



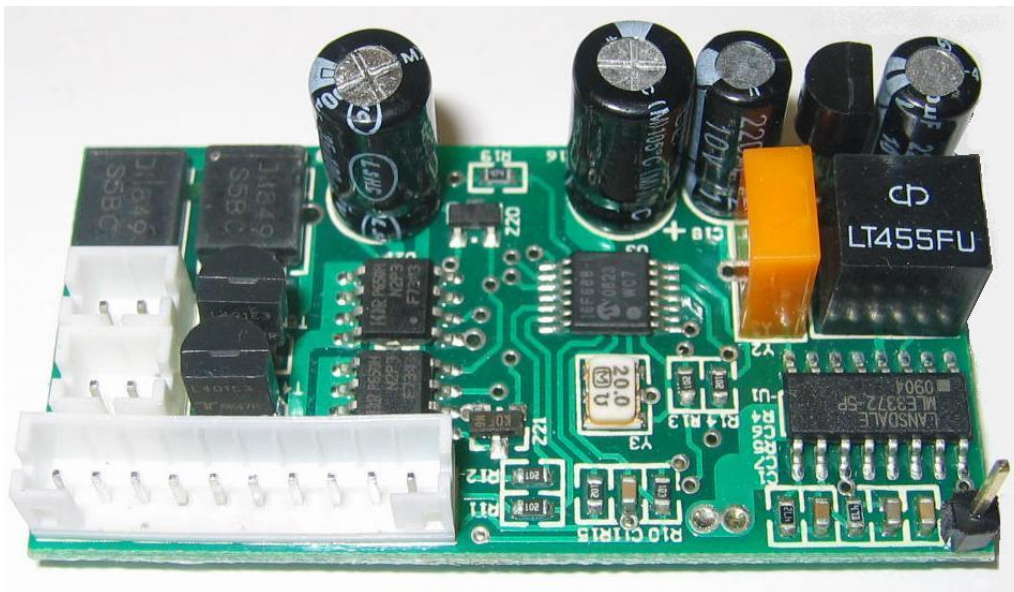
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[www.electricrr.com](http://www.electricrr.com) /

[err@3rdrail.com](mailto:err@3rdrail.com)

# Mini Commander 2

## Instruction Manual

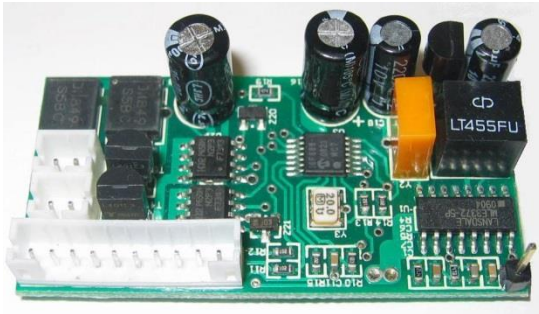


### Cool Features

- Fully compliant with TMCC standards
- Command and Conventional Operation
- True Full Wave DC small motor driver, 2 Amp Continuous, 4 Amp Peak
- Outputs for either F/R Lamps, Couplers, or Smoke and Front lamp
- Solder-less board connections make installation simple and quick
- Direct drive for LEDs with directional control
- Serial Output for Rail Sounds Commander
- Complete kit, all required parts included
- Small Size - 2" L x 1" W x 0.65" H
- Maximum safe track voltage is 18 VAC

## Overview

The Electric Railroad Company Mini Commander 2 is designed specifically for operating vehicles such as locomotives, rolling stock, and accessories with small DC motors. The Mini Commander 2 kit addresses the unique aspects of this compact motive power. The end result will be a greatly enhanced operating experience. The optional Rail Sounds Commander is easily integrated to add sounds for even greater realism.



Mini Commander 2



Rail Sounds Commander (Optional)

The Mini Commander 2 is a fully integrated TMCC receiver, decoder, and motor driver without the need for any additional parts or modules. It directly drives DC motors with 100 step control. Three distinct versions provide directional control of the lights, couplers, or smoke and headlight. A Serial Data output provides the ability to drive the Rail Sounds Commander. Each version also supports direct drive of forward and reverse LEDs. The LEDs are available separately.

