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3/18



***Lionel  
Custom Switch  
Machine Controller  
(CSM2)  
Owner's Manual***



# Thank You!

Your layout has always been more than the sum of its parts. But until now, combining those parts into a complete system could be a challenge. Lionel's new Layout Control System or "LCS," fulfills the LEGACY promise of integrated locomotive and layout control.

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*Lionel®*, *TMCC®*, *LEGACY®*, *FasTrack®*, *TrainMaster®*, *CAB-1® Remote Controller*, *Pullmor®*, *TMCC®*, *Accessory Motor Controller™*, *AMC™*, *Accessory Switch Controller™*, *ASC™*, *Track Power Controller 300™*, *TPC 300™*, *Block Power Controller™*, *BPC™*, *SensorTrack™*, *LCS®*

# What is Lionel's Layout Control System?

LCS doesn't replace your existing Lionel Legacy Control system. It adds to it! You can control your layout from Lionel Cab Remote controllers or from smart devices like an Apple iPad and run locomotives, operate track switches, accessories and lighting. Create automatic events to control passing locomotives and other layout accessories or switches.

LCS is a modular system, with each product offering unique features. No single LCS product will do everything and not every layout will require every type of LCS device. But a fully realized LCS system will likely include the following:

- A Lionel Command Base (Legacy or Base-1L) for locomotive control
- LCS WiFi so you can control your layout from smart devices like an iPad®
- LCS ASC2, to operate switches, lighting and accessories
- LCS BPC2 for block power control
- LCS SensorTrack (one or more) which adds a new level of interactivity with compatible Lionel Legacy and Vision locomotives
- LCS SER2 for computer control and use of existing Lionel serial devices like the TPC-300 and TPC-400
- LCS AMC2 for controlling accessory motors and lights
- LCS CSM2 for controlling the DZ-2500 switch machine
- LCS IRV2 for SensorTrack compatibility on layouts that do not use FasTrack!

## How it works!

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**Y**our Lionel Cab Remote sends commands to your Command Base. In turn, the base controls your locomotives via a one-way communication link. LCS works in parallel with your existing command base, adding a wired network of control modules. Spread across your layout, these LCS modules operate switches, lighting, accessories and track power blocks. LCS is bidirectional, meaning modules can send and receive commands.

And here's where it all comes together: Since LCS can also send commands back through the command base, LCS devices can operate your locomotives as well as your layout! For example, a module like SensorTrack™ can make a loco blow a grade-crossing signal as it passes. And the LCS WiFi module connects devices like an Apple iPad® to your layout so you and your friends can easily operate switches, locos and more.

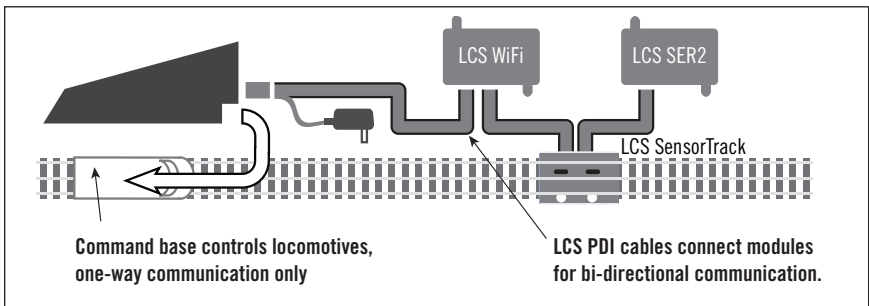


Figure 1. LCS doesn't replace your Lionel Command Base—it adds to it!

# What is Lionel's Layout Control System?

## LCS CSM2 Module

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The CSM2 module was created for use with the Z-Stuff DZ-2500 switch machine. This switch machine is widely used in the 3-rail O Gauge market on many different track systems. It allows for TMCC communication which allows the user to control the switch machine from a Cab-1, Cab-1L, or Cab2 remote. The CSM2 also allows for control of the switch machine through the LCS APP and provides the throw position for up to 7 machines!

- Provides serial line for DZ-2500 TMCC operation.
- Non-derail operation compatibility.
- Monitor up to 7 DZ-2500 throw positions on LCS APP.
- Additionally, module has 4 block power control positions (see BPC2 for functionality).
- DZ-2500 connection board available through Electric Railroad or Lionel Customer Service.
- Can be operated from Lionel CAB remotes and/or the LCS App+LCS Wi-Fi



Figure 2. LCS CSM2 Module

## ***Installing Your First LCS Device***

**T**he following section describes installation of a new LCS system. If you already have installed your first LCS component, please skip ahead to the next section titled “Installing additional LCS devices.”

When installing a new LCS system, the process you will follow depends on which (if any) Lionel Command Base is to be connected to your LCS system. Following sections describe starting a new LCS installation with a Legacy Base, a Base-1L or without any command base.

### **The LCS DB-9 Cable with Power Supply**

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**E**very LCS system requires exactly one 6-81499 LCS DB-9 Cable with Power Supply. This special cable has three connectors: (A) a DB-9, with a “pig-tail” cable-mount power supply connector (C) and also a 10-foot cable with an “LCS PDI” connector at its end (B). See below:

The cable receives power from the included DC wall-pack (12VDC at 1A). Power for each LCS device is supplied through the single LCS data cable. The LCS DB-9 Cable with Power Supply wall-pack is capable of powering dozens and dozens of LCS devices, depending on type. An additional power booster/cable extender is available for extremely large LCS installations.

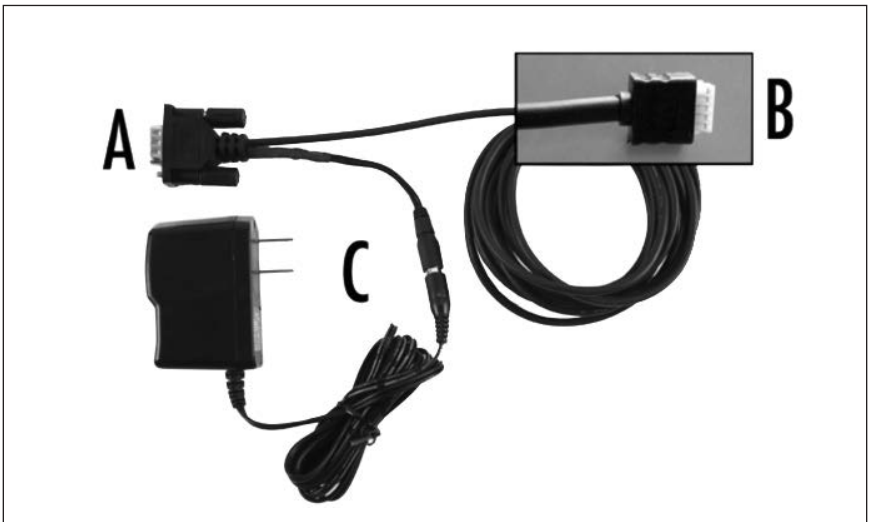


Figure 3. The LCS DB-9 Cable with Power Supply (sold separately)

# Installing Your First LCS Device

## Installing a new LCS system with a Legacy Base

---

To install a new LCS system on a layout with a Legacy Command Base:

1. Turn off power to your layout and Legacy Base
2. Connect the DC wall-pack to the female cable-mount connector of the LCS DB-9 Cable.
3. Connect the DB-9 connector of the LCS DB-9 Cable to your Legacy Command Base.
4. Connect the LCS PDI cable end of the LCS DB-9 Cable to either connector on your LCS device, such as an LCS WiFi or LCS SensorTrack or any other Layout Control System product.
5. Restore power to your layout and Legacy Base.
6. Plug in the LCS wall-pack power supply.

