

## SERVICING

This Train Power 10 is built with pride by USA Trains and is covered by a limited warranty. (See limited warranty terms). Please follow these instructions carefully before sending your power pack for service:

1. Return power pack in its original box with the proper inserts and then pack the original box in a proper shipping carton so it is well protected in shipment. The package must be fully insured and prepaid. USA Trains is not responsible for damage or loss during shipment.

2. Include a note explaining the problem and servicing you need performed. Be sure to include your name, street address, (NO P.O. BOXES PLEASE) City, State, Country (if outside U.S.A) and zip code along with a daytime phone number including area code. If the power pack service is not covered by warranty, a reasonable service fee will be charged. For any power pack to be returned outside the continental U.S.A., please include \$20.00 U.S. currency to cover return postage. Any power pack returned to customers in the continental U.S.A. will be pre-paid by USA Trains.

3. Ship your item to:

USA TRAINS  
662 CROSS STREET  
MALDEN, MA. 02148

## LIMITED ONE YEAR WARRANTY

This Train Power 10 is warranted for one year from the original date of purchase. The power pack will operate to the specifications stated within or it will be repaired or replaced at our option. The pack must have been operated with the proper input voltage and not have been damaged by careless handling, by immersion in water, or storage in a damp place. This pack must be returned to USA Trains packed in its original box with the proper inserts and then packed in a proper shipping carton so it is well protected in shipment. The package must be fully insured and prepaid. USA Trains is not responsible for damage or loss during shipment. If unit is to be serviced under the terms of the warranty, proof of the original purchase must be furnished. Do not send the original receipt, it may not be returned. Transportation costs incurred by the customer are not covered under this warranty.



# USA TRAINS

## TRAIN POWER 10 OWNERS MANUAL



USA TRAINS  
P.O. BOX 100  
MALDEN, MA 02148, USA  
[www.usatrains.com](http://www.usatrains.com)  
781-322-6084



Dear Customer,

We would like to thank you for your selection and purchase of our power pack. You have selected a product designed with state of the art engineering and will provide you with many years of enjoyment. As with all electrical products be sure to read the entire owners manual prior to operation.

Happy Railroading  
USA TRAINS

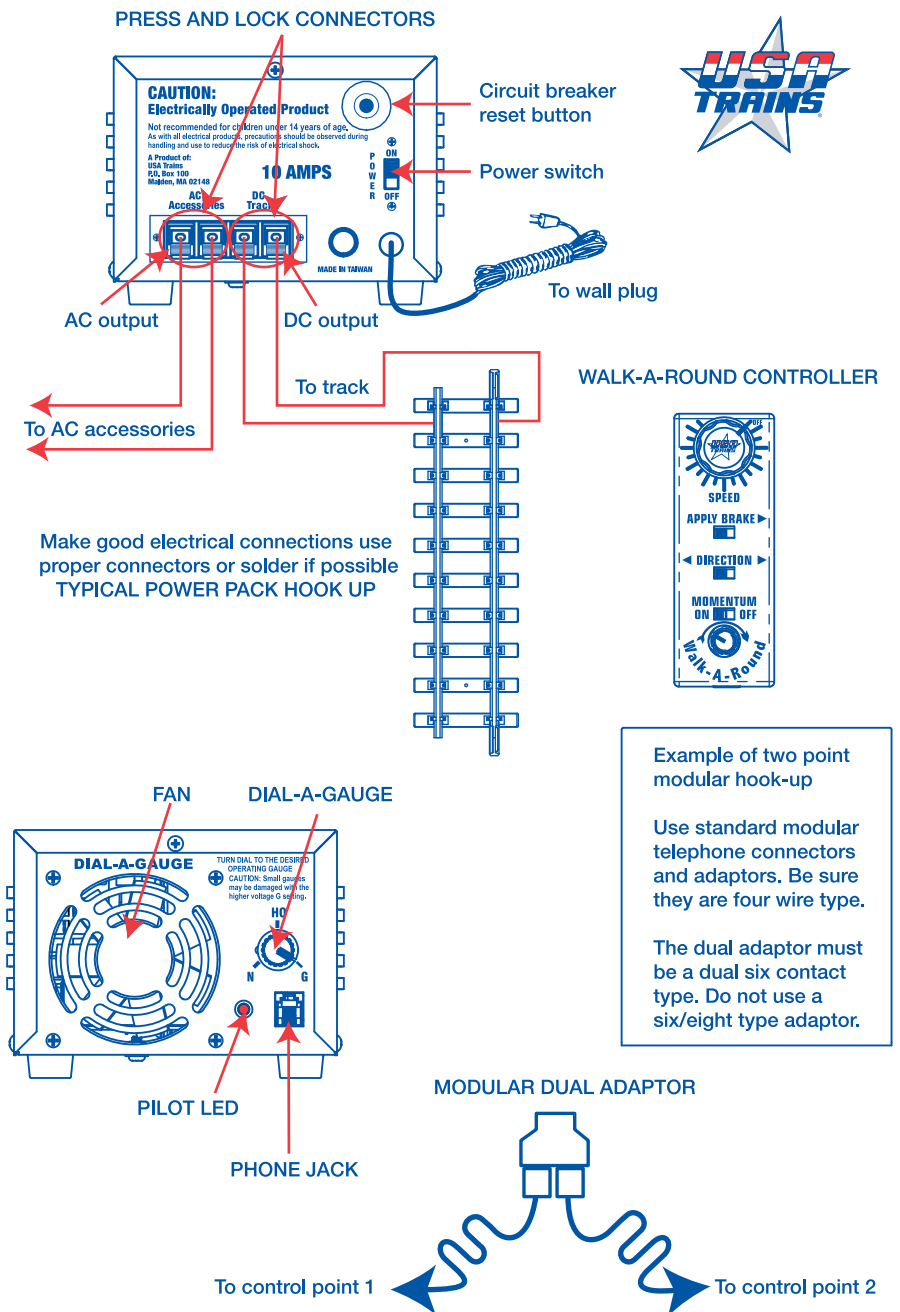
**CAUTION:** Electrically operated product. Do not allow children to operate. This product is not a toy. It is designed for indoor use only. Use outdoors only under dry conditions and store indoors when not in use. Use caution when you use any electrical device outdoors.



