



DB210/DB220 Manual

Includes Instructions for:
DB210 Booster
DB220 Dual Booster
DB210 OPTO Booster



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Introduction

Congratulations on your purchase of a Digitrax DB210/DB220 Booster.

The design of the Digitrax Complete Train Control® system lets you operate your layout the way you choose. With LocoNet® you simply connect system components to build the layout control system that you've always wanted! The Digitrax system reduces and simplifies layout wiring.

The DB210/DB220 Boosters are add on components for existing Digitrax Systems to add more available power to run trains. The DB210 Booster can be configured as a 3,5, or 8 amp booster in either normal or auto reversing function. The DB220 Dual booster provides 2 booster sections that can be configured as 3,5, or 8 amp boosters in either normal or auto reversing functions. The DB210 OPTO is an opto-isolated version of the DB210 for use specifically with common rail wiring.

In addition to your DB210/DB220 you'll need a suitable DC power supply. The DB210 accepts a DC 13.8V to 24V power supply with 3,5, or 8 amp capability. The DB220 Dual booster accepts a DC 13.8V to 24V power supply with 6,10, or 16 amp capability. Digitrax power supplies are recommended however you may use your own existing suitable power supply.

Your success with and enjoyment of our products are very important to us. After all, this is a hobby and it is FUN!!! Please read this manual carefully before you install your DB210/DB220. This manual has all the information you will need to get your DB210/DB220 up and running. You may also find it useful to refer to your Starter Set or Command Station Manual. If you have questions not covered by this manual please visit our web site at www.digitrax.com where you'll find the Digitrax on-line Tech Support Depot is always open! For more specific questions go to helpdesk.digitrax.com to open a support ticket so our tech support reps can help you out.

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1.0 DB210/DB220 Quick Start Guide

These instructions will get you up and running in just a few minutes! It is recommended that you use this quick start guide before adding the DB210/DB220 to an existing Digitrax installation to ensure the DB210/DB220 is in working order and to test any features you are unfamiliar with. A full description of all controls and technical reference information are included later in this manual to help you fully incorporate the DB210/DB220 into your layout control system. Once you've completed the initial testing of your DB210/DB220 on a test track, you can implement it on your layout.

1.1 Connect the DB210/DB220 to the power supply

1. Set the DB210/DB220's SCALE switch to the scale you are running: N, HO, O/G. Use the lowest setting that will run your layout.
2. Set the MODE switch on the DB210/DB220 to the RUN position.
3. Set the AUTO REV switch to OFF
4. Set the AMPS switch to the appropriate setting for your power supply. The 3 or 3/3 setting is recommended for initial testing.
5. Connect the DB210/DB220 to an adequate stand alone power supply using the terminals marked + and -. *See Section 3.0 regarding powering your DB210/220.*
6. Plug in the power supply to power up your DB210/DB220.
7. DB210/DB220 will beep four times and its PWR indicator will light RED winking off every 3 seconds as a "Heartbeat".

1.2 Connect Your DB210/DB220 to your Command Station

1. Use a known good LocoNet Cable to connect from one of the LocoNet A,B, or C ports to your Command Station.
2. Plug a throttle into an available the LocoNet jack.
3. Press the **PWR** key then the **N / -** key on your throttle. The TRACK STATUS LED on the Booster should be off.
4. Press the **Y / +** key on your throttle. The TRACK STATUS LED should come on green.
5. Turn the **R** Throttle Knob of the throttle about 1/4 turn. You should see the right side "SEL" in the display begin to blink.
6. Press the **LOCO** key, then the **LAMP/0** key, then the **LOCO** key. You should see "00" replace the blinking "SEL".
7. Turn the **R** Throttle Knob clockwise to "99".
8. Press the **REVERSE / R** key and look for a change in brightness (or color) of the TRACK STATUS LED on the booster. Turn **R** Throttle Knob counterclockwise to "00".
9. Connect the RAIL A and RAIL B terminals from your booster to a section of test track, for the DB220 connect RAIL 2 A and RAIL 2 B to a separate

piece of test track. Place an analog locomotive (without a decoder) on the track. The loco should “sing”. Use the **R** Throttle Knob to control speed and the **REVERSE / R** key to control direction. For the DB220 preform this test on both sections of test track.

10. Place a locomotive with a decoder with a known address on the track. Turn the **L** Throttle Knob. You should see the left side “SEL” in the display begin to blink. Press the **LOCO** key, then the numbers for the address, then the **LOCO** key. The loco address will replace the blinking “SEL”.
11. Use the **L** Throttle Knob to control speed and the **L / REVERSE** key to control direction of the decoder equipped loco and the **R** Throttle knob and the **REVERSE / R** key to control the analog locomotive. For the DB220 preform this test on both sections of test track.

