

BASIC OPERATIONS

Starting your board

Press and hold the POWER button until you hear the beeper “click” and see the LED flash the battery level, then release:

- GREEN **8.6 volts or more**
- YELLOW **8.5 volts to 7.5 volts**
- RED **7.4 volts or less**

Firing Modes

All (5) Firing Modes are enabled by default and indicated by a “fast flash” on the LED. Tapping the power button advances to next available mode. This operation is programmable.

- PURPLE **RAMPING** PSP default/ininitely tunable
- BLUE **SEMI AUTO** 1 shot per pull
- TEAL **REACTIVE** 2-5 shots per pull/release
- GREEN **BURST** 2-5 shots per pull
- YELLOW **FULL AUTO** Fires continuously while pulled

Eye Control and Eye/Breach Status

Tap the eye button to toggle the eye operation On and Off. All eye status and breach issues are indicated by a **RED LED**

- SOLID ON** No ball detected and Long Beep
- SLOW FLASH** Eyes Toggled Off (*no mode changes)
- FAST FLASH** Blocked Eyes (*when enabled)

When the LED is displaying the “fast flash” Firing Mode LED, your eyes are operating, detecting paint, and ready to fire.

Turning your board off

Press and Hold the power button about 3 seconds until the LED **FLICKERS WHITE** and shuts off, then release the power button.

PROGRAMMING and CUSTOMIZATION

Settings Mode

To adjust your board settings, hold down the trigger and turn the marker on. Once the LED starts flashing **WHITE**, release the trigger and power button.

The LED will now start a **PURPLE FLICKER** indicating you are at the first adjustable setting (Firing Mode / see settings list). Tapping the trigger advances to the next adjustable setting and eventually wraps back around to this first setting again.

When the LED is indicating the setting you wish to adjust, pull and hold the trigger until you hear the “selection” tone, and then let go. The board will then count (flash and beep) the current value of the setting. When the board is done counting you have 3 seconds to start the entry of a new value by tapping the trigger the number of times for the new value. To save the new setting value, tap the power button (like an ENTER KEY). The board will then “rainbow flash” the LED, sound a “save” tone, then revert back to the LED indication for the setting you have adjusted. If you want to double-check your newly adjusted value, pull and hold the trigger again to restart the counting operation.

Restoring Factory Defaults

Pull and hold the trigger in Settings Mode for 5 seconds until you hear the “reset” tone and the LED illuminates **SOLID WHITE**. Release the trigger and the LED will flash **WHITE 3x** again then return back to the first programming setting with all settings restored to default values.

STANDARD INCLUDED FEATURES

Forced Shot - Active during empty breach conditions when you pull & hold the trigger (use this to trigger sound activated loaders).

Trigger Buffering - Automatically “queues up” a valid trigger pull when actively firing a ball for fast and smooth paint streaming.

BPS Fine Tuning Mode

The BPS Fine tuning mode allows you to easily adjust and maximize your marker’s rate of fire. The true rate of fire can be influenced by many factors external to your marker, including temperature, paint, ambient pressure changes from weather or altitude, along with general weather conditions overall.

Throw in the additional variance in accuracy of the microcontroller in your gun and the chronograph you’re shooting across and you get a compounding of many small, but influential factors.

Rate of fire is controlled in your marker by calculating a “Holdoff Delay” based on the desired rate of fire you want to shoot at. While this value is an ideal number based on standard clock timing operations, this delay can fall long or short for all the reasons iterated above.

The BPS Fine Tuning mode lets you add or subtract up to 15ms of time from this delay on a **per firing mode basis**, providing you the ability to easily and precisely adjust your rate of fire to squeeze every last bit of performance from your marker despite all the internal and external conditions that can affect it.

Start tuning by firing a few shots across the chronograph to determine your current rate of fire (best measured in full auto or burst modes - however, you can tune and compensate for all modes).

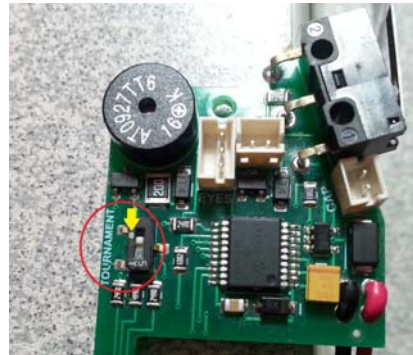
DECREASE the rate of fire by tapping the power button, or INCREASE the rate of fire via a tap and hold operation with the power button. Fire several more shots and determine if the new rate of fire is at or below the max BPS rate allowed by your event. Repeat this process until you’re satisfied with the rate. Once set and consistent, shut down the marker to save off this new rate with a pull and hold of the trigger.