## FEATURES

- Designed to operate DC model trains
- Dial-A-Gauge allowing for operation of N, HO, and G scale model trains
- Walk-A-Round controller with memory feature
- Momentum feature for realistic start-up and braking
- Circuit protection to prevent electrical damage to the power pack

## TRAIN POWER 10 FEATURE AND FUNCTION DIAGRAM



## RATINGS

The Train Power 10 provides a full 200 VA of power, but not all to the track. The track output will furnish a sustained 180 VA for train operation. This rating is at full output voltage and for the largest amount of current at that voltage. The outlet voltage can be as high as 20 volts or as low as 8 volts, depending on the current drawn as determined by the "Dial-A-Gauge" position. "Dial-A-Gauge" will determine these maximum voltage outputs. The "HO" position is 12 volts, the "G" position is 20 volts. The "N" position is 8 volts, etc. You cannot have both 20 volts and over 10 amps at the same time. To determine the power factor for the track output, divide the voltage being used into 180 VA rating to obtain the current you are using. The other 20 VA are available from the AC accessory voltage terminals on the rear of the power pack. If more power is required for the accessories, you will have to give it up from the track terminals. The power pack will always try to protect itself from operational failure by overloaded conditions.

There are no user serviceable parts within the power packs. Please refer service to proper technical personnel. The factory will repair any unit with proper components to maintain the proper safety requirements as required by initial design. There is no way to increase the power output of this pack. Do not attempt to increase power by using a step-up type of input transformer, and do not plug them into any power source other than the standard 110 VAC 60 Hertz provided by the wall outlet.

### RATINGS ITEMIZED

ITEM	TRAIN POWER 10	RATING
Input Power	120	Volts AC
Power Frequency	60	Hertz
Power Used	300 VA Max	VA
Output Power	200 VA Max	VA Total
Output Range-Volts	0-20 (Track)	Volts DC
Output Amps.	10 (Track)	Amps. DC
Output Volts	19 (Accessory)	Volts AC
Output Split - Track	180	VA Track
Output Split - Accessories	20	VA Access.
Protection	Electronic	Shut Down
Console Weight	10 (Approximate)	Pounds
Controller Weight	5 (Approximate)	Ounces
Console Size	4.3"H x 5.6"W x 10.2"D	Inches
Controller Size	1.5"H x 1.8"W x 4.8"L	Inches
Power Cord	Toy Plug	6.0 Ft.
Controller Cord	Coiled	15.0 Ft

## GENERAL INFORMATION

The "Train Power 10" is designed to operate all standard DC Gauge model trains. The output voltage is high enough for G Scale and the output voltage wave form is delicate enough for N Scale. The design of this power pack includes a very special circuit that provides the correct waveform and voltage for slow speed operation without overheating even the most sensitive instrument motor. The unique circuit that adjusts the output for each scale train is called "Dial-A-Gauge."