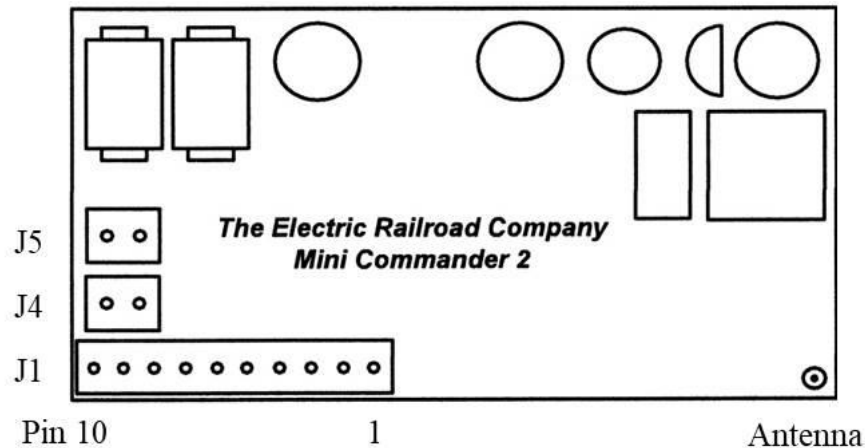
## Parts Included

- Mini Commander 2 circuit board (three versions available)
- 10 Position Cable Assembly (with 9 wires)
- 2 – 2 Pin Connectors with Leads
- Program/Run Switch with Leads
- Antenna Cable Assembly
- Shrink Tubing
- Foam Mounting Pad
- Cable Ties
- Installation & Operation manual

## Available Optional Parts

- Rail Sounds Commander Kit
- 3mm Warm White LEDs

## Mini Commander 2 Connections



Connector J5 (Rear)  
 Pin 1 (left) - Common  
 Pin 2 (right) - Hot

Connector J4 (Front)  
 Pin 1 (left) - Common  
 Pin 2 (right) - Hot

### Connector Pin Description

Pin 1	–	Program/Run Switch Connection
Pin 2	–	Front LED Positive (Low Current)
Pin 3	–	Rear LED Positive (Low Current)
Pin 4	–	(not used – no wire attachment)
Pin 5	–	Outer Rails Power Connection (Common)
Pin 6	–	Outer Rails Power Connection (Common)
Pin 7	–	Serial Data for Rail Sounds Commander
Pin 8	–	Motor Connection Positive
Pin 9	–	Motor Connection Negative
Pin 10	–	3 <sup>rd</sup> rail Power Connection/Hot
Antenna	–	Antenna wire connection

### TMCC Operation of J4 & J5 Outputs

Connector	Lamp Version	Coupler Version	Smoke & Headlamp Version
J4 Pin 1	Front Lamp Common	Common	Front Lamp Common
J4 Pin 2	Negative DC	Front Pulse	Front Negative DC
J5 Pin 1	Rear Lamp Common	Common	Smoke Common
J5 Pin 2	Negative DC	Rear Pulse	Smoke Hot (AC)

The J5 & J4 outputs vary with track voltage. Details are in the table. For lamps they are roughly ½ track voltage. When operating in conventional mode only the Lamp Version has controllable outputs.

### **Smoke Operation**

When using the Smoke & Lamp version, a chuff signal may be used by grounding the chuff line using a cherry switch. Only the Sunset smoke unit (circa 2018 and beyond) has been tested and requires at least 12 VAC track signal to work reliably. Other smoke units that require more than 0.8 A for operation may burn out the on-board triac and should not be used. Of course you can purchase a replacement unit if you ignore this!

