

## ION/SP-8 INSTALLATION

Follow your Ion/SP-8 owner's manual for instructions on the removal of the stock board and installation of the new board. Blackheart has been designed to fit in your Ion/SP-8 without any modification. **NOTE: You must reuse the banjo fittings from your stock board assembly on the new upgrade board.**

## OPERATING INSTRUCTIONS

**1** Press and hold the On/Off Button for two seconds. The board will chirp and then power on, entering vision firing mode. This action also powers off the gun.

**2** The On/Off Button can be used to switch back and forth from base mode to vision mode by pressing the button quickly and observing the chirp and change in light pattern from a steady blink to an interrupted blinking sequence.

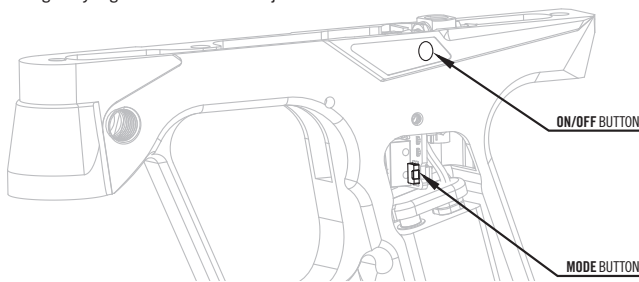
**3** To access the Mode Button inside the grip frame, remove the screws from the rubber grip on the ON/OFF BUTTON side of the gun. By pressing the Mode Button once, the board will enter into Adjustment Mode. A solid yellow light indicates you are in Dwell Adjustment Mode. As you continue pressing the Mode Button, you will cycle through the modes which are each defined by a specific color and flash sequence (see chart).

**4** While in any of these modes, wait 4 seconds and the speaker will chirp to identify what the range is set to. For example, if it was in the Dwell Setting Mode and the Dwell was set to 30, after 4 seconds the speaker would chirp 30 times.

**5** If you decide to leave the adjustment table without making any changes, simply pull and release the trigger one time, and the board will go back into its base (non-vision) firing mode. **CAUTION: If there is air charged in the gun, it will not be able to fire while in Adjustment Mode. However, as soon as you release the trigger, you will be able to fire the gun.**

**6** To change one of the settings while the board is in any of the modes listed in the adjustment table, complete the following steps:

- 1. Pull and hold the trigger for 3 seconds;** the speaker will chirp 5 times to indicate that you can make adjustments.
- 2. While the trigger is still being held, navigate through the range of settings by pressing the Mode Button to adjust down, or the On/Off Button to adjust up.** The speaker will make a high pitched chirp for each adjustment up, and a low pitched chirp for each adjustment down.
- 3. Once you have reached your desired setting, releasing the trigger will put the board back into base fire mode and save your new setting.** The board will chirp rapidly when it can't go any higher or lower in an adjustment mode.



## ADJUSTMENT TABLE

Modes	Light Color	Mode Button	On/Off Button	Range
Dwell	Solid Yellow	Down	Up	1 – 89
ROF (Rate of Fire)	Solid Red	Up	Down	1 – 91
Firing Modes	Single Blink Yellow	Down	Up	1 – 4
Debounce	Single Blink Red	Down	Up	1 – 25
BSA (Bolt Stick Adjust)	Double Blink Yellow	Down	Up	1 – 26
Kick-In Rate Adjust	Double Blink Red	Down	Up	1sps – 10sps
Sustain Rate Adjust	Fast Blink Yellow	Down	Up	1sps – 10sps
Number of Shots to Enter Firing Mode	Fast Blink Red	Down	Up	1 pulls – 10 pulls
Shortcut Key*	Yellow & Red	Both	Both	N/A

\*Shortcut Key: When both buttons are depressed for 1 second, the board will chirp and the red and yellow lights will stay on to identify that your fire rate has been set to 14.7 SPS.

## MODE DESCRIPTIONS

**DWELL:** This adjusts how long the bolt stays forward on each firing cycle. Too low of a Dwell will not allow the marker to fire. If the Dwell is set too high you will lose gas efficiency. Refer to your Ion/SP-8 manual for instructions to set your Dwell.

**RATE OF FIRE (ROF):** This can also be labeled "Pause Time," because with every adjustment, you are increasing or decreasing the pause time between each shot. This is why this mode is the only mode where you press the "down" Mode Button to increase the setting. Adjusting up (increasing the pause between shots) will turn your ROF down and adjusting down (decreasing the pause between shots) will increase ROF.