This power pack provides the user with a convenient Walk-A-Round control handle that easily controls speed, direction, momentum and braking. The cord connecting the control handle to the power supply is a standard four conductor modular telephone cord. This cord can be extended by using standard telephone extension cord available from most retail stores. The only conditions are that it be four conductor and not over fifty (50) feet in length. Be sure to match the type of modular plug, a six (6) position using four wires, not a four (4) position such as that used between the hand-set and desk portion of a standard telephone.

The power console contains the power portion of the pack. The power from a standard 110 volt wall outlet is safely isolated and reduced to the range of voltage proper for model train operation. The power console has a power ON/OFF switch, line cord connection for the hand-held controller, DC output connectors for powering the train track, and AC output connectors for AC accessories. When the power switch is placed in the "ON" position, there is a pilot light to indicate there is power output. The voltage from the wall is isolated and reduced by the input transformer. This voltage is supplied to the DC output terminals and the AC accessory terminals. There is also a circuit that provides output voltage (speed) and polarity (direction) controls to the track terminals as well as low voltage to power the Walk-A-Round controller.

## SAFETY

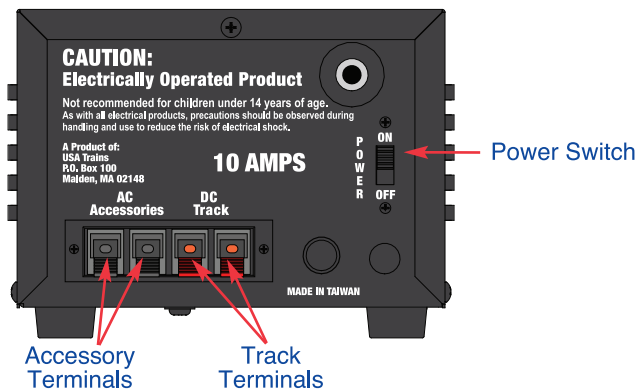
Many model trains are operated by experience modelers that exercise common sense when using a product that plugs into a wall outlet. Other users are small children that are not aware of the many dangers of using the power supplied by a wall outlet. To the adult supervising these children, please make sure the plug and wire connected to the plug are in good condition, not frayed, or cut. The wall outlet should be in good condition and not be overloaded with other electrical products or extension cords. The operating surface should be dry and not around standing water. Do not use in a damp basement or outdoors. The power pack must be kept dry and free of moisture when operating or in storage. This product is designed for adult operation and any child under the age of fourteen (14) should use this product under adult supervision.

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

## TRACK CONNECTION

The "Train Power 10" includes new hookup connectors called "Press 'N Lock." They simplify the wiring connection to the power supply and no tools are required to use them. Simply strip back at least 1/2 inch (bare wire) push the lower part of the connector and insert the bare wire into the open hole and release the wire locks into position. There are four (4) terminals on the back of the pack (see figure 1).

Figure 1



The two on the left side are labeled "AC" and are for connection of any accessories that operate 18 to 20 volts AC. Common uses of these terminals would be switch machines, lighting of buildings or railroad signals. The two right side terminals are used for connection to the train track and are used to power DC trains. The power controller can supply all of the rated power to the train, but only if power is not lost in the wire or in the tracks. For best results, use at least a wire size of 20 gauge stranded wire. If the layout has a lot for track or track length use jumper wires to the portion of the layout furthest from the power console. These jumper wires should parallel the track voltage. Longer wires on large layouts may require a larger wire such as 18 gauge to prevent voltage drop from the power pack to the track at long distances. There are two ways to do this.

(1) Run several smaller gauge wires to several points on the layout.

(2) Run one larger gauge set of wires to the furthest point in the layout.

This is done since the track has more voltage drop than the wire. Check to make sure there are no loose strands that may touch the other track or accessory terminal. Keep wires neat and away from traffic areas. The wires from the accessory voltage terminals on the left must be kept away from the track voltage wires and terminals. Make all connections with the power "OFF." After each connection, turn the power "ON" to ensure proper connection and there is no short circuit.

**CAUTION:** Use DC connections for track power. Do not use the AC terminals to operate the track as this may cause damage to your locomotive. Use AC terminals for accessories only.