1.3 Quick Start Problems?

If you encountered problems at any step in this Quick Start Section:

First, try backing up a step until you get results described. The steps included in this installation procedure are set up so that if you follow them carefully, any problems you encounter will be easy to isolate and correct.

If that does not work or if you have other questions or problems, we encourage you to visit the Tech Support Depot at www.digitrax.com/support. You may also submit help ticket to our tech support staff at helpdesk.digitrax.com.

There are thousands of successful Digitrax installations around the world and we want to be sure that yours is one of them.

2.0 Layout Power Districts

The DB210/220 is designed to add additional power to your layout to run more trains by setting up power districts. A power district is an electrically isolated section of the layout including the power wiring, booster and power supply that drives it. Power districts are used for power distribution, not for train control as with DC blocks. Power districts may be divided into sub-districts for short circuit management within the power district or for auto reversing. Even though blocking is not required for train operation with DC, dividing the layout up into power districts (and sub-districts) is needed for the following reasons:

2.1 Number of Locos

Additional power districts may be needed to provide enough power to operate more locomotives than one power supply alone can handle. For example a 5 amp booster and power supply will operate between 10 and 15 average N-scale locomotives and between 6 and 10 HO locomotives. If you wish to run more locos on your layout, then you will need to set up more power districts to provide more total power.

2.2 Short Circuits

Additional power districts and sub-districts can be used to prevent the whole

layout from shutting down when short circuits (like de-rails or an operator running a switch) occur in any given power district or sub-district. If a short occurs in one district or sub-district, only that area of the layout shuts down, the rest of the layout keeps operating.

2.3 To set up power districts & sub-districts:

1. Determine how you want to arrange power districts and sub-districts.
2. Double gap the rails at each end of the power district and single gap for sub-districts within districts.
3. Connect a Digitrax booster and power supply to each district. Use a Digitrax Power Manager (PM42, etc.) with your booster to set up sub-districts.
4. Connect the Digitrax boosters to the command station via LocoNet and the General Return wire on pin4 (GR).

2.4 Do I have enough power to run my trains?

Use the “quarter trick.” Once your Digitrax command station and booster(s) are installed and the layout is powered up, use a quarter (or other piece of conductive material) to short both rails at various places on the layout. If you have enough power at that location, the booster for that power district will chirp and shut down. If the booster does not shut down, then you need to lower the wiring resistance to allow reliable short-circuit detection.

2.5 Reversing Section Wiring

You can operate reversing sections automatically with Digitrax Complete Train Control using an auto-reversing booster such as the DB210/220 or a reversing section controller such as an AR1 or PM42. You must double gap (completely isolate) both ends of the reversing section just like with any other layout. Note that automatic reversing will not properly work with analog (non decoder equipped) locos. When the polarity change occurs, decoder equipped locomotives will continue at the speed and in the direction commanded but any analog engines running may respond to the polarity change by reversing direction.

To handle auto reversing, you need two devices, one that acts as the system polarity reference and another to detect a polarity mismatch and correct it. For example, if you are using two Digitrax boosters, one acts as the polarity reference and the other handles the polarity reversal for the reversing section. You can also use a DB210/DB220 and PM42 to handle automatic reversing sections.

A single Auto Reversing Booster can be used to handle more than one reverse section however, the unit can only fix a polarity mis-match at one gap at a time. If more than one train is entering or leaving the reverse loops connected to a single booster at the same time, a short will occur. More than one train can be in the reverse loop at any time but, only one can cross a double gap at a time.

2.6 Power Managers for Sub-Districts & AutoReversing

If you want the benefits of setting up power districts on your layout but you don't need to add more power to run more trains, you can use a Power Manager like the PM42 to set up sub-districts within booster power districts. With a Power Manager you can separate the output of one or more boosters into multiple sub-districts that can be set up as either auto-reversing or as smart circuit breakers for short circuit management. For more information about this option check our web site at www.digitrax.com.

2.7 Using AR1 for AutoReversing

If you have a single reversing section that doesn't need its own booster, you can use the AR1 single unit auto reverser to set up a reversing section.

3.0 Powering your DB210/DB220

The DB210 is for use with DC POWER input ONLY, MAXIMUM INPUT 8 AMPS, 24VDC, DO NOT Exceed 25VDC maximum Input. Minimum Input 13.8VDC.

The DB220 is for use with DC POWER input ONLY, MAXIMUM INPUT 16 AMPS, 24VDC, DO NOT Exceed 25VDC maximum Input. Minimum Input 13.8VDC.

