

GET THE MOST OUT OF YOUR RAMPAGE BOARD BY VIEWING OR
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After your marker is switched on, you may notice the Blue and Red LED's are on and there is no ball loaded in the breach. Assuming your hopper is properly attached and filled with paint, the most likely cause is that you have not yet switched on your electronic hopper or you just need to give your hopper a "shake" so a ball feeds properly. Once a ball is properly loaded, the Ball Feed LED's will go out and switch to the Firing Mode display indicating you're ready to fire.

To turn on your marker just momentarily press the power button. There is no need to hold this button down. Your marker will switch on INSTANTLY!

Although the Rampage board for the ION offers the most comprehensive set of marker controls available, your Rampage™ board requires NO programming and comes pre-configured with the most optimal default settings. Once installed, just switch it on and GO PLAY!

QUICK STARTUP OF THE RAMPAGE™ BOARD

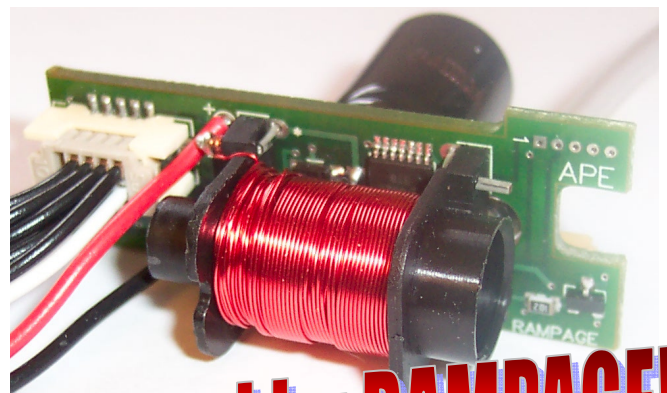
The Rampage™ board is a high-performance upgrade for your marker. We recommend you use a fresh battery before any major tournament or event to ensure peak performance. To change your battery, please refer to your original ION™ owners manual.

USING YOUR NEW RAMPAGE™ BOARD

WARNING - ALL PERSONS WITHIN RANGE OF A PAINTBALL MARKER MUST USE PROPER EYE PROTECTION. NEVER DISASSEMBLE A MARKER WHILE IT IS UNDER PRESSURE WITH COMPRESSED AIR OR CO2. ALWAYS REMOVE THE AIR SOURCE BEFORE WORKING ON YOUR MARKER. ALWAYS FOLLOW THE MANUFACTURER'S INSTRUCTIONS WHEN USING OR WORKING ON YOUR MARKER. NOT FOLLOWING PROPER INSTRUCTION MAY CAUSE PERSONAL INJURY AND/OR POSSIBLE DAMAGE TO YOUR MARKER. USE THIS PRODUCT AT YOUR OWN RISK.

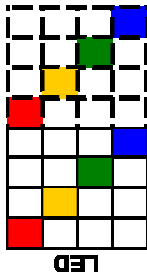


RAMPAGE™ USERS GUIDE



Powered by RAMPAGE!

Firing Mode
 Semi
 Burst
 Reactive
 Full Auto
 Rampage 1
 Rampage 2
 PSP3
 NXL



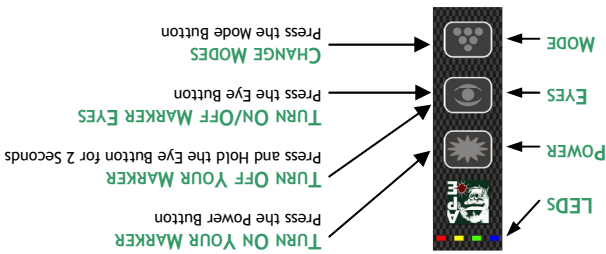
Semi - One shot per Trigger Pull (x= 2 to 5)
 Burst x - x rounds fired per Trigger Pull (x= 2 to 5)
 Reactive - x rounds fired per Trigger Pull and y rounds fired per Trigger Release (x= 1 to 5, y= 1 to 5)
 Full Auto - Fires continuously while the trigger is held
 Rampage 1 - Definable Ramping (defaults to a burst ramping mode)
 Rampage 2 - Definable Ramping (defaults to a full-auto ramping mode)
 PSP3 - Three shots in Semi-Automatic then transitions to 3 Round Burst. Returns to Semi-Automatic after 1 second of no activity.
 NXL - Semi-Automatic for the first 3 shots, then Full Automatic on the 4th pull and hold. Resets to Semi-Automatic after 1 second of no activity.