### **Program/Run Switch**

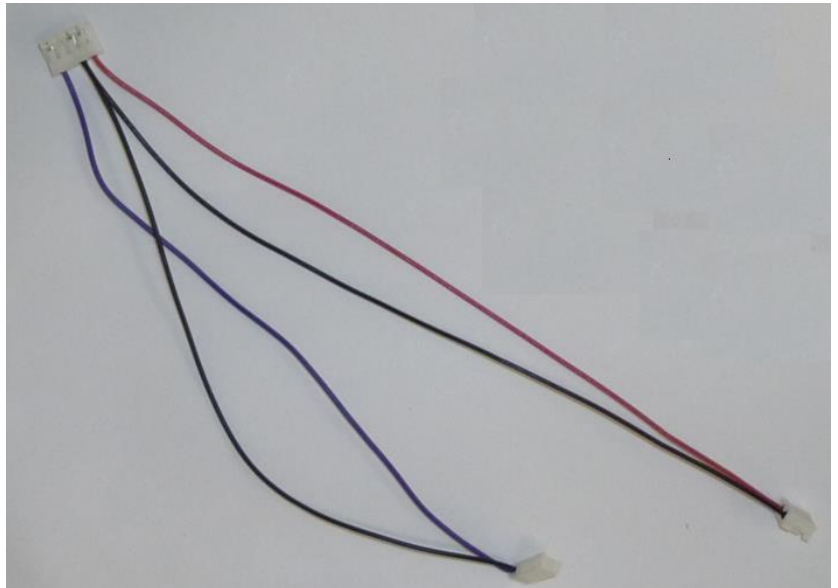
The provided program/run switch should be connected between Pins 1 and 5-6. The “Program” position occurs when the two pins are shorted. Mount the switch where it may be easily accessed unless you are going to program it initially then close up the project.

### **Front/Rear LED Connection**

LEDs may be connected directly to the Mini Commander 2 board using the appropriate pins. Pin 2 is positive for the front LED and negative may use either Pin 5 or 6. The rear LED uses Pin 3 for positive. Testing has been done for 2 and 3.2 volt LEDs. The optional 3mm LEDs provide a warm white light similar to an incandescent bulb. The long lead is the anode or positive connection. These LEDs do not have a base or flange allowing them to be inserted into most engine lamp lens areas. The diameter of 3mm is about 1/8” diameter.

### **Optional Rail Sounds Commander Connections**

This board has two connectors as shown in the lower right of the accompanying picture. The top left connector will not be used with the Mini Commander 2 and may be removed. Connect the two black wires together and to J1 Pin 5-6. The Red wire should be connected to J1 Pin 10. Lastly the serial purple wire should connect to Pin 7 (Serial Data). Location of the sound board and speaker is installation dependent.



If you are using a steam commander, the chuff input is per the Rail Sounds Commander instructions. This same chuff input should not be used to create a chuff with any existing smoke unit.

## **Motor Connection**

Pins 8 & 9 from J1 connect directly to the unit's motor. The positive and negative notation is useful when you already know the motor direction with power. In many cases, you should not solder the wires to the motor until after the unit has been tested and the proper forward direction is demonstrated. If required, simply reverse the wires to Pins 8 & 9. Then the connections may be soldered and covered with shrink tubing.

## **Power Connections**

The common Pins 5 & 6 should be connected together and attached to the chassis or other connection to the outside rails. These pins represent the common signal for J4, J5 and the optional LEDs. The AC hot Pin 10 should be connected to the center rail rollers or pickup.

## **Important Notes**

- Leave the circuit board in its anti-static packaging until ready to be installed. Dissipate any static electricity before handling by touching a grounded metal object. Avoid working on carpeted floors in cool dry areas and, if possible, use an antistatic wrist strap. It's best to hold circuit boards by the edges and avoid touching contacts and components.
- Take care when connecting or disconnecting cables. When disconnecting a cable, always pull on the cable connector, not on the cable itself!
- Pictures of products may vary from actual products received. The Electric Railroad Company reserves the right to improve the products on successive manufacturing cycles.

# Operation

## Command Mode

The Mini Commander 2 comes pre-programmed as Engine #1. To change the engine ID, follow this procedure:

1. Make sure a Command Base is connected to the track.
2. Set the Unit Program/Run switch to Program (Pins shorted).
3. Place the Unit on the track and apply power.
4. On the Remote, press [ENG] then the number (1 – 99) for the engine selected.
5. Press [SET]. The headlight will flicker and the horn (with Rail Sounds) will blow as the ENG ID is stored. For example, to set the Engine ID to 4:

[ENG]      4      [SET]

6. Remove power from the track and place the switch back to Run.

## Command & Conventional Mode

The unit may be run in either Command or Conventional mode. When running in Conventional mode, the cycling of engine direction can be overridden by placing the Program/Run switch in the Program position. This will lock the engine direction to last direction traveled. Before running the unit again in Command mode it is very important to first return the Program/Run switch to the Run position.



