"Let it rip in YOUR grip!"

NoX Quest Upgrade Chip
"H.I.P." Chip

**NOX is not responsible for settings that the user sets to make there guns illegal for tournament paintball (ie. NPPL or PSP). Its the users responsibility to insure the filter settings are set to specific tournament standards. Also NOX is not responsible for dirty, worn or user setup "Bouncy" switches. Specifications for NOX products may change without notice.

Features:
- Specifically designed as a replacement chip for the Quest board
- Uses NoX's Newest "Unleashed Code"
- Extensive set of tournament and recreational firing modes with configurable mode modifiers for custom tournament and breakout modes –13 MODES--
- Highly accurate ROF indicator reads out the maximum BPS achieved based on a moving average during a string
- Four eye modes for delayed shot, dropped shot with clearing shot, eye check bypass for full speed dry-fire testing, disabled for markers without eyes or damaged eyes
- Seven LED color palettes to choose from
- Advanced power saving logic dims indicator and eye LEDs to dramatically reduce power draw during idle periods
- Full adjustability of dwell, trigger debounce, paint delay, mechanical debounce, first shot drop-off, ROF, ROF fine adjust, bypass ROF, ramp start point, ramp level, burst count, shot modifiers, auto shutdown timer, and seven color palettes
- On demand battery level indicator and automatic low level indication
- On demand selection of bypass eye mode for dry-firing
- Full LED status indication of breech, pad and trigger inputs
- Automatic blocked eye detection with configurable ROF reduction and recovery

Installation:

First insure that the air is off, and then refer to your markers instruction manual. When removing or installing chips the user must be careful not to damage the chip and/or board. If you are not "comfortable" with this install please see your nearest gun technician.<NoX is not responsible for miss installed chips>

1. Remove the screws on the left side of the marker
2. Remove the battery
3. Locate the stock chip (Bottom of the frame in a chip socket)
4. Remove the chip (it is best to use a small flat head screw driver and gently pry alternating sides slowly)
5. Install the "HIP" chip—**BE VERY CARFULL ON ALIGNMENT**-- (Slowly insert the chip making sure that the notch on the chip lines up with the notch on the socket) <NoX is NOT responsible for miss installed CHIPS>
6. If the board fails to turn on please check
   a. Fresh Battery
   b. Battery harness is not damaged
   c. Proper installation of the Chip

Power Button Functions
1. Power up marker: Briefly press power button until LED lights up. On release of the button the led will flash the battery condition.
2. Power down marker: Press and hold power button for two seconds until LED changes color and then goes off.
3. Check battery status: Tap power button while marker in powered up and DIP switch 1 is in the OFF position.
4. Read out the BPS: Tap power button with DIP switch 1 in the ON position. The number of blinks indicates the maximum ROF reached during the last string based on a four shot moving average. This works with paint, dry-firing or just practicing with the trigger.
5. Bypass eye check to dry-fire: Press eye button until LED changes color and release. The LED blink pattern will change (Blue/White for default palette) to indicate the new eye mode. The marker will now fire at full speed with an empty breech. The eyes are still functional in this mode and the bolt return is still read to moderate the cycle speed to match the current ROF setting. This can be used to advantage to tune the regulators for maximum performance with air.
6. Restore eye check when bypassed: Press eye button until LED changes color and release. The LED blink pattern will change (solid or blinking Blue for default palette) to indicate the new eye mode. The marker will now fire normally.

LED Status Indicator (using default palette selection 5)

Empty Breech:	Blinking Blue
Ball in Breech:	Solid Blue
Eye Check Bypassed:	Alternating Blue/White
Eyes Faulted:	Alternating Blue/Yellow
Eyes Disabled:	Alternating Blue/Red
Trigger Pulled:	Solid Green
Eye Pad Pressed:	Solid Purple
ROF Count:	Blinking Green
Good Battery:	Pulsing Green
Fair Battery:	Pulsing Yellow
Poor Battery:	Pulsing Red

Power Management

The chip continuously monitors the idle time and automatically dims the status LED to 1/4 power and turns off the eye LED after ten seconds of idle time and further dims the status LED to 1/16 power after thirty seconds of idle time. Pulling the trigger or pushing the power buttons instantly restores both LEDs to full brightness and resets the timer. After the configured shutdown idle time has passed, the chip will shutdown and enter an extremely low power use sleep state. Pressing the power button briefly will wake up the chip and initialize the board settings.