Your Rampage™ board has 8 different firing modes. To change modes, press the Mode Button. Each time the Mode Button is pressed, the LED

MODE

SELECTING YOUR

FIRING



The Rampage keypad is used exclusively with your Rampage ION board. The keypad adheres to the back of your grip with an industrial strength adhesive. Before adhering your keypad, be sure the grip back surface is dry and clean. For best results, let the keypad adhesive "cure" for 24 hours before use. NOTE: - THE KEYPAD WILL NOT STICK TO ROUNDED GRIP FRAMES. NEVER CONNECT OR DISCONNECT YOUR KEYPAD WITH THE BATTERY INSTALLED.

RAMPAGE KEYPAD



For technical support or help with your existing product, please contact

SUPPORT@GOAPEONLINE.COM

OR

VISIT OUR FORUMS AT WWW.GOAPEONLINE.COM

Advanced Paintball Electronics
 P.O Box 125
 Odessa, Florida 33556-0125

PRODUCT WARRANTY

Rampage boards are covered against manufacturer defects for a period of 1 year. We DO NOT warrant the solenoid OR external wiring. If you have any questions, please ask before you purchase our product.

VOIDING YOUR WARRANTY

- Improper Installation (we can install your product for you)
- ANY alteration to the Circuit Board or code
- Improper use, misuse, abuse or physical damage
- Mishandling and/or Electro-Static-Discharge (ESD) damage

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VER 1.4

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RAMPAGE QUICK REFERENCE

Legend / Description
 Solid LED Display
 Blinking LED Display

Turn Marker On (INSTANT ON)
 Power Button (press)

Turn Marker Off
 Press & Hold the EYE button for 2 Seconds

Trigger Trainer Mode
 Pull & Hold Trigger and Press the Power Button

Reset ALL Setpoints for their Default value
 Press & Hold the Mode button While Pressing the Power Button

Select Profile to Load (1-4)
 Press & Hold the EYE button While Pressing the Power Button

Eye Status
 Eyes OFF (via button press)

Eyes OFF (via iFault control)

Eyes active and no ball in breach

LED ID



Only if EYES On

Firing Mode Setpoints	LED ID	Default	Min/Max
Cap Mode		2	1/2
Max Global Rate of Fire (Eyes ON)		15	10/40
Max Global Rate of Fire (Eyes OFF)		12	10/20
Burst Mode Rounds		3	2/5
Reactive Pull Rounds		1	1/5
Reactive Release Rounds		1	1/5
Tournament Mode (when active)		7	1/8
Group 1 Firing Mode enable		15	1/15
Group 2 Firing Mode enable		15	1/16
Trigger Trainer Operation		1	1/4
Breakout Mode		13	1/13

Marker Control Setpoints	LED ID	Default	Min/Max
Trigger Debounce (ms)		10	1/20
Trigger Buffering (No/Yes)		2	1/2
Anti Mechanical Bounce		5	1/20
Solenoid Dwell (ms)		30	1/40
Dwell Modulation (ms)		10	1/20
Bolt Stick Dwell (ms)		16	1/16
Bolt Stick reset time (sec)		15	1/25
Breach Load Delay (ms)		3	1/10
Bolt Return Delay (ms)		20	1/40
Eye Mode		2	1/5
Auto Shut Off (3 min ticks)		1	1/20
Lightbar Mode		1	1/6
Lightbar Pattern		6	1/7

Rampage Mode 1 Setpoints	LED ID	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)		2	1/4
1st Ramp Mode Rounds		2	1/6
1st Ramp Mode BPS		10	10/40
1st Ramp Point Pull Rate		4	2/10
2nd Ramp Mode (semi/burst/reactive/auto)		2	1/4
2nd Ramp Mode Rounds		3	1/6
2nd Ramp Mode BPS		15	10/40
2nd Ramp Mode Reset Timer		20	1/20
2nd Ramp Point Pull Rate		8	2/10
3rd Ramp Mode (semi/burst/reactive/active)		2	1/4
3rd Ramp Mode Rounds		4	1/6
3rd Ramp Mode BPS		20	10/40
3rd Ramp Mode Reset Timer		20	1/20

Rampage Mode 2 Setpoints	LED ID	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)		4	1/4
1st Ramp Mode Rounds		10	1/6
1st Ramp Mode BPS		10	10/40
1st Ramp Point Pull Rate		*	2/10
2nd Ramp Mode (semi/burst/reactive/auto)		4	1/4
2nd Ramp Mode Rounds		10	1/6
2nd Ramp Mode BPS		15	10/40
2nd Ramp Mode Reset Timer		10	1/20
2nd Ramp Point Pull Rate		*	2/10
3rd Ramp Mode (semi/burst/reactive/active)		4	1/4
3rd Ramp Mode Rounds		*	1/6
3rd Ramp Mode BPS		20	10/40
3rd Ramp Mode Reset Timer		10	1/20

* These settings are not used with Auto Firing mode

Programming Mode Operations

To enter into Programming Mode, press & hold the MODE button for 2 seconds, then release when the Lightbar starts flashing.

