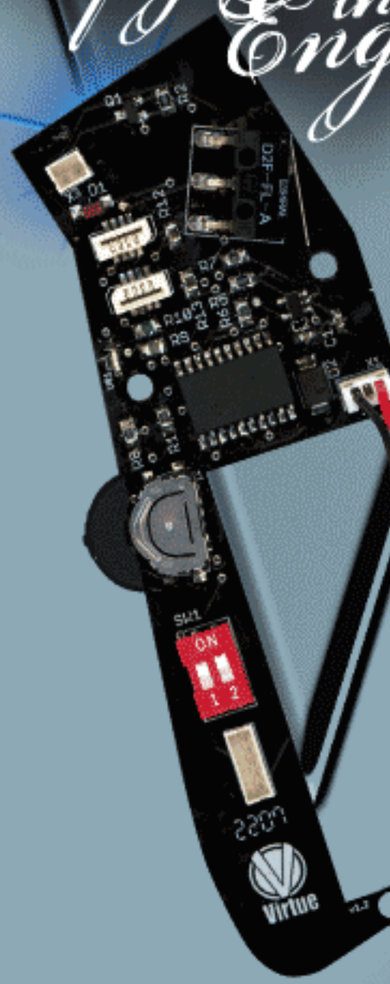
VIRTUE

A1 Board Manual

Upgrade the Engine



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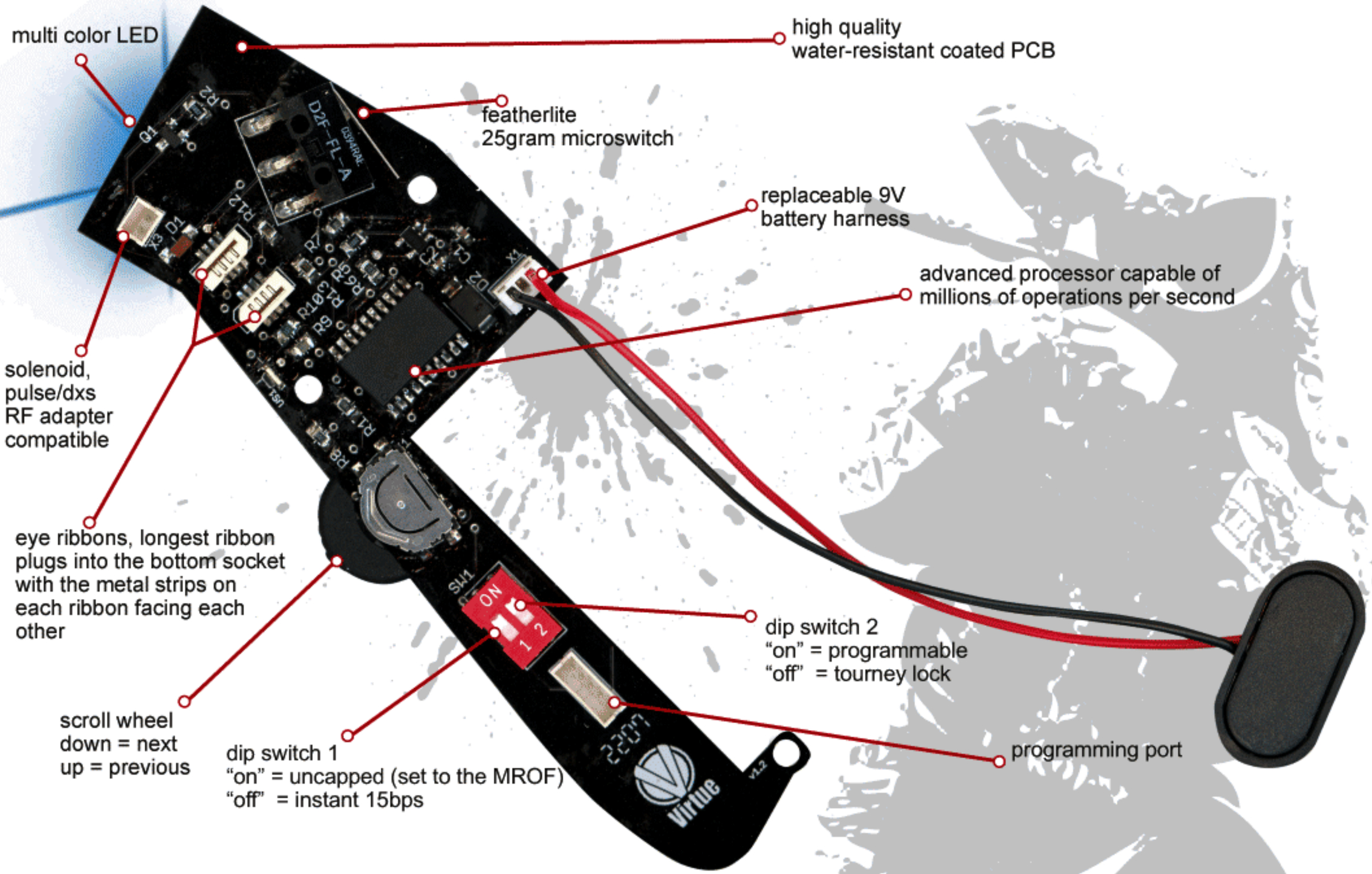

Why Virtue

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.