Bolt Delay Monitor

The Bolt Delay is automatically calculated on a per shot basis and adapts to the actual bolt cycle speed to insure the delay is correct for all marker and lubrication conditions. The bolt delay is used to mask the false bolt return seen when the bolt pushes the ball past the eyes.

Eye Fault Detection

The chip monitors the bolt return on a per shot basis and if the bolt return is not seen within a reasonable period of time, the eye status will automatically change to faulted and the ROF will be adjusted to the configured Bypass ROF. This is used to reduce further chopping when the eyes have become paint blocked from a breech chop. Should the eyes clear from continued firing or being swabbed, the eye status will automatically return to good and the ROF setting will return to normal. It should be noted that when dry-firing without air, the breech needs to be clear of paint and the bolt retracted to run the solenoid at full speed.

Battery Monitor

The battery condition is continuously monitored and may be read out at any time by briefly pressing the power button with the first DIP switch in the OFF position. The status LED will blink rapidly in Green for a good battery, Yellow for a low battery and Red for an exhausted battery. If the battery becomes exhausted, the status LED will automatically blink Red on a ten second interval and the battery must be replaced as soon as possible to insure correct electrical operation of the marker.

ROF Monitor

The maximum ROF attained for a string of four or more shots is continuously calculated based on a four shot moving average. After one second of idle time, a new calculation will be made during the next string. This may be read out in blinks on the status LED at any time by briefly pressing the power button with the first DIP switch in the ON position. This function will also calculate cycle rate when dry-firing and pull rate when practicing with the trigger and no air. This function requires a minimum firing rate of 4 shots per second to obtain a reading.

Enter Programming Mode

1. Make sure tournament lock (second DIP switch) is in OFF position
2. Make sure marker is powered off
3. Hold trigger in and turn on marker by briefly pressing power button until LED goes on
4. Continue to hold in trigger until LED goes off and then release trigger
5. LED will turn Red and blink one time indicating the top level menu selection for Firing Mode

Enter Programming Mode with Factory Default Settings

1. Make sure tournament lock (second DIP switch) is in OFF position
2. Make sure marker is powered off
3. Hold trigger in and turn on marker by briefly pressing power button until LED goes on
4. Continue to hold in trigger for ten seconds until LED goes off and then turns back on White, now release trigger.
5. LED will turn Red and blink one time indicating the top level menu selection for Firing Mode. All settings will be at their factory default values.

Menu Navigation

To navigate the top level menu, use short pulls to advance to the next selection. The color will change and the status LED will blink out the menu selection number. The menu will start over after the last selection. It is not necessary to wait for the blinking in order to advance to the next selection or to view/change a selection.

1. Firing mode (Red)
2. Eye Mode (White)
3. Dwell (Blue)
4. Adaptive Trigger Debounce (Yellow)
5. Loader Debounce (Purple)
6. Mechanical Debounce (Green)
7. Drop-off Adjustment (Red)
8. ROF (White)
9. ROF Fine Adjust (Blue)
10. Bypass ROF (Yellow)
11. Ramp Point (Purple)
12. Ramp Level (Green)
13. Burst Count (Red)
14. Mode Modifier (White)
15. Shutdown Timer (Blue)
16. Color Palette (Yellow)

Viewing a Menu Selection

Hold in the trigger until the status LED changes color to Teal and then release the trigger. The LED will blink out the current setting and return to the top level menu color for the current selection.

Changing a Menu Selection

Hold in the trigger until status LED color changes to Teal and then turns off, now release the trigger. The LED will blink out the minimum setting in Red and then turn off. You now have two seconds to begin adding counts to the minimum setting using short pulls until the desired count is reached. The LED will blink Red each time the trigger is pulled. Two seconds after the last pull is registered, the LED will blink out the new setting in Teal and return to the top level menu color for the current selection. The new setting has now been stored into the processor and will be remembered the next time the marker is powered up.