Note: Grey terminal connectors are only rated for a Maximum of 8 Amps and should only be used with compatible 8 Amp boosters and Command Stations. The DB220 uses a special Black Connector that is rated for 16 Amps. **ONLY BLACK CONNECTORS CAN BE USED WITH THE DB220.**

There are many DC power supplies and power packs that can supply the input power for the DB210/DB220. Most regular DC model railroad power packs are not able to supply sufficient amperage to the DB210/DB220, because they were designed to run only 1 or 2 locomotives in a DC blocked Common Rail system. With Complete Train Control you'll be running multiple locomotives in Direct Home wired power districts so, you'll need to provide more power to each district.

It is recommended that when selecting a DC power supply the voltage should slightly exceed the scale track voltage you plan to run by about approximately 1 to 2V DC, and should provide sufficient current to support the chosen 3/5/8 Amp limit setting. The DC input voltage should not exceed track scale voltage by more than 3V. If the DC supply voltage exceeds track scale voltage by more than 3V the DB210/DB220 will adjust to Safe Operation Mode see Section 4.10.4.

When connecting a DC power supply to an ADVANCED DB210/220 booster the Positive(+) power supply lead connects to pin7 terminal labeled + 8A or + 16A, and the negative(-) lead connects to pin6 terminal labeled - 8A or -16A.

A Current Protection Device (CPD) should be used on all positive (+) leads. This CPD (fuse, circuit breaker etc.) should match the corresponding boosters' current rating.

Power to the DB210/DB220 should not be rapidly cycled ON-OFF-ON. When power to the unit is switched off, wait 30 seconds before turning on the power again.

3.1 General Return Wire

A booster return wire should be connected to the General Return (GR or GROUND) pin 4 terminal on all non-Opto boosters. The General Return wire should be **sized to conduct full track current** to the terminal on all non-opto boosters. The purpose of this general return is to carry transient booster currents safely between power districts and prevent damage to LocoNet connectors. This overall layout general return may optionally be connected to safety ground to protect from stray voltages. *See Figure 1*

3.2 Sharing a power supply between multiple boosters

Special wiring considerations must be followed when sharing a high amperage DC power supply, such as the PS2012, between multiple boosters/command stations. In the situation where multiple boosters share a common DC power supply the positive (+) DC power supply connection will be made to pin7 via CPD's on all units that will be sharing the DC supply.

On Advanced DB210/220 boosters this will be the terminal + 8A or + 16A.

On Legacy boosters this will be the left-most terminal labeled "POWER IN".

The Negative(-) DC power supply lead must be connected to pin4 General Return (GR or GROUND) terminals via the general return wire on all non-opto boosters.

3.3 Powering the DB210 OPTO

Every DB210 OPTO booster must be powered by a separate DC power supply.

Thus a DB210 OPTO connected on a Common Rail layout cannot share a power supply with any other Booster or Command Station. All DB210 OPTO boosters must not have any connection to the general return (GR or GROUND) pin 4. This booster's LocoNet connections are specially isolated for Common Rail operation.

Notes: Current Protection Devices (CPDs) on positive leads should match each boosters current rating.

Only connect DC power leads to Pins 7 and 4 with polarity as shown for safe operation. DC power leads should be adequately sized for load and fault currents.

All non-opto boosters should be connected to the general return via pin 4.

Power supply sharing is only supported by non-opto boosters. Opto boosters must each be powered by a separate supply.

Other connections omitted for clarity. Ensure connections are correct and reliable.