Once in Programming Mode the Lightbar will display a blinking Red LED indicating you are in the first top level Setpoint—Firing Mode Setpoints. There are 4 top level setpoints:

- Firing Mode Setpoint Group
- Marker Control Setpoint Group
- Rampage 1 Setpoint Group
- Rampage 2 Setpoint Group

To Scroll to the NEXT top level Setpoint Group, pull and release the trigger. Use the MODE button to select the Setpoint Group you want to access.

Once a group is selected, you'll then display the setpoints in the group. To Scroll through the Setpoints, pull and release the trigger. Use the MODE button to select the Setpoint you want to access.

When selected the setpoint will "flash" it's current value (in blue). To modify the current setpoint, press the MODE button again, then enter the new value via the trigger. Press the Mode button again to accept the new value. The Blue LED will flash the new value.

Use the EYE button to move back through the Setpoints and Setpoint Groups to Exit Programming mode. Refer to the Programming Example provided herein for more information.

Firing Mode Setpoints

Cap Mode – (1 = Uncapped / 2 = Capped). When Uncapped (1), the marker will fire as fast as the marker and hopper can cycle. When Capped (2), the max rate of fire will not exceed the MGRF Eyes ON rate (with eyes ON) or the MGRF Eyes OFF rate (when eyes are OFF).

MGRF Eyes ON – When operating in "Capped" mode, this sets the "Eyes On" Max Global Rate of Fire (in Balls per second) of all firing modes (except ramping). If the Cap Mode is "Uncapped", this value is not used.

MGRF Eyes OFF – This sets the "Eyes OFF" Max Global Rate of Fire (in Balls per second) of all firing modes (except ramping).

Burst Mode Rounds – This value sets the number of rounds fired for each trigger pull in Burst Mode.

Reactive Pull Rounds – This value sets the number of rounds fired for each trigger pull in Reactive Mode.

Reactive Release Rounds – This value sets the number of rounds fired for each trigger release in Reactive Mode.

Tournament Mode – Determines what mode will be locked in for Tournament play when the Tournery Mode Lock Switch is ON. Refer to the table below for Mode Values.

Value	Mode
1	Semi
2	Burst
3	Reactive
4	Full Auto
5	Rampage 1
6	Rampage 2
7	PSP3
8	NXL

Activate the Tournament mode by placing the Tournery Switch in the ON position and power cycling the marker. Tournament Mode deactivates the MODE button and caps the rate of fire at 15 BPS. (Semi mode operates UNCAPPED if Cap Mode = 1).

Group 1 Firing Mode Enable - Allows you to enable/disable the Group 1 Firing Modes. By default, all modes in this group are enabled. Refer to the Group 1 Firing Mode Table for values.

Group 2 Firing Mode Enable—This setting allows you to enable or disable Group 2 Firing Modes. By default, all modes in this group are enabled. Refer to the Group 2 Firing Mode Table for values.

Group 1 Firing Mode enable					Group 2 Firing Mode enable				
Value	Auto	Reactive	Burst	Semi	Value	NXL	PSP3	Ramp2	Ramp1
1	No	No	No	YES	1	No	No	No	YES
2	No	No	YES	No	2	No	No	YES	No
3	No	No	YES	YES	3	No	No	YES	YES
4	No	YES	No	No	4	No	YES	No	No
5	No	YES	No	YES	5	No	YES	No	YES
6	No	YES	YES	No	6	No	YES	YES	No
7	No	YES	YES	YES	7	No	YES	YES	YES
8	YES	No	No	No	8	YES	No	No	No
9	YES	No	No	YES	9	YES	No	No	YES
10	YES	No	YES	No	10	YES	No	YES	No
11	YES	No	YES	YES	11	YES	No	YES	YES
12	YES	YES	No	No	12	YES	YES	No	No
13	YES	YES	No	YES	13	YES	YES	No	YES
14	YES	YES	YES	No	14	YES	YES	YES	No
15	YES	YES	YES	YES	15	YES	YES	YES	YES
16	No	No	No	No	16	No	No	No	No

Trigger Trainer Operation—This setting controls Trigger Trainer mode. Mode 1 displays a rate bar graph (1 to 20 BPS) and with air attached, emits a small "puff" to simulate firing. Mode 2 displays the same rate bar graph with no "puff". Mode 3 displays your rate in binary (1 to 16 BPS) with a "puff", and Mode 4 is the binary display with no "puff". Trigger rates in binary mode are established by "adding" the LED values: Red = 1, Orange = 2, Green = 4 and Blue = 8

Breakout Mode—This setting allows you to select several different styles of breakout modes. All shots prior to full auto are semi auto. Refer to the Breakout Mode Table for values. Breakout mode is off by default.

