

INSTALLING THE NCE SB3A/SB5 UPGRADE CHIP

1. Unplug the SB3A/SB5.
2. Remove the 2 screws that hold the top to the bottom of the case.
3. Carefully work the top of the case up and off. Set aside.

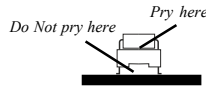


NCE SB5



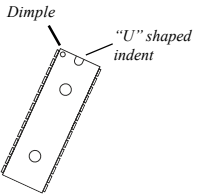
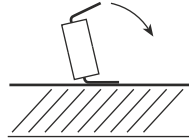
4. Locate the Microprocessor chip along the right hand side of the case. It is the largest chip inside the SB3A/SB5.

5. Use a small Flat screw driver or hobby knife to separate the Microprocessor chip from the socket. Make sure you pry BETWEEN the socket and the chip. Work end to



end lifting a little on one end, then a little on the other end. Pry the Microprocessor chip straight up from the socket. You will no longer need this chip but hang on to it for the time being.

6. The new Microprocessor chip may come to you with its legs slightly splayed outward. You will need to bend these legs so that they are straight down from the sides of the chip. Place the chip on a flat, hard surface as shown in the diagram and bend the body of the chip so that the legs are straight. Repeat with the opposite side legs.



7. There is a small "U" shaped indent or dimple in one end of the chip. This is the TOP of the chip. Place the chip on the socket with this "U" shape toward the rear of the case.

8. Align the legs to the socket. When satisfied that ALL of the legs are in line with a socket position, press the new chip down into the socket. Work from end to end, press a little on one end, then a little on the other end. Keep doing this until the Microprocessor chip is FULLY seated in the socket.



9. Examine the installation to ensure ALL 28 of the legs have engaged the socket correctly.
10. Replace the top of the case and the 2 screws that hold the top to the bottom. DO NOT OVERTIGHTEN THE SCREWS. You could inadvertently break the screw boss inside the case.
11. Plug the SB3A/SB5 back into your railroad and enjoy the greatest train control in model railroading!

Smart Booster v 1.65B

The SB5 Smart Booster adds expanded and updated features to a Power Cab DCC system. The first and most noticeable feature is additional power (5 Amps) to run trains and accessories.

Your PowerCab used with the SB5 can now be unplugged and used in true walk around fashion. It no longer needs to remain connected for the system to work.

Up to 6 cabs can be used with the SB5 (Cab address range 2 through 7).

Equipped Cabs have up to six recalls each when used with the SB5.

Additional 5 Amp boosters (DB5) may be added to the SB5 for even more power handling on larger layouts.

This manual covers only the addition and installation of the SB5 to a Power Cab system. For operation consult your Power Cab manual.

The SB5 does NOT have a programming track output. The basic Power Cab provides this capability.

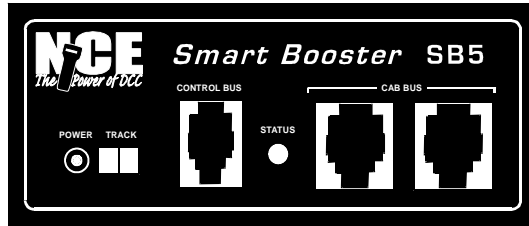
Use only the power supply included with the SB5. Use of another supply will void the warranty.

Power Connection:

The round connector plug from the power supply goes into the round power socket marked Power.

Track Terminals:

Strip 1/4 inch of insulation from the ends of your Track Bus wires coming from your track. Remove the Track connector plug from the SB5, it just pulls out. Insert the wires into the two pin plug. Tighten the screws so that they are snug. Not too tight, just snug. Insert this plug in the two pin socket on the SB5 marked Track.



SB5 Face Plate

Cab Bus - 6 Wire (RJ-12) Socket:

For small layouts and for checking out the system before final wiring, the Cabs can be directly connected to the SB5. For larger layouts this jack provides the ability to connect a longer/larger bus.

You may plug a cab directly into either of the cab bus jacks or a cab bus cable may be used to connect to additional UTP connector panels around the layout.