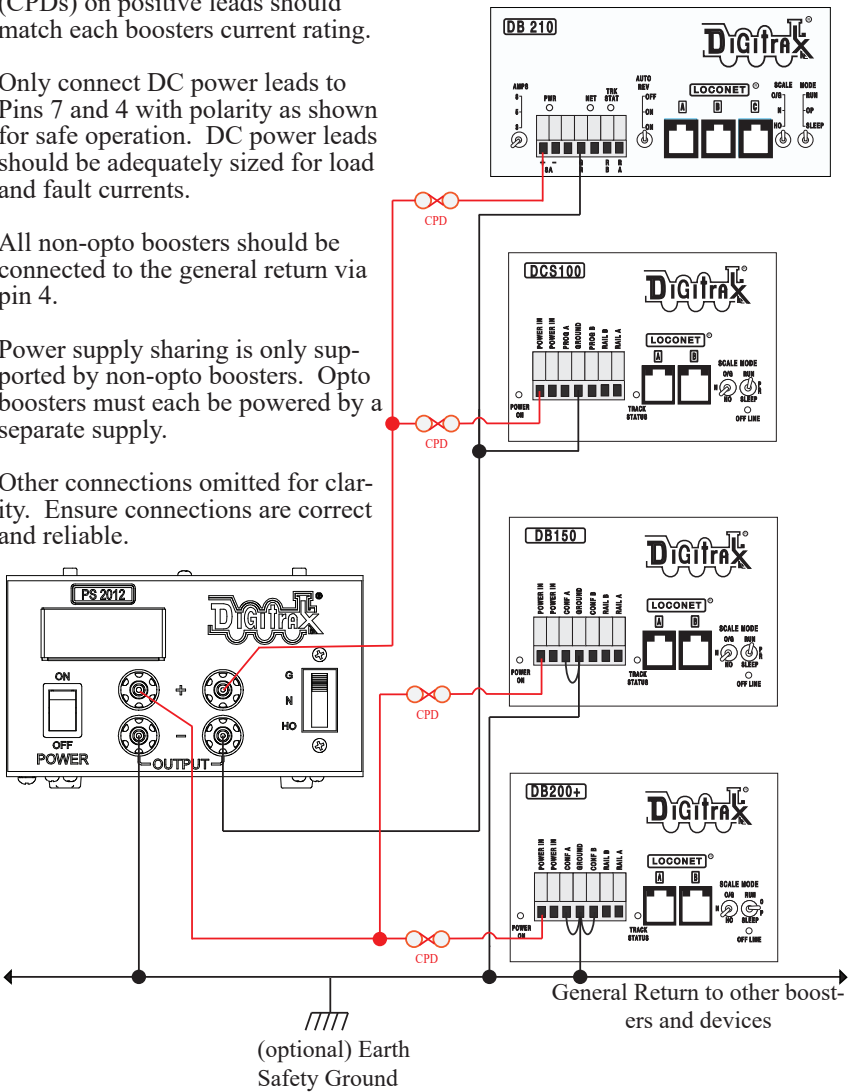
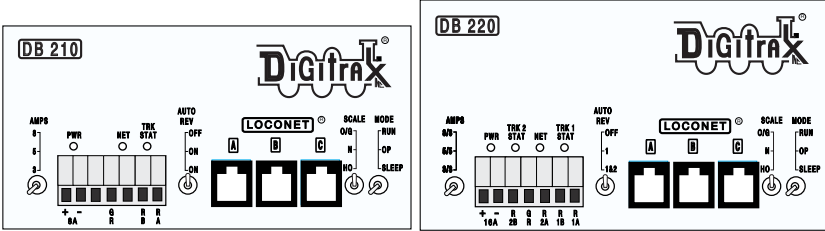


Figure 1: DC power sharing connections with multiple non-opto isolated boosters

4.0 DB210/DB220 Control Panel



4.1 AMPS Switch

The AMPS switch is used to set your Boosters desired output amperage. The DB210 can be configured for 3,5, or 8 amps of power. The DB220 can be configured for dual 3,5, or 8 amps of power. Your booster should be set to match the output rating of your command station and be powered by a suitable power supply.

4.2 Power (PWR) Indicator

This LED indicates there is power supplied to the DB210/DB220. It will light either RED when power is supplied. The PWR indicator will light RED winking off every 3 seconds as a “Heartbeat” when the unit is in RUN mode. *See Section 6.0 for full light (LED) indication list.*

4.4 Power In Terminals (“+” and “-” 16A or 8A)

The DB210/220 are powered using the screw terminals labeled “+” and “-” when using a dedicated DC power supply. For a shared DC power supply use the “+” and “GR” terminals. When using the screw terminals make sure that the polarity of the power supply matches the correct terminals on the connector. The DB210/DB220 is reverse input protected, however it will not power on if the DC polarity is incorrect. *See section 3.0 for instructions on powering your DB210/220.*

4.4 Rail 2B and 2A terminals (R 2B and R 2A)

These are the second set of booster outputs used with the DB220 dual booster. Connect these terminals to the track sections powered by the DB220s second booster outputs. Be sure to use double gaps between each booster section and always connect the same rail to the same terminal on each booster. For example connect all Rail A terminals to the right rail and all Rail B terminals to the left rail or vice versa on all track sections.

4.5 Track 2 Status (TRK 2 STAT) Indicator

The Track 2 Status indicator shows that there is voltage on the Rail 2B (R 2B) and Rail 2A(R 2B) terminals. The indicator will be lit when there is track voltage, and not lit when track voltage is off. The indicator will change color indicating various degrees of “Zero Stretching” if used to operate a conventional (analog) locomotive.

4.6 General Return (GR) Terminal

The terminal marked General Return (GR) provides a primary current return between boosters and other devices, electrical safety features, and a RF ground reference. This is also the connection point that should be used for the negative(-) connection from a shared power supply. See section 3.0 regarding powering your DB210/220. This should be the ONLY point of any DB210/DB220 installation that is connected to the AC safety ground pin provided on most 3 pin 110V AC power sockets. Grounding the system is a sensible optional safety precaution.