**Note!** If using a Legacy command base, it must have software rev 1.52 or higher installed.

Your system should resemble the figure below.

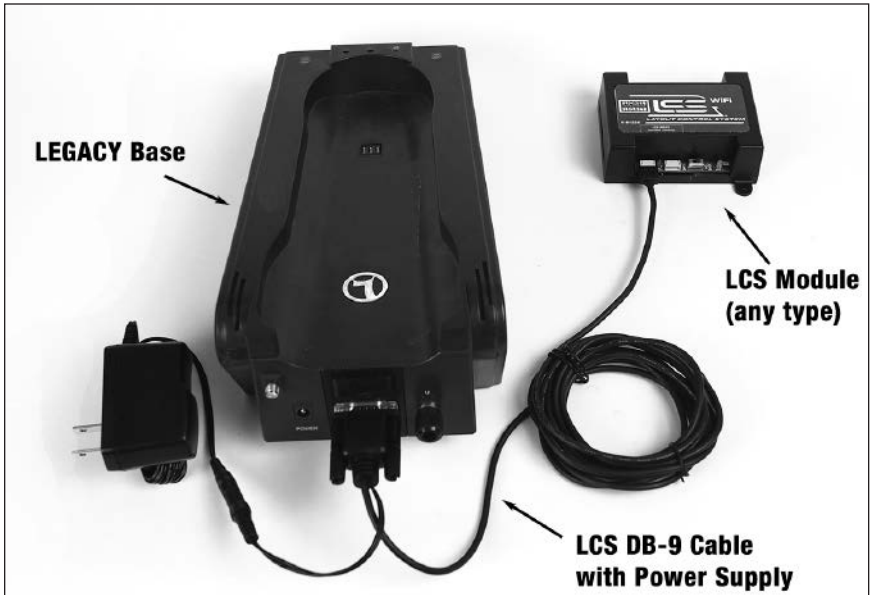


Figure 4. Installing a new LCS system with a LEGACY Base

Once connected and powered-up, the yellow LED on the Legacy Base will blink once every second. With this setup, you can control Lionel locomotives and Layout Control System products using a Legacy Remote(s) and optionally CAB-1L remote(s).

If you have additional LCS devices to install, see “Installing additional LCS devices.” If not, skip ahead to the next section of this manual, “Configuring your LCS Device.”

# Installing Your First LCS Device

## Installing a new LCS system with a Base-1L

---

To install a new LCS system on a layout with a Base-1L Command Base:

1. Turn off power to your layout and Base-1L
2. Connect the DC wall-pack to the female cable-mount connector of the LCS DB-9 Cable.
3. Connect the DB-9 connector of the LCS DB-9 Cable to your Base-1L.
4. Connect the LCS PDI cable end of the LCS DB-9 Cable to either connector on your LCS device, such as an LCS WiFi or LCS SensorTrack or any other Layout Control System product.
5. Restore power to your layout and Base-1L.
6. Plug in the LCS wall-pack power supply.

Your system should resemble the figure below.

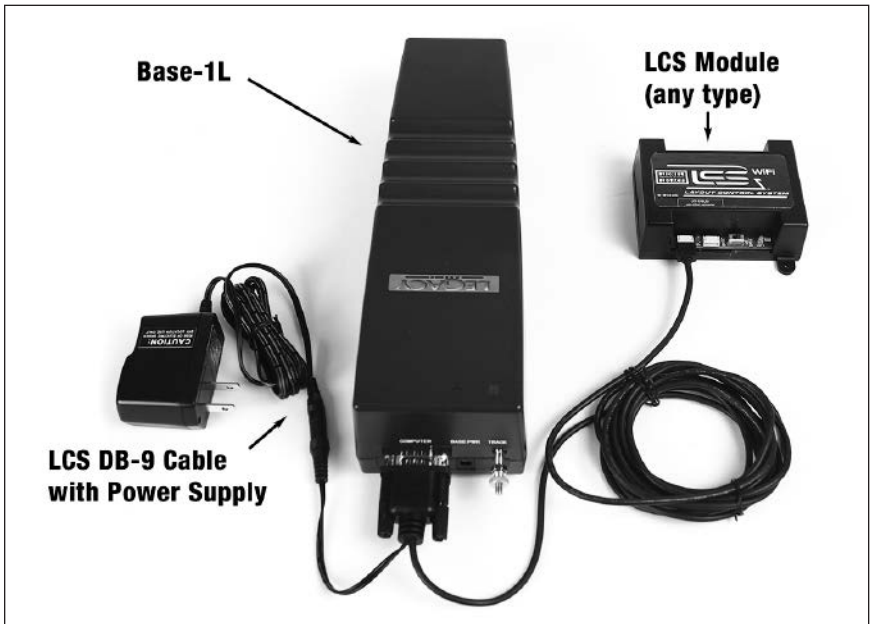


Figure 5. Installing a new LCS system with a Base-1L

Once connected and powered-up, the red LED on the Base-1L will blink once every second. With this setup, you can control Lionel locomotives and Layout Control System products using a CAB-1L remote(s).

If you have additional LCS devices to install, see “Installing additional LCS devices.” If not, skip ahead to the next section of this manual, “Configuring your LCS Device.”

# ***Installing Your First LCS Device***

## **Installing LCS with Legacy AND TrainMaster Command Bases**

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**T**he following instructions apply ONLY if you are using one or more original CAB-1 remotes with a Legacy command base. It is not necessary to follow these instructions to use the CAB-1L remote with a Legacy command base.

In order to complete this installation, you will need a CAB-1 remote, an original TMCC Trainmaster command base, a Legacy Command Base with Legacy CAB-2 remote and the Legacy serial Y cable (included with the Legacy command base).

**Note!** This is the ONLY supported application for the Legacy Y cable. The “Command base” end of the Legacy Serial Y cable cannot be directly connected to any accessory other than the original TMCC TrainMaster command base.

To install a new LCS system on a layout with a Legacy Command Base, an original TMCC Command Base and a Legacy Serial Y Cable:

1. Turn off power to your layout, Legacy Base and TMCC TrainMaster command base.
2. Connect the DC wall-pack to the female cable-mount connector of the LCS DB-9 Cable.
3. Connect the DB-9 connector of the Legacy Serial Y cable to your Legacy Command Base.
4. Connect the “Command Base” end of the Legacy Y cable to the DB-9 connector of your TMCC Trainmaster Command Base.
5. Connect the DB-9 end of the LCS DB-9 Cable to the “Serial Comm” connector of the Legacy Y cable.
6. Connect the LCS PDI cable end of the LCS DB-9 Cable to either connector on your LCS device, such as an LCS WiFi or LCS SensorTrack or any other Layout Control System product.
7. Restore power to your layout, Legacy Base and TMCC TrainMaster command base.
8. Plug in the LCS wall-pack power supply.

**Note!** If using a Legacy command base, it must have software rev 1.52 or higher installed.



# Installing Your First LCS Device

## Installing LCS with Legacy AND TrainMaster Command Bases (continued)

Your system should resemble the figure below.



Figure 6. Installing LCS with Legacy AND TrainMaster Command Bases

Once connected and powered-up, the yellow LED on the Legacy Base will blink once every second. With this setup, you can control Lionel locomotives and Layout Control System products using any combination of LEGACY Remotes, CAB-1L remotes and original CAB-1 remotes.

If you have additional LCS devices to install, see “Installing additional LCS devices”. If not, skip ahead to the next section of this manual, “Configuring your LCS Device.”