**FIRING MODE:** There are 4 different modes that you can cycle through while in the Firing Mode adjustment stage. Here are the different modes and their descriptions:

- 1. [Semi-Auto]** This mode is strictly semi-auto only. The kick-in rate and sustain rate are not applicable in this mode. Use this mode for playing in the NPPL Super 7 or any other tournament which doesn't allow any ramping software.

**NPPL IDEAL SETTING:** *Debounce:* as low as possible without causing the trigger to "bounce." *ROF:* 20

- 2. [3 Shot Burst]** This firing mode is mostly for fun, and generally not legal at any tournaments. For each pull of the trigger the gun will fire 3 shots.

- 3. [NXL Full-Auto]** The name is just what it suggests, it is full auto after you pull the trigger the set amount of times and then continue to hold the trigger. If you happen to release the trigger, you have just under one second to pull it again and jump right back into Full Auto without the normally required kick-in shots. This mode is fully adjustable with KICK-IN RATE, NUMBER OF SHOTS TO ENTER FIRING MODE, ROF

**NXL IDEAL SETTING:** *Kick-In Rate:* 1, *Number of Shots to Enter Firing Mode:* 3, *ROF:* 14.7

- 4. [Rebound]** This firing mode makes it much easier for any user to reach the max fire rate. This mode can be fully adjusted with KICK-IN RATE, SUSTAIN RATE, NUMBER OF SHOTS TO ENTER FIRING MODE and ROF. This is the best mode for the Millennium Series and PSP.

**PSP IDEAL SETTING:** *Kick-In Rate:* 1, *Sustain Rate:* 1, *ROF:* 14.7, *Number of Shots to Enter Firing Mode:* 3.

**MILLENNIUM SERIES IDEAL SETTING:** *Kick-In Rate:* 8, *Sustain Rate:* 8, *ROF:* 14.7, *Number of Shots to Enter Firing Mode:* 3.

**DEBOUNCE:** This setting will affect all firing modes, although it is normally only effective in Semi-Auto Mode. The lower you set the Debounce, the more sensitive it makes the trigger. If you set the Debounce too low and pull the trigger slowly, the kick back might make it shoot more than once. At many tournaments, that would be an illegal gun. Also, if you set the Debounce to 1, it will shoot at Full Auto, which isn't legal at many fields and tournaments.

**BSA (Bolt Stick Adjustment):** This setting affects all firing modes and is used to help compensate for any first shot drop. (First shot drop is when a gun's first shot is very low in velocity compared to the following shots.)

After the gun sits for 10 seconds, the board will increase the Dwell setting to alleviate any first shot drop. The increase is based on the level of your current BSA setting. If you do not experience any drop, then you would be at the lowest setting within the BSA to avoid any hot gun penalties.

**KICK-IN RATE:** This setting affects REBOUND and NXL FULL AUTO; it refers to the shots per second you must reach by pulling the trigger before the board will "kick-in" to NXL Full Auto or Rebound. The higher the setting, the harder it will be to kick into either of the modes. The lower the setting, the easier it will be to kick in.

**SUSTAIN RATE:** This setting affects REBOUND; it refers to the shots per second you must sustain by pulling the trigger to keep the board "kicked in" to Rebound. The higher the setting, the faster you will have to pull the trigger to sustain the Rebound. The lower the setting, the slower you will have to pull the trigger to sustain the Rebound.

**NUMBER OF SHOTS TO ENTER FIRE MODE:** This setting affects REBOUND and NXL FULL AUTO; it adjusts how many shots are needed to be pulled in order for it to kick into Full Auto or Rebound Modes. You can adjust it from 1–10 pulls. This means that if it is set to 10, you must pull the trigger 10 times before it will kick into the chosen mode.

**SHORTCUT KEY:** This affects all firing modes—and is a handy feature. If you adjust your rate of fire to something higher than the tournament-legal 15 balls per second, all you have to do is hold the Mode and On/Off buttons simultaneously for one second. This will put your rate of fire back to 14.7 balls per second. (The board will chirp and both lights will stay on.)

## SHOCKER/NERVE INSTALLATION

Follow your Shocker/Nerve owner's manual for instructions on the removal of the stock board and installation of the new board. Blackheart has been designed to fit in your Shocker/Nerve without any modification.

## OPERATING INSTRUCTIONS

**1** Press and hold the On/Off Button for two seconds. The board will chirp and then power on, entering vision firing mode. This action also powers off the gun.

**2** The On/Off Button can be used to switch back and forth from base mode to vision mode by pressing the button quickly and observing the chirp and change in light pattern from a steady blink to an interrupted blinking sequence.

**3** To access the Mode Buttons inside the grip frame, remove the screws from the rubber grip on the Non-Vision side of the gun. By pressing the Mode Down Button once, the board will enter into Adjustment Mode. A solid yellow light indicates you are in Dwell Adjustment Mode. As you continue pressing the Mode Down Button, you will cycle through the modes which are each defined by a specific color and flash sequence (see chart).