NOTE—THESE MODES ARE FOR PRACTICE ONLY. THEY ARE ILLEGAL TO USE IN A GAME OR TOURNAMENT.

Value	Breakout Modes
1	Fires a Full Automatic Burst at MGRF on the 1st Trigger Pull and Hold
2	Fires a Full Automatic Burst at MGRF on the 2nd Trigger Pull and Hold
3	Fires a Full Automatic Burst at MGRF on the 3rd Trigger Pull and Hold
4	Fires a Full Automatic Burst at MGRF + 2bps on the 1st Trigger Pull and Hold
5	Fires a Full Automatic Burst at MGRF + 2bps on the 2nd Trigger Pull and Hold
6	Fires a Full Automatic Burst at MGRF + 2bps on the 3rd Trigger Pull and Hold
7	Fires a Full Automatic Burst at MGRF + 4bps on the 1st Trigger Pull and Hold
8	Fires a Full Automatic Burst at MGRF + 4bps on the 2nd Trigger Pull and Hold
9	Fires a Full Automatic Burst at MGRF + 4bps on the 3rd Trigger Pull and Hold
10	Fires a Full Automatic Burst Uncapped on the 1st Trigger Pull and Hold
11	Fires a Full Automatic Burst Uncapped on the 2nd Trigger Pull and Hold
12	Fires a Full Automatic Burst Uncapped on the 3rd Trigger Pull and Hold
13	Breakout Mode Disabled

Marker Control Setpoints

Trigger Debounce – This value sets amount of time (in milliseconds) the trigger must remain inactive prior to accepting a new trigger pull. Lowering this value can cause your marker to fire errantly when making successive trigger pulls. Raising this value will prevent errant firing and provide reliable firing in sync with your trigger pulls.

Trigger Buffering – (1 = OFF / 2 = ON). This setting allows you to buffer a trigger pull during the bolt cycle, resulting in your marker firing more smoothly in all modes. The default value is ON.

Anti Mechanical Bounce—Used in Semi Automatic Mode only. This trigger filter prevents inadvertent firing due to marker recoil. Raising this value provides more filtering during slow trigger pulls.

Solenoid Dwell – This value controls the amount of time (in milliseconds) the solenoid is energized. If too low, the bolt will partially stroke and not fire properly. If the value is too high the valve remains open for too long, wasting air and battery power.

Dwell Modulation – This setting allows you to adjust (in milliseconds) how much of the dwell time is modulated (pulsed at 70 KHz). Lower Dwell Modulation times will consume more power when the solenoid is energized. Higher Dwell Modulation times consume less power when the solenoid is energized. Raising this value too high may prevent the solenoid valve from opening altogether.

Bolt Stick Dwell – This setting allows you to add additional milliseconds of dwell to your existing dwell setting. This will only affect the first shot fired after the Bolt Stick Reset Time is exceeded. You can add up to 15 milliseconds of dwell or choose a value of 16 (default) to disable the Bolt Stick Dwell setting. You should only use this setting IF you experience first shot drop off.

Bolt Stick Reset Time (seconds) - This setting allows you to set the amount of time the trigger can remain idle before adding the Bolt Stick Dwell setting. This value is ignored if the Bolt Stick Dwell is disabled.

Breach Load Delay – This setpoint establishes the amount of time (in milliseconds) the eyes must see a ball in the breach. This ensures a ball has dropped fully into the breach before the marker fires. This can also compensate for reflective shelled paints.

Bolt Return Delay – This setpoint establishes the amount of time (in milliseconds) after firing a round that the marker waits to see the bolt transition back past the eyes. This value can be lowered when using aftermarket high performance bolts. This also establishes the amount of time to recharge for the next shot, and provides the time out period to determine if an eye fault has occurred.

Eye Mode - Your Rampage board comes with unmatched Eye control using our exclusive iFault™ technology. iFault™ provides advanced eye logic for your marker. While your eyes are functioning, your marker will fire at the MGRF Eyes ON BPS rate. If your marker's eyes become disabled, iFault™ will switch to the MGRF Eyes OFF BPS rate automatically. If your eye functionality returns, iFault™ will automatically resume firing at the MGRF Eyes ON BPS rate. Refer to the table below for Eye operation values.