# ***Installing Your First LCS Device***

## **Installing a new LCS system with NO Command Base**

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**T**he Layout Control System can be used without a Lionel Command base. This would be appropriate for a layout which only uses “conventional” or “transformer-controlled” locomotives or a different type of locomotive control system such as DCC. An LCS WiFi is required, as are one other LCS module (such as ASC2 or BPC2).

To install a new LCS system on a layout that does NOT include Lionel Command Base:

1. Connect the DC wall-pack to the female cable-mount connector of the LCS DB-9 Cable.
2. Connect the LCS PDI cable end of the LCS DB-9 Cable to either connector on your LCS WiFi.
3. Set the Base/No Base switch to “NO BASE.”
4. Leave the DB-9 connector of the LCS DB-9 Cable unconnected.
5. Plug in the LCS wall-pack power supply.

With this setup, you can control other Layout Control System products using compatible software on smart devices connected via WiFi or from a computer using a wired serial connection via an LCS SER2. Since this configuration does not include a command base, you will not be able to use Lionel Cab Remotes, command-controlled locomotives or wireless command controlled switches or accessories in conjunction with this LCS system.

If you have additional LCS devices to install, see “Installing additional LCS devices”. If not, skip ahead to the next section of this manual, “Configuring your LCS Device.”

# Installing additional LCS devices

This section describes adding a new device to an existing Layout Control System installation. If you are installing a brand new LCS system, please refer to the previous section of this document, “Installing Your First LCS Device.”

Adding additional LCS devices to an existing Layout Control System requires an additional cable for each new device. These “LCS PDI Cables” come in a variety of pre-made lengths. They are not included with LCS devices, and must be purchased separately. LCS PDI Cables are available in a variety of lengths:

6-81500 - LCS PDI 1ft Cable

6-81501 - LCS PDI 3ft Cable

6-81502 - LCS PDI 10ft Cable

6-81503 - LCS PDI 20ft Cable

Each new device is connected via LCS PDI cables in a “daisy-chain” fashion (one to the next, and so on). The order of devices in the “chain” is up to you. The only exception is that an LCS WiFi must be the first device in the chain if no Lionel Command Base is present.

To connect each additional LCS device:

1. Find the “last” LCS device in the chain. One of its two LCS PDI connectors will be in use, the other will be empty.
2. Using your chosen length LCS PDI Cable, connect one cable end to the unused LCS PDI connector of the last LCS device in the chain.
3. Connect the second cable end to either of the LCS PDI connectors on your new LCS device (see figure below). Your new LCS device is now the last one in the chain.

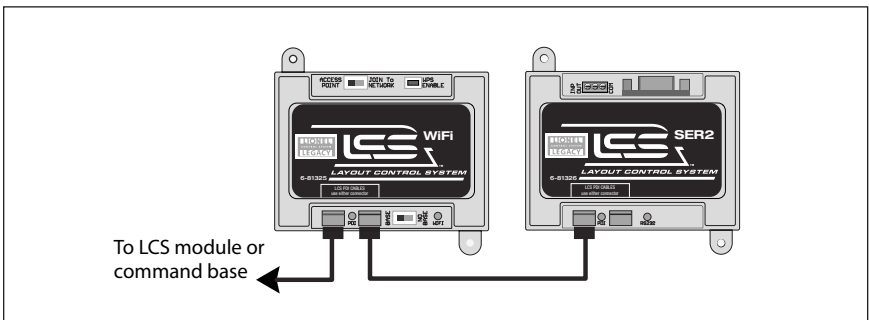


Figure 7. Installing additional LCS devices

# Configuring Your CSM2

The illustration below shows the names and locations of each switch, connector, and indicator light on your LCS CSM2 module. The function of each is described on following pages.

**A – Screw terminal for serial data output and 7 switch-sense screw terminals for DZ-2500 switch machines. Run wires from here to your switch machines (see installation instructions).**

**B – Screw terminals for 4 track power blocks.**

**C – LCS PDI cable inputs. Use either connector.**

**D – Red LCS PDI activity indicator.**

**E – Program switch used to set either the switch throw position or block power control TMCC ID base address.**

**F – Input Power terminals.**

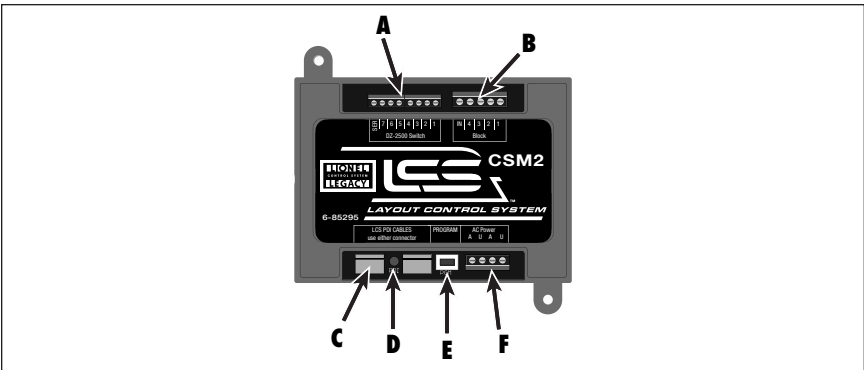


Figure 8. CSM2 callouts.

These additional steps are needed to connect your CSM2.

**Note!** The block power control functionality of the CSM2 is optional.

1. Connect an accessory transformer to the Relay Power Terminals.
2. Run wires from CSM2 to your DZ-2500 switch machine.
3. Set the CSM2's switch machine configuration. Make sure the TMCC IDs of your track switches match exactly to the base address and switch-sense screw terminal position on your CSM2.
4. Wire your track power blocks (optional to use this functionality of CSM2).
5. Set the CSM2's block power control configuration.

# Configuring Your CSM2

## Wiring an Accessory Transformer to Input Power Terminals

Your CSM2 requires an external power source to operate the relays and switch machines. This must be supplied from a separate accessory transformer and is required for both the switch machine operation and the block power control operation.

Connect an accessory transformer with a 12-14VAC output to the CSM2's front screw terminal connections marked "A" and "U" as shown in Figure 9 below. If your installation includes more than one CSM2, they can share the same accessory transformer as long as the combined current draw of the relays does not exceed the capacity of the accessory transformer (see specifications, electrical at the end of this document).

**Note!** Reversing the "A" and "U" connections on the CSM2 will damage your DZ-2500 Switch Machines if powered up! Make sure to closely follow the labels on the CSM2.

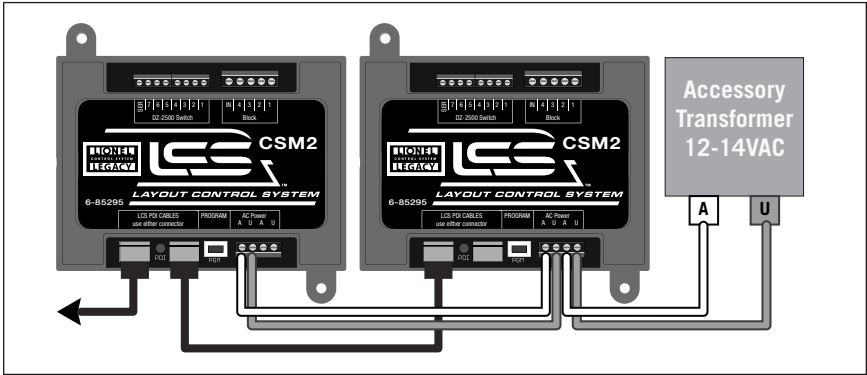


Figure 9. Connecting two CSM2 modules with LCS PDI cables and an accessory transformer

The CSM2 requires separate external power to operate the internal relays. Multiple CSM2 modules can be wired in a daisy-chain fashion as shown above. Other LCS modules can also be daisy-chained with the CSM2 such as the BPC2.