5. **Fully Adjustable Ramping:** Virtue's Ramp mode is limitless.You control exactly when your gun starts ramping once you pull the trigger at a specified rate (5bps – 15bps), and exactly how much it will ramp by (10-200% or Unlimited).

6. **More Modes:** Virtue has 7 base modes of fire, but don't let the number 7 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: Adjustable Debounce, Mechanical Bounce, Dwell, Eye Delay, Anti Bolt Stick (First Shot Drop off), Ramp Activation Speed, Ramp Percentage, and Max Rate of Fire.

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:** Virtue doesn't hide from its customers. You can contact Virtue's office by phone or email 6 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.

A1 Board Features At A Glance

Barrels, bolts, triggers...the same old upgrades, using the same old technology. Virtue is the only upgrade that actually replaces your gun's engine, improving performance at every level. Virtue upgrades the engine of your paintball gun.

Virtue's advanced trigger and eye logic ensure your marker will be the fastest on the field, while never breaking a ball, even in straight semi-auto. Virtue's fully adjustable modes, place virtually an infinite number of firing capabilities at your finger tips

- Integrated scroll wheel with multi color LED
- 8 Modes of fire - Semi Auto, PSP Mode, NXL Mode, Ramp Mode, Auto Response, Full Auto, Breakout Mode, and the **new Select-A-Mode**.
- 15BPS Ready - Be ready for any tournament series! Put dip switch 1 in the off position, and your maximum rate of fire is capped at 15bps!
- All firing modes have user adjustable maximum rates of fire from 10.50bps to unlimited rates of fire!
- Pulse Ready – Just plug in Virtues Pulse adapter harness.
- Virtue Trigger 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, Anti-Mechanical Bounce (AMB), Eye Sensitivity, Ramp Activation Speed, Ramp Percentage, Anti-Bolt Stick (ABS).
- Power Efficient Software extends the life of your battery.
- 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.
- Forced Shot allows the marker to be fired when the eyes are enabled, but no object is in the breech.
- 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 A1 Board:

1. Place the marker on its LCD side and remove the grip cheek by taking the screws out and disconnect the macro line hose, which will make removing the other items easier.
2. Gently disconnect the two eye ribbons and disconnect the solenoid wire.
3. There are two screws that attach your frame to your gun. Remove these two screws and remove your frame from the marker.
4. There is two screws that hold in your trigger in place. Loosen them enough to remove the trigger from the frame so that you can to remove the stock board. The board has three tiny screws that hold the board to the frame. Remove these screws being careful not to strip them and remove the upper plastic shield off the stock board.
5.Begin to lift the stock board from the trigger side first and then slide it out of the frame, making sure the scroll wheel button does not get damaged. At this time you will see the other side of the shield. Leave this here, it provides a non conductive surface for the Virtue Board to sit on.
6. Next, slide the Virtue board into place making sure you insert the scroll wheel first. If you do not do it this way, you run the risk of breaking the scroll wheel off.
7. Once you have slid your Virtue Angel 1 Board into place, screw the board down with the three screws from the stock board. Snug the screws when putting them in, and test to make sure the scroll wheel is not being affected nor has any obstructions.
8. Put the trigger back into the gun. You should back out all of the trigger adjustment screws. This is to make sure you do not crush the mirco switch when you reattach the frame to the body.
9. Reattach your frame to your body. Make sure you hold the wires in a safe spot while you do this. Once your frame is secure. Plug your macro hose back in and reattach your eyes and solenoid wires.
10. Lastly adjust your trigger to your liking. Connect a battery to your Brand New Angel 1 board. Close the grip up, read the rest of the manual and go have some fun.

LED Indicator

The LEDs on the side of the grip tells you the status of your marker.

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

Power Operation

To turn the Virtue Angel Board on, Simply press the scroll wheel in. To turn the marker off, press and hold the scroll wheel for 2 seconds.

Eye Operation

When the marker is turned on the eye system is automatically enabled. The eyes can then be turned off by pressing the scroll wheel for 1 second. To turn the eyes back on, turn the gun off, and then back on again. When the eyes are disabled the max rate of fire will not go over 23bps.