Value	Mode
1	Eyes On operation with iFault™ processing ENABLED. - Allows manual Eye On/Off operation via eye pushbutton.
2	Eyes On operation with iFault™ processing DISABLED (factory default) - Allows manual Eye On/Off operation via eye pushbutton.
3	Eye Bypass Mode with iFault™. - Dry firing mode only. - Provides test mode for Bolt Return delay adjustment (via iFault™ alarm) - Marker operates at EYES ON MGRF. - EYES OFF MGRF available via Eye PB tap (displays EYES OFF indicator) - Eye processing bypassed EXCEPT for iFault™ - Bypasses power-up no ball in breach indicator
4	Eye Bypass Demo Mode - Dry firing mode only. - Marker defaults to EYES ON MGRF. - EYES OFF MGRF available via Eye PB tap (displays EYES OFF indicator) - Eye processing bypassed including power-up "no ball in breach"
5	Eye Disable Mode - Use for broken or missing eyes - All Eye processing and Eye functions disabled - Defaults to EYES OFF MGRF

Auto Shutoff – This setting allows you to adjust if or when you would like your marker to shut off automatically after no firing activity. Auto Shutoff values range from 2 – 20, with each increment adding 3 minutes of time to the delay. This provides shutoff times from 6 to 60 minutes. A value of 1 defeats the Auto Shutoff feature, and your marker will remain on until you manually shut it off.

Lightbar Mode – This setting controls the LED Lightbar display. Mode 1 (default) displays the current Firing Mode continuously. Modes 2, 3 & 4 are pre-programmed LED blink patterns. Mode 5 is a user defined blink pattern. Mode 6 is Stealth mode (LED's Off) and all Firing Modes display momentarily after each Firing Mode change.

Lightbar Pattern – Select from 7 different Lightbar flash patterns. This is used in Lightbar mode 5 only.

Rampage Mode 1 Setpoints

Rampage Mode 2 Setpoints

Ramp Mode – This option determines the firing mode for each stage of ramping. Choose Semi (1), Burst (2), Reactive (3) or Auto (4).

Ramp Mode Rounds – This option sets the number rounds that apply to the selected firing mode.

Semi Mode - defines the number of rounds to fire at the defined Pull Rate in order to ramp to the next stage.

Burst Mode - defines the number of rounds fired for each trigger pull.

Reactive Mode - defines the rounds fired for each trigger pull & release.

Auto Mode - defines the number of successive rounds fired in order to ramp to the next stage.

Ramp Point Pull Rate – This option sets the trigger pull rate required (in Hz / triggers per second) to transition to the next ramping stage. It is not used for Auto Mode operation.

Ramp Mode BPS – This option sets the ball per second (BPS) cap rate for the current ramping stage. This value can be set from 10bps to 40bps and relies upon operational eyes. The Ramping BPS rate is overridden by the MGRF Eyes OFF rate if the marker eyes are disabled.

Ramp Mode Reset Timer – This option sets the amount of time the trigger can be at rest and yet still remain in the current ramping stage before reverting back to the 1st Ramp Mode. This time value is entered in 10ths of a second.



Programming Tutorial for the Rampage ION Board

WARNING: Before attempting to Program your Rampage board, you **MUST** remove any air source and cover your barrel with a barrel blocking device. Additionally, be sure there is no hopper attached to the marker and no ball in the breach of the marker to prevent accidental firing. Also, the following steps assume you are at the default setting and you are starting from the power off position.

TOP LEVEL GROUPS

Your Rampage board controls are organized into four Setpoint Groups or Top Level Groups.



