# Virtue REDEFINED™

UPGRADE™ THE ENGINE

the www.virtuepaintball.com
# MANUAL

valid for most Virtue boards

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## #1

## Why Virtue®

1. **Smoother Shooting:** Virtue® will shoot the most consistent, smoothest streams of paint with ease.

2. **Easy Trigger Programming:** Change modes and settings through the trigger without opening the grip.

3. **Enhanced Trigger Sensitivity:** Virtue® Logic scans the trigger thousands of times every second, ensuring each pull is registered so you can shoot faster than ever.

4. **Advanced Eye Logic:** Virtue® Logic upgrades the firing system in your paintball gun to ensure your marker never chops paint again. Virtue® Redefined™ now includes Anti-Breach-Bounce Breakbeam Eye Logic.

5. **Fully Adjustable Ramping:** Virtue®'s Ramp mode is limitless. You control exactly when your gun starts ramping through the Ramp Initiation (1st - 10th shot) & Ramp Activation Speed (5bps – 15bps), and exactly how much it will ramp by (10-200% or Unlimited).

6. **More Modes:** Virtue® boards have 10 base modes of fire, but don't let the number 10 fool you. Unlike other boards that give you a fixed number of preset modes to choose from, each of Virtue®'s modes can be customized to your settings. There are literally thousands of modes to choose from.

7. **Complete Control:** All the settings on Virtue® are fully adjustable, giving you complete control over your gun: Two Player Profiles, Adjustable Debounce, Mechanical Bounce, Dwell, Eye Delay, Anti Bolt Stick, Ramp Activation Speed / Percentage / Initiation and Max Rate of Fire adjustable down to the 10th ball per second.

8. **Quality Control:** Virtue® hand tests each and every Board before it leaves the factory, ensuring you'll have a reliable, working Board.

9. **Superior Customer Support:** You can contact Virtue® by phone or email 5 days a week. Never be forced to wait several days just to get a quick question answered!

10. **Lifetime Warranty & Lifetime Upgrades:** Virtue® is the only upgrade Board guaranteed for life.

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## #2

## Virtue® Redefined™ Features At A Glance

Virtue® Redefined™ is the most comprehensive upgrade to the Virtue® platform to date. We've included all the original #1 Upgrade Virtue® software features, and added new modes & settings to make your gun perform to its full potential.

• 10 Modes of fire - Semi Auto, PSP Mode, NXL Mode, Millennium Mode, Auto Response, Full Auto, Breakout Mode, Ramp Mode, and Select-A-Mode™ and Training Mode.
• Player Profiles™ - Create and store two customizable player profile that make complex setting, rate of fire, and mode changes to your gun with the flip of a single dip switch.
• Wireless Upgrade Ready – Ready for future Virtue® wireless upgrades.
• Virtue® Trigger Logic and Redefined™ Eye Logic constantly monitors the trigger to ensure every trigger pull is recognized, giving you the fastest responding gun, and highest possible rates of fire.
• Adjustable Debounce, Dwell, Closing Dwell (Mini), Anti-Mechanical Bounce, Eye Delay, Ramp Activation Speed, Ramp Percentage, Ramp Initiation, Anti-Bolt Stick, Max Rate of Fire, 10th BPS MROF, Breakbeam/Reflective Eye Modes (Shocker).
• Ultra Bright LED status indicator - instantly know the status of your gun. If it's loaded, empty, has an eye malfunction and more.
• Increased Power Efficient Software - over 200,000 shots in testing.
• All settings are stored in non-volatile memory so they will not be lost when the battery dies or is removed.
• 10 minute idle auto-shutdown saves battery life.
• Low battery indicator software.
• Fail safe Factory Reset - reset all settings to Factory Defaults.
• Forced Shot allows the marker to be fired when the eyes are enabled, but no object is in the breech - just hold down the trigger for 1 second.
• Instant On allows the marker to be fired instantly upon turn on.
• Tournament Lock/Unlock allows the marker to be programmed through the trigger without having to constantly open the grip. With the tournament lock enabled, settings cannot be changed without opening up the grip.

## Installing Your Virtue® Board:

Below is a general installation guide. For precise details on your particular gun, please consult your particular gun's manual.
1. Open the grips and disconnect the battery from the stock board.
2. Carefully disconnect all wires and remove the screw(s) holding the stock board in place and remove the stock board.
3. Reconnect all wires to the Virtue® board, making sure plugs are aligned properly in the right direction.
4. Reinstall screws securing Virtue® board in place.
5. Connect your battery, and screw the grip back into place.