Control Bus - 4 Wire (RJ-H) Socket:

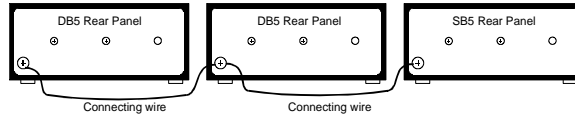
Connect the 4 pin cable from this socket to the first DB5 or PB105 Booster. This is the low level DCC signal that will be amplified by the power booster(s).

Status Light:

This light is always on except when a short circuit occurs (see "short circuit protection" below).

Ground Screw:

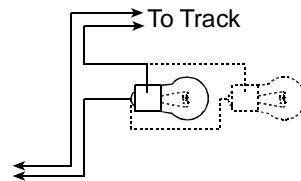
The screw on the rear of the SB5 is used to connect the SB5 to other ground screws on DB5 Boosters. We do not recommend connecting to earth ground or house ground.



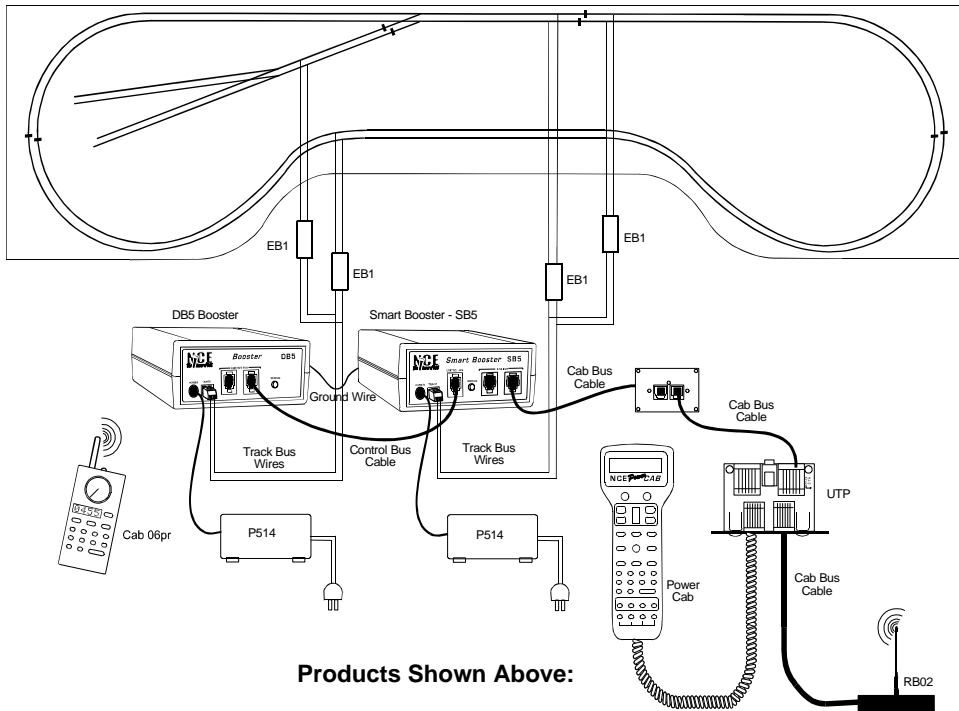
Short Circuit Protection:

The P514 Power Supply that is supplied with the SB5 incorporates internal short circuit protection that will shut down track power in the event of a short circuit. The unit will attempt to re-energize the track every 3-4 seconds until the short is cleared. The Status LED conveys status of the track power. The LED will 'blip' each time the P514 attempts to restore track power, steady 'on' of the LED indicates track power is restored.