## TROUBLE SHOOTING CHART

PROBLEM	POSSIBLE CAUSE	POSSIBLE CURE
No response from hand controller	Phone type modular jack out or loose.	Push plug in until it clicks.
Power lamp on but no response.	Possible break in phone cord at or near modular plug.	Inspect and repair cord if possible.
All accessories working but no track power.	Broken or loose wire to the track terminals.	Replace wire or re-install the wires.
Loco erratic, stops off and on.	Dirty track.	Clean tracks as explained.
Loco stops running after 20 min. of running.	Probable overload.	Reduce load.
Loco overheats or is hard to run, or will not run slow.	Bad motor or tight brushing or bearing.	Replace motor or lube the gears. See dealer.
Loco will not run at slow speeds.	Bad motor armature	Replace the motor
Loco stopped but lamp in cab or headlight on.	Damaged loco motor switch not set properly.	Repair loco or set the switch to the correct position.
Train slows in certain areas of the layout.	Track wiring is too light in these areas.	Use heavier gauge wires or run extra wires to the affected area.
Speed has fast return brake released.	Brake switch used but momentum is off.	Do not use the brake without using momentum.
Direction switch has no effect on loco.	Modular plug loose. Possible wire broken in controller cord.	Make sure modular plug is secure or possibly requires factory repair.
No power from console; power on & LED glowing.	Internal fault or faulty component.	Requires factory repair.
No AC accessory voltage at terminals.	Open wire in console.	Requires factory repair.

## TROUBLE SHOOTING

The over-current protection system designed in the power pack will cause the units to shut down if the design current is exceeded. When a DC motor is at rest, the armature impedance is very low, and when power is applied to the motor, very high currents can flow through the motor. The currents can be several times the running currents used by the motors. If you have several motors connected to the same power pack, and the pack starts to turn off, then on and off again, you may be exceeding the design limitations of the pack. To pull a large current load, start by applying the voltage very slowly until the locomotive(s) starts to roll. When the armatures of the motors are rotating, the current drops, and you can now increase the speed as desired.

The power packs are designed to overcome this problem by delaying the effect of the short circuit shutdown system for a short time after the power is applied. This time is limited, however, to a short duration to prevent stress to the output device.

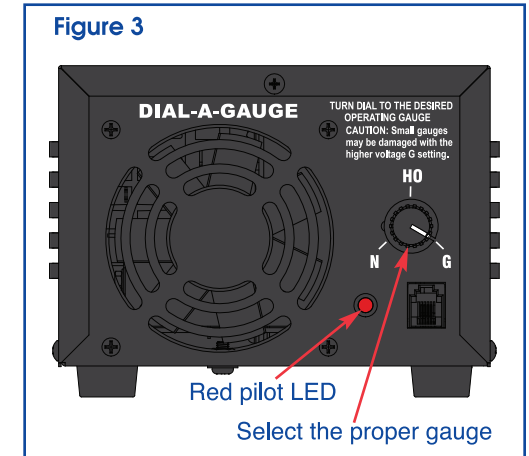
The power transformer is protected by an internal circuit breaker that has been designed to open if the transformer internal temperatures exceed the safe design limits for heat protection. When this occurs, the entire power pack will shut down and appear dead. If this happens, turn "OFF" power pack and wait until the temperature drops low enough for the circuit breaker to reset. If the transformer circuit breaker opens, the load you are demanding from the pack is too large. Reduce the number of locomotives or reduce the size of load in some other way. Transistor power packs must protect the internal devices in this way to prevent rendering the pack useless in the event of a short, or excess temperature of the output device. The Train Power 10 can produce in excess of 10 amps, before the short circuit systems shuts down the output circuit, and even higher currents for very short durations. The power transformer circuit breaker will open though, if this high current is sustained for a long period. The accessory outputs are protected by a special fast acting circuit interrupt device. It will automatically reset after the load is returned to normal.

PROBLEM	POSSIBLE CAUSE	POSSIBLE CURE
Unit dead, no lights.	Power switch OFF or unit unplugged.	Turn power switch ON. Plug unit into wall outlet.
Unit quits after hot.	Circuit breaker trips.	Allow time for unit to cool. Reduce load.
Track power ON/OFF	Electronic shut-down working.	Reduce load or increase speed slowly.
Power ON, slow or no response to speed control.	Momentum switch ON	Turn Momentum switch OFF.

## INSTALLATION AND OPERATION OF HAND CONTROLLER

First make sure that the power pack switch is in the "OFF" position (see Figure 1). Plug the hand controller into the jack located in the front of the power console. When properly inserted, it will click. To remove, press the small tab and pull. Now refer to Figure 2 and set the controls on the hand controller as follows:

- SPEED to the "OFF" position
- MOMENTUM to the "OFF" position
- Set the "DIAL-A-GAUGE" to the proper gauge (see figure 3)



Clear the track of everything except a test locomotive. Turn the power to the "ON" position. The red pilot LED on the front panel should glow. Move the "DIRECTION" switch to the right position and listen for click inside the power console. If any of these fail to operate, be sure the modular plug is in properly. Slowly turn the SPEED control clockwise until the locomotive starts to move to the right. If the locomotive goes to the left, then reverse the power leads between the track and power supply.