# Configuring Your CSM2

## Wiring the DZ-2500 Switch Machine to the CSM2

---

The CSM2 provides the TMCC serial data to the DZ-2500 switch machine so that the machine can be controlled from a Lionel CAB remote or the LCS App. Note that the CSM2 does not provide power to the switch machines, it simply throws them. The CSM2 can also monitor the throw position of up to 7 DZ-2500s. To monitor additional switch machines, a second CSM2 is required.

Each DZ-2500 switch machine has 6 total wires going to it. The following chart shows the functions for those wires.

Wire Color	Connection/Purpose
RED	Power/Hot/A; 12-14VAC
BLACK	Common/Ground/U
BLUE	TMCC Serial Data
YELLOW	Non-derail Straight/Thru
GREEN	Non-derail Turn/Out
WHITE	Z-Stuff Push Button/Lionel N/A

Figure 10. DZ-2500 Wire Color Code

Each DZ-2500 requires 2 connections to the CSM2. The serial data line (the blue wire coming from the switch machine) and one of the two non-derail lines (yellow or green wire coming from the switch machine).

Since the CSM2 does not provide power to the DZ-2500, an accessory power transformer is required. This can be the same accessory power that is used to power the CSM2 relays. A constant 12-14VAC is recommended. This connects to the red (POWER/A) and black (GROUND/U) wires of the switch machine.

Lastly, the DZ-2500 has a white wire. This is used solely for Z-Stuff push buttons and is not required to connect to any Lionel devices. See figure 11 on page 15.

# Configuring Your CSM2

## Wiring the DZ-2500 Switch Machine to the CSM2 continued

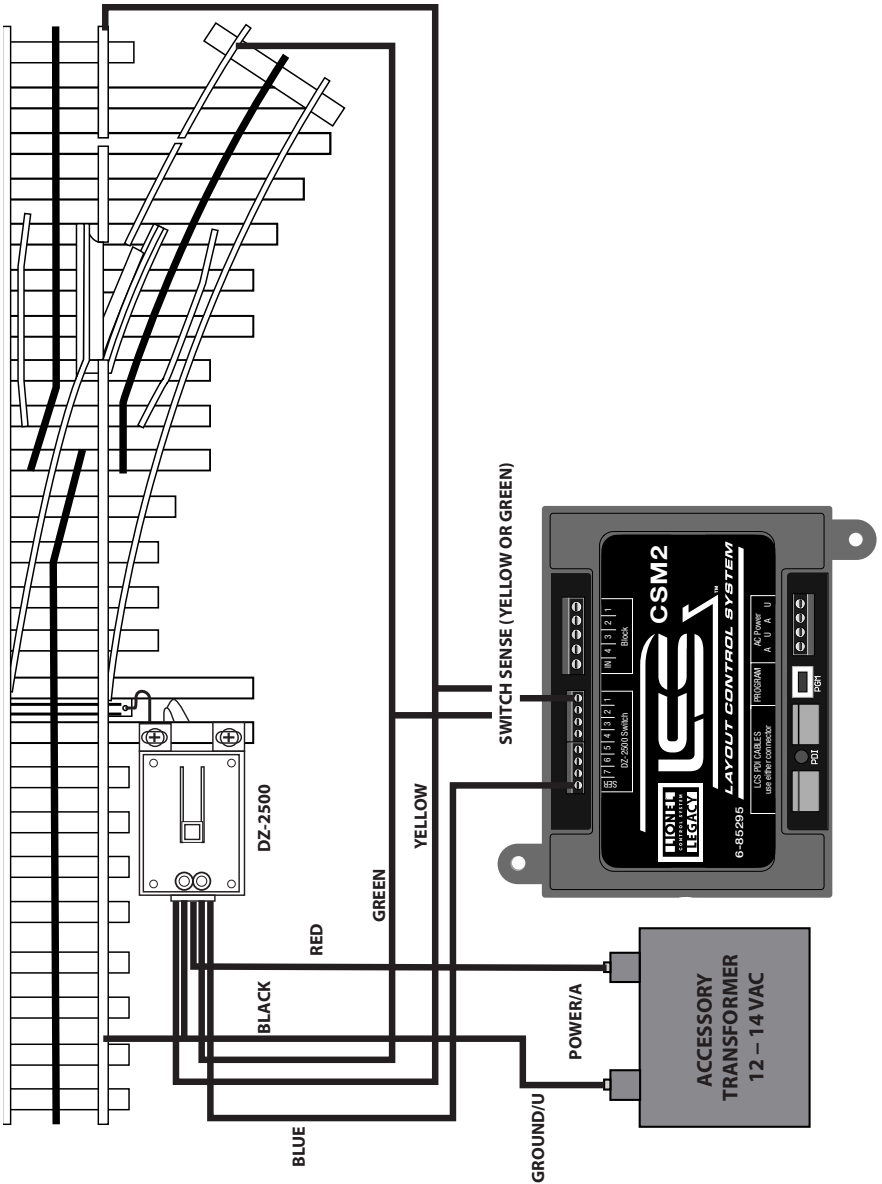


Figure 11. Wiring a single DZ-2500 Switch Machine to the CSM2

## Configuring Your CSM2

### Wiring the DZ-2500 Switch Machine to the CSM2 continued

Which color wire you use for the switch-sense depends on which direction on the switch you desire to be the “straight” or “thru” direction. In the LCS App, a green arrow indicates which direction is the “straight” direction. When the switch is in the “turn” or “out” position, the arrow turns to red. If you want the “straight” direction to physically be the straight portion of track in the switch, then you would connect the DZ-2500’s yellow wire to the CSM2. If you want the curved or turnout portion of the track to be the “straight” direction, then you would connect the DZ-2500’s green wire to the CSM2.

The color of the switching direction can also be modified in the LCS App. When in edit mode, select the switch you want to change. Below the image of the TMCC remote, there's a toggle to "Reverse Switching Colors" - this will change the green "thru" arrow to the turnout and the red arrow will change to the straight direction.



Figure 12. LCS App showing how to Reverse Switching Colors



## ***Configuring Your CSM2***

### **Wiring the DZ-2500 Switch Machine to the CSM2 using the Break-out Board**

---

**L**ionel has created a Breakout Board, or connection board, for the DZ-2500. The board is currently available for purchase through Electric Railroad or through Lionel Customer Service (Part number 1908010). The Breakout Board offers many advantages over installing the DZ-2500 switch machines directly to the CSM2. See figure 13 on page 18.

- Ease of wiring – The DZ-2500 hooks right into the Breakout Board using a simple push button connector, so adding or removing only takes seconds.
- Separated non-derail allows for easier wiring and also utilizes both switch-sense lines.
- Added circuitry protects your DZ-2500. A derailed train, which would cause a short circuit, has the potential to damage a DZ-2500 if the non-derail wires are connected. The added protection on the Breakout Board means the short circuit will not reach the DZ-2500, protecting your investment.
- Power LED so you know when the power is turned on to the switch machine. This can be helpful when trying to track down power issues.
- Daisy-chain wiring for DZ-2500 serial and accessory power. Helps to avoid using terminal blocks or large solder joints.