The circuit protection of the SB5/P514 is not intended to protect the booster from long term short circuits. Do not allow a long term short circuit to persist for more than 3 or 4 minutes or damage may result. Therefore we strongly recommend an external short circuit protection device. This can be as simple as one or more automotive tail light bulbs such as an #1156 or similar wired in series with the track power output of the booster. NCE makes a variety of circuit

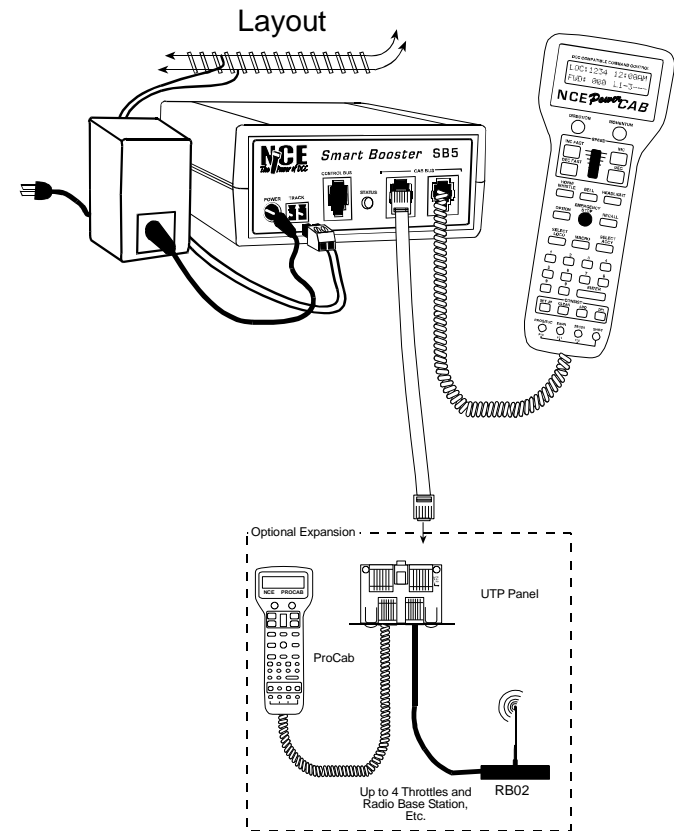


Expanded Use of NCE Products



Products Shown Above:

SB5	5240031
DB5	5240032
PowerCab	5240025
UTP Panel	5240207
EB1 Circuit Breakers.....	5240225
RB02 Radio Base Station.	5240023
Cab06pr Radio Throttle.....	5240044



protection devices and circuit breakers such as the CP6 and the EB1. This provides a means to divide your layout into separate power “districts.” A short or derailment in one district will only affect that section of track without shutting down other sections of the layout.

Connecting Extra Boosters:

The Control Bus output connector is used to connect additional boosters to the SB5. See diagram on page 6.

Layout Wiring:

For runs up to about 25 feet (8 meters), we recommend #16 gauge wire as a layout “track power bus”. If you need more than 25 feet #14 gauge is a better choice. For power drops from the track to the bus #20, #22 or #24 gauge wire is sufficient if you keep the length to 18 inches or less. With code 83 or larger rail keep your drops 6 feet (2 meters) or less apart. Code 70 and smaller rail should be about every 3 feet (1 meter). While it is not absolutely required, we suggest twisting the track power bus wires together (2 to 4 turns per foot). Don’t bother twisting short power runs or power drops.

Electrical Specifications:

P514 Power Supply (included) Replacement part number 5240238
 Maximum continuous track current (with cooling) 5.1 Amps
 Factory track voltage setting: 12 or 13.8 Volts. Selectable by switch on P514

Available Connections:

- 1- Two position TRACK output power connector
- 1- CONTROL BUS output connector
- 2- Cab bus "RJ" connectors
- 1- DC Power connector
- 1- Ground screw on rear of box

Indicator Lights:

- 1- DC power on (red LED)

DCC Specifications of the SB5:

Maximum number of cabs (throttles): 6 - Cab Addresses MUST be in the range of 2 through 7

Plus USB, AIU, Mini Panel accessories in address range of 8 through 10

Maximum number of simultaneous trains: 18

Functions controlled: 29

Locomotive address range: 1-127 (short), 0-9999 (long)

Accessory address range: 1-2044

Signal address range: 1-2044

Maximum number of advanced consists: 16 (addresses 112-127)

