OTC3000

OPERATING TRACK CONTROLLER
REFERENCE MANUAL
VERSION 1.0

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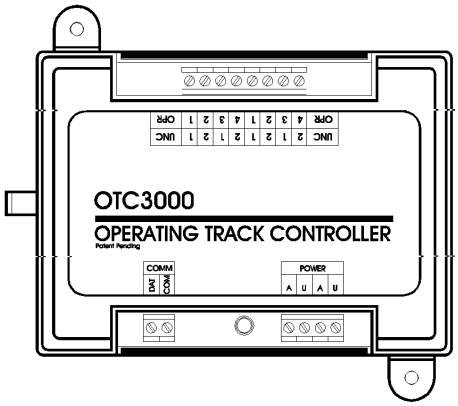
INTRODUCTION

The OTC3000 Operating Track Controller is designed to operate any operating or uncoupling tracks. It is completely compatible with the Lionel Trainmaster Command Control system.

The main feature of the OTC3000 is its ability to run two operating tracks directly without the use of any external relays replacing the older two pushbutton controllers. Wiring is simple, only 4 wires are necessary. The OTC3000 can also be configured to operate four uncoupling tracks. Only two wires are required for each uncoupler.

This manual is designed to take you through the basic operation and wiring details of the OTC3000. Please take the time to read this information before attempting to connect it to your layout.



SPECIFICATIONS

Physical

Size 3.7” x 2.7” x 1.2”

Mounting with two #4 pan head sheet metal screws

Electrical Ratings

Input Voltage 9 Volts to 20 Volts AC

Input Supply Current 50 ma

COMM input signal +/- 12 Volts

Maximum Output Voltage 30 Volts AC or DC

Maximum Output Current 15 Amps AC or DC

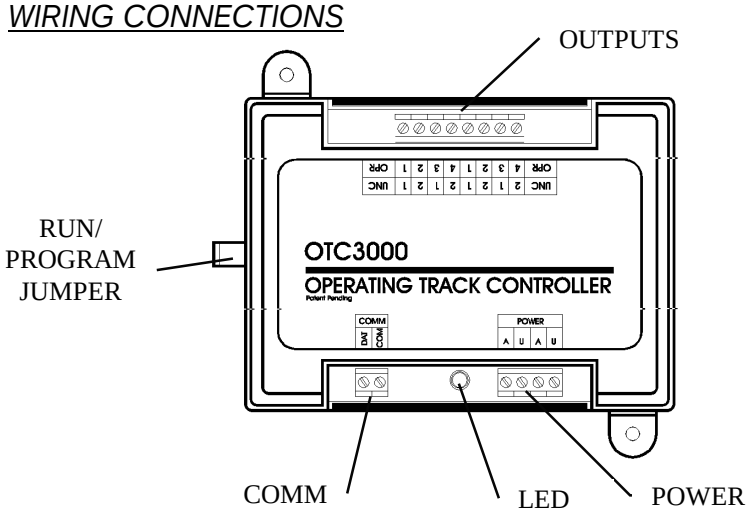
GENERAL INFORMATION

TERMS

An explanation of the terms used in this manual is given below:

- DAT: The RED wire connected to the COMM connector
- COMM: Communication connections.
- COM: The GREEN wire connected to the COMM connector
- POWER A: Lionel terminology for power connection to accessory transformer
- POWER U: Lionel terminology for neutral or common connection to accessory transformer
- UNC Output designator for uncoupling tracks
- OPR Output designator for operating tracks
- LED: Indicator to let you know the controller is working
- TERMINAL: Connector strip where you connect the wires
- DAISY CHAIN: Linking multiple controllers together to add additional switch and accessory operations

WIRING CONNECTIONS



POWER

The Power connections on the OTC3000 are located in the lower right hand corner and are marked as POWER. This is the power to run the module.

Two connections are required between the OTC3000 and the transformer:

- The first connection to the OTC3000 is the **POWER A** terminal. It is connected to the **accessory A terminal or power** side of the transformer.