**CAUTION:** The speed of the locomotive is proportioned to the setting on the SPEED control and "DIAL-A-GAUGE" setting. Keep the train at scale speeds. The output of this power pack provides enough voltage for operation of G scale trains as well as the smaller HO and N scales. If you provide too much voltage to the locomotive, the motor(s) in the locomotive may burn out. Keep scale speeds in mind when operating. Take care to place the "DIAL-A-GAUGE" on the proper gauge setting.

## MOMENTUM FEATURE

With the locomotive stopped, place the MOMENTUM switch to the "ON" position. As you increase the power, the locomotive will "slowly" increase speed providing the operator with realistic train operation. The operator can simulate the slow controlled acceleration of a "real" train. Momentum can also be used to simulate a "real" train taking a long time to come to a stop. As the SPEED control is moved to the "OFF" position the power to the locomotive is gradually decreased automatically by the momentum feature and the train gradually comes to a complete stop. The brake feature can also be used to slow the locomotive at a faster rate and can be used to "BRAKE" in turns by pushing the switch "ON/OFF." When released, the locomotive will return to the run position. Use of the brake switch without momentum may cause an abrupt stop of the locomotive.

**NOTE:** The MOMENTUM dial adjusts the degree of momentum allowing the modeler to experiment with the rate of accelerations/deceleration of his train.

## DIRECTION CONTROL

The locomotive should come to a complete stop before changing direction. This will avoid any possible damage to the motors or gears of your locomotive.

## MEMORY FEATURE OF WALK-A-ROUND CONTROLLER

This power pack provides the user with a flexibility of control found on few power packs; true walk around control. The circuit provides the user with the ability to unplug the controller, and move from point to point as the train continues to run. The layout can be wired with as many control points as the user desires, all with modular plugs and jacks. If the train is high-balling along the right of way and you want to be where the action is, you can unplug the hand controller from one jack and plug into a jack where the train is without losing speed or direction control. The track voltage decreases at a very slow rate when the hand controller is unplugged. The direction and speed will be maintained for several minutes under these conditions. If the controller settings (speed or momentum) are changed while unplugged, the new "control instructions" will override when plugged back in.

Only one controller can be used at any one time with each power console, but you can move the controller to any position you have wired with a modular jack connected to the power console. Keep the maximum distance to the farthest point under 50 feet. Beyond this range the control may not be reliable. See the diagram at the end of this manual for suggested remote wiring.

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

## CIRCUIT PROTECTION

This power pack has many features including a fault sensing circuit that will prevent electrical damage to the power pack, wiring connected to the track, and accessories. The circuit will also sense the heat within the power console and reduce the output circuit until the temperature is back at safe design levels. All the control circuits are operated from an internal voltage regulator. This prevents variations in operation when the line voltage is too low or too high. The circuit also provides a voltage waveform that will operate any scale locomotive for long periods to time without overheating the armature in the locomotive motor and causing damage. The output voltage is filtered with a large electrolytic capacitor to prevent any fast rise-time pulses getting into the locomotive motor.

## CARE AND MAINTENANCE

The Train Power 10 was designed to run in a dry environment. If using outdoors, care should be used to keep the unit dry at all times. Do not leave unit outdoors - store in a dry environment indoors. To clean it, use only a soft, damp cloth; if needed, use a small amount of glass cleaner on the cloth first. Do not allow any solvents to set on the surface on the power console, or the hand controller.

The placement of the power console is critical to have the unit provide the maximum amount of power it was designed to furnish. Place the unit in a dry location where it can get some air movement. You need not provide any other source of cooling air beside the internal fan, but please do not fence (or box) it in.

## TROUBLE SHOOTING

The most common problems associated with power packs are the initial wiring to the layout. Be sure that the wires that are connected to the power console are securely connected to the terminal connectors. The wires must neat and not frayed. Be sure the modular plug from the hand controller is all the way into the jack. It will snap into place when the modular plug from the hand controller is all the way into the jack, it will snap into place when correctly installed. Check the wires connecting the track to the power pack. Make sure there are no shorts, or openings in the connections.

Make sure the power console is connected to the wall outlet and the outlet is providing electricity. If the pilot LED is on and glowing red the unit has power.

The Train Power 10 provides automatic output shutdown to the track terminals if there is a short in the wires. If you cannot get a locomotive to move on the main layout, connect the power pack to a short length of test track and see if the problem is in the pack, or the layout wiring.

Dirty track can cause a locomotive to run in an erratic manner. Cleaning the tracks may be required.