

MRC *PRODIGY* DCC

We make DCC easy to enjoy



Model Rectifier Corporation

Setting the standards with innovative technology

MRC *PRODIGY* DCC

INTRODUCTION

Thank you for purchasing MRC's *PRODIGY* DCC system. You now own one of the most advanced, easy to use DCC systems available. The MRC *PRODIGY* DCC will enhance your enjoyment of your train layout for many years to come. With the *PRODIGY* DCC System, you can now control up to 32 locomotives. It will give you, your family, and friends the opportunity to all participate in running your trains.

Specifications

Input: 16-18 Volts AC or 18-20 volts DC
Output: DCC signal with 16 volts amplitude
Maximum current : 3.5Amp
Address capability: up to 32 address: 1-32
Handheld capability: up to 4

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TERMINOLOGY

Please familiarize yourself with the following terminology. It will help you to understand the instructions.

Command Station (base unit; also called console): A device that sends Digital Command Control (DCC) signals to decoders to control them or to program them. MRC *PRODIGY* DCC console is a compatible command station.

Handheld: A device plugged into the base unit. Most of your operations are on the handheld. You can plug four handhelds into the base unit. Additional handhelds can be purchased separately.

Standard Loco: Any locomotive without a decoder is called a standard loco. It is always assigned to address #1 in your *PRODIGY* DCC system.

Locomotive Decoder: A small device that is installed in the loco and receives DCC signals from the command station. Each decoder can memorize its address and other operational data. It only follows the command assigned to its address. All decoders are programmed to address #3 at the factory. A locomotive installed with address #3 is referred to as decoder loco #3 or simply as loco #3.

Run Mode: *PRODIGY* DCC has three operating modes: Run mode, Program mode and Consist Setting mode. It is the Run mode that lets you operate your locos. Please follow the white color lettering on the handheld when you are in Run mode. To select Run mode, place the mode switch on base unit to Run position.

Program Mode: Use this mode to program your decoder's address and other operational data. Follow the red color lettering on the handheld when you are in Program mode. To select Program mode, plug a handheld into jack #1 and place the mode switch to Program position. Program light should glow indicating you are in Program mode.

Consist Setting Mode: To add, delete and clear a consist. Follow the orange color lettering on the handheld when you are in Consist Setting mode. To select Consist Setting mode, press Consist Setting button. Consist Setting light will glow indicating you are in Consist Setting mode. To exit Consist Setting mode, press Consist Setting button again.

Section 1 QUICK START

Your *PRODIGY* DCC package contains a *PRODIGY* DCC console, a handheld controller and a power supply. All you need to do is plug the power supply into the console and connect your layout (track) to the base unit.

NOTE: If you use a conventional CAB Control/Isolated block system, you should activate all block switches and disconnect your conventional Power Pack.

Each handheld has simplified QUICK START instructions on the reverse side. You should be able to use it to operate most aspects of the system without any further reading of the manual. However, we recommend you read all instructions to get the most enjoyment and to learn about all of the features offered in the *PRODIGY* DCC system.

Section 2 RUN OPERATION

1. Switch the power switch to the **On** position and select run mode by placing the mode switch to **Run** position.
2. Place a standard loco and loco #3 on your track and plug the handheld into any one of the 4 jacks.
3. To operate loco #3, turn the address selector dial to #3 and position the address **bank selector** switch to 1-16. Acquire the loco by pressing the desired direction button. You have now acquired the loco. Once you acquire the loco, you can adjust its speed by turning the throttle and change its direction by pushing the direction buttons. You can also operate its headlight on and off by pressing the light button. If your decoder has an accessory function #1, you can turn on or turn off the function by pressing F1.

To acquire a locomotive;

- a. Select your desired address.
- b. If the current throttle setting is what you desire, press any button to acquire the address. If not, acquire the address by turning the throttle knob quickly to your desired setting.

Note: If you turn the throttle too slowly, you will fail to acquire the new address and you still control the last loco.

4. To operate the standard loco, select and acquire address #1 in the same manner as above. You should be able to operate it at the same time loco #3 is moving.

You have just operated 2 locos with your new DCC system. It's that easy.