- The second connection is the **POWER U** terminal. It is connected to the **U terminal or common side** of the accessory transformer.

It is recommended that you use separate accessory transformer with the output of 12 Volts AC. This will allow the OTC3000 to function regardless of whether the track voltage is ON.

Additional terminals are supplied to easily daisy chain the accessory power to other ALC3000 family members. To do this, simply repeat the connections of both the and U terminals to other ALC3000 family members. It is recommended to color code both the A and U wires and maintain this color coding throughout the layout.

COMM

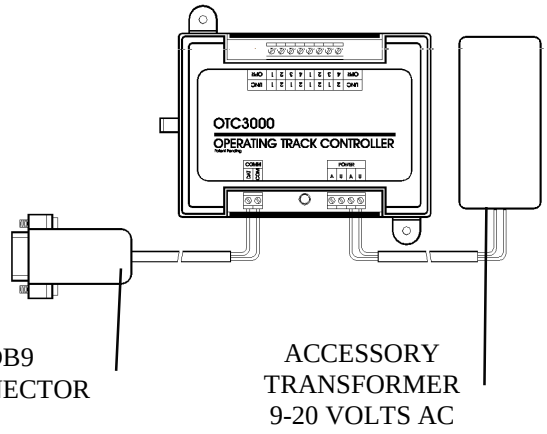
The COMM connections on the OTC3000 are located in the lower left hand corner and are marked as connector terminal COMM. These connections supply the communication or COMM to each ALC3000 family member. It tells the ALC3000 family controller what you want to do.

Two connections are needed between the OTC3000 and the Lionel Command Base. To make these connections, you will need 22 gauge stranded wire with a DB9 connector on one end. The interface cable plugs into the Lionel Command Base connector marked **Computer**. IC Controls can provide ready to use cables for connecting together the entire ALC3000 Family. You may purchase these cables by ordering part #ICC3001-6 or -20 depending on length.

- The first connection is the DAT (DATA) connection. This would be the **red** wire of the IC controls ICC3001 cable.

- The second connection is the COM (Common wire of the communication port) connection. This would be the **green** wire of the IC controls ICC3001 cable.

Making your own cable is explained in detail under CONNECTING THE CABLE FROM THE OTC3000 CONTROLLER TO THE COMMAND BASE. The completed connections to the OTC3000 are shown below.



OTC3000 Functional Description

The OTC3000 can operate either 2 operating tracks or 4 uncoupling tracks. Operating tracks contain an uncoupling section along with two extra interrails to supply power to operating cars. These tracks have four connections that directly connect to the OTC3000. No external components are required. Pressing the **AUX1** function connects terminals 2-3-4 together. Pressing **AUX2** function connects terminals 1-2 and 3-4 together. The internal connection inside the OTC3000 is like a push button switch operated from the handheld. It doesn't supply power to the circuit, only electrical connections.

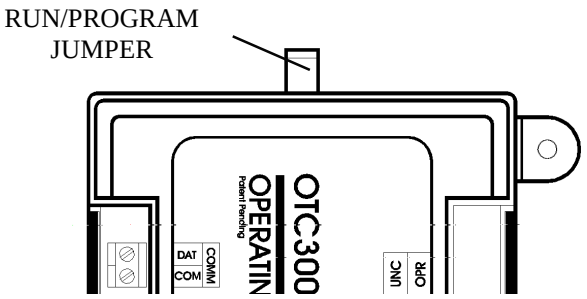
Uncoupling tracks contain only an uncoupling coil and have either one or two connections based on type and manufacturer. Pressing the **AUX1** function connects terminals 1-2 of the first set of connections. Pressing the **AUX2** function connects terminals 1-2 of the second set of connections. The internal connection inside the OTC3000 is like a SPST switch operated from the handheld. It simply connects terminal 1 to 2.