Exiting Programming Mode

To exit programming mode, turn off the marker. The next time the marker is powered up, the new settings will be read in and take effect.

Firing Mode Options

1. Tournament Semi Automatic Unlimited
   This mode delivers one ball per pull with no ROF cap. Mode Modifiers and ROF settings are not applied.
2. Tournament Capped Semi Automatic
   This mode delivers one ball per pull capped at the ROF setting. Mode Modifiers are not applied.
3. Tournament PSP 3 Ball Burst
   This mode delivers the first three balls in Capped Semi Automatic mode, then on the fourth pull delivers three balls per pull capped at the ROF setting. After one second of idle time, the pattern repeats. Mode Modifiers are not applied.
4. Tournament NXL Full Auto
   This mode delivers the first three balls in Capped Semi Automatic mode, then on the fourth pull enters Full Automatic Mode. After one second of idle time, the pattern repeats. Mode Modifiers are not applied.
5. Tournament Millennium
   This mode delivers the first three balls in Capped Semi Automatic mode, then as soon as the pull rate reaches the Ramp Point setting, the ROF ramps straight to the full ROF setting. Any time the pull rate drops below the Ramp Point Setting, the ramp is turned off. After one second of idle time, the pattern repeats. Mode Modifiers are not applied.
6. Semi Automatic
   This mode delivers one ball per pull with no ROF cap. Mode Modifiers are applied.
7. Capped Semi Automatic
   This mode delivers one ball per pull capped at the ROF setting. Mode Modifiers are applied.
8. Auto Response
   This mode delivers one ball on the pull and one ball on the release capped at the ROF setting. Mode Modifiers are applied.
9. Burst
   This mode delivers the number of balls in the Burst setting on each pull capped at the ROF setting. Mode Modifiers are applied.
10. Full Auto

This mode delivers a continuous stream of balls as long as the trigger is held down capped at the ROF setting. Mode Modifiers are applied.

11. Step Ramp
    As soon as the pull rate reaches the Ramp Point setting, the ROF ramps straight to the full ROF setting. Any time the pull rate drops below the Ramp Point Setting, the ramp is turned off. Mode Modifiers are applied.
12. Linear Ramp
    This mode offers the greatest level of adjustability and performance and uses three settings to control its behavior. As soon as the pull rate reaches the Ramp Point setting, the ROF is scaled by the Ramp Level Setting until the ROF setting is met. Any time the pull rate drops below the Ramp Point Setting, the ramp is turned off. Mode Modifiers are applied.
13. Training
    This mode allows three uncapped semi shots to be fired and then pauses until one second of idle time has passed and repeats the pattern. This mode is intended to be used in team practice to teach good shooting skills and conserve paint.

Eye Mode Options

1. Delayed Shot
   This mode will wait up to 1/2 second for a ball to drop into the breech before proceeding with a shot.
2. Dropped Shot
   This mode will wait up to 1/2 second for a ball to drop into the breech before dropping a shot with an empty breech. If the trigger is held during this wait time, the shot will proceed as if in Delayed Shot mode.
3. Eye Check Bypassed
   This mode bypasses the ball in breech check and allows the shot to take place immediately for dry-firing. The eyes are still active in this mode and the bolt return is used the same way it is with a normal shot sequence. The eyes will still fault if the breech is blocked during the shot. This mode closely simulates a normal shot sequence and can be used to tune the marker.
4. Eyes Disabled
   This mode completely ignores the eyes and fires the shot immediately, The ROF is limited to a maximum setting of 20 BPS in this mode.

Dwell Options

The dwell setting determines the amount of time the solenoid is energized during a shot. The value can be set between 5-25 milliseconds.

Adaptive Trigger Debounce

This setting removes the electrical noise from the micro-switch and prevents bounce from registering as intended shots. The algorithm used adapts to the actual amount of switch noise on a per pull basis and allows for shorter debounce times than a typical timer based approach. This results in a much more responsive trigger. The value can be set between 1-15 and is not in milliseconds.