**4** While in any of these modes, wait 4 seconds and the speaker will chirp to identify what the range is set to. For example, if it was in the Dwell Setting Mode and the Dwell was set to 30, after 4 seconds the speaker would chirp 30 times.

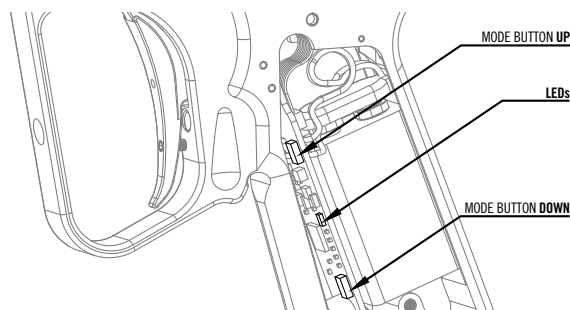
**5** If you decide to leave the adjustment table without making any changes, simply pull and release the trigger one time, and the board will go back into its base (non-vision) firing mode. **CAUTION: If there is air charged in the gun, it will not be able to fire while in Adjustment Mode. However, as soon as you release the trigger, you will be able to fire the gun.**

**6** To change settings while the board is in any of the modes listed in the adjustment table, complete the following steps:

**1. Pull and hold the trigger for 3 seconds;** the speaker will chirp 5 times to indicate that you can make adjustments.

**2. While the trigger is still being held, navigate through the settings by pressing the Mode Down Button to adjust down, or the Mode Up Button to adjust up.** While adjusting, the speaker will make a high pitched chirp for each adjustment up, and a low pitched chirp for each adjustment down.

**3. Once you have reached your desired setting, releasing the trigger will put the board back into base fire mode and save your new setting.** The board will chirp rapidly when it can't go any higher or lower in the adjustment mode.



## ADJUSTMENT TABLE

Modes	Light Color	Mode Up Button	Mode Down Button	Range
Dwell	Solid Yellow	Down	Up	1 – 89
ROF (Rate of Fire)	Solid Red	Up	Down	1 – 91
Firing Modes	Single Blink Yellow	Down	Up	1 – 4
Debounce	Single Blink Red	Down	Up	0 – 25
BSA (Bolt Stick Adjust)	Double Blink Yellow	Down	Up	0 – 25
Kick-In Rate Adjust	Double Blink Red	Down	Up	1sps – 10sps
Sustain Rate Adjust	Fast Blink Yellow	Down	Up	1sps – 10sps
Number of Shots to Enter Firing Mode	Fast Blink Red	Down	Up	1 pull – 10 pulls
DET Level	Long Blink Yellow	Down	Up	1 – 2
Shortcut Key*	Yellow & Red	Both	Both	N/A

\*Shortcut Key: When both buttons are depressed for 1 second, the board will chirp and the red and yellow lights will stay on to identify that your fire rate has been set to 14.7 SPS

## MODE DESCRIPTIONS

**DWELL:** This adjusts how long the bolt stays forward on each firing cycle. Too low of a Dwell will not allow the marker to fire. If the Dwell is set too high you will lose gas efficiency. Refer to your Shocker/Nerve manual for instructions to set your Dwell.

**RATE OF FIRE (ROF):** This can also be labeled "Pause Time," because with every adjustment, you are increasing or decreasing the pause time between each shot. This is why this mode is the only mode where you press the "down" Mode Button to increase the setting. Adjusting up (increasing the pause between shots) will turn your ROF down and adjusting down (decreasing the pause between shots) will increase ROF.

**FIRING MODE:** There are 4 different modes that you can cycle through while in the Firing Mode adjustment stage. Here are the different modes and their descriptions:

**1. [Semi-Auto]** This mode is strictly semi-auto only. The kick-in rate and sustain rate are not applicable in this mode. Use this mode for playing in the NPPL Super 7 or any other tournament which doesn't allow any ramping software.

**NPPL IDEAL SETTING:** *Debounce:* as low as possible without causing the trigger to "bounce." *ROF:* 20

**2. [3 Shot Burst]** This firing mode is mostly for fun, and generally not legal at any tournaments. For each pull of the trigger the gun will fire 3 shots.

**3. [NXL Full-Auto]** The name is just what it suggests, it is full auto after you pull the trigger the set amount of times and then continue to hold the trigger. If you happen to release the trigger, you have just under one second to pull it again and jump right back into Full Auto without the normally required kick-in shots. This mode is fully adjustable with KICK-IN RATE, NUMBER OF SHOTS TO ENTER FIRING MODE and ROF.