Each of these devices connected to the OTC3000 can draw up to 15Amps each and up to 30V AC or DC. More than one operating track or uncoupling track may be connected to the same outputs, but both will operate at the same time. If separate control is required, connect each to separate outputs.

Details on how the select between operating and uncoupling track is covered in the **Setting the Operating Mode.**

Run/Program Jumper

The Run/Program jumper is located on the left side of the OTC3000. The jumper is a small black connector that is easily removed and replaced. It controls whether the OTC3000 should perform a command or **SET** its accessory number. The jumper should only be removed when you are setting its number.



To set the address of the OTC:

- Remove the **jumper** from the OTC3000
- Select the **ACC button** followed by the accessory number, **1-99**
- Press the **SET** button on the handheld to set the number

The LED will Long Blink steady for one (1) second if the command is accepted and the address has been set. **Make sure to replace the jumper for normal operation.**

Use of LED light

The LED light located at the bottom center of the OTC3000 indicates the proper operation of the controller. There are three different types of flashes, the Quick Flash, the Short Blink, and the Long Blink, to indicate the different functions of the controller.

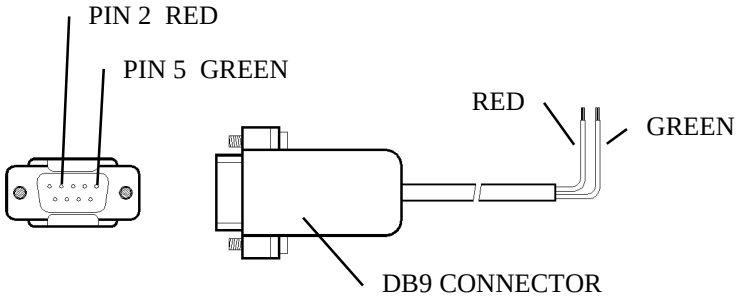
Quick Flash: The Quick Flash is one tenth ($1/10^{th}$) of a second in duration. (It flashes so fast you can hardly see it. If you were to say one thousand and one, you would only be able to say one thou). The Quick Flash indicates that the OTC3000 is receiving information from the command base, but that the information is **NOT** for this accessory controller. For example, when you control the speed to a locomotive on the track, the information is being sent to the locomotive and not to the OTC3000 controller.

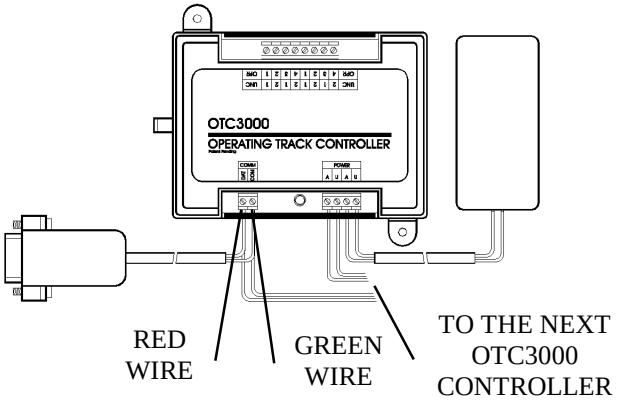
Short Blink: **A** one-half (1/2) second Short Blink indicates the OTC3000 has received a command telling it to do something. It indicates normal operation when an accessory is selected on the handheld. For example, the Short Blink will occur when you select accessory #5 AUX1 and accessory 5 is being controlled by the OTC3000.

Long Blink: A one (1) second Long Blink indicates the OTC3000 has a SET command that should be stored into the OTC3000 for later use. For example, a Long Blink will result when the Run/Program jumper is removed and a SET Accessory number is done (setting an accessory number is covered further in the manual).