Loader Debounce

This setting is the amount of delay time used after a ball is detected in the breech until the shot may proceed. This allows the ball to settle in place and

helps prevent chops. The setting is dependant on the loader type. For force fed loaders, 2-5 milliseconds is good. While for gravity fed loaders, 8-12 milliseconds may be required. The value can be set between 0-15 milliseconds.

Mechanical Debounce
This setting helps remove unwanted trigger pulls caused by the mechanical movement of the marker against the trigger during the bolt cycle. This setting will reduce trigger responsiveness and should be set as low as possible. The best approach to mechanical debounce issues is to use a heavier switch or trigger pull and a deeper activation point. The value can be set between 0-10 and is not in milliseconds.

Drop-off Adjustment
This setting is the amount of additional dwell time applied to a shot when the marker has been idle for 20 or more seconds. This is used to help reduce first shot drop-off. This setting can result in high velocity shots and should be set as low as possible. The value can be set between 0-15 milliseconds.

ROF (rate of fire)
This setting is used to cap the maximum rate of fire. The value can be set between 14-25 balls per second, with a setting of 26 reserved for an unlimited rate of fire. The maximum rate achieved is dependant on the cycle speed of the gun and the feed rate of the hopper.

ROF Fine Adjust
This setting is used to fine tune the rate of fire and is added to the ROF setting. The value can be set between 0 – 0.75 balls per second (0 = 0, 1 = 0.25, 2 = 0.5, 3 = 0.75)

Bypass ROF
This setting is used to cap the rate of fire to a low value when the eyes are faulted due to a breech chop. The value can be set between 8-14 balls per second.

Ramp Point
This setting determines the minimum pull rate need to activate ramping when using a ramping mode. The value can be set between 4-12 pulls per second.

Ramp Level
This setting determines the amount of ramp scaling used for the Linear Ramp firing mode. The value may be set between 1.1-3.0 times the actual pull rate in 0.1 increments. This allows for anything between a very gradual up to an extremely aggressive ramp setting.

Burst Count
This setting determines the number of balls fired per pull when using the Burst firing mode. The value can be set between 2-4 balls.

Mode Modifier
1. None
2. First three shots in Semi Automatic, reset after one second of idle time
3. First shot in Semi Automatic, second shot in Full Automatic

Auto Shutdown Timer
1. Five Minutes
2. Ten Minutes
3. Fifteen Minutes
4. Twenty Minutes
5. T2hirty Minutes
6. One Hour

7. Never

Color Palette

1	
Ball in Breech:	Red
Empty Breech:	Red/Black
Eye Check Bypass:	Red/White
Eye Fault:	Red/Yellow
Eye Disable:	Red/Purple
Pad Press:	Blue
Trigger Pull:	Green

2	
Ball in Breech:	Yellow
Empty Breech:	Yellow/Black
Eye Check Bypass:	Yellow/White
Eye Fault:	Yellow/Purple
Eye Disable:	Yellow/Red
Pad Press:	Blue
Trigger Pull:	Green

3	
Ball in Breech:	Green
Empty Breech:	Green/Black
Eye Check Bypass:	Green/White
Eye Fault:	Green/Yellow
Eye Disable:	Green/Red
Pad Press:	Blue
Trigger Pull:	Purple

4	
Ball in Breech:	Teal
Empty Breech:	Teal/Black
Eye Check Bypass:	Teal/White
Eye Fault:	Teal/Yellow
Eye Disable:	Teal/Red
Pad Press:	Blue
Trigger Pull:	Green

5. (default)	
Ball in Breech:	Blue
Empty Breech:	Blue/Black
Eye Check Bypass:	Blue/White
Eye Fault:	Blue/Yellow
Eye Disable:	Blue/Red
Pad Press:	Purple
Trigger Pull:	Green

6	
Ball in Breech:	Purple
Empty Breech:	Purple/Black
Eye Check Bypass:	Purple/White
Eye Fault:	Purple/Yellow
Eye Disable:	Purple/Red
Pad Press:	Blue
Trigger Pull:	Green

7	
Ball in Breech:	White
Empty Breech:	White/Black
Eye Check Bypass:	White/Purple
Eye Fault:	White/Yellow
Eye Disable:	White/Red
Pad Press:	Blue
Trigger Pull:	Green