## LED Indicator

The LED Indicator tells you the status of your marker.

| | |
|---|---|
| Solid Yellow | (During startup) Low battery |
| Flickering Blue | Eye Enabled / Ball in Breech |
| Flickering Red | Eye Enabled / No Ball in Breech |
| Flashing Red | Eye Disabled |
| Flashing Blue | Eye Malfunction |

## Power Operation

To turn the Virtue® Board on, Simply press the marker power button and the Virtue® board will instantly turn your marker on. To turn the marker off, press and hold the power button for 3 seconds.

## Eye Operation

When the marker is turned on the eye system is automatically enabled. If your gun has only a power button, hold the power button for 1 second when the eyes are on to shut the eyes off. If your gun has a dedicated eye button, hold the eye button for 1 second when the eyes are on to shut the eyes off.

## Eye Malfunction - Flashing Blue LED

The eye logic differentiates between a ball being fired, and something continually blocking the eye (like your finger). If the eye becomes blocked, the LED will flash blue, indicating an eye malfunction and will automatically decrease the rate of fire to pevent balls from being chopped. When the object blocking the eye is removed the eye will automatically return to working mode.

## Low Battery Indicator - Yellow LED at Start Up

If your battery is low, the LED will be yellow for 1 second when you turn the marker on. If this happens, please change your battery as soon as possible.

## PLAYER PROFILES™ - Dip Switch 1 (on & off)

Create and store 2 customizable Player Profiles™ that make complex setting, rate of fire, and mode changes to your gun using the 1st Dip Switch. This is ideal for players who play in 2 different leagues, or want to set up their gun to quickly switch from two different configurations.

Dip Switch 1 "On": Use Player Profile 1
Dip Switch 1 "Off": Use Player Profile 2

Do not think of the Player Profiles as "on" or "off". Instead, use the "on" and "off" positions of the switch to switch between two different profiles. The player profile setting stores your last changed settings based on how the gun is setup in the programming menu in the current dip switch position. The stock settings for Player Profile 1 and 2 are the same.

*Ex. With Dip Switch 1 "On" enter the programming menu (see pg 5) and set your gun to your favorite NPPL settings-- make changes to the Debounce, Anti Mechanical Bounce, Rate of Fire, and Firing Mode.*

*Now set Dip Switch 1 to "Off" and enter the programing menu to make changes to your gun to be setup for X-Ball - put the gun in PSP Mode, Set the Rate of Fire to 13bps, Set the 10th BPS setting to 0.2bps. (So your marker will shoot 13.2bps), adjust the Debounce, decrease the Eye Delay.. make whatever changes you like.*

*Then between each tournament all you have to do is flip the dip switch to switch between "On" and "Off" for your custom NPPL and PSP modes.*

**ION/EOS USERS:** Ion boards are too compact to have a dip switch and instead use a button on the bottom half of the board. To alternate between player profiles, **with the gun off, press and hold this button for 5 seconds** until the LED flashes *Blue for Player Profile 1* or flashes *White for Player Profile 2*.

## Dip Switch 2 - Tournament Lock

Toggle the tournament lock on and off by adjusting dip switch 2. With dip switch 2 in the on position (unlocked), your Virtue® board can be programmed. Flip dip switch 2 to the off position (locked) to put your gun in tournament lock. Even with the programming menu locked, Player Profiles can still be accessed by flipping dip switch 1.

**ION/EOS USERS:** Ion boards are too compact to have a dip switch and instead use a button on the bottom half of the board. To lock and unlock the programming menu, **with the gun off press this button for 1 second** to toggle the LED between *Red for Locked and Green for Unlocked*.

## Factory Default Reset

To return all settings to the factory defaults, while in programming mode, hold the trigger down for 10 seconds until the LED turns white. Once the LED turns white, the LED will then flash through the rainbow of colors indicating that all settings have been returned to the factory default.

## Programming Mode Colors & Settings

To program your Virtue® board, hold down the trigger and turn the marker on. As the multicolor LED begins to cycle through a rainbow of colors, release the trigger. The LED will stop on purple, indicating you are now in the first programming setting; Firing mode. Tapping the trigger will then toggle through the different programming settings.