4.7 Rail B (RB) and Rail A (RA) or Rail 1B (R1B) and Rail 1A(R1A) Terminals

Depending on if you have a DB220 or DB210 these terminals will be labeled either R1B or RB and R1A or RA. Connect these terminals to the track sections powered by the DB210/DB220. If you are using more than one booster, be sure to use double gaps between each booster section and always connect the same rail to the same terminal on each booster. For example connect all Rail A terminals to the right rail and all Rail B terminals to the left rail or vice versa on all track sections.

4.8 Track Status (TRK STAT) or Track 1 Status (TRK 1 STAT) Indicator

Depending on if you have a DB220 or DB210 this indicator will be labeled either TRK STAT and TRK 1 STAT. The TRACK STATUS indicator shows that there is voltage on RA or R1A and RB or R1A terminals. The indicator will be lit when there is track voltage, and not lit when track voltage is off. The indicator will change color indicating various degrees of “Zero Stretching” if used to operate a conventional (analog) locomotive.

4.9 LOCONET Jacks A, B and C

These jacks let you expand your Digitrax system by simply plugging LocoNet devices in to the system. They can be used for throttles and other LocoNet devices. These jacks are functionally the same and can be used interchangeably.

4.10 SCALE Switch (O/G, N, HO)

This switch sets the nominal track voltage.

4.10.1 DB210/DB220 Voltage Trim Settings.

The DB210/DB220 is capable of custom voltage output ranging from approximately 8v to 24v with a suitable power supply. Each of the 3 scale settings can be trimmed to a custom voltage setting.

The following ranges correspond with each track setting:

	Nominal Voltage default	Nominal Voltage @ max decreased trim	Nominal Voltage @ max increased Trim
O/G	20.4v	18v	24v
HO	14.7v	14.5v	18v
N	12.4v	9v	14.5v

Note: The DB210/DB220 can only OUTPUT approximately as much voltage as it is receiving. If you are only using a 15V DC power supply the DB210/DB220 cannot output more than ~15V DC. Use a power supply that approximates your planned track voltage.

The DB210 is for use with DC POWER input ONLY, MAX INPUT 8 AMPS, 24VDC, DO NOT Exceed 25VDC Input.

The DB220 is for use with DC POWER input ONLY, MAX INPUT 16 AMPS, 24VDC, DO NOT Exceed 25VDC Input.

To Adjust Voltage Trim:

1. Set Mode Switch to OP. PWR indicator will flash GREEN alternating with the PROG indicator flashing RED. DB210/220 must be connected an active command station.
2. Select Address 01 on a throttle plugged in directly to the DB210/DB220. Make sure any Locos with address 01 are removed from the layout.
3. Set OPSW 05 to C. *See section 7.0 for instructions on setting OPSW.* The unit will start beeping continuously.
4. Set Scale Switch to the Scale voltage you wish to adjust.
5. Using the Throttle with 01 selected, adjust Forward Speed to increase Voltage trim up above default. Adjust Reverse Speed to decrease voltage trim down below default.
6. The voltage can only be adjusted up or down by the range referenced in the chart above. The DB210/DB220 will beep continuously as long as it is in range. When you reach a value that is out of range the DB210/DB220 will stop beeping. Once you decrease the trim UP or Down the DSC240 will beep again once you are in range.
7. To determine the actual track voltage, measure the DC voltage (unloaded) from Rail A to Ground and Rail B to Ground, then add the two values together.
8. Once you have set your desired voltage set the Mode Switch to RUN and the voltage settings will be retained.
9. To set additional Scale setting voltage trim repeat steps 1-8 for each Scale setting..

To Reset to Voltage default:

1. Set Mode Switch to OP. PWR indicator will flash GREEN alternating with the PROG indicator flashing RED. DB210/220 must be connected an active command station.
2. Select Address 01 on a throttle plugged in directly to the DB210/DB220. Make sure any Locos with address 01 are removed from the layout.
3. Set OPSW 05 to C. *See section 7.0 for instructions on setting OPSW.* The unit will start beeping continuously.
4. Set Scale Switch to the Scale voltage you wish to reset.
5. Using the Throttle with 01 selected set speed to 0.
6. Once you have reset your desired voltage set the Mode Switch to RUN and the voltage settings will be retained.
7. To reset additional Scale setting voltage trim repeat steps 1-8 for each Scale setting..

Note: Voltage trim values for all scales will reset if OpSw40 (factory default) is Closed. All other settings will also be reset to defaults.