Maximum number of old consists: 36 (6 per cab)

Maximum number of Recalls: 6 per cab

Resetting (Rebooting) the System:

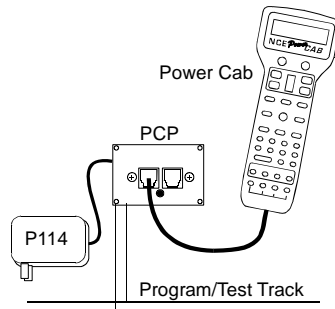
The SB5 has a large power storage capability. This stored up power will continue to operate the microprocessor in the SB5 for up to 15 seconds after power is removed. To reset the system, turn the power off for at least 20 seconds (wait until the red DC power LED goes completely out). If you see the "NCE SB5" message on your cab when you re-apply power, the system has properly reset to normal power up condition. If the above message does not appear during the power up process remove power and wait a bit longer before restoring it.

Returning the System to Original Factory Settings:

At the "normal display" press <PROG/ESC> followed by <5>. Press <ENTER> about ten times until the "RESET SYSTEM?" Prompt appears. Press <6> followed by <1> to reset the system to factory default condition. This takes about 10 seconds.

Using a Program Track:

The SB5 is a combination command station and booster, it does not have a dedicated Program Track. It does have the ability to Program on the Main. To access the NCE Program Track, you will need to have available, the original set up of the Power Cab and use it connected to a separate piece of track that you can use as the Program Track.



SB5 Booster Mode:

You can disable the command station portion of the SB5 to use it as a "Dumb Booster" with another DCC system. To set the SB5 to booster only mode:

1. Move the small switch on the bottom of the SB5 toward the rear of the box.
2. Connect a PowerCab or ProCab to the SB5.

- a. Press <PROG/ESC> followed by <5> to see the SET CMD STATION prompt on the LCD of the cab
- b. Press <ENTER> repeatedly until you see "ENABLE BOOSTER"
- c. Press <1> to enable booster only mode
- d. The status LED on the SB5 should start flashing rapidly indicating that there is no DCC signal present and the SB5 is now in Booster mode.

The "Control Bus" jack on the front of the SB5 becomes a DCC signal input rather than a DCC signal output. Connect your DCC signal here.

To return the SB5 to normal command station mode, just reverse the above process (switch toward front of box, disable booster mode in SET CMD STATION).

Note: When in Booster mode cabs connected to the SB5 will still appear to work normally except the word "BOOSTER" will replace the fast clock display. These cabs will not be able to affect actual operation of trains or accessories.

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Limited Warranty

NCE guarantees that when used with the factory supplied Power Supply, every Power Cab and Smart Booster DCC System is free from physical defects in material and workmanship for a period of 1 year. Use of a different Power Supply will void the warranty.

Within the first year full repair or replacement will be made to the original purchaser of any item that has failed due to manufacturer defect. Should the item no longer be produced and the item not repairable a similar item will be substituted at the manufacturer's discretion. The customer pays only shipping to the NCE Warranty Center. Please save your original receipt as a photocopy of it may be requested. NCE returns the items UPS ground unless other arrangements are made in advance. After the first year a fair and reasonable service charge may be placed on each failed item returned for repair.

This warranty is not valid if the customer has intentionally misused, miswired, performed any unauthorized alterations to the product, used the incorrect Power Supply or removed any product protection devices. In this case a service charge will be applied for all repairs and replacements. To protect the warranty, please contact the Warranty Center for authorization prior to altering any product. In no event will NCE's liability exceed the price paid for the product from direct, indirect, special, incidental or consequential damages resulting from the use of the product, its accompanying software or its documentation. NCE makes no warranty or representation, expressed, implied or statutory with respect to its products or the contents or use of this documentation and accompanying software and specifically disclaims its quality, performance, merchantability, or fitness for any particular purpose. NCE reserves the right to revise or update its products, software, or documentation without obligation to notify any individual or entity.

Please contact the Warranty Center for specific shipping instructions and any service charges before returning any product for service.

NCE Warranty Center - 585-265-0230