When the Led is lit for the setting you wish to adjust, pull and hold the trigger until the LED begins to flash, and then let go. The LED will flash the number of times the current value is set to. When the LED stops flashing you then have 3 seconds to enter in the new value by tapping the trigger the amount of times you want the new value to be set to. After you have set the new value, the LED will flash the number of times you have entered, and then flash the rainbow of colors and then return to the color you have adjusted indicating that the new value has been saved. To exit programming mode at any time, shut the marker off.

## Programming Continued

For programming instructions see the previous page, or the specific page of the setting you wish to adjust below.

| | |
|---|---|
| Firing Mode (pg 6) | Purple |
| Debounce (pg 7) | Green |
| Ramp Activation Speed (pg 7) | Blue |
| Ramp Percentage (pg 8) | White |
| Ramp Initiation Shot Count | Flickering Teal |
| Dwell (pg 8) | Red |
| Eye Delay (pg 9) | Teal |
| Anti-Mechanical Bounce (pg 9) | Yellow |
| Anti Bolt Stick (pg 9) | Flickering Green |
| Max Rate of Fire (pg 10) | Flickering Red |
| 10th BPS Max Rate of Fire (pg 10) | Flickering Blue |
| Eye Mode (Shockers only) (pg 11) | Flickering Yellow |
| Closing Dwell (Mini only) (pg 11) | Flickering Yellow |

## Firing Mode: Purple - Values 1 - 10 (default 1)

If you want to change firing modes first determine the number of the firing mode you want to change to:

1. Semi Auto: 1 trigger pull equals 1 shot.

2. PSP Ramping: First 3 shots are Semi Auto. The 4th shot shoots 3 shots per pull at your "Max Rate of Fire". Let go of the trigger for 1 second and the 3 shot Semi Auto count restarts.

3. NXL Style Full Auto: First 3 shots are Semi Auto. The 4th shot the marker shoots in 3 shot bursts per pull or full auto if you hold the trigger at your "Max Rate of Fire". Let go of the trigger for 1 second and the 3 shot Semi Auto count restarts.

4. Millennium Mode: First 3 shots are Semi Auto. The 4th shot the marker ramps 2 shots per trigger pull as soon as long as you maintain a trigger speed of 6 balls per second. The gun will ramp to your "Max Rate of Fire". Let go of the trigger for 1 second and the 3 shot Semi Auto count restarts. For Millennium play make sure to set the Max Rate of Fire to 12bps.

5. Auto Response: Shoot twice as fast as you pull the trigger. One shot per pull, and one shot per release of the trigger.

6. Full Auto: Hold down the trigger and fire at your "Max Rate of Fire".

## Firing Mode Continued: Purple - Values 1 - 10 (default 1)

7. Breakout Mode: Turn the gun on and the first shot shoots full auto as long as you hold the trigger. Release the trigger and the gun goes in "Ramp Mode". Restart your marker when in this mode to repeat the Breakout function.

8. Ramp Mode: Create a truly custom mode based on 4 Programming Settings: Ramp Activation Speed, Ramp Percentage, Ramp Initiation, and Max Rate of Fire. Once you have adjusted these 4 Settings (or just use the default settings), put your gun into Ramp Mode to access your custom mode.

Set the Ramp Initiation Shot Count to control how many purely semi only shots you want at the start of your string before the gun starts ramping (1-10). When you reach the "Ramp Activation Speed" the marker will ramp the rate of fire by your "Ramp Percentage" setting, up to your "Max Rate of Fire".

9. Select-A-Mode: Cycle through firing modes on the fly. Focus on playing and having fun without stopping to enter the programming menu.

**Two Button Guns:** Turn the gun on once you are in Select-A-Mode and tap the top button. The LED will flash the number of times of the mode you are in. Press the bottom button to scroll to the next Virtue® mode in the programming menu (modes 1-8, training mode excluded). Tap the top button to return to the previous mode. By default, Select-A-Mode starts in Semi Auto. When you restart the marker Select-A-Mode starts in the last previously used mode.

**One Button Guns:** Turn the gun on once you are in Select-A-Mode and tap the power button. The LED will flash the number of times of the mode you are in. Press the power button to scroll backwards and change your mode to the previous mode in Virtue's firing mode list (modes 1-8, training mode excluded). By default, Select-A-Mode starts in Semi Auto. When you restart the marker Select-A-Mode starts in the last previously used mode.