CONNECTING OTC3000 TO THE COMMAND BASE

The ALC3000 controller family requires a cable to be connected from the Command Base to the ALC3000 controller family. This is done by using a simple two-wire cable. The cable should be made of #22 gauge stranded wire containing a RED and GREEN wire. This cable may be purchased ready-made from IC Controls as #ICC3001-6' or -20'. You may choose to build your own cable. The details of how to do this are as follows. The connector required to hook to the command base is called a Male DB-9 (Radio Shack Part #276-1537). Connect the RED (DAT) wire to pin 2 of the DB9 connector. Connect the GREEN (COM) wire to pin 5 of the DB9. Take the time to locate the markings on the connector.





Connecting the OTC3000 to the Command base.

- Start by connecting the DB9 end of the cable to the Command Base marked Computer

- Connect the RED wire to the DAT terminal of the COMM connector located on the OTC3000

- Connect the GREEN wire to the COM of the COMM connector located on the OTC3000. Additional ALC3000 family members can be added by simply daisy chaining the RED (DAT) and GREEN (COM) wires from this OTC3000 to the next.

Notice the **COMM** and **POWER** cables are just loops from one unit to the next. A separate transformer may be needed if noise from the Lionel command control signal interferes with communications. This is indicated by a steady green COMM light located on the OTC3000. If the green light of the OTC is always on, you will need to use a separate supply. If you are currently using other ALC3000 family members with an isolated supply just loop the power from it. Only connect this separate supply to the bottom side to ALC3000 family controllers. Do not connect it to the U terminal of the track or command base. The OTC3000 uses very little power to operate, so many of them can be connected to one transformer.

Halt Button in Handheld

Pushing the halt button on the handheld will remove the power to the layout by shutting down any OTC3000 that was on. To operate the OTC3000 after halt has been pressed simply reselect the OTC3000 and it will operate as normal.

SETTING THE OPERATING MODE

The OTC3000 can be set to two different operating modes. The first is to function with an operating track. In this configuration, the OTC3000 can operate two independent operating tracks. To set the OTC3000 to this type of operation, complete the following:

- Remove the **jumper** from the OTC3000
- Select the **ACC button** followed by **(98)**
- Press the **SET** button on the handheld to set the number
- Replace the **jumper** from the OTC3000

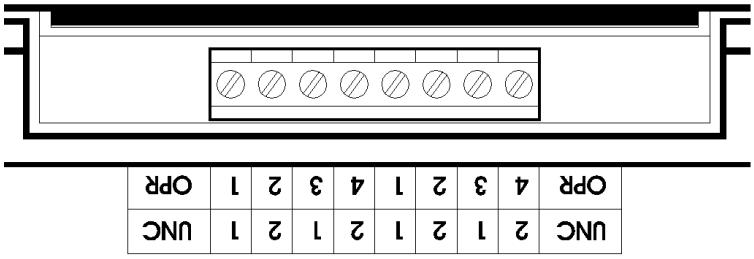
The second is to function with uncoupling tracks. This allows four uncoupling tracks to operate independently from one OTC3000. To set the OTC3000 to this type of operation, complete the following:

- Remove the **jumper** from the OTC3000
- Select the **ACC button** followed by **(99)**
- Press the **SET** button on the handheld to set the number
- Replace the **jumper** from the OTC3000

These mode selections will not change the accessory address of the OTC3000 and can be done at any time.

Setting the OTC3000 Accessory Address

Accessory Number			
	7	8	OTC #4
	5	6	OTC #3
	3	4	OTC # 2
	1	2	OTC # 1



The connections on the top of the OTC3000 are divided into two groups, OPR for operating track and UNC for uncoupling track. Once you have decided which type of track you want to control, set the mode as described in the previous section. Then use the appropriate marking shown above to connect either operating or uncoupling tracks.

For example, if we were trying to connect the third uncoupling track to the OTC3000, you would use the row marked UNC. Notice that there are four groups of 1-2. Each is a connection pair to an uncoupling track. The connection in our example would be the third set from the left side.

If you are using the OTC3000 to operate operating tracks then use the row marked OPR, Notice that there are two groups of connections marked 1-2-3-4. These are the connections to the operating track. The first operating track is operated from the connection on the left, the second from the right.