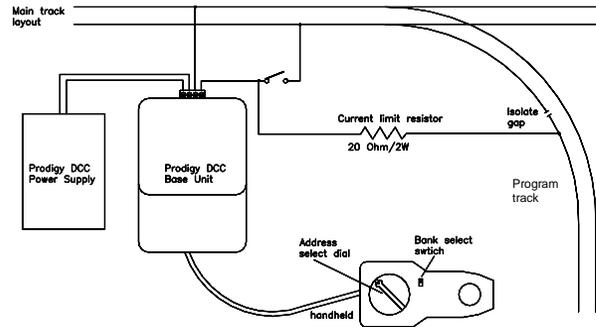
For emergency stop, press the **Stop** button. It will halt all operations on the layout. The green LED will blink indicating the emergency stop. To restore operation, press the **Start** button.

When an overload occurs, the unit will stop providing any power to the rails and the both LEDs (orange and green) blink. The system will restore the output automatically once the overload is removed.

Section 3 DECODER PROGRAMMING

Make a Program Track

It is a good practice to make a program track. With the program track you do not have to remove all locos from the layout in order to program one loco. You can drive or put a loco onto the program track and switch off your layout. When you finish programming, switch on the layout and drive or place the loco back into the layout.



In case of incorrectly wired decoder, the 20 ohm resistor protects it from being damaged.

Use this resistor to set up your program track

Program Loco Address

The address is the number assigned to a decoder to identify the decoder. All decoders are programmed with address #3 as the factory default. You can change the address any time by programming.

To program a decoder, select the loco you wish to program and place it onto a program track. Then select the program mode by plugging the handheld into jack #1 and then positioning the Mode switch to Program. The Program light on the base unit will light indicating you are in the program mode.

To program the address, select the address you want to assign the loco by rotating the dial, and then press the Program Address button. Please wait 5 seconds for completion.

Example: How to program decoder with address #2

1. Put loco on program track.
2. You must have the handheld plugged into Jack #1 and the Mode switch positioned on the base unit to Program. Program LED will light.
3. Turn the address selector dial to #2 and switch the address bank selector to 1-16.
4. Press Program Address button. Loco will jerk slightly. Wait 5 seconds for completion.

You've just programmed the loco with address #2. It's that easy. Now position the Mode switch on the base unit to Run. You should be able to operate the loco with address #2.

Helpful hint: Make a chart indicating the road names, road numbers and assigned address numbers for your locos and keep this chart near your PRODIGY DCC system for reference.

Program Start Voltage

This is the voltage required to start the locomotive's motor and overcome its weight and friction to make it begin to move. You can program your locomotive with a start voltage so that it will begin to move as soon as the throttle kicks in.

To program start voltage, adjust the throttle for start voltage setting and then press the Program Start Volt button.

Program Top Voltage

The top voltage (top speed) is the voltage (speed) at full throttle. The *PRODIGY* DCC top end voltage is set for maximum output. If you are running a switcher, you may want the top end voltage to be less than full output for more realistic performance at top throttle setting.

To program the top voltage, adjust the throttle for the top voltage setting and then press the Program Top Volt button.

Top voltage is a unique programming feature that we added into the *PRODIGY* DCC System. Other manufacturer's decoders may not be able to use it. The early MRC decoders AD305, AD310, AD320 and AD330 do not have this function. All our new decoders such as AD315 and AD350 will support this feature.

Program Momentum

Momentum simulates the drag of a heavy train as it starts and stops. Real trains do not jack rabbit start and stop on a dime. You can program in the amount of momentum you want for the train at hand.

To program momentum, adjust the throttle for momentum setting and then press the Program Momentum button. The higher you set on the throttle dial the more momentum you add.

Program Reverse Polarity

Decoders are programmed with normal direction setting, i.e. it runs forward when you press the forward direction button. But for multi-lash up locos, operating back to back, one loco has to be programmed with reverse polarity.

To program reverse polarity, press the Reverse Polarity button.

To program the loco back to normal direction setting, just reprogram its address. Programming reverse polarity twice will not give you normal direction setting.

Program Analog Enable

This feature allows the decoder equipped loco to be programmed to run on a standard analog (DC) layout. When you reprogram a loco with its address, it disables the analog running ability.