# Installation - Example

Before beginning, please take time to read through the instructions and plan your installation. Examine the wiring already present in the Unit. You will first need to remove some parts to prepare the chassis for the new upgrade components.

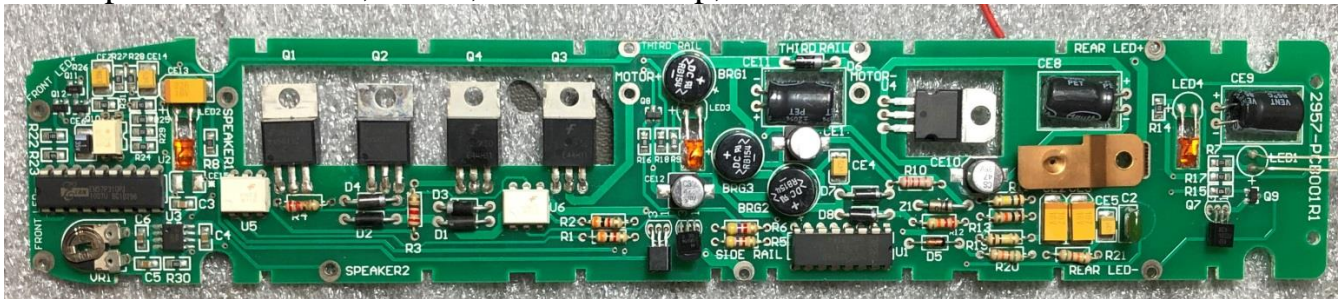
This installation is provided only as an example and different

units may require another approach. The following picture shows the unit to be converted.



## Preparation

1. Remove the shell and set it aside so it will not be damaged. For this Atlas unit four screws hold the body to the chassis.
2. The Atlas Trolley has the electronics in the ceiling of the unit with designations as to which pin is outside rail, motor, front/rear lamp, etc.



3. The Atlas trolley uses 3mm lamps for forward and reverse so we will use the LED outputs from the Mini Commander 2 to power these directly.
4. This particular installation required interior lighting and the rear marker LED is connected with a resistor to the LED strip. A small supply (available separately) regulates the output of J4 for proper lighting effects. The J5 (rear lamp) is not used.
5. Connect the wire from the “Common” posts to the unit’s chassis.

## Wiring

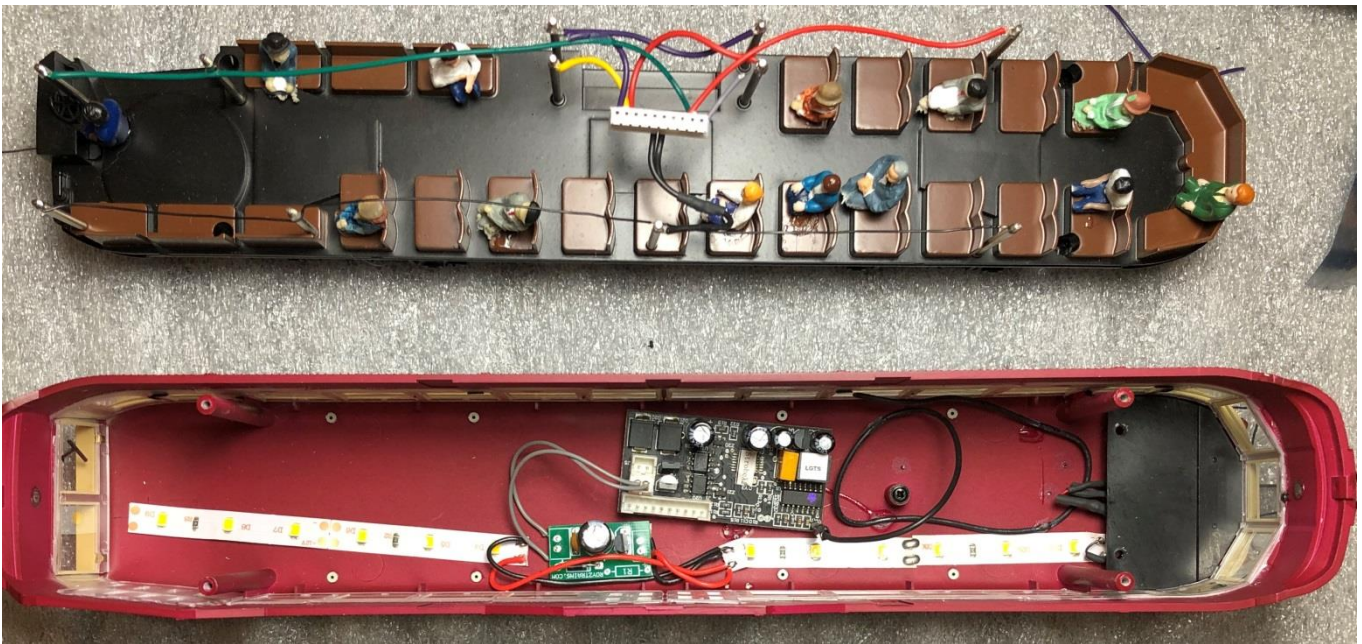
Take your time while wiring. Wires may be trimmed to remove excess length as necessary.