**Note!** Each DZ-2500 requires its own Breakout Board.

# Configuring Your CSM2

## Wiring the DZ-2500 Switch Machine to the CSM2 using the Break-out Board continued

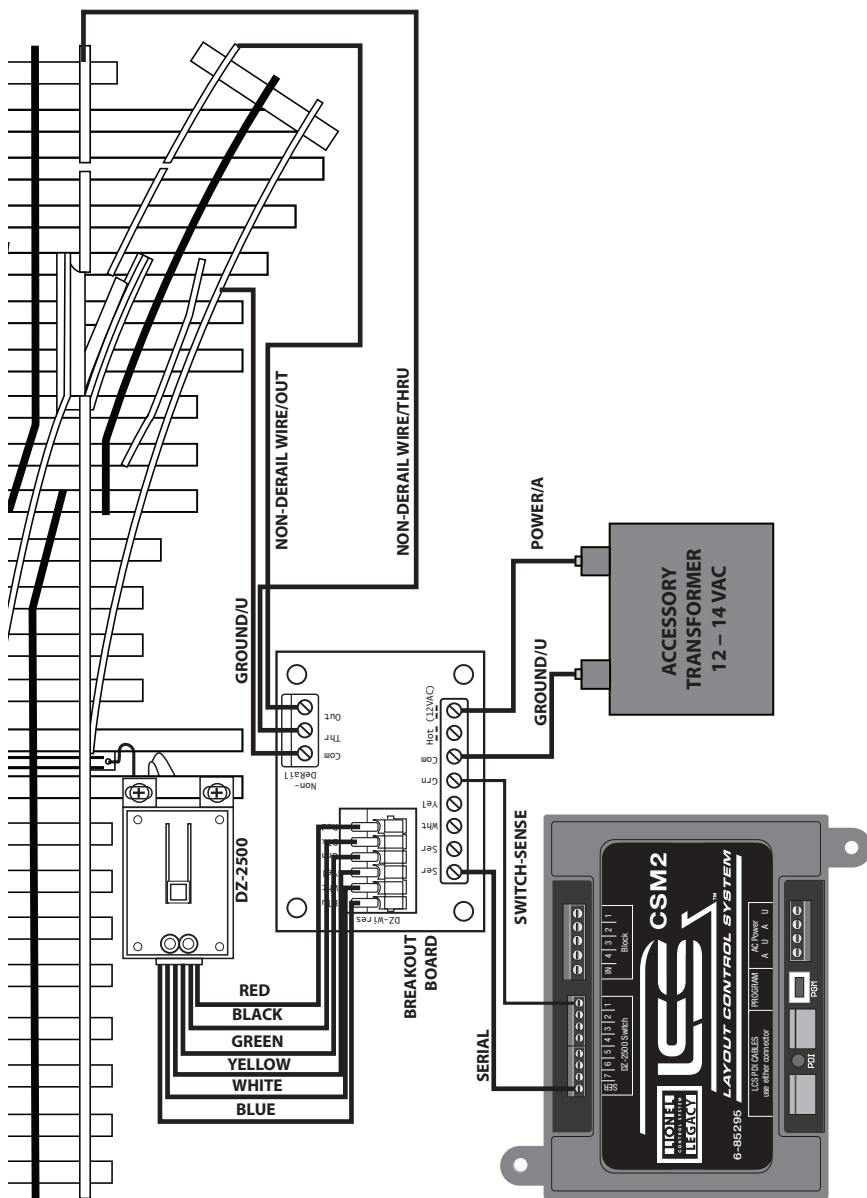


Figure 13. Wiring DZ-2500 to CSM2 using Lionel Breakout Board

## ***Configuring Your CSM2***

### **Wiring the DZ-2500 Switch Machine to the CSM2 using the Break-out Board continued**

---

Wiring the DZ-2500 using the Breakout Board is very straight-forward. Follow these steps:

1. Connect accessory power to the Breakout Board. The power needs to be supplied from an accessory transformer and needs to be set to 12-14VAC. Use caution: reversing the power into the board could potentially cause damage to your DZ-2500. For additional DZ-2500/Breakout Board installs, the power can be daisy-chained through the screw terminal connector. Carefully read the labels on the Breakout Board.
2. Connect the serial line from the CSM2 to the Breakout Board. This line can also be daisy-chained to the next Breakout Board if more than one DZ-2500 is being used. Carefully read the labels on the Breakout Board.
3. Connect the switch-sense to the CSM2. Your first DZ-2500 goes to the #1 screw terminal. Following DZ-2500 switch machines go to #2 and so on. Each CSM2 can provide switch-sense to the LCS App for up to 7 total DZ-2500 switch machines. Additional DZ-2500 switch machines require an additional CSM2.
4. There are 3 wires for the non-derail feature. Carefully read Breakout Board labels. C is for common. Connect to regular track ground/common/U. T is for thru. This is the switch direction you use as the “straight” or “thru” direction. O is for out. This is the turnout direction for your switch machine. Both T and U must be connected to the switch rails that are normally isolated from regular ground.
5. Connect the DZ-2500’s 7 wires. Carefully read the labels on the Breakout Board. To install the wires, simply press the button and insert the bare wire. Use caution: having the wires installed in the incorrect positions could damage your DZ-2500.

The Breakout Board also has 4 mounting holes. You can mount the board under your layout or wherever is most convenient. Be mindful of the components/solder joints on the back of the board. Installing the board without using spacers on the backside of the screws could damage the board.

# ***Configuring Your CSM2***

## **Programming the DZ-2500 Switch Machine**

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**T**his section will explain how to give the DZ-2500 switch machine a TMCC ID. For further information on programming the DZ-2500 and other features, review the Z-Stuff manual that came with the switch machine or that can be found on the Z-Stuff website.

1. Power should be applied to the DZ-2500 and LCS system. To program the DZ-2500, the LED on the switch machine must be red. If it is green, press the switch machine's button once to throw it to the red position.
2. Press and hold the switch machine's button for 4 seconds after it throws to the green position. The green LED will flash followed by the red and green LEDs flashing. Release the button. The LEDs will now flash rapidly waiting for an address.
3. Using a Lionel CAB remote, press SW for switch, enter the desired switch number (for example, 15), then press SET. The green LED should then be lit indicating that the TMCC ID has been set. If the LED flashes and stops, then there was a programming error.

If the LED on the DZ-2500 isn't lit in the correct color, that can be changed. The "straight" or "thru" position should be green. If it is red, follow these steps:

1. With the DZ-2500 thrown so that the green LED is lit, press the button on the switch machine and hold it for 2 seconds after the switch machine has change to the opposite position. This will cause the switch machine to throw to the opposite position, the LED to turn red, and then after 2 seconds the LED will switch to flashing green to indicate that it is set for the thru position.
2. The position that was red should now be green and vice versa.

# ***Configuring Your CSM2***

## **Configuring the DZ-2500 Switch-Sense Connections**

---

**T**he switch-sense connections allow the LCS App to know which direction the switch is thrown. The base ID of your CSM2 should be set to match the lowest-number of a connected DZ-2500. This means each connected DZ-2500 has to have the same TMCC ID as the CSM2 channel it is connected to.

Example: If the CSM2 base ID is number 12, then the DZ-2500 switch machine connected to switch-sense screw terminal #1 would also have to have a TMCC ID of 12. A DZ-2500 connected to switch-sense #2 would have a TMCC ID of 13, and so on.

To configure your CSM2 switch-sense:

1. Turn power to your command base and LCS system on.
2. Press and hold the CSM2 PGM button for 1 second. The red LED will begin blinking slowly.
3. On your Lionel CAB remote, press SW (Switch addressing).
4. Enter the desired 1 or 2 digit base address for your CSM2. This should match the TMCC ID of the DZ-2500 connected to switch-sense screw terminal #1.
5. Press SET. The CSM2's red LED will flash quickly, then return to slow flashing.
6. Press Aux1 if the switch is already setup in the "straight" or "thru" configuration. Press Aux2 to invert the switch-sense input to the LCS App.
7. To exit programming mode, press the SET button again.