To program analog enable, press the program Analog Enable button.

***NOTE:** Program Analog Enable will also program the loco with factory set direction setting.*

Section 4 CONSISTING

Consisting (multi-lashup)

Before DCC, it was very difficult to lash (couple) two or more locos together because they may not have started at the same time or run in the same direction. With DCC technology you can program locos to all start moving at the same time.

Consist Setting

Select consist setting mode first by pressing Consist Setting button. Consist LED will glow, indicating that you are in consist setting mode. In consist mode, you can add a loco into the consist group or delete a loco from a consist group or clear the entire consist group. To add locos into a consist group, dial loco address and then press Add Loco button. You can add as many locos as you want and whenever you want. The last added loco is the lead loco. You can control the speed and direction of all the locos in the consist group by controlling the lead loco. **When you finish with the consist setting, press Consist Setting button again to exit consist setting mode, then begin operating your consist.**

Consist setting does not program any decoder. Once you turn off the power switch all consist groups will be cleared. *It only makes the locos in the consist group respond to the lead address' speed and direction. You are still able to control each loco's light and accessory function individually by using their original address.*

To delete a loco from the consist group, select consist setting mode again. Dial loco address to be deleted, then press Delete Loco button. If you wish to delete the lead loco from you consist, clear the entire consist and rebuild a new consist with a new lead loco.

If you want to clear the consist group, stop the group and then press Clear Consist button. Once you clear the consist group, each loco will respond its original address. When you finish consist setting, press Consist Setting button again to exit consist setting mode.

You can program one consist group per input jack. Therefore the *PRODIGY* DCC System can operate up to four consist groups and each can be set independently. Once the consist is set, you can operate the consist group from any jack just as you would to operate a single loco. Remember to exit the consist mode after setting up your consist. If you remain in the consist setting mode (LED on), you can run a loco but you cannot control direction or lights.

If more than one handheld is used, your *PRODIGY* system has the ability to let the other users to continue operating their trains while you build a consist.

Section 5 PRIORITY OF PLUGS

If you operate the *PRODIGY* DCC system with one handheld only, you may skip this section. If you have more than one handheld, then please read this section.

There are four input plugs on the console to accept up to four handheld controllers. From left to right they are: plug #1, plug #2, plug #3 and plug #4. The handheld plugged into plug #1 is referred to as handheld #1. Handheld #1 has the highest priority and handheld #4 has the lowest priority. The higher priority handheld can take over the loco acquired by lower priority handheld.

The following example shows how the priority works.

Let us assume that the base unit has four handhelds connected and loco #3 is at idle (not acquired). Handheld #4 selects and acquires loco #3. It now controls loco #3.

Handheld #4 brings loco #3 to a stop by moving the throttle to 0. If handheld #3 selects and acquires loco #3, it takes over loco #3 from handheld #4.

Now handheld #3 adjusts its throttle at 30%. The loco #3 will respond to handheld #3 and run at 30% of full speed.

Then handheld #2 selects and acquires the loco #3 and adjust its throttle to 60%. The loco #3 will responds to handheld #2 and run at 60% speed.

Now if handheld #1 selects and acquires the loco #3 and adjust its throttle to full. The loco #3 will responds to handheld #1 and runs at full speed.

As soon as handheld #1 releases loco #3 by unplugging or selecting and acquiring a loco other than #3, the loco #3 will respond the handheld #2's speed setting, at 60% of full speed. If handheld #2 releases loco #3, then loco #3 will follow handheld #3's speed setting and runs at 30% speed. If handheld #3 releases loco #3, the handheld #3's operator will find the loco has stopped, because it responds to handheld #4.

The *PRODIGY* DCC system has memory capabilities. When using any handheld to control one locomotive, that locomotive will continue in its last direction and speed, even when you acquire a new loco or unplug that handheld from the base unit, so long as no other handheld acquires the loco.

There are two rules for plug priority that operators should always keep in mind to avoid confusion.

Rule #1: When you operate a loco and find you lose control, the loco may be acquired by higher priority handheld.