**NXL IDEAL SETTING:** *Kick-In Rate:* 1, *Number of Shots to Enter Firing Mode:* 3, *ROF:* 14.7

**4. [Rebound]** This firing mode makes it much easier for any user to reach the max fire rate. This mode can be fully adjusted with KICK-IN RATE, SUSTAIN RATE, NUMBER OF SHOTS TO ENTER FIRING MODE and ROF. This is the best mode for the Millennium Series and PSP.

**PSP IDEAL SETTING:** *Kick-In Rate:* 1, *Sustain Rate:* 1, *ROF:* 14.7, *Number of Shots to Enter Firing Mode:* 3.

**MILLENNIUM SERIES IDEAL SETTING:** *Kick-In Rate:* 8, *Sustain Rate:* 8, *ROF:* 14.7, *Number of Shots to Enter Firing Mode:* 3.

**DEBOUNCE:** This setting will affect all firing modes, although it is normally only effective in Semi-Auto Mode. The lower you set the Debounce, the more sensitive it makes the trigger. If you set the Debounce too low and pull the trigger slowly, the kick of the marker might make it shoot more than once. At many tournaments, that would be an illegal gun. Also, if you set the Debounce to 0, it will be in Full Auto Mode, which isn't legal at many fields and tournaments.

**BSA (Bolt Stick Adjustment):** This setting affects all firing modes and is used to help compensate for any first shot drop. (First shot drop is when a gun's first shot is very low in velocity compared to the subsequent shots.)

After the gun sits for 10 seconds, the board will increase the Dwell setting to alleviate any first shot drop. The increase is based on the level of your current BSA setting. If you do not experience any drop, then you would be at the lowest setting within the BSA to avoid any hot gun penalties.

**KICK-IN RATE:** This setting affects REBOUND and NXL FULL AUTO; it refers to the shots per second you must reach by pulling the trigger before the board will "kick-in" to NXL Full Auto or Rebound. The higher the setting, the harder it will be to kick into either of the modes. The lower the setting, the easier it will be to kick in.

**SUSTAIN RATE:** This setting affects REBOUND; it refers to the shots per second you must sustain by pulling the trigger to keep the board "kicked in" to Rebound. The higher the setting, the faster you will have to pull the trigger to sustain the Rebound.

**NUMBER OF SHOTS TO ENTER FIRE MODE:** This setting affects REBOUND and NXL FULL AUTO; it adjusts how many shots are needed to be pulled in order for it to kick into Full Auto or Rebound Modes. You can adjust it from 1–10 pulls. This means that if it is set to 10, you must pull the trigger 10 times before it will kick into the chosen mode.

**DET LEVEL:** This is to adjust for Vision sensitivity. For a Shocker, it should be set to 1, and for a Nerve it should be set to 2.

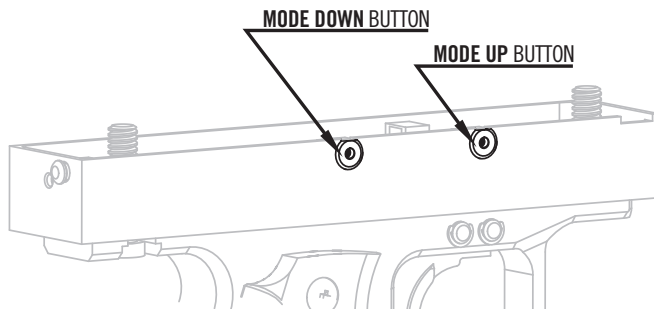
**SHORTCUT KEY:** This affects all firing modes—and is a handy feature. If you adjust your rate of fire to something higher than the tournament-legal 15 balls per second, all you have to do is hold the Mode and On/Off buttons simultaneously for one second. This will put your rate of fire back to 14.7 balls per second (the board will chirp and both lights will stay on).

## IMPULSE INSTALLATION

Follow your Impulse owner's manual for instructions on the removal of the stock board and installation of the new board. Blackheart has been designed to fit in your Impulse without any modification.

## OPERATING INSTRUCTIONS

- 1 Press and hold the On/Off Button for two seconds. The board will chirp and then power on, entering vision firing mode. This action also powers off the gun.
- 2 The On/Off Button can be used to switch back and forth from base mode to vision mode by pressing the button quickly and observing the chirp and change in light pattern from a steady blink to an interrupted blinking sequence.
- 3 By pressing the Mode Down Button once, the board will enter into Adjustment Mode. A solid green light indicates you are in Dwell Adjustment Mode. As you continue pressing the Mode Down Button, you will cycle through the modes which are each defined by a specific color and flash sequence (see chart).
- 4 While in any of these