4.10.2 Heat Dissipation

It is normal for the DB210/DB220 to be warm to the touch when it is in use. It is designed to absorb and dissipate the power difference between the input voltage and the selected scale output stabilized voltage, at the current load being drawn. If the unit is not able to dissipate excess heat, over temperature thermal shutdown may occur. When the DB210/DB220 experiences a over-temperature shutdown, the booster will turn off and the DB210/DB220 will beep and the PWR indicator will flash alternating GREEN/RED once a second. We recommend that you locate the unit in a location where it can dissipate heat. If you experience frequent over temperature shutdowns, you can add a small fan to increase airflow over the rear heat sink and cool the DB210/DB220.

4.10.3 Troubleshooting DB210/DB220 Shutdowns

1. Move the DB210/DB220 so that the heat sink has a flow of cool air.
2. Place the DB210/DB220 out of direct radiant heat like sunshine or a room heater.
3. Try direct cooling by using a small fan to blow air onto the heat sink.
4. Lower the track load current.
5. Reduce the input voltage from the power supply.

If the DB210/DB220 beeps 4 times and shuts down briefly and then comes back on again, it is probably being run too close to its pre-set current limit. In this case it may clip or mutilate some outgoing packets to keep the track current within acceptable limits. To solve this problem, reduce the track current load by setting up additional power districts to provide more total power for the layout.

4.10.4 DB210/DB220 Safe Operation Mode

We recommended when selecting a DC power supply, that the voltage slightly exceed the track voltage at which you plan to run your layout. However, the DC input voltage should not exceed track voltage by more than 3V. If the DC supply voltage exceeds track voltage by more than approximately 3V the DB210/DB220 will enter Safe Operation Mode and proportionally lower the maximum current limit.

In safe operation mode the DB210/DB220 will limit the current available to power the track in order to prevent damage to the DB210/DB220. When the DB210/DB220 is in safe operation mode the PWR indicator will wink off 2 times every 4 seconds. To avoid your DB210/DB220 entering safe operating mode and get the full 5 or 8 amps of power, your power supply voltage should not exceed your track voltage by more than approximately 3V.

4.11 MODE Switch

The MODE switch settings are:

- RUN normal operations.
- OP customize the DB210/DB220 by changing its option switch settings.
- SLEEP shutdown the system and all throttles that are plugged in to the system.

4.12 NET Indicator

The NET indicator is a red LED that displays information about what the DB210/DB220 sees on LocoNet. When your layout is wired correctly and LocoNet is operating properly, the NET indicator will be on and it will wink off any time a good LocoNet message is detected by the DB210/DB220. The table below explains the patterns you will see for this indicator.

NET LED Indication	Meaning
Solid Red	LocoNet OK
On, wink off	DB210/DB220 detects a valid LocoNet message
Off	DB210/DB220 detects low voltage on LocoNet or Sleep Mode

4.13 Auto Reversing (AUTO REV) Switch

The AUTO REV switch sets if the booster or boosters are used for auto Reversing. See section 8.0

5.0 DB210/DB220 Audible Sounds

The DB210/DB220 uses several beeps and clicks that can be used as diagnostic tools that help you debug a number of conditions. Some Audible sounds mean different things depending on the DB210/DB220's current mode.

Sound	Meaning
Continuous short beeps	In Voltage Trim Mode, selection is in range.
1 Short Beep	During operation, DB210/DB220 has recovered from a fault
2 Short Beeps	Initial DB210/DB220 Power on
4 short Beeps	Booster short circuit shutdown.
4 Long Beeps	Input Voltage is out of the range 13.8V to 24V DC

DB210/DB220 AUDIBLE SOUNDS

6.0 DB210/DB220 Indication Lights

The DB210/DB220 uses different combinations of the available indicators to provide information. The indicators can show what mode the DB210/DB220 is in as well as indicate errors and operations.

Indications	Meaning
PWR RED winking off every 3 seconds as a “Heartbeat”	The DB210/DB220 is powered on, Normal Operation Mode.
PWR off blinking on RED every 4 seconds	The DB210/DB220 is in SLEEP mode.
PWR flashing RED, all other indicators off	Input Voltage out of Range 13.8V to 24V DC.
PWR flashing GREEN	DB210/DB220 Internal fuse blown, replace fuse.
PWR RED winking off 2 times every 4 seconds	The DB210/DB220 is in Safe Operation Mode. Check your power supply to make sure it is appropriate for your track voltage settings.
PWR flashing GREEN simultaneously with NET flashing RED	The DB210/DB220 is in Options Switch Mode.
PWR flashing alternating GREEN/RED once a second	The DB210/DB220 is overheated and has shutdown.
PWR flashing Green alternating with NET flashing RED slow, about once a second	The DB210/DB220 is updating IPL firmware Via LocoNet.
TRACK STATUS is lit	Indicates there is power to the track. This indicator will be GREEN or different shades of Yellow/Orange depending on Zero Stretching.
NET indicator Solid RED on	LocoNet OK.
NET indicator Solid on RED, wink off	DB210/DB220 detects a valid LocoNet message.
NET indicator off	DB210/DB220 detects a low voltage on LocoNet.