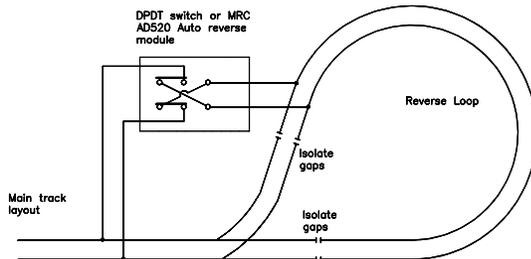
Rule #2: When you switch to a new loco and you find that the old loco suddenly changes its state, the old loco may be responding to lower priority handheld. To avoid this problem, if you have a lower priority handheld and you have completed use of your loco, simply unplug your handheld from the console or acquire a non-assigned address.

Section 6 REVERSE LOOP

The following diagram shows a reverse loop with a double-pole double-throw (DPDT) switch. It allows you to change the polarity of the reverse loop section.

Before a loco crosses the first isolating gap you must make sure the polarity of reverse loop section and main track are matched at the first gap. (If not flip the switch.) Otherwise it will cause a short circuit. After the loco passes the first gap completely, you need to change the polarity of the reverse loop section by flipping the switch so that the polarity of the reverse loop section and main track are matched at the second gap. If the loco is a standard loco, you need to flip the switch and push its direction button on the *PRODIGY* DCC after it passes the first gap.

The MRC Auto Reverse Loop Module (item number AD520) can be used in place of the DPDT switch for automatic operation of the loop. It is only for decoder equipped locos. See your hobby dealer to purchase this item.



Section 7 OPTIONAL ACCESSORIES FOR DCC

MRC offers various accessories for your DCC layout, including a ***PRODIGY* DCC Sound Station** that operates from the *PRODIGY* handheld.

Contact your favorite hobby dealer for other accessories or check our website at www.modelrectifier.com for updates.

Section 8 TROUBLE SHOOTING

A DCC system is made up of a command station (base unit) and decoder equipped locos. Whenever you have problems try to find out if the cause of the problem is the command station or the decoder. If you can control a standard loco in both directions, your base unit is OK. The fault must lie in the decoder.

Are you in the correct Address Bank (1-16 or 17-32)?

You may have changed the bank address by moving the bank switch accidentally. Check for correct setting.

Dirty track and wheels

A common problem in all DCC systems is the decoder-equipped locomotive's pickup. Keep wheel and track surfaces clean. Intermittent and jerky operations are often caused by an oxide coating or dirt on either the track or loco's wheels. When you have problems always check the track and wheels and make sure they are clean.

Decoder lost memory

If you lose control of a loco, please reprogram it and try again.

Check decoder's connection

Remove the locomotive shell and check the connection of the decoder. Are there any broken wires?

The console or handheld lights flash and power is lost

Check for a short circuit. Remove the short and the unit will automatically reset and power will come back on. The problem can also be caused if you run more than 6 HO locomotives at one time. If you draw too much current due to heavy loads, you may wish to invest in MRC's Power Booster (item number AD501) that will provide 8 amps of power. Contact your hobby dealer for price and availability.

Other questions?

Call our customer service department at (732) 225-6360 between hours of 9:00am and 6:00pm Eastern Time. Also refer to our website at www.modelrectifier.com under *Frequently Asked Questions* section on the *PRODIGY* DCC.

Section 9 SERVICE INFORMATION

Your *PRODIGY* DCC has been thoroughly tested at the factory. *Do not shut down your layout unnecessarily.*

Before returning your unit for repair or servicing, **please read Section 8 TROUBLE SHOOTING to make certain it is defective.** Please telephone our service department at (732) 225-6360 before returning your unit. Please have the following information handy before you call:

1. Name and model number of the power supply, including a power booster (if applicable), used with the *PRODIGY* DCC.
2. Your name, shipping address and daytime phone number.

If it should become necessary to return your system, pack it in its original carton, then pack the original carton into a larger carton with at least three inches of packing material all around. Include a clearly printed letter with your name, address and daytime telephone number, and a detailed description of the problem you are experiencing.

Send your *PRODIGY* DCC by Parcel Post Insured or United Parcel Service to:

Model Rectifier Corporation
Att: Customer Service Dept.
80 Newfield Avenue
Edison, NJ 08837



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