BPS RATE DECREASE - Tap the Power Button and you’ll hear a “decrease” tone for a slower rate of fire (+1ms Holdoff).

BPS RATE INCREASE - Press and Hold the Power Button for 1 second until you hear an “increase” tone for faster rates (-1ms Holdoff).

TOURNAMENT LOCK

When installing your Vindicator Board, note the position of the Tournament Lock switch. It is labeled “Tournament” and slides up and down. In the UP position as indicated by the dot (see yellow arrow), the board is programmable. Slide the switch down to lock out all program changes for compliance with tournament rules.



STK Paintball, Inc.

PO Box 1725
Lyons CO 80540

Phone: 303.823.9222
E-mail: sales@stkpaintball.com

PROTO RIZE



Vindicator
LED Upgrade
Board



USER
MANUAL

STK Paintball, Inc.

VINDICATOR SETTINGS TABLE

LEGEND (ms) = Milliseconds (sec) = Seconds (bps) = Balls Per Second (pps) = Pulls Per Second			
Firing Mode Settings			
Mode Enable/Disable*	Purple Flicker	1 - 31	31
Ramping Mode Settings			
Max Rate of Fire (bps)	Blue Flicker	5-25	10
Semi/Safety Shots	Teal Flicker	1-8	3
Kick-In Rate (pps)	Green Flicker	1-8	8
"Ramp To" Mode	Yellow Flicker	1-4	3
"Ramp To" Setup	Red Flicker	1-3	3
Sustain Rate (pps)	Purple Fast Flash	1-8	8
Restart Timer (0.1 sec)	Blue Fast Flash	1-16	10
Semi Auto Settings			
Max Rate of Fire (bps)	Teal Fast Flash	5-25	12
Reactive Settings			
Max Rate of Fire (bps)	Green Fast Flash	5-25	12
Rounds per pull/release	Yellow Fast Flash	1-5	1
Burst Settings			
Max Rate of Fire (bps)	Red Fast Flash	5-25	12
Rounds per pull	Purple Slow Flash	2-5	3
Full Auto Settings			
Rate of Fire (bps)	Blue Slow Flash	5-25	12
Trigger Settings			
Leading Edge Debounce (ms)	Teal Slow Flash	1-30	10
Trailing Edge Debounce (ms)	Green Slow Flash	1-30	10
Solenoid Settings			
Dwell Time (ms)	Yellow Slow Flash	5-50	40
First Shot Dropoff Dwell* (ms)	Red Slow Flash	1-8	8
First Shot Dropoff Delay (sec)	Purple Solid	1-25	10
Eye Settings			
Breach Load Delay (ms)	Blue Solid	1-20	3
Operation Mode*	Teal Solid	1-3	1
Eyes Off Max Rate of Fire (bps)	Green Solid	5-15	10
Marker Settings			
Notification Control*	Yellow Solid	1-4	3
Auto Shutoff Timer *	Red Solid	1-20	1
Description	LED	Range	Reset

SPECIALIZED SETTING DEFINITIONS*

Auto Shutoff Timer

1 = Auto Shutoff Disabled (default)
2 to 20 = Shutoff Delay Time in 3-minute increments

Notification Control

1 = AUDIO Notifications Only (NO LED)
2 = LED Indications ONLY (NO AUDIO)
3 = LED Indications and Audio Notifications enabled (default)
4 = ALL Notifications OFF (NO LED and NO AUDIO / Night Games)

Eye Operation Mode

1 = Eyes On Operations (default)
2 = Eyes On with Eye Block Detect (Automatic BPS adjustment)
3 = Eyes Off Operations (Bypass eye operation / Fire @ Eyes Off BPS)

First Shot Dropoff (FSDO) Dwell

1 to 7 = FSDO enabled adding 1-7ms of dwell after the FSDO delay
8 = FSDO operations are disabled and the FSDO delay is ignored

Firing Mode Enable/Disable

Control which modes are available and selectable by tapping the power button in firing mode:

Value	Ramp	Semi	React	Burst	Auto
1	On	Off	Off	Off	Off
2	Off	On	Off	Off	Off
3	On	On	Off	Off	Off
4	Off	Off	On	Off	Off
5	On	Off	On	Off	Off
6	Off	On	On	Off	Off
7	On	On	On	Off	Off
8	Off	Off	Off	On	Off
9	On	Off	Off	On	Off
10	Off	On	Off	On	Off
11	On	On	Off	On	Off
12	Off	Off	On	On	Off
13	On	Off	On	On	Off
14	Off	On	On	On	Off
15	On	On	On	On	Off
16	Off	Off	Off	Off	On
17	On	Off	Off	Off	On
18	Off	On	Off	Off	On
19	On	On	Off	Off	On
20	Off	Off	On	Off	On
21	On	Off	On	Off	On
22	Off	On	On	Off	On
23	On	On	On	Off	On
24	Off	Off	Off	On	On
25	On	Off	Off	On	On
26	Off	On	Off	On	On
27	On	On	Off	On	On
28	Off	Off	On	On	On
29	On	Off	On	On	On
30	Off	On	On	On	On
31	On	On	On	On	On

RAMPING MODE SETTING DEFINITIONS

Semi/Safety Shots

1 to 7 = Number of required semi shots before ramping starts
8 = No semi shots required prior to ramping

Kick-In Rate

1 to 7 = Required trigger pull rate to initiate the ramping mode
8 = No required trigger pull rate prior to ramping

"Ramp To" Mode

1 = Percentage Ramping (multiplies your Rate of Fire)
2 = Reactive Ramping (fire per pull and release)
3 = Burst Ramping (fire multiple shots per pull)
4 = Full Auto Ramping (fire continuously as the trigger is held)

"Ramp To" Setup

1 = 100%, 2 = 200%, 3 = 300% (if Percentage Ramping)
1 to 3 = Shots per pull and release (if Reactive Ramping)
2 to 3 = Shots per pull (if Burst Ramping)
(n/a—Not applicable if Auto Ramping)

Sustain Rate

1 to 7 = Required trigger pull rate to maintain the ramping mode
8 = No required trigger pull rate to maintain ramping

Restart Timer

1 to 15 = Restarts in semi (0.1 to 1.5 seconds) if not at Sustain Rate
16 = Restarts in semi immediately (0 seconds) if not at Sustain Rate

TUNING MODES

Your *Vindicator* board has 2 unique tuning modes that allow you to easily adjust your marker for optimal performance and compliance. Both of these tuning modes are interactive requiring live fire across a chronograph. Ensure you and everyone around are wearing approved eye protection when performing these operations.

Starting the Tuning Modes

Power up your board with a press and hold of the Power button for about 5 seconds until you hear the "tuning tone" and the LED turns off, then release the Power button.

There are (2) tuning Mode choices available from here and you must select one in order to continue. Click the trigger to select the tuning mode choice, then tap the Power Button.

● RED/BLUE Dwell Optimizing Tuner
● YELLOW/TEAL BPS Fine Tuner

Once you have chosen your *Tuning Mode*, you'll then need to select which **FIRING MODE** to use for your tuning operation. Click the trigger to change between firing mode choices, and then tap the Power Button on the **SOLID LED** of your choice:

● PURPLE RAMPING
● BLUE SEMI AUTO
● TEAL REACTIVE
● GREEN BURST
● YELLOW FULL AUTO

Power Down in Tuning Mode

The Power Button is employed to increase or decrease the Tuning Mode values for both tuning mode operations, thus when you've completed your tuning updates, make a final shot then "pull and hold the trigger" for about a half second until the LED turns **SOLID WHITE**, then release the trigger. The marker will shut off and all your adjustments are all automatically saved.

Dwell Optimizer Tuning Mode

The Dwell Optimizer allows you to easily adjust and optimize your air solenoid dwell timing interactively with the use of a chronograph. Each time you start the Dwell Tuning Mode, the board will reset the current dwell timing to the default factory setting.

Paint choice can affect velocity so it's best to select the paint you intend to shoot at your event. You'll be shooting across the chronograph based on the MODE you selected at the BPS rate that's currently program med for that mode.

Start tuning by firing a few shots across the chronograph, then adjust your regulator pressure up or down as required to attain a velocity of 280-290 fps (or the FPS required by your event). With your regulator pressure and velocity established, you can now start optimizing the dwell time.

Fire several shots (3 to 4) over the chronograph, then DECREASE the dwell 1ms and fire several more shots. If the velocity remains in the 280-290 fps range, continue to DECREASE the dwell by 1ms and fire several more shots until you see the velocity drop from the initial 280-290 fps range.

Once the velocity drops, INCREASE the dwell by 1ms. Fire several more shots again over the chronograph to ensure your shot velocity is consistently back to the 280-290 fps range.

DWELL DECREASE (1 millisecond) Tap the Power Button and you'll hear the "decrease" tone.

DWELL INCREASE (1 millisecond) Press and Hold the Power Button for 1 second until you hear the "increase" tone.