10. Training Mode: Train to improve your rate of fire. The low dwell and eye logic will not allow you to fire a ball in Training Mode. The firing mode is set to semi auto, and the dwell is lowered to reduce noise, and air usage. Practice tapping the trigger as fast as possible. Once you stop pulling the trigger, the software will calculate your peak rate of fire for the string. The LED indicator will then display your peak rate of fire by flashing teal and purple. Teal indicates the 10's column, and Purple indicates the 1's column. Ex) 15bps is 1 flash Teal and 5 flashes Purple. 9bps would be 0 Teal flashes and 9 Purple flashes.

Then, remembering the number of the firing mode you want to change to (semi is 1, psp is 2, nxl is 3, etc) do the following steps:
1. With the marker off, and tournament lock off, hold the trigger and turn the marker on. Release the trigger once the marker turns on.
2. The LED will cycle through a rainbow of colors and stop on purple.
3. Pull and hold the trigger until the LED flashes (default is semi auto, so the LED will flash once).
4. When the LED stops flashing, tap the trigger the number of times of the desired mode (semi is 1 tap, psp is 2 taps, nxl is 3 taps, etc).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on purple, indicating the new value has been set and you are now in the new firing mode.
6. To exit programming mode, shut the marker off.

## Debounce: Green - Values 1 - 30 (default 5)

Debounce is the amount of time the trigger has to be released before the next trigger pull is registered. Virtue®'s debounce algorithm, ensures every pull is registered giving the highest possible rate of fire. Values range from 1-30 (milliseconds) with the default set to 5.

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on green for Debounce.
3. Hold the trigger, the LED will flash what the Debounce is set to.
4. Tap the trigger the number of times of the desired debounce (1-30).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on green. The new value has been set.
6. To exit programming mode, shut the marker off.

## Ramp Activation Speed: Blue - Values 5 - 15 (default 5)

Ramp Activation Speed affects Firing Mode 8 (Ramp Mode). The default setting is 5: pull the trigger at 5bps to activate ramping, which is determined by the "Ramp Percentage" setting. The Ramp Activation Speed setting waits for your Ramp Initiation Shot Count to be reached before kicking in. For instance, if you set Ramp Initiation to 7, the first 7 shots will be Semi Auto, after that as soon as you reach the Ramp Activation Speed as defined in this setting the gun will start to Ramp based on your Ramp Percentage. Values are equivalent to balls per second. For example, 5 = 5bps; 10 = 10bps, etc.

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on Blue for Ramp Activation Speed (RAS).
3. Hold the trigger, the LED will flash what the RAS is set to.
4. Tap the trigger the number of times of the desired RAS (5-15).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on blue. The new value has been set.
6. To exit programming mode, shut the marker off.

## Ramp Percentage: White - Values 1 - 23 (default 5)

Ramp Percentage affects Firing Mode 8 (Ramp Mode). Default is 5, which shoots unlimited once you reach the Ramp Activation Speed. The percentage table below shows the percentage of shots that will be added to your gun once the Ramping kicks in.

| Value | Percentage | Value | Percentage | Value | Percentage |
|---|---|---|---|---|---|
| 1 | 100% | 8 | 20% | 16 | 60% |
| 2 | 200% | 9 | 25% | 17 | 65% |
| 3 | 300% | 10 | 30% | 18 | 70% |
| 4 | 400% | 11 | 35% | 19 | 75% |
| 5 | Unlimited | 12 | 40% | 20 | 80% |
| 6 | 10% | 13 | 45% | 21 | 85% |
| 7 | 15% | 14 | 50% | 22 | 90% |
| | | 15 | 55% | 23 | 95% |

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on White for Ramp Percentage.
3. Hold the trigger, the LED will flash what the Ramp % is set to.
4. Tap the trigger the number of times of the desired Ramp % (1-23).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on white. The new value has been set.
6. To exit programming mode, shut the marker off.

## Ramp Initiation Shot Count: Flickering Teal - Values 1 - 10 (default 1)

The Ramp Initiation Shot Count affects Ramp Mode. The Ramp Initiation Shot Count sets how many shots must be fired before the Ramp Mode kicks in; all trigger pulls must be within 1 second of each other. A value of 2 means 2 shots must be fired before Ramping starts based on your Ramp Activation Speed and Ramp Percentage.

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on Flickering Teal for Ramp Initiation Shot Count.
3. Hold the trigger, the LED will flash what the Ramp Initiation Shot Count is set to.
4. Tap the trigger the number of times of the desired Ramp Initiation Shot Count(1-10).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on Flickering Teal. The new value has been set.
6. To exit programming mode, shut the marker off.

