

SM-PB3 Push Button Stack Match Controller Manual

(www.hamation.com)



Front and Rear Views of the SM-PB3 controller.

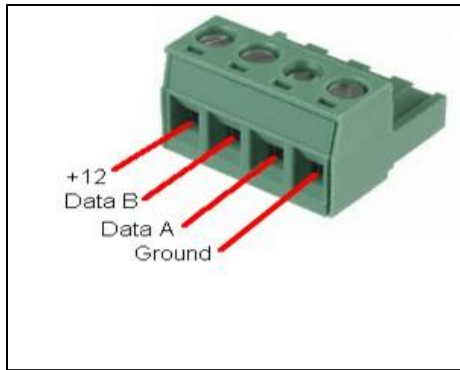
Introduction

The PB-3 Stack Match controller is a replacement for the rotary switch Stack Match controller. It features pushbutton switches for easy antenna selection and has an Auxiliary output that may be used for phase control or any other purpose that requires +12 V DC to activate. It is a component of the ShackLAN product line and as such can be fully remotely controlled via computer with our ShackLAN Control Center software. All outputs are switched with relay contacts for maximum reliability and power for the external switching unit may be applied from a separate power source to provide maximum isolation from the ShackLAN network. There is also a PTT input to allow different stack configurations for transmit and receive. Up to four PB-3 controllers may be used on the ShackLAN network. Configuration is simple using pushbutton switches on the front panel. The PB-3 has two operating modes to suit your operating preference. The default mode is push-on/push-off for antenna selection and the other is direct antenna selection.

Installation

ShackLAN Network and Power Wiring

All units in the ShackLAN product line use the same connector and pinouts for their network connections. Older units, as well as antenna switches and controllers, network connections are made to a 4-pin removable terminal block using the diagram below. Only a single connection to a power source is required as power is distributed throughout the network. A good, inexpensive source for the network cable is standard CAT-5 network cable. Stranded cable is recommended as solid wire is prone to breaking under the screw connectors. A good source for stranded CAT-5 cable is Monoprice. Parallel three wires for the +12 V DC and three other wires for the Ground connections. Be sure you use one of the twisted pairs for the data connections. Only a single wire is needed for each of the data lines as they carry no current. When using CAT-5 cable, be sure to use the same parallel combinations on each unit in the system.



Newer ShackLAN products use a 6-pin "RJ-12" connector, also known as a modular telephone connector, for interconnecting the ShackLAN units. Connections from the antenna switch controllers to the antenna switch still use the 4-pin screw terminal connector. Many units have a pair of connectors to facilitate "daisy-chaining" of the units. Each unit is supplied with a 36" cable. Be aware that 6-conductor modular telephone cables are rare in your local variety store. Some may have 4 conductors and can be used if necessary but many of these "cheap" cables have only 2-conductors which will not work.

Only one ShackLAN device should be connected to your power supply as power is distributed over the network. For early units with only the green 4-pin connector, connect the power to the +12 V DC and GND pins on only one unit. Later units have a separate power jack and a modular network connector. The power jack on the later units is a standard 2.1 mm connector with center pin positive. Voltage should be between 12 V DC and 14 V DC. Do not exceed 15 V DC as each unit has spike and surge suppression that clamps at 16 volts. Current requirements depend on how many devices are on the network but supply of 1 amp is adequate for most systems. Those with multiple antenna switches should have at least 500 mA for each switch. A 36 inch (91.44 cm) power cable is supplied with each unit. The wire with the white tracer is positive and the solid black wire is ground.

Isolated Switch Power (optional)

The PB-3 controller may be configured to use a separate power source for the remote switch unit to isolate the remote switch unit power from other units on the ShackLAN network. This is recommended if you are in a lightning prone area. This feature requires power to the controller be supplied via the ShackLAN network from other units. Isolate the power by opening the power connection between the 2.1 mm power jack and the modular network connectors using the following procedure:

- 1 - Remove the rear panel and slide the control board far enough out of the case to expose the black relays.
- 2 - Cut the two small wire jumpers located behind the PTT jack to the right of the relays.
- 3 - Slide the control board fully into the case.
- 4 - Install the rear panel.

Connect the isolated power source to the 2.1 mm power jack. Center pin is positive. The supplied power cable may be used and the wire with the white tracer is positive and the solid black wire is ground.

Remote Switch Connections

Connections to the remote switch unit are made using the green 6-wire terminal plug. The basic Stack Match requires five wire connections. Add an additional wire each for phase switching and an auxiliary function. Connections assume that antenna 1 is the top antenna and from the rear panel are:

- IN - Connect to IN terminal on remote unit
- 3 - Connect to #3 terminal on remote unit
- 2 - Connect to #2 terminal on remote unit
- 1 - Connect to #1 terminal on remote unit
- G - Connect to GND terminal on remote unit

A - Auxiliary control output for any purpose requiring +12 V DC when enabled (optional)

PTT Input (optional)

Connect a cable from the PTT input to the PTT output on the radio if you wish to have separate antenna configurations for transmit and receive or to prevent antenna switching during transmit periods. Ground this input to activate. You will need a "Y" adapter if you are using an amplifier.

Configuration

Unit ID (network address)

If you are using multiple PB-3 controllers in your station and want computer or remote control ability you must set each controller to a unique address. This is done with front panel switches by holding in the ALL pushbutton while pressing one of the other pushbuttons and then releasing both pushbuttons. Unit ID is set as follows:

- PB-3 #1 = ALL + TOP
- PB-3 #2 = ALL + MID
- PB-3 #3 = ALL + BOT
- PB-3 #4 = ALL + AUX

The controller will blink the LED next to the pushbutton three times to indicate the unit ID.

Operating Mode

The default operating mode (Mode 1) is Push-On/Push-Off. The alternate mode (Mode 2) is direct selection. This mode directly selects the antenna whose button is pressed. Multiple antennas are selected by simultaneously pressing the buttons for the desired antennas. Switch between the two modes by pressing and holding the AUX button longer than two seconds. Upon releasing the button the current mode will be indicated by flashing two LEDs as follows:

- Mode 1 = TOP + AUX LEDs (Push-On/Push-Off mode)
- Mode 2 = MID + AUX LEDs (Direct selection mode)

Operation

Power Up

On power up the PB-3 Controller will scan thru the four LED indicators and then flash one of the LED three times to indicate the unit ID. The PB-3 will then flash one of the antenna LEDs with the AUX LED to indicate the operating mode. The controller is now ready for use.

Antenna Selection Mode 1

In Mode 1 the antenna buttons toggle the antenna selection. This is the simplest mode of operation. Pressing one of the antenna buttons will alternate between adding and removing that antenna from the stack. Note that the controller will not allow you to unselect all antennas. All antennas may be quickly selected using the ALL button.

Antenna Selection Mode 2

In Mode 2 the antenna buttons directly select antennas. Pressing the TOP button will select only the top antenna. Same for MID and BOT buttons. To select two antennas you must press buttons for both antennas simultaneously. All three antennas are easily selected with the ALL button.

Transmitting Antenna Configuration

The PB-3 has the ability to switch to a different antenna configuration for transmitting. Set the transmit configuration as in normal operation and then press and hold the ALL button for longer than two seconds to save the transmit configuration. The controller will flash the antenna LEDs to indicate success. Invalid configurations are indicated by flashing the AUX LED. The PB-3 will now use this configuration whenever the PTT input is active.