



The SB3a 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.

Power Cab(s) used with the SB3a 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 4 cabs can be used with the SB3a (Cab address range 2 through 5)

Cabs have up to six recalls each when used with the SB3a.

Additional 5 Amp boosters (DB3a) may be added to the SB3a for even more power handling on larger layouts.

This manual covers only the addition and installation of the SB3a to a Power Cab system. For operation consult your Power Cab manual.

The SB3a does NOT have a programming track output. The basic Power Cab provides this capability.

Power Supply:

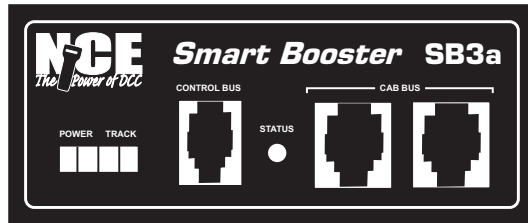
The SB3a requires a 14-18 Volt AC transformer (or 18-24 Volt DC power supply) capable of supplying 5 or more Amps. Under no circumstances should the voltage be greater than 24 VAC or 30VDC or certain damage will occur. Always use separate transformers for each booster. A suitable transformer is the NCE P515.

Power Terminals:

The two transformer or power supply wires connect here. DO NOT CONNECT the power wires to 120 Volts wall (mains) power.

Track Terminals:

The two wires to your railroad track should be connected here. DO NOT CONNECT the transformer power to the TRACK terminals or damage will result (we can tell).



SB3a Face Plate

Cab Bus - 6 Wire RJ-12 Socket:

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. For small layouts and for checking-out the system before final wiring, the Cabs can be directly connected to the SB3a. For larger layouts this jack provides the ability to connect a longer/larger bus.

Control Bus - 4 Wire RJ-H Socket:

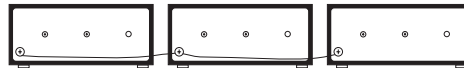
Connect the 4 pin cable from this socket to the first Power Station. This is the low level DCC signal that will be amplified by the power booster(s).

Status Light:

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

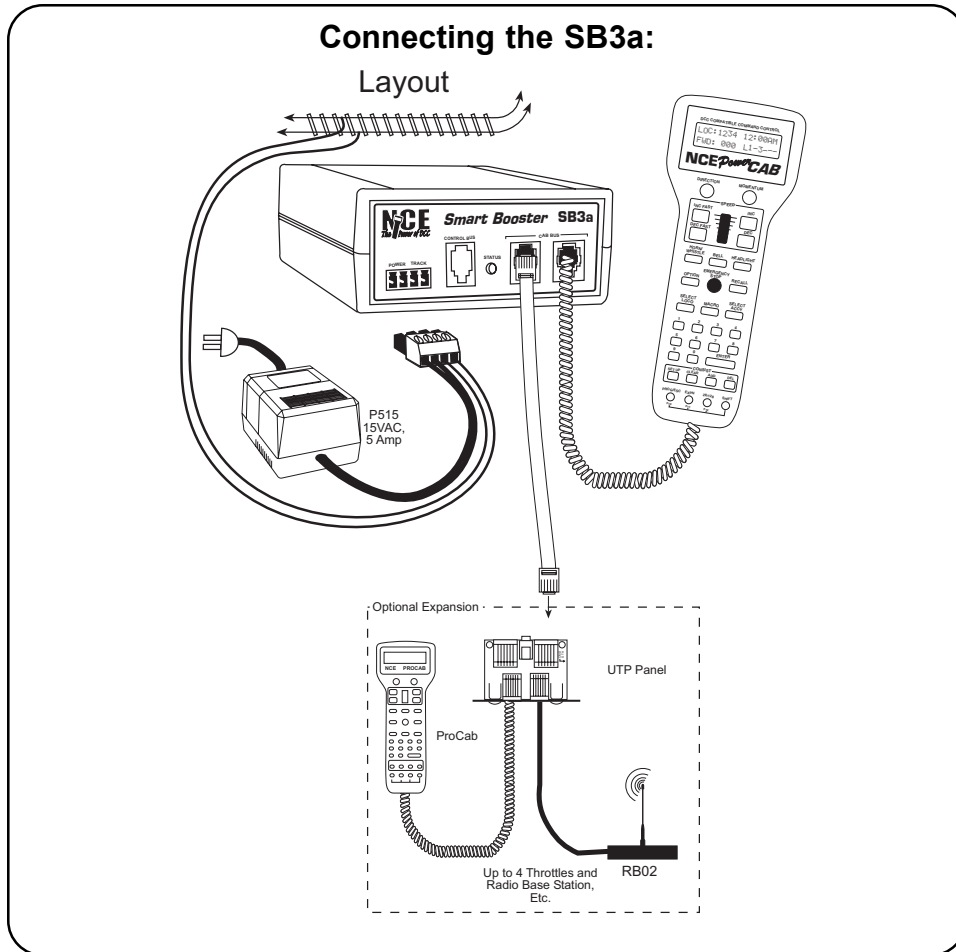
Ground Screw:

The screw on the rear of the SB3a is used to connect the SB3a to other ground screws on DB3a Boosters. We do not recommend connecting to earth ground or house ground.



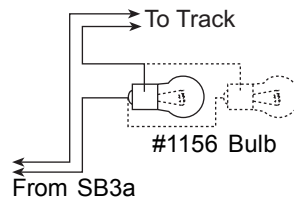
Short Circuit protection:

The SB3a incorporates internal short circuit protection that will shut down the 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 track power LED conveys status



of the track power. The LED will 'blip' each time the SB3a attempts to restore track power, steady 'on' of the LED indicates track power is restored.

The internal circuit protection of the SB3a 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 (see diagram). NCE makes a variety of circuit protection devices and circuit breakers such as the CP6, EB1 and the EB3. 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 SB3a. 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 or #22 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:

Input power requirement: 14-18 Volts AC (50/60Hz), 5 or more Amps

Maximum continuous track current (with cooling) 5.1 Amps.

Factory track voltage setting: 13.8v

Available connections:

- 1- Four position AC POWER input/TRACK output power connector
- 1- CONTROL BUS output connector
- 2- Cab bus "RJ" connectors
- 1- Ground screw on rear of box

Indicator lights:

- 1- DC power on (red LED)

DCC Specifications of the SB3a:

Maximum number of cabs: 4 - Cab Addresses MUST be in the range of 2 through 5.

Maximum number of simultaneous trains: 12

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: 24 (6 per cab)

Maximum number of Recalls: 6 per cab

Resetting (rebooting) the System:

The SB3a has a large power storage capability. This stored up power will continue to operate the microprocessor in the SB3a 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 SB3a

BOOSTER” 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.

Extended Function Control

F13-F28: While holding the Shift key down, press the HEADLIGHT key once to access F10 through F19. Still holding the Shift key down, press the Headlight key one more time to access F20 through F28. Release both buttons. You will see the F10-F19 or F20-F28 displayed on the Pro Cab LCD in the lower, right corner.

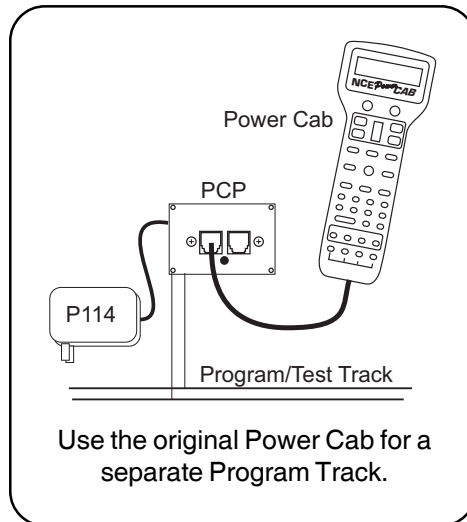
To turn on or off a function, just press the **LAST** digit of the function number. For example: To turn on Function 14, press and **HOLD DOWN** the SHIFT key while you press the HEADLIGHT key. Release the Headlight and Shift key. Then press the 4 button. Function 14 will turn on. To turn on Function 23, press and **HOLD DOWN** the SHIFT key while you press the HEADLIGHT key **TWICE**. Release the HEADLIGHT and SHIFT key. Then press the 3 button. Function 23 will turn on. This is a toggle key sequence. When you turn a Function on, you will need to go through the sequence again to turn the Function off.