# Configuring Your CSM2

## Configuring the DZ-2500 Switch-Sense Connections continued

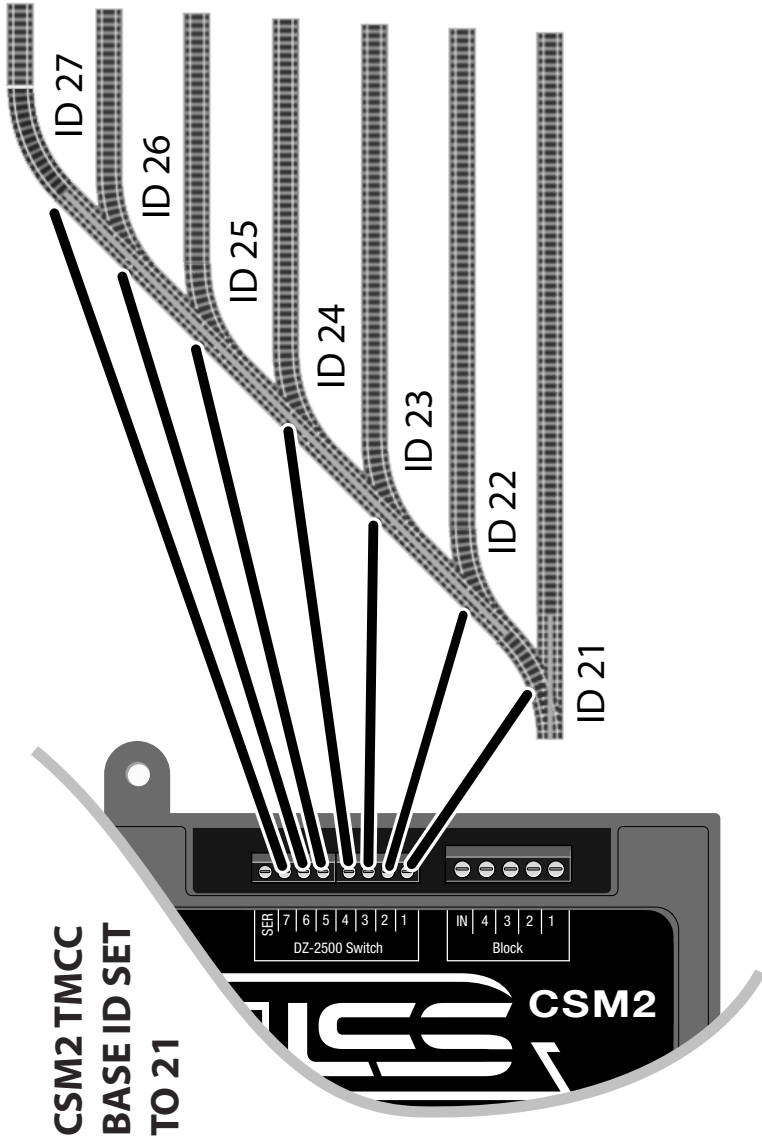


Figure 14. Each switch-sense screw terminal must connect to a DZ-2500 with a corresponding TMCC ID

# ***Configuring Your CSM2***

## **Wiring the CSM2 for Block Power Control**

---

**W**hen connected to track power blocks, the CSM2 will be able to switch on and off the power. However, the power to these blocks will simply be passing through the CSM2 relays. The CSM2 does NOT supply the operating power required by the blocks.

To connect the relay power terminals on your CSM2:

1. Attach one wire to the Common/Ground/U terminal of your transformer and connect it to the POWER U terminal on the CSM2. Do not connect this terminal to the outside rail.
2. Attach another wire to the Power/A terminal of your transformer and connect it to the POWER A terminal on the CSM2.
3. If your layout includes additional modules such as CSM2, BPC2, or ASC2 devices, you can use the spare A and U terminals on the first unit to jumper power to your next device as shown in Figure 14 on page 22.

# ***Configuring Your CSM2***

## **CSM2 Block Power Control Software Configuration**

---

**Y**our CSM2 software configuration is a single operation that controls 4 distinct areas:

To connect the relay power terminals on your CSM2:

1. Track Addressing vs. Accessory Addressing.
2. The base address/TMCC ID use to control connected track power blocks.
3. The optional “restore last relay settings on power-up” mode. When selected, any track blocks that were powered on when you last shutdown your layout will be automatically turned on at power-up.
4. Sub-mode setting. The 4 TMCC ID choice is recommended. The 1 TMCC ID sub-mode is reserved for future use and won't work with a Cab remote.

See figure 15 on page 24 for the CSM2 configuration flow chart for block power control.



# Configuring Your CSM2

## CSM2 Block Power Control Software Configuration continued

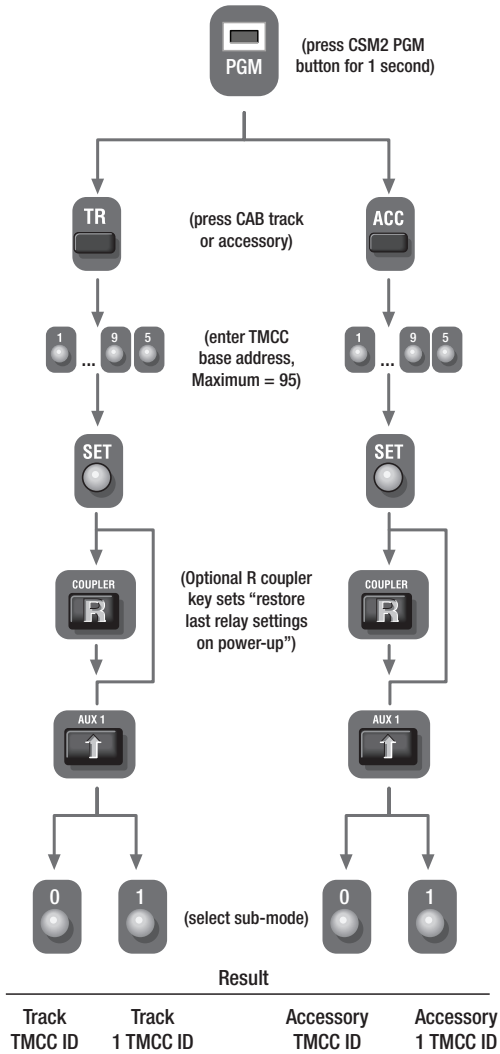


Figure 15. CSM2 configuration flow chart for block power control

# Configuring Your CSM2

## Configuring your CSM2 for TRACK Addresses

---

**Y**our CSM2 can be addressed as either a TR (track) device or an ACC (accessory). The features available in both addressing modes are identical; choose whichever suits your layout best. Note that while configuring your CSM2 following the instructions below, all track block power relays will automatically be switches to their off position. Once programming is complete, you will need to turn the desired relays back on manually.

To configure your CSM2 for TRACK-address operation:

1. Turn power to your command base and LCS system ON.
2. Press and hold the CSM2 PGM button for 1 second. The red LED will begin blinking slowly.
3. On your Lionel cab remote, press TR to choose TRACK-address operation.
4. Enter the 1 or 2 digit base address/TMCC ID.
5. Press SET. The red LED will go on solid for 1 second and then continue flashing.
6. Now, you may optionally press the Coupler “R” button. Doing so turns on the “restore last relay settings on power-up” feature.
7. Finally, set the “4 TMCC ID” sub-mode. Press Aux1, then 0. The red LED will go on solidly for 1 second and then turn off. The configuration process is complete.