Setting the address of the OTC3000 is easy. You must first decide which numbers you would like to control. Both operating tracks and uncoupling tracks are considered accessories. Accessories are selected by using the ACC button on the handheld. There are always two accessory numbers assigned to each OTC3000. Each operating track is considered one

accessory, whereas two uncoupling tracks operate as one accessory. The latter uses the AUX1 and AUX2 keys to select which one of the two is operated. For example, if you want the OTC3000 to operate as accessory number 9 and 10, just make the necessary POWER and COMM connections. NOTE: It is not necessary at this time for the power inputs and outputs to be connected to SET the accessory number.

- Remove the **Run/Program jumper** from the side of the OTC3000 that you wish to SET
- Select **ACC** button on the handheld
- Next select **number 9** then press **SET**

The OTC3000's LED should Long Blink for one (1) second indicating that you have set the block number. If it does not, make sure the Run/Program jumper is removed and repeat until the Long Blink indicator is on. After the Long Blink replace the Run/Program jumper and test the operation of the OTC3000.

To test the function:

- Select **ACC**
- Select the **number 9**
- Then press the **AUX1** button

You should hear the Relay click and the OTC3000's LED will Short Blink. If the LED only Quick Flashes, the accessory number that has been SET does not match the accessory number that is being tested. **NOTE:** The factory default setting for the OTC3000 is for accessory numbers 1-2.

NOTE: Always remember to replace the Run/Program jumper after you have SET the accessory number.

OPERATING OPERATING TRACKS

Each operating track is assigned one accessory or **ACC** number. Each operating track has two separate functions. The first is to uncouple. This is done by pressing the **AUX1** key on the handheld. The second function is to power the two extra sets of rails in an operating track. This is done by pressing the **AUX2** key.

For example, to activate operating track number 3, press the following keys on the handheld:

- **ACC (3)** followed by **AUX1** operates the uncoupler.
- **ACC (3)** followed by **AUX2** operates the operating track.

OPERATING UNCOUPLING TRACKS

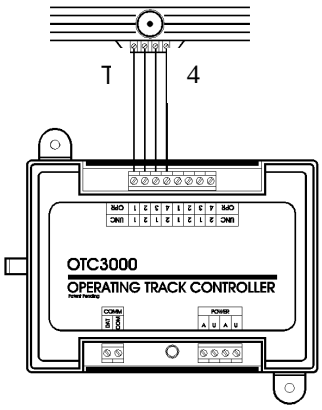
Two uncoupling tracks are assigned one accessory or **ACC** number. **AUX1** and **AUX2** function give separate control to each uncoupling track.

For example, to operate uncoupling tracks connected to accessory numbers 5 and 6, press the following keys on the remote:

- **ACC (5)** followed by **AUX1** operates the first uncoupler.
- **ACC (5)** followed by **AUX2** operates the second uncoupler.
- **ACC (6)** followed by **AUX1** operates the third uncoupler.
- **ACC (6)** followed by **AUX2** operates the forth uncoupler.

WIRING OPERATINGTRACKS

Wiring operating tracks with the OTC3000 is a simple task. Four connections are required. Looking at the diagram below the operating track is labeled 1, 2, 3, and 4, left to right. When using track voltage to power the operating track, just connect 1 to 1, 2 to 2, 3 to 3, and 4 to 4. The uncoupling function is activated by selecting the accessory (**Number**) followed by the **AUX1.** The operating function of the track is activated using the **AUX2** key.

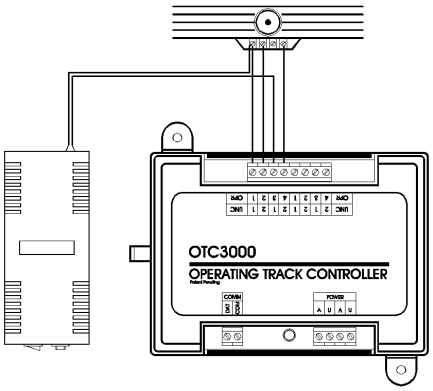


Wiring an OTC3000 using track power.