THE INDIVIDUAL SETPOINTS ARE ORGANIZED UNDER EACH OF THE TOP LEVEL GROUPS

Rampage Mode 2 Setpoints	Default	Min/Max	Rampage Mode 1 Setpoints	Default	Min/Max	Marker Control Setpoints	Default	Min/Max	Firing Mode Setpoints	Default	Min/Max
1st Ramp Mode (semi/burst/reactive/auto)	4	1/4	1st Ramp Mode (semi/burst/reactive/auto)	2	1/4	Trigger Debounce (ms)	10	1/20	Cap Mode	2	1/2
1st Ramp Mode Rounds	10	1/8	1st Ramp Mode Rounds	2	1/8	Trigger Buffering (No/Yes)	2	1/2	Max Global Rate of Fire (Eyes ON)	15	10/40
1st Ramp Mode BPS	10	10/40	1st Ramp Mode BPS	10	10/40	Anti Mechanical Source	5	1/20	Max Global Rate of Fire (Eyes OFF)	12	10/20
1st Ramp Point Pull Rate	*	2/10	1st Ramp Point Pull Rate	4	2/10	Solenoid Dwell (ms)	30	1/40	Burst Mode Rounds	3	2/5
2nd Ramp Mode (semi/burst/reactive/auto)	4	1/4	2nd Ramp Mode (semi/burst/reactive/auto)	2	1/4	Dwell Modulation (ms)	10	1/20	Reactive Pull Rounds	1	1/5
2nd Ramp Mode Rounds	10	1/6	2nd Ramp Mode Rounds	3	1/6	Bolt Stick Dwell (ms)	16	1/16	Reactive Release Rounds	1	1/5
2nd Ramp Mode BPS	15	10/40	2nd Ramp Mode BPS	15	10/40	Bolt Stick reset time (sec)	15	1/25	Tournament Mode (when active)	7	1/8
2nd Ramp Mode Reset Timer	10	1/20	2nd Ramp Mode Reset Timer	20	1/20	Breach Load Delay (ms)	3	1/10	Group 1 Firing Mode enable	15	1/15
2nd Ramp Point Pull Rate	*	2/10	2nd Ramp Point Pull Rate	8	2/10	Bolt Return Delay (ms)	20	1/40	Group 2 Firing Mode enable	15	1/16
3rd Ramp Mode (semi/burst/reactive/active)	4	1/4	3rd Ramp Mode (semi/burst/reactive/active)	2	1/4	Eye Mode	2	1/5	Trigger Trainer Operation	1	1/4
3rd Ramp Mode Rounds	*	1/6	3rd Ramp Mode Rounds	4	1/6	Auto Shut Off (3 min ticks)	1	1/20	Breakout Mode	13	1/13
3rd Ramp Mode BPS	20	10/40	3rd Ramp Mode BPS	20	10/40	Lightbar Mode	1	1/6			
3rd Ramp Mode Reset Timer	10	1/20	3rd Ramp Mode Reset Timer	20	1/20	Lightbar Pattern	6	1/7			

* These settings are not used with Auto Firing mode

Changing Firing Mode Setpoints - MGRF

In this example you will navigate to the Firing Mode Setpoints and change the Maximum Global Rate of Fire (MGRF) when the Marker Eyes are on to 20 balls per second (bps) from the default of 15bps. Additionally, you will set the MGRF when the Marker Eyes are OFF to 10bps from the default of 12bps.

1		Turn Marker on by pressing the Power button
2		The Eye Alert will come on indicating there is no ball in the breach. Press the Eye button 2 times to bypass the alert. The solid Red LED indicates you are in Semi firing mode.
3		Hold the Mode button for 2 seconds to enter programming mode. All four LEDs will flash several times to indicate you have successfully entered Programming Mode.
4		The Blinking Red LED indicates you are in the Firing Mode Setpoints
5		Since the Firing Mode Setpoints is the first Setpoint Group, press the Mode button one time to indicate you wish to select this group. The Solid Red LED indicates you are at the first setpoint (Cap Mode) under the Firing Mode Setpoints.
6		Pull the trigger one time to scroll to the next Fire Mode Setpoint. The Solid Yellow LED indicates you are at the MGRG Eyes On setting.
7		Press the Mode button one time to indicate you wish to change this setting. The Blue LED will blink out the current value.
8		Press the Mode button again to indicate you want to enter a new value. The Blue LED will go out.
9		Pull the trigger 20 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
10		Press the Mode button again to store the new value. The Blue LED will blink 20 times indicating the new value.
11		Press the EYE button one time to exit the MGRF Eyes ON Setpoint
12		The Solid Yellow/Red LED indicates you are back in the Firing Mode Setpoints- MGRF Eyes On.
13		Pull the Trigger one time to scroll to the next setpoint (MGRF Eyes OFF). The Solid Yellow/Red LED indicates you are at the MGRF Eyes OFF Setpoint.
14		Press the Mode button one time to indicate you wish to change this setting. The Blue LED will blink out the current value
15		Press the Mode button again to indicate you want to enter a new value. The Blue LED will go out.
16		Pull the trigger 10 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
17		Press the Mode button again to store the new value. The Blue LED will blink 10 times indicating the new value.
18		Press the EYE button one time to exit the MGRF Eyes Off Setpoint.
19		Press the EYE button one time to exit to the Top Level or Setpoint Groups.
20		The Blinking Red LED indicates you are at the Top Level Setpoint Groups.
21		Press the EYE button one time to exit the Programming mode. All four LEDs will flash several times indicating you are leaving programming mode.
22		The Solid Red LED indicates you are in Semi-Automatic Firing mode.

Changing Marker Control Setpoints - Dwell

In this example you will navigate to the Marker Control Setpoints and change the Dwell to 25ms from the default of 30ms.