**Note!** The other sub-mode, “1 TMCC ID” addressing, reserved for future use and will not work with Cab remotes.

To operate your CSM2 in TRACK address mode:

1. Press the TR button on your remote.
2. Enter the ID number matching the address range set in the configuration step above. Hint: this will be equal to the TMCC ID/base address (see step 4, above) or one of the next 3 numbers.
3. Press Aux1 to turn a power block on.
4. Press Aux2 to turn a power block off.

Example: If your CSM2 has a TMCC ID/base address of 12 and you want to control the track power block wired to the third screw terminal, press the TR button, then press 1, 4 (ID 14) and then press Aux1 and Aux2 to turn that power block on and off.

# Configuring Your CSM2

## Configuring your CSM2 for ACCESSORY Addresses

---

**T**o configure your CSM2 for ACCESSORY-address operation:

1. Turn power to your command base and LCS system ON.
2. Press and hold the CSM2 PGM button for 1 second. The red LED will begin blinking slowly.
3. On your Lionel cab remote, press ACC to choose ACCESSORY-address operation.
4. Enter the 1 or 2 digit base address/TMCC ID.
5. Press SET. The red LED will go on solid for 1 second and then continue flashing.
6. Now, you may optionally press the Coupler “R” button. Doing so turns on the “restore last relay settings on power-up” feature.
7. Finally, set the 4 TMCC ID sub-mode. Press Aux1, then 0. The red LED will go on solidly for 1 second and then turn off. The configuration process is complete.

**Note!** The other sub-mode, “1 TMCC ID” addressing, reserved for future use and will not work with Cab remotes.

To operate your CSM2 in ACCESSORY address mode:

1. Press the ACC button on your remote.
2. Enter the ID number matching the address range set in the configuration step above. Hint: this will be equal to the TMCC ID/base address (see step 4, above) or one of the next 3 numbers.
3. Press Aux1 to turn a power block on.
4. Press Aux2 to turn a power block off.

Example: If your CSM2 has a TMCC ID/base address of 64 and you want to control the track power block wired to the third screw terminal, press the ACC button, then press 6, 6 (ID 66) and then press Aux1 and Aux2 to turn that power block on and off.

### Additional Commands

The CSM2 will identify by holding the numeric “0” (Legacy Reset) command by turning on the red PDI activity LED. This identifying mode will only work when using the TMCC ID base address.

The CSM2 will turn off all outputs if a numeric “0” (Legacy Reset) command is received. The CSM2 will also turn off all outputs if a “System Halt” command is received. Use the HALT button only in emergency situations.

# Track Power Wiring Examples

This section of the manual describes configuring the CSM2 for operation of up to 4 individual track power blocks. Track power should be connected to the terminals on the CSM2. Refer to Figure 8 on page 12, letter B. The label “Block” shows which terminals correspond to power blocks 1 through 4. These blocks share a common connection.

Keep in mind that the CSM2 does not supply power to the connected tracks; this device simply acts as an ON/OFF switch. It is recommended that the CSM2 COMM connection be used for the “hot” leg of your external power.

## Wiring a single track power block

To connect a single track power block to your CSM2:

1. Attach one wire to the Power/A terminal on your power supply and connect it to the COMM terminal of the CMS2.
2. Attach another wire to the Common/Ground/U terminal on the power supply and connect to the outside rail of your track.
3. Attach a third wire to the remaining accessory power terminal and connect it to a numbered terminal on the CSM2 (terminal 1 shown in the illustration).
4. Attach the other end of the wire from step 3 to the center rail of your track.

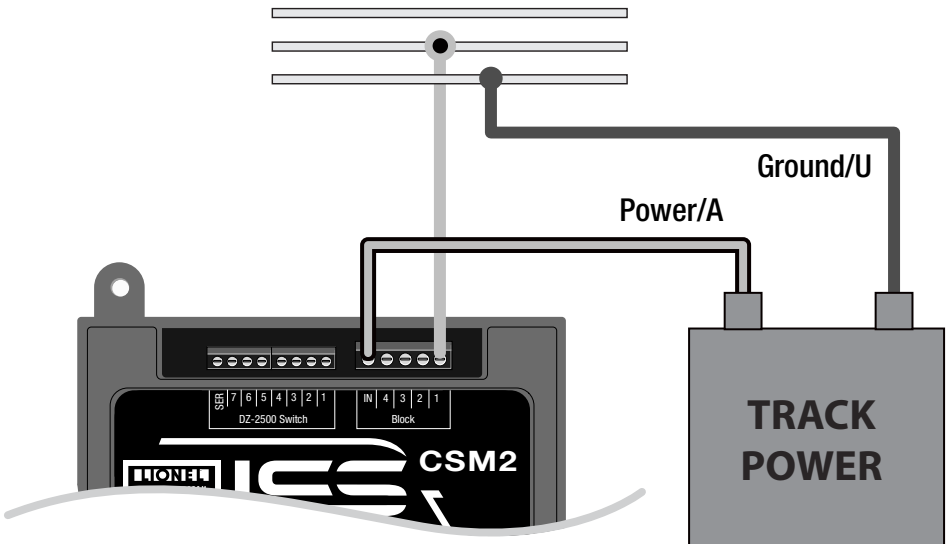


Figure 16. A single track power block wired to the #1 terminal. The external power supply provides operating power for your locomotives; the CSM2’s internal relays turns power on or off to that track.

# Track Power Wiring Examples

## Wiring for all 4 power blocks to a single transformer

To connect all four track power blocks to a single track power transformer using your CSM2, refer to the wiring diagram below. The Power “A” terminal from the track power transformer must be connected to the COMM terminal on the CSM2. Your track power transformer must have sufficient capacity to operate the combined current draw of all operating locomotives on all active track power blocks.