DB210/DB220 INDICATION LIGHTS

7.0 Customizing DB210/DB220-Option Switch Setup

The Option Switch (OpSw) setup allows you to customize the operation of the unit to meet your layout and operation preferences. The DB210/DB220's power up defaults are fine for most applications and the DB210/DB220 will run "out of the box."

7.1 Changing DB210/DB220 Option Switches

1. See the Option Switch Table below to decide which option switches you want to change.
2. Move the MODE toggle switch on the front of the DB210/DB220 into the "OP" position. The DB210/220 must be plugged into an active command station to configure it's OPSW. The PWR indicator will flash GREEN alternating with the PROG indicator flashing RED.
4. Connect your DT4xx or later throttle directly to the DB210/DB220 LocoNet A,B,or C.
5. Press the **SWCH** key on your throttle to enter Sw (Switch) mode. Since the DB210/DB220's MODE toggle switch is set to "OP", switch commands from your throttle will now control DB210/DB220 internal option switch settings instead of the accessory decoders (usually turnouts) on the layout.



6. Key in the number of the OpSw. In the example above, we have keyed in 6. As you browse through the OpSws, the right side of the text area will show the current setting for each OpSw, either "c" or "t".
7. Use the **CLOC / c** key to set the OpSw to **c** (closed) or the **OPTN / t** key to set the OpSw to **t** (thrown). In the example above we have changed OpSw 6 from its factory setting of **t** to **c**.
8. Exit DB210/DB220 Option Switch Mode by moving the MODE toggle switch on the DB210/DB220 to "RUN." Remember to reconnect LocoNet to the DB210/DB220. Track power will resume to the state it was in when you entered Option Switch Mode.

Note: Do not adjust any Op Switches that are not listed.

Unlisted option switches are reserved and changing them may cause problems with your system.

Special Instructions for DB210/DB220 Op Switches 39 and 40

For these Op Switches to work properly,

1. Set the OpSw to “**c**” by pressing the **CLOC / c** key.
2. Set the DB210/DB220’s MODE Switch to “SLEEP” mode.
3. Set the DB210/DB220’s MODE Switch back to “RUN” mode.
4. The operation will occur (data will be cleared) and the option switch will reset to “**t**”.
5. Your throttle display will still show “**c**” even though the reset has occurred.
6. The display will update the next time you access the OpSw.

7.2 DB210/DB220 Option Switch Tables

The following tables provide a list of the DB210/DB220 Option Switches and the impact of the change on the system.

DB210/DB220 Option Switch Tables

Option Switch #	Effect on System operation	Factory Default
OpSw 05**	c = Enter Voltage trim Mode	t
OpSw 18	t = Normal DB210/DB220 booster short circuit shutdown time	t
	c = Extended DB210/DB220 booster short circuit shutdown time	
OpSw 39*	c = Clears all internal memory states	t
OpSw 40*	c = Clears all internal memory states and sets Voltage Trim to default. Resets DB210/DB220 to factory default	t
<i>DB210/DB220 Option Switch Tables</i>		

*See special instructions in *above* for setting OpSw 39, and 40.

** See special instructions in *Section 4.10.1* for setting Voltage Trim.

8.0 Using the DB210/220 as an auto reversing booster

The DB210/220 can be configured as an auto reversing booster. The DB220 dual booster can be configured so that 1 or both of its boosters are configured for auto reversing. With the DB210 setting the switch to ON will cause the booster to be auto reversing. With the DB220 dual booster you have the option of either configuring either one or both of the boosters to be auto reversing. Set the AUTO REV switch to 1 and the R1A and R1B track outputs will be auto reversing. Set the AUTO REV switch to 1&2 and both R1 and R2 track outputs will be auto reversing.

In order for auto reversing to work a reference booster must be used. This can be either your command station or another booster. In the case of the DB220 when only R1A and R1B output are set for auto reversing the R2A and R2B outputs can be used as the reference booster. Visit www.digitrax.com for more information on auto reversing.

Use the figure 2 as a guide to configuring the DB210/220 for Reverse Loops. Note that the DB210/220 connections to the track are NOT directly connected to the track of any other booster or command station on your layout. In every case Digitrax requires double gapped isolation for each booster and command station.