1		Turn Marker on by pressing the Power button
2		The Eye Alert will come on indicating there is no ball in the breach. Press the Eye button 2 times to bypass the alert. The solid Red LED indicates you are in Semi firing mode.
3		Hold the Mode button for 2 seconds to enter programming mode. All four LEDs will flash several times to indicate you have successfully entered Programming Mode.
4		The Blinking Red LED indicates you are in the Firing Mode Setpoints
5		Pull the trigger to scroll to the next top level menu Marker Control Setpoint. The Blinking Yellow LED indicates you are in the Marker Control Setpoints.
6		Press the Mode button to indicate you want to select this group.
7		The solid Red LED indicates you are at the first setpoint - Trigger Debounce under the Marker Control Setpoints.
8		Pull the trigger to scroll to the next setpoint - Trigger Buffering; indicated by a solid Yellow LED
9		Pull the trigger to scroll to the next setpoint - Anti Mechanical Bounce; indicated by a solid Yellow/Red LED
10		Pull the trigger to scroll to the next setpoint - Solenoid Dwell; indicated by a solid Green LED
11		Press the Mode button one time to indicate you wish to change this setting. The Blue LED will blink out the current value.
12		Press the Mode button again to indicate you want to enter a new value. The Blue LED will go out.
13		Pull the trigger 25 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
14		Press the Mode button again to store the new value. The Blue LED will blink 25 times indicating the new value.
15		Press the EYE button to exit the Dwell Setpoint. The solid Yellow/Red indicates you are at the Dwell setting in the Marker Control Setpoints.
16		Press the EYE button to exit the Marker Control Setpoints. The Blinking Yellow LED indicates you are in the Top Level Menu Groups.
17		Press the EYE button one time to exit the Programming mode. All four LEDs will flash several times indicating you are leaving programming mode.
18		The Solid Red LED indicates you are in Semi-Automatic Firing mode.

Reset ALL values to their default settings

The following steps will reset all marker values to their default settings. Using these steps will also reset any profiles or user definable ramping you may have created or saved.

1		Turn the marker off
2		From the OFF state, press and hold the Mode button.
3		While holding the Mode button, press the Power button. All four LEDs will flash indicating your reset is complete
4		Release the Mode button.
5		The Marker will now be in the Semi-Automatic Firing mode.

Using Profiles

Your Rampage board has the ability to store up to 5 programmable profiles. The default profile is used whenever you turn on the marker. By invoking a startup sequence, you can easily switch between the 4 additional profiles. A profile is a complete clone of your marker settings. Therefore, a profile consists of ALL setpoints including your definable ramping modes. Profiles allow you to instantly re-program your marker. The following steps will guide you through setting up a simple profile to change the Lightbar settings. Even though this example only changes one value, keep in mind that you can change ANY number of setpoints and store them in your profile.

1		While Pressing and holding the Eye button turn on the marker by pressing the Power Button.
2		The solid Red LED indicates you are in 1 st Profile. (To change profiles, use the trigger to scroll)
3		Press the Eye button to select the 1 st or Red Profile
4		Hold the Mode button for 2 seconds to enter programming mode. All four LEDs will flash several times to indicate you have successfully entered Programming Mode.
5		The Blinking Red LED indicates you are in the Firing Mode Setpoints
6		Pull the trigger to scroll to the next top level menu - Marker Control Setpoints. The Blinking Yellow LED indicates you are in the Marker Control Setpoints.
7		Press the Mode button to indicate you want to select this group.
8		The Solid Red LED indicates you are at the first setpoint (Trigger Debounce).
9		Pull the trigger 11 times to scroll to the Lighbar Mode setpoint -indicated by a solid Blue/Green LED
10		Press the Mode button one time to indicate you wish to change this setting. The Blue LED will blink out the current value.
11		Press the Mode button again to indicate you want to enter a new value. The Blue LED will go out.
12		Pull the trigger 3 times to input the new value. The Blue LED will blink with each trigger pull to indicate it has been registered.
13		Press the Mode button again to store the new value. The Blue LED will blink 3 times indicating the new value.
14		Press and hold the EYE button until the marker shuts off.

Starting in a Profile

To start your marker using the settings in the 1st or Red Profile do the following:

1		While Pressing and holding the Eye button turn on the marker by pressing the Power Button
2		The solid Red LED indicates you are in 1 st Profile.
3		Press the Eye button to select the 1 st or Red Profile.

Your Lightbar should now be flashing in Lightbar 2 mode. To return to the Default profile, turn your marker off, then turn your marker on without holding the Eye Button.

Ramping Worksheet

This tool is provided to help you pre-determine the settings for Rampage Ramping Modes.