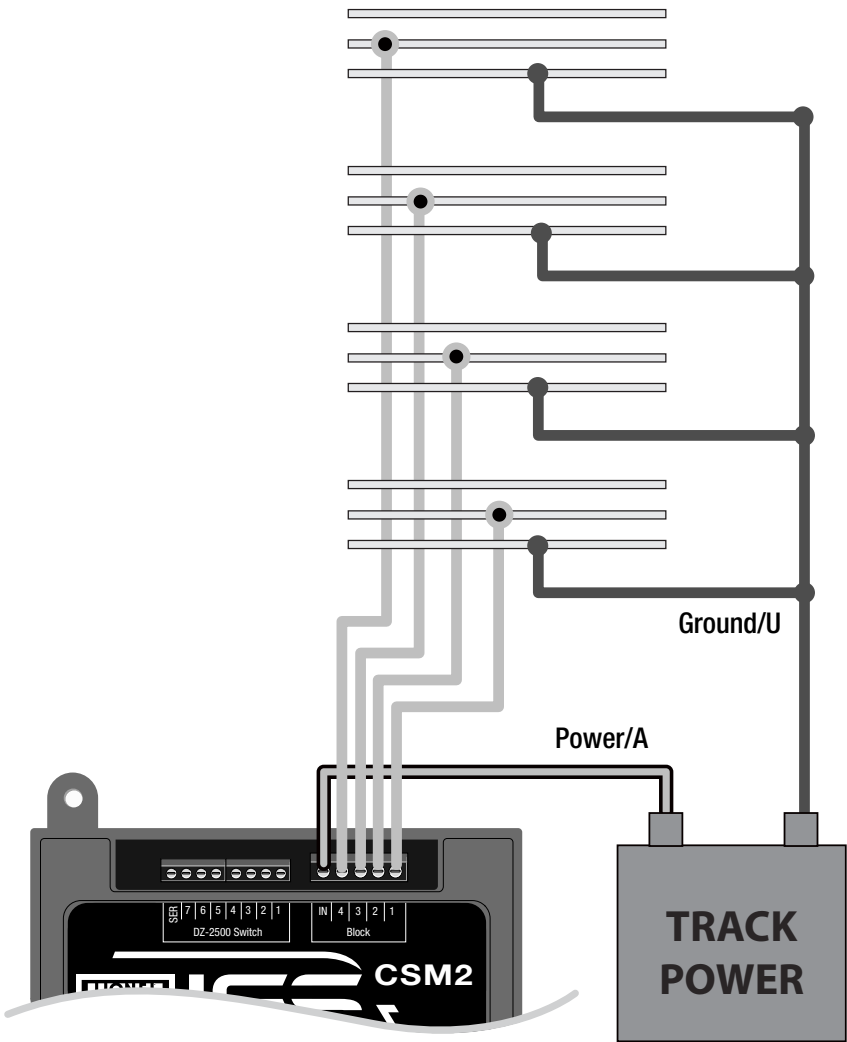


Figure 17. Four track power blocks wire to the CSM2

# ***Track Power Wiring Examples***

## **Controlling Tracks wired to the CSM2**

---

**T**o address your block, press TR or ACC and the TMCC ID# of the block on the CAB remote controller. Be sure to enter the specific ID# corresponding to the CSM2 terminals to which the block is wired.

Once you've addressed a track power block, it can be operated using the Aux1 and Aux2 keys on your remote.

To turn track power on:

Press the Aux1 button on your CAB remote controller.

To turn track power off:

Press the Aux2 button on your CAB remote controller.

## **Finding the correct ID for each of the CSM2's Blocks**

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**I**f a block does not operate as expected, it may be that you have not addressed it by the right TMCC ID#. Recall that each CSM2 has a base address that you must assign. Use the base address to determine the specific TMCC ID# of each up to four connected blocks. Block 1's ID is the same as the base address. Block 2's ID is the base address plus 1.

For example, assume your CSM2 has a TMCC base address of "1". If you would like to operate the block wired to the third terminal of the CSM2, you need to press TR (or ACC), 3 on your CAB remote controller. Then operate that block using Aux1 or Aux2.

If your CSM2 had a different base address, for example 17, then the address of the third block would be 19. In this case, you'd press TR (or ACC), 1, then 9 (address 19) on your CAB remote controller. Then control power to that block using Aux1 or Aux2.

The CSM2's LED illuminates for one half of a second to indicate that it has received a command.

# Appendix

## Operation of LEDs

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**O**n power up, the Red LED on your CSM2 will turn on for 1 second. If it remains on continuously, this indicates a problem with the LCS PDI cabling or your command base.

During operation, the Red LED flickers when commands are passing through the LCS PDI bus.

## Specifications of the LCS CSM2

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### *Mechanical*

- Size: 3.7" x 2.7" x 1.2"
- Mounting: Two #4 pan head sheet metal screws

### *Electrical*

- Input PDI supply current: 50 mA

### **External Output Power/Accessory Transformer (for Block Power Control only)**

- Input relay voltage: 12-14VAC
- Input relay current: ~60mA x4 (~240 mA max)

### **Relay Contact Specifications (for Block Power Control Only)**

- Maximum relay contact voltage: 24 volts (AC or DC)
- Maximum relay contact current: 20 amps

## Lionel Limited Warranty Policy & Service

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This Lionel product, including all mechanical and electrical components, moving parts, motors and structural components, with the exception of **LIGHT BULBS, LED's & TRACTION TIRES** are warranted to the original owner-purchaser for a period of **one year from the original date of purchase** against original defects in materials or workmanship when purchased through a **Lionel Authorized Retailer\***.

This warranty does **NOT** cover the following:

- Normal wear and tear
- Light bulbs or LED's
- Defects appearing in the course of commercial use
- Damage resulting from abuse/misuse of the product

Transfer of this product by the original owner-purchaser to another person voids this warranty in its entirety. Modification of this product in any way; visually, mechanically or electronically, voids the warranty in its entirety.

Any warranted product which is defective in original materials or workmanship and is delivered by the **original owner-purchaser** (this warranty is non-transferable) to Lionel LLC or any Lionel Authorized Service Station **MUST** be accompanied by the original receipt for purchase (or copy) from an **Authorized Lionel Retailer\***, will at the discretion of Lionel LLC, be repaired or replaced, without charge for parts or labor. In the event the defective product cannot be repaired, and a suitable replacement is not available, Lionel will offer to replace the product with a comparable model (**determined by Lionel LLC**), if available. In the event a comparable model is not available the customer will be refunded the original purchase price (requires proof of purchase from the **Authorized Lionel Retailer\*** it was originally purchased). Any products on which warranty service is sought must be sent freight or postage prepaid (Lionel will refuse any package when postage is due). **Transportation and shipping charges are not covered as part of this warranty.**

**NOTE: Products that require service that do not have a receipt from an LIONEL AUTHORIZED RETAILER\* will be required to pay for all parts required to repair the product (labor will not incur a charge) providing the product is not older than 3 years from date of manufacture and is within 1 year from date of purchase. A copy of the original sales receipt is required.**

**In no event shall Lionel LLC be held liable for incidental or consequential damages.**

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**S**ome states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion may not apply to you. This warranty gives you specific legal rights and you may have other rights which vary from state to state.

### Instructions for Obtaining Service

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**I**f service for this Lionel LLC product is required; bring the item, along with your **DATED** sales receipt and completed warranty information (at the bottom of this page) to the nearest Lionel Authorized Service Station. Your nearest Lionel Service Station can be found by calling 1-800-4-LIONEL or by accessing the website at [www.lionel.com](http://www.lionel.com).

If you prefer to send your Lionel product directly to Lionel, for repair you must **FIRST** call 586-949-4100 extension 2 or write to Lionel Customer Service, 6000 Victory Lane, Concord, NC 28027. Please have the 6-digit Lionel product number, the date of original purchase, the dealer where the item was purchased and what seems to be the problem. You will receive a return authorization (RA) number to ensure your merchandise will be properly tracked and handled upon receipt at Lionel LLC.

Once you have your Return Authorization (RA) number, make sure the item is packed in its original Styrofoam inner container which is placed inside the original outer display box (this will help prevent damage during shipping and handling). This shipment **MUST** be prepaid and we recommend that it be insured with the carrier of your choice.

Please make sure you have followed all of the above instructions carefully before returning any merchandise for service. You may choose to have your product repaired by one of Lionel LLC's Authorized Service Stations after its warranty has expired. A reasonable service fee should be expected once the product warranty has expired.

### Warranty Information

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**P**lease complete the information below and keep it, along with your **DATED ORIGINAL SALES RECEIPT**. You **MUST** present this form **AND** your **DATED SALES RECEIPT** when requesting warranty service.

\*A complete listing of Lionel Authorized retailers can be found by calling 1-800-4-LIONEL or by visiting our website at [www.lionel.com](http://www.lionel.com).

Products that are more than 3 years old, from date of manufacture, are not applicable for warranty coverage, even if they have never been sold prior to this date. (Under no circumstance shall any components or labor be provided free of charge.)

Name \_\_\_\_\_  
Address \_\_\_\_\_  
Place of Purchase \_\_\_\_\_  
Date of Purchase \_\_\_\_\_  
Product Number \_\_\_\_\_



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