1. Due to space constraints and the desire to add internal lighting, the optional Rail Sounds Commander was not used. The end of the serial wire (Pin 7) was cut short and the end covered with shrink tubing. This wire will not be used.

2. In this example, the trolley was programmed before the body was reinstalled as there was no easy location to mount the Run/Program switch. Pin 1 was cut to about ½” and left hanging to allow future reprogramming if needed.
3. Double check all wiring and verify that there are no exposed wire strands that could cause a short circuit.
4. The antenna should be attached to the underside of the roof or some other isolated area.
5. The unit may be tested and potentially programmed before final assembly. In this example, the circuit board was attached to the connector as shown in the top of the next picture.

## Mounting

Prior to permanently attaching the board, spend some time test fitting the board to ensure proper



placement. Take your time, and when ready use a piece of double stick tape to mount the Mini Commander 2 board where it will be minimally intrusive. Use only one layer of double stick tape.

## Final Assembly

Without the optional Rail Sounds Commander, the body is ready to be re-installed.



## Limited Warranty

Sunset Models Inc. warrants to the original consumer purchaser that this product will be free of defects in materials and workmanship for a period of 90 days from the date of original purchase. This warranty does not cover service, repair, or replacement to correct any damage caused by improper installation, improper connection, external electrical fault, accident, disaster, misuse, abuse, or modifications to the product. All other express or implied warranties, including the implied warranty of merchantability and fitness for a particular purpose, are hereby disclaimed. If this product is not in good working order as warranted, the sole and exclusive remedy shall be repair or replacement. In no event shall Sunset Models Inc., or any dealer, distributor, or authorized installation and/or repair service provider be liable for any damages in excess of the purchase price of the product. This limitation applies to damages of any kind, including but not limited to, direct or indirect damages, lost profits, lost savings or other special, incidental, exemplary or consequential damages whether for breach of contract, tort or otherwise, or whether arising out of the use of or inability to use the product, even if Sunset Models Inc., or any dealer, distributor, or service provider has been advised of the possibility of such damages or any claim by any other party. Some states do not allow the exclusion or limitation of incidental or consequential damages so the above limitation or exclusion may not apply to you. During this warranty period, the product will either be repaired or replaced (at our option) without charge to the purchaser, when returned either to the dealer with proof of the date of purchase or directly to Sunset Models Inc. when returned prepaid and insured with proof of date of purchase. Some states do not allow limitations on how long an implied warranty lasts, so such limitations may not apply to you. This warranty gives you specific legal rights, and you may also have other rights, which vary from state to state.

## Repairs

Each and every product is thoroughly tested before it is shipped. The likelihood that it is not working when it reaches you is very small. However, if after troubleshooting it yourself you cannot get it to work properly, you should contact us to help determine the problem.

Should your product ever need repair, return it postpaid directly to Sunset Models Inc. If the product is within the warranty period, it will be repaired or replaced and returned to you free of charge. Units out of warranty will be repaired or replaced for a service charge of \$30.00 at our option.

Please email to [err@3rdrail.com](mailto:err@3rdrail.com) for return authorization before returning any product.

## Disclaimer

**Improper installation or configuration of the Mini Commander 2 Board can cause overheating and fires! Since it is not possible to understand every installation, it is the consumer's responsibility to verify proper operation of the upgrade to prevent malfunction. If you are unsure of install, please contact us first before taking any risks!**

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