Press the EXPN key and you can see which function is turned on or off. This is display only, you must go back to SHIFT and HEADLIGHT keys to actually turn a function on or off. The top line of the LCD has functions 1-14, ‘-’ indicates the function is off, a digit (1=F1, 2=F2, etc.) means the function is on. The 2nd LCD line shows functions F15-F28 in the same manner. Pressing EXPN a second time returns the cab to the normal display.

Note: This feature will not work in Radio Mode on a Pro Cab.

Using a Program Track:

The SB3a 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.



SB3a Booster Mode:

You can disable the command station portion of the SB3a to use it as a “Dumb Booster” with another DCC system. To set the SB3a to booster only mode:

1. Move the small switch on the bottom of the SB3a toward the rear of the box.
2. Connect a PowerCab or ProCab to the SB3a.
 - a. Press <PROG/ESC> followed by <5> to see the SET SMD 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 SB3a should start flashing rapidly indicating that there is no DCC signal present and the SB3a is now in Booster mode.

The “Control Bus” jack on the front of the SB3a is now a DCC signal input rather than a DCC signal output. Connect your DCC signal here.

To return the SB3a 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 SB3a 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 every Power Cab and Smart Booster DCC System is free from physical defects in material and workmanship for a period of 1 year.

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 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

Power Cab and SB3a Accessories



Pro Cab™ - 524-10

Our deluxe Pro Cab provides the most user-friendly access to all system features. Uncomplicated menus on the easy to read, backlit LCD display guide you through the most advanced operations with a minimum of fuss. Our **Pro Cab-R™** - 524-11 is also available radio equipped.

Engineer/Operator Cabs

The **Cab04™** and **Cab05™** are our most popular engineer cabs. Both cabs feature easy selection of locos/consists, single button operation of decoder functions, momentary HORN button. Our unique OPTION button that can be programmed to act as any button you wish, even those found on a much larger cab.

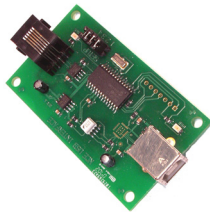
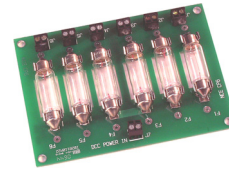
The **Cab04™** uses a more conventional knob for speed control and is available with either a potentiometer (**Cab04p™** - 524-12) or digital encoder (**Cab04e™** - 524-14). Both varieties of the Cab04 can be set to YARD mode. Yard mode makes the speed knob act as a "center off" speed control.

The **Cab05™** - 524-16 uses pushbuttons for loco speed control.

Cab 04p™ is also available radio equipped (524-13).

CP6 Circuit Protection - 524-227

Circuit protection for up to 6 sections of your railroad. Operates with ANY DCC system. Factory set to 1 Amp per section. Sections can be connected together for more power per section. See optional lamp packs below for 1.75 Amps per section.

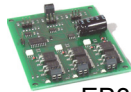


USB Interface - 524-223

Add this USB computer interface for computer programming and/or operation of your Power Cab equipped layout. Requires USB cable, computer and railroad computer program such as JMRI Decoder Pro and Panel Pro.

UTP Cab Bus Panel - 524-207

This is our low cost, easy to use cab bus panel. All four RJ-12 jacks are wired in parallel for easy plug and play use. Includes a black anodized fascia plate.



EB3



EB1

EB1™ - 524-225

Provides short circuit protection for a single power district. Can be used with any DCC command system rated at 3 to 10 Amps.

EB3™ - 524-217

Provides short circuit protection for up to three power districts. Can be used with any DCC command system rated at 3 or more Amps.