Other manufacturers operating tracks may be used with the OTC3000. The following list is a description of the connections needed inside the operating track.

- Terminal 1 is connected to the neutral or outside rail and one side of the uncoupling coil.
- Terminal 2 is connected to the left operating rail and the other side of the uncoupling coil.
- Terminal 3 is connected to the middlie or track power rail.
- Terminal 4 is connected to the right operating rail.

You may not want to power the operating track from track voltage. Reasons for this may include appling a lower voltage or wanting the the track to operate when track voltage is off. To do this, remove the wire connected to terminal 3 of the operating track. Then connect terminal 3 of the OTC3000 to the power connection of the accessory transformer. Make sure the accessory transformer has a neutral connection to the U terminal or outside rail.

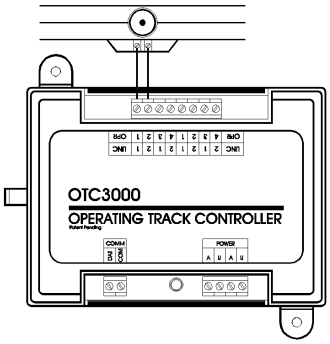


Wiring an OTC3000 using accessory power

WIRING UNCOUPLING TRACKS

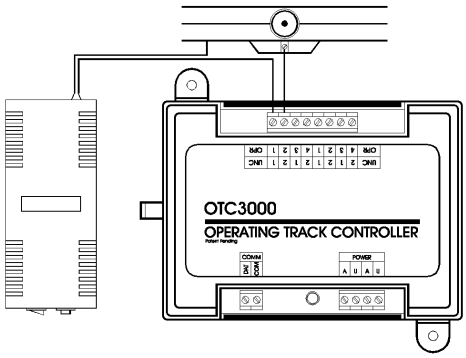
Uncoupling tracks need two connections to the OTC3000. These connections are marked in pairs on the OTC3000 as 1 and 2. The OTC3000 operates like a SPST push button switch. Some uncoupling tracks have 2 terminals, others have one. For the uncoupling tracks that have two, connect each wire of the

uncoupling track to the 1 and 2 pins of the OTC3000. In the figure below this would be operated by using the **AUX1** button on the handheld. If these connections were made to the next set on the right, it would operate using the **AUX2** button. In this configuration the uncoupling track is using track power to operate.



OTC3000 connection to two wire uncoupling track.

Some uncoupling tracks only have one terminal or you may want to operate your uncoupling track without the use of track power. To do this, an accessory transformer is used to supply power to the uncoupling track. Single terminal uncoupling tracks have an internal connection to the U or outside rail. Connect the single terminal to the OTC3000 or the connection that goes to the uncoupling coil. Then connect the matching pair terminal of the OTC3000 to the power terminal of the accessory transformer. This will allow the uncoupler to operate independently of the track voltage.



OTC3000 connected to accessory transformer.

Additional Information and Tech Support

IC Control is continually trying to make its products the best in the market place. Your input on our products is very important to us. It allows us to shape our products to your needs. If you have any comments or questions on any of our products, please feel free to contact us. We can be reached at:

IC Controls
P.O. Box 296
New Boston, MI 48164
ATT: Marketing Dept.

Warranty Information

IC Controls stands behind their products with a one-year parts and labor warranty. If a product fails to operate because of a manufacturing defect, IC Controls will, at their discretion, repair or replace it free of charge for a period of one year from the date of purchase. To return a defective product, please include the following:

- Defective unit
- Dated sales receipt
- Reason for return
- A check for $5.00 to cover postage and handling

Send the above information to:

IC Controls
P.O. Box 296
New Boston, MI 48164
ATT: Returns Dept.

Please allow 2 to 3 weeks for processing.

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