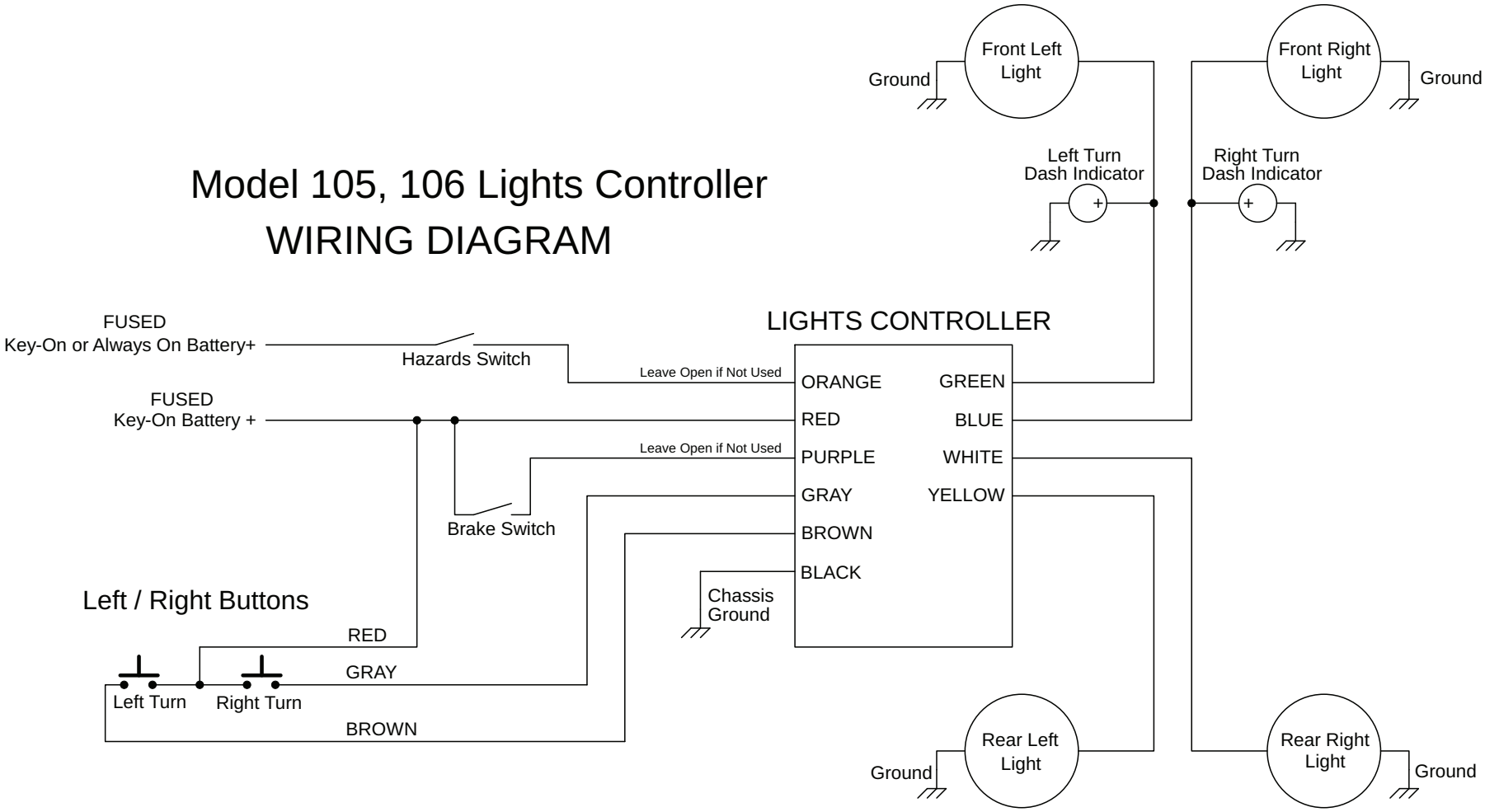
Model 105, 106 Lights Controller
WIRING DIAGRAM



Installation

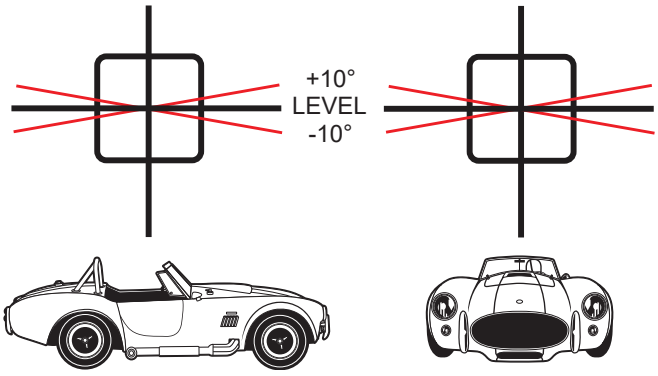
Controller Mounting

The controller must be mounted level to the ground to keep the motion sensors axis aligned with the vehicle. Leveling just by sight should be sufficient, ±10°. It does not need to be exact. Any side can be up as the controller's sensors can detect this. The controller will also automatically align to be straight to the vehicle. Mounting the controller at an angle will add error to the turning measurement and reduce the auto-cancel accuracy.

Most vehicles will have a convenient location under the dash. For motorcycles, the controller is typically mounted under the seat. Consider the existing harness and how wires will be routed when choosing a location.

The controller can be mounted using the two holes on the back-plate. The 0.18" diameter holes accept #8 [4 mm] screws.

IMPORTANT: Mount the controller level, front to back, and left to right, any side up, plus or minus 10 degrees.



Wire Functions

Wire Color		Name	Function
Black	10	Ground	Battery (-) or chassis ground. Must be able to handle the full fused capacity.
Red	7	Key-On Power	Power to the lights controller when the key or ignition switch is on. Connect to fused key-on power.
Orange (optional)	8	Hazards	When power is applied, through a hazards switch, the front and rear lights will blink. Connect the switch to either a fused always-on, or fused key-on power source. The switch should be rated to handle the full load of all lights. Refer to the wiring diagram for how to connect the hazards switch. If power is from an always-on source, the hazards lights will work even if the key or ignition switch is off. If connected to a key-on power source the hazards lights will only function if the key is on. If not used leave this wire open with the wire conductor protected.
Gray	3	Right-Turn Button	When power is applied, through the right-turn button, the right turn sequence is started. The right side front and rear lights will blink until canceled.
Brown	2	Left-Turn Button	When power is applied, through the left-turn button, the left turn sequence is started. The left side front and rear lights will blink until canceled.
Purple (Optional)	1	Brake Switch	Connect to the brake pedal switch or brake light wire. When brakes are first applied the brake lights will quick-flash two times then stay on while the brake is pressed. If a turn sequence is also requested, the left or right front and rear lights will also blink until canceled. If not used leave this wire open with the wire conductor protected.
Green	4	Front Left Light	Connect to the front-left turn signal light and the left-turn dash indicator.
Blue	5	Front Right Light	Connect to the front-right turn signal light and the right-turn dash indicator.
White	6	Rear Left Light	Connect to the rear-left turn signal light.
Yellow	9	Rear Right Light	Connect to the rear-right turn signal light.

Limited Warranty

Microflex Labs warrants this unit against defects in materials and workmanship for a period of one year from the date of shipment. Microflex Labs will, at its option, repair or replace equipment that proves to be defective during the warranty period. This warranty includes parts and labor.

A Return Materials Authorization (RMA) number must be obtained from the factory and clearly marked on the outside of the package before equipment will be accepted for warranty work.

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