## Dwell: Red (default varies)

Dwell is the amount of time that the solenoid will be activated. Different Dwell values apply depending on the marker you are using. The default setting varies depending on marker type.

| Gun Type | Default Dwell |
|---|---|
| Angel G7 Virtue® Board | 14 |
| Angel 1 Virtue® Board | 6.5 |
| DM6/7/8/PM8 Ultralite Virtue® Board | 18 |
| Ego 05 Virtue® Board | 9 |
| Ego 06 Virtue® Board | 9 |
| Ego 07/8 Virtue® Board | 9 |
| Etek Ego Virtue® Board | 12 |
| Ion/XE/EOS/Epiphany Universal Virtue® Board | 30 (QEV 12-16) |
| Intimidator (2k4/5, Alias) Virtue® Board | 10 |
| Marq 6/7/Rapper/Closer/Protégé/Vice Virtue® Board | 8 |
| Mini Virtue® Board | 18 |
| Proto Rail / Proto 07 Virtue® Board | 14 |
| Proto SLG Virtue® Board (Sear Timing) | 25 (18 if using in PM7) |
| Shocker Virtue® Board | 12 |

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on red for Dwell.
3. Hold the trigger, the LED will flash what the Dwell is set to.
4. Tap the trigger the number of times of the desired Dwell.
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on red. The new value has been set.
6. To exit programming mode, shut the marker off.

## Eye Delay: Teal - Values 1-50 (Default 5)

The Eye Delay setting adds a small delay after the eye has seen a ball before it allows the marker to shoot. Players using non-force fed loaders may need to raise this setting to prevent chopping. The default setting is 5, with 1 being the fastest (No delay)

## Anti Mechanical Bounce: Yellow - Values 1-10 (Default 3)

Anti-Mechanical Bounce (AMB) allows you to adjust for mechanical bounce, which happens when "kick" from shooting causes the marker to fire extra shots. The default setting is 3, which is a low AMB. Settings range from 1-10 with 1 being AMB off (fastest) and 10 being slowest.

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on Yellow red for AMB.
3. Hold the trigger, the LED will flash what the AMB is set to.
4. Tap the trigger the number of times of the desired AMB (1-10).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on yellow. The new value is set.
6. To exit programming mode, shut the marker off.

## Anti Bolt Stick: Flickering Green - Values 1-20

Anti Bolt Stick increases the Dwell for only the first shot in a string after a delay in firing to ensure your gun does not have bolt stick or first shot drop off.

| Gun Type | Default |
|---|---|
| Angel G7 & Angel 1 *Virtue® Boards* | 1 |
| DM6/7/8/PM8 *Ultralite Virtue® Board* | 10 |
| Ego 05, 06, 7/8, Etek *Virtue® Boards* | 1 |
| Ion/XE/EOS/Epiphany *Universal Virtue® Board* | 6 |
| Intimidator, Marq, Mini *Virtue® Boards* | 1 |
| Proto Rail / Proto 07 *Virtue® Board* | 10 |
| Proto SLG *Virtue® Board (Sear Timing)* | 1 |
| Shocker *Virtue® Board* | 10 |

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on flickering green for Anti Bolt Stick.
3. Hold the trigger, the LED will flash the Anti Bolt Stick value.
4. Tap the trigger the number of times of the desired Anti Bolt Stick (1-20).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on flickering green. The new value is set.
6. To exit programming mode, shut the marker off.

## Max Rate of Fire Balls Per Second: Flickering Red - Values 7 - 25 (default 7)

The Max Rate of Fire BPS applies to all modes of fire and is adjustable from 8 to 25bps (or unlimited). The default value is 7, for unlimited, 8 is 8bps, 9 is 9bps, etc. Use the "Max ROF Balls per 10th of a Second" (below) to precisely set the rate of fire in 10th of a second increments. i.e. set this setting to 12, and the "Max ROF Balls per 10th of a Second" to 3, to have a rate of fire of 12.3 balls per second. **For a step by step guide, see the list at the bottom of the page**

## Max Rate of Fire Balls Per 10th of a Second:
### Flickering Blue - Values 1 - 10 (default 10)

The Max ROF Balls per 10th of a Second applies to all modes of fire and is adjustable from 1 to 9 (balls per 10th of a second). Use the "Max ROF Balls per 10th of a Second" to precisely set the rate of fire in 10th of a second increments. A value of 1 adds 0.1 bps to the MROF, 2 adds .2bps, etc. EX: Set the "Max Rate of Fire Balls Per Second" (above) setting to 12, and this setting to 3, to have a rate of fire of 12.3 balls per second. The default value is 10, which adjusts the additional balls per 10th second equal to 0 (a "Max ROF BPS" of 15, and a "Max ROF balls per 10th of a Second" of 10, would yield 15bps, not 16bps).

The 10th of a second setting will vary slightly from gun to gun. Virtue® recommends setting your rate of fire slightly below the regulations of the tournament you are playing in. If the maximum ROF is 13.3, it is advisable to set your gun under 13.3bps.

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on flickering red for Max Rate of Fire.
3. Hold the trigger, the LED will flash what the Max Rate of Fire is set to.
4. Tap the trigger the number of times of the desired MROF (7-25).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on flickering red. The new value for Max ROF balls per second is set.
6. Tap the trigger once for Flickering Blue, Max Rate of Fire Balls Per 10th of a Second.
7. Hold the trigger until the LED flashes the Max ROF Balls per 10th Second value.
8. Tap the trigger the number of times of the desired balls per 1/10th second (1-9 for 1 through .9bps, 10 is equal to 0)
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on flickering blue. The new value for Max ROF balls per 10th second is set.
6. To exit programming mode, shut the marker off.

## (Shockers Only) Eye Mode: Flashing Yellow- Values 1 - 2 (default 2)

All 07/08 (NXT) Shockers and newer currently use a breakbeam eye system. All 03 – 06 (SFT) Shockers use a reflective eye system. You need to set the Eye Mode setting of the Virtue® Shocker Board to match the eye system in your Shocker. Failure to do so and your eyes will work in reverse.

Value 1. Reflective Eye Logic
Value 2. Breakbeam Eye Logic

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*(Mini Only)*
## Closing Dwell: Flickering Yellow- Values 10 - 40 (default 18)

The Invert Mini requires power to the solenoid in both directions. This setting allows the user to adjust the amount of time the solenoid is energized in ½ millisecond increments to make the bolt return to the resting position. The default value is 18, which is equal to 9 milliseconds (x), and the values range from 10 – 40. Too high or too low of a setting will affect consistency and velocity.

1. Hold the trigger, turn the gun on, and then release the trigger.
2. The LED will flash a rainbow of colors and stop on purple. Tap the trigger until it stops on Flickering Yellow for Closing Dwell.
3. Hold the trigger, the LED will flash what the Closing Dwell is set to.
4. Tap the trigger the number of times of the desired Closing Dwell (10-40).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on Flickering Yellow. The new value has been set.
6. To exit programming mode, shut the marker off.

## Troubleshooting

Virtue® Boards are backed by a lifetime warranty and guaranteed to be free of any defects for life. If you encounter any problems with your gun please consult your gun's user manual first, as the problem may not be related to the Virtue® Board.

**Tip #1 When in doubt, replace the battery! Your marker will behave erratically if your battery is low.**

**Gun won't turn on:**
Check to make sure battery connected securely.
OR
Replace the battery.

**Won't go into programming mode:**
Make sure tournament lock is unlocked.

**Rate of fire is slow:**
Make sure you are using a fast hopper such as a HALO or VLocity with fresh batteries.
OR
Reset your boards settings to factory default.
OR
Eyes may be dirty, damaged or blocked. Turn off eyes and dry fire with no paint. If marker shoots fast, your eyes are dirty or damaged, or the eye wiring harness needs to be replaced.

## Troubleshooting continued...

**Gun will not fire (solenoid may or may not click):**
Make sure you are using a new 9 volt battery.
OR
Make sure the trigger is making contact with the microswitch.
OR
Reset your boards settings to factory default.
OR
Increase the Dwell.

**Poor air efficiency:**
Decrease the Dwell.

**Eyes are not working:**
Make sure you are in the correct eye mode and that the eyes are on.
OR
Check the eye wire harness for broken or pinched wires
OR
Clean and realign eyes.

**Breaking too much paint:**
Note: Is it cold out? Paint gets brittle and breaks easily in the cold.
OR
If **not** using a forcefeed hopper, increase the Eye Delay.
OR
Verify that the eyes are turned on (pg 5).

**Drop off:**
Replace the battery.
OR
Lube the gun lightly. Make sure it is clean and fresh lube is present.
OR
Increase the Anti Bolt Stick.
OR
Increase Dwell.

*Virtue® Board specifications subject to change without notice.*