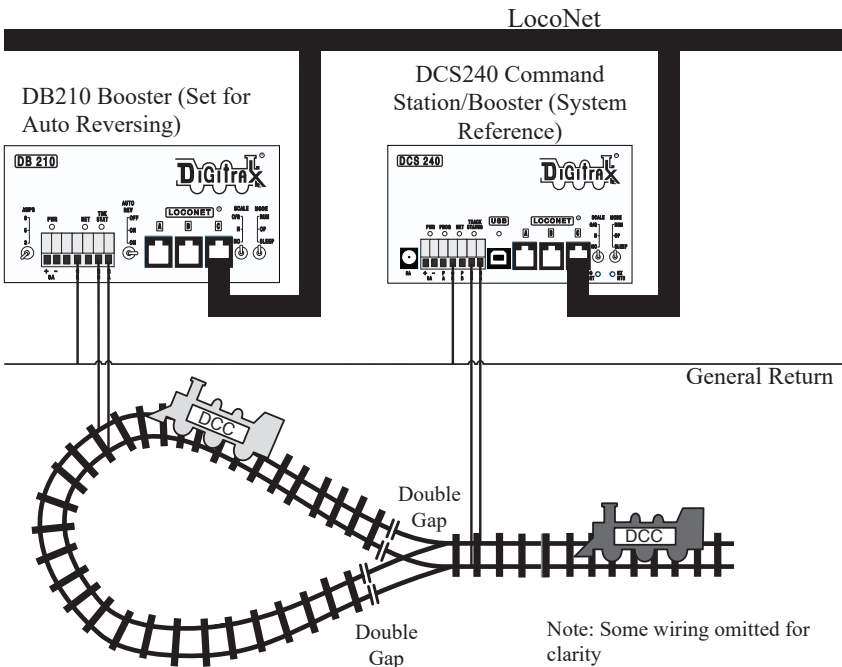


Figure 2: Using a DB210 for Auto Reversing

9.0 Updating the DB210/DB220 to the latest firmware

Occasionally Digitrax makes updates and improvements to the operational code of its products. In order to update your DB210/DB220 you will need to have the DigiIPLII utility installed on a computer connected to your LocoNet and the latest firmware (.dmf) file. The DB210/DB220 can be updated via LocoNet using a DCS240, PR3 or other computer to LocoNet interface. When updating via LocoNet the PWR indicator will flash Green alternating with the NET indicator flashing RED slow, about once a second For complete instructions and the latest firmware files visit <http://www.digitrax.com/downloads/>.

10.0 Troubleshooting Problems

10.1 Clean Track

The majority of intermittent operation problems can be traced to bad connections and poor or noisy wheel pickups on locomotives. Check track cleanliness and quality of wheel pickups.

10.2 The Quarter Trick

If your track does not have adequate power supply to the locomotives, then the signal won't get through either. Take a quarter or screwdriver blade and go around your layout creating electrical shorts every 10 feet. Your DB210/DB220 should beep 4 times and shutdown when the short is present. When the short is removed, the booster should beep once within 2-3 seconds and return to normal operation. If this does not happen, then you need to add more feeders. *See Section 2.0.*

10.3 The LT1 Tester

Check your LocoNet cables with the LT1 tester to be sure you don't have any cables that were made incorrectly. *See your Command Station Manual for more information.*

FCC Information

Radio or TV Interference: (this information is MANDATED by the FCC) This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measure

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

Note that any modifications to the equipment not expressly approved by Digitrax voids the user's authority to operate under and be in compliance with CFR 47 rules, as administered by the Federal Communication Commission. Digitrax believes any conscientiously installed equipment following guidelines in this manual would be unlikely to experience RFI problems.

For Canadian Users:

“This digital apparatus does not exceed the Class B limits for Radio noise emission from digital apparatus set out in the Radio Interference Regulation or the Canadian Department of Communications.”

Le present appareil numerique n emet pas de bruits radio-electriques depassant les limites applicables aux appareils numeriques de la classe B prescrites dans le Reglement sur le brouillage radioelectrique edicte par le ministere des Communications du Canada.

Warranty and Repair Information



Digitrax gives a one-year “no worries” warranty against manufacturing defects and accidental customer damage on all Digitrax products. That’s it! Simple, straightforward warranty, no tricky language!

All warranties on Digitrax products are limited to repair or replacement of Digitrax products at the discretion of Digitrax. Except to the extent expressly stated, there are no warranties, express or implied, including but not limited to any warranties of merchantability or fitness for a particular purpose.

For items that are no longer covered under warranty, whenever possible we will make repairs to units at fair and reasonable rates.

Please visit our warranty and repair page at www.digitrax.com/warranty for warranty and repair information and procedures.

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Digitrax Tech Support Team

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Contains links to all instructions sheets and manuals, application notes, videos and tons of helpful information.

Digitrax Decoder Selector

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Helps you find which decoder will fit in a particular locomotive.

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