Eye Malfunction - Flashing Blue LED

Thee 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. When the object blocking the eyes 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.

Dip Switch 1 - 15bps Cap

Dip switch 1 is the Max Rate of Fire/15bps Cap lock. If dip switch 1 is in the on position, your max rate of fire is set to your “Max Rate of Fire” setting. If dip switch 1 is in the off position, the Max Rate of Fire of all modes is capped at 15bps. After changing this setting, you must turn the marker off before it takes effect.

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 Angel can be programmed. Flip dip switch 2 to the off position (locked) to put your gun in tournament lock.

Programming Mode Colors & Settings

To program the Virtue Angel 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:

Firing Mode (pg 7).....Purple
Debounce (pg 8).....Green
Ramp Activation Speed (pg 8).....Blue
Ramp Percentage (pg 9).....White
Dwell (pg 9).....Red
Eye Delay (pg 10).....Teal
Anti-Mechanical Bounce (pg 10).....Yellow
Anti-Bolt Stick (pg 11).....Flickering Green
Max Rate of Fire (pg 11).....Flickering Red

Scroll Wheel - Unique to the Virtue A1 Board

The scroll wheel on the Angel 1 Virtue Board can be used to cycle through settings when you are in the programming menu (see above). Press the wheel down to advance to the next setting, and press it up to return to the previous setting. The scroll wheel also works with the new Select-A-Mode by cycling through modes on the fly (see #8 on pg.6).

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.

Firing Mode: Purple - Values 1 - 8 (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 full auto at your “Max Rate of Fire”. Let go of the trigger for 1 second and the 3 shot Semi Auto count restarts.

4. Ramp Mode: 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”. The default is when your trigger speed reaches 5bps, the marker will ramp up to the maximum speed your loader can feed.

5. Auto Response: Two shots per pull. One shot on the pull, and one shot on the release of the trigger.

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

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. Select-A-Mode: Use the scroll wheel to cycle through firing modes. Turn the gun on and first tap the scroll wheel up or down, LED will flash the number of times of the mode you are in. Then press the scroll wheel down to advance to the next firing mode, or press the scroll wheel up to return to the previous firing mode. By default, Select-A-Mode starts in Semi Auto. When you restart the marker Select-A-Mode remembers the previous mode you used and will automatically start in that mode.

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 4 (Ramp Mode). The default setting is 5: pull the trigger at 5bps to activate ramping, which is determined by the "Ramp Percentage" setting. 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 - 21 (default 1)

Ramp Percentage affects Firing Mode 4 (Ramp Mode). Default is 1, which shoots unlimited once you reach the Ramp Activation Speed.

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

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 % (1-21).
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.

Dwell: Red - Values 10 - 30 (default 13)

Dwell is the amount of time that the solenoid will be activated. The values are set in 1/2ms increments so a value of 10 equals 5ms. The default is 13, and the values range from 5 – 30.

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 (10-30).
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).

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 Teal for Eye Delay.
3. Hold the trigger, the LED will flash what the Eye Delay is set to.
4. Tap the trigger the number of times of the desired Eye Delay (1-50).
5. The LED will flash the number of taps you entered, then flash the rainbow of colors, and stop on teal. The new value has been set.
6. To exit programming mode, shut the marker off.

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 (Default 1)

Anti-Bolt Stick (ABS) is the dwell time added to overcome first shot drop off. Provides for an extra 1 – 20 milliseconds of dwell.

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 ABS.
3. Hold the trigger, the LED will flash the ABS value.
4. Tap the trigger the number of times of the desired ABS (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: Flickering Red - Values 1-25 (Default 1)

The max rate of fire applies to all modes of fire and is adjustable from 10.5bps to unlimited.

Value	BPS	Value	BPS	Value	BPS
1	Unlimited	8	13.5	16	17.5
2	10.5	9	14	17	18
3	11	10	14.5	18	18.5
4	11.5	11	15	19	19
5	12	12	15.5	20	20
6	12.5	13	16	21	21
7	13	14	16.5	22	22
		15	17	23	23
				24	24
				25	25

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 ROF.
3. Hold the trigger, the LED will flash the Max ROF value.
4. Tap the trigger the number of times of the desired Max ROF (1-25).
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 is set.
6. To exit programming mode, shut the marker off.

Troubleshooting

The Virtue A1 Board is backed by a lifetime warranty and guaranteed to be free of any defects for life. If you encounter any problems with your A1 please consult your A1 user manual first, as the problem may not be related to the Virtue A1 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 [dip switch 2 "on"]

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.

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.

Troubleshooting continued...

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 A1 Board specifications subject to change without notice