1st Ramp Mode	Semi	Burst	Reactive	Auto
1st Ramp Mode Rounds	(Shots) 1 to 10	(Pull) 1 to 10	(Pull & Release) 1 to 10	(Pull & Hold) 1 to 10
1st Ramp Mode Pull Rate	2 - 10 hz	2 - 10 hz	2 - 10 hz	n/a
1st Ramp Mode BPS	10 - 40 bps	10 - 40 bps	10 - 40 bps	10 - 40 bps
2nd Ramp Mode	Semi	Burst	Reactive	Auto
2nd Ramp Mode Rounds	(Shots) 1 to 10	(Pull) 1 to 10	(Pull & Release) 1 to 10	(Pull & Hold) 1 to 10
2nd Ramp Mode Reset Timer	.1 to 2.0	.1 to 2.0	.1 to 2.0	.1 to 2.0
2nd Ramp Mode Pull Rate	2 - 10 hz	2 - 10 hz	2 - 10 hz	n/a
2nd Ramp Mode BPS	10 - 40 bps	10 - 40 bps	10 - 40 bps	10 - 40 bps
3rd Ramp Mode	Semi	Burst	Reactive	Auto
3rd Ramp Mode Rounds	n/a	(Pull) 1 to 10	(Pull & Release) 1 to 10	n/a
3rd Ramp Mode Reset Timer	.1 to 2.0	.1 to 2.0	.1 to 2.0	.1 to 2.0
3rd Ramp Mode BPS	10 - 40 bps	10 - 40 bps	10 - 40 bps	10 - 40 bps

Note - Pull rate is not used when Full Auto Mode is set / Matrix value is 1 for combination calc

Rampage 1 Rampage 2

Input	Rampage 1	Rampage 2
Input 1	1st Ramp Mode	
Input 2	1st Ramp Mode Rounds	
Input 3	1st Ramp Mode BPS	
Input 4	1st Ramp Mode Pull Rate	
Input 5	2nd Ramp Mode	
Input 6	2nd Ramp Mode Rounds	
Input 7	2nd Ramp Mode BPS	
Input 8	2nd Ramp Mode Reset Timer	
Input 9	2nd Ramp Mode Pull Rate	
Input 10	3rd Ramp Mode	
Input 11	3rd Ramp Mode Rounds	
Input 12	3rd Ramp Mode BPS	
Input 13	3rd Ramp Mode Reset Timer	

How to Determine Your Markers Mechanical Maximum Rate of Fire

Like the Speedometer on your car, just because it shows a maximum speed of 150 mile per hours doesn't mean it can actually go that fast. Several factors need to be considered when determining your markers top end balls per second (BPS) speed. Some factors include physical upgrades such as aftermarket bolts, Quick Exhaust valves (QEV's) etc. In addition to Physical changes, Marker adjustments to Dwell and Bolt Return Delay will determine your maximum rate of fire.

To determine your markers top BPS rate, you must first establish the minimum values for the Bolt Return Delay and Dwell. Based on the default values, your marker will operate from 10 to 18 bps with no changes to the Bolt Return Delay or Dwell. Since aftermarket upgrades will make these settings different from marker to marker, you will need to determine the values particular to your marker. First, establish the minimum Dwell time which your marker will operate consistently. This is essentially a trial and error process. Once your minimum Dwell time has been determined, follow the same process with your Bolt Return Delay setting. Once you have determined your minimum Bolt Return Delay value, complete the following formula to determine your markers top BPS rate of fire.

The Table below uses a simple formula using the following calculation: $1000 \div (\text{Solenoid Dwell} + \text{Bolt Return Delay}) = \text{Maximum Rate of Fire}$

Bolt Return Delay (in Milliseconds)

	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35
5	100.0	90.9	83.3	76.9	71.4	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0
6	90.9	83.3	76.9	71.4	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4
7	83.3	76.9	71.4	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8
8	76.9	71.4	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3
9	71.4	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7
10	66.7	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2
11	62.5	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7
12	58.8	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3
13	55.6	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8
14	52.6	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4
15	50.0	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0
16	47.6	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6
17	45.5	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2
18	43.5	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9
19	41.7	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5
20	40.0	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2
21	38.5	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9
22	37.0	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5
23	35.7	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2
24	34.5	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9
25	33.3	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7
26	32.3	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4
27	31.3	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1
28	30.3	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9
29	29.4	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.8
30	28.6	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4
31	27.8	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2
32	27.0	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2	14.9
33	26.3	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2	16.9	16.7	16.4	16.1	15.9	15.6	15.4	15.2	14.9	14.7
34	25.6	25.0	24.4	23.8	23.3	22.7	22.2	21.7	21.3	20.8	20.4	20.0	19.6	19.2	18.9	18.5	18.2	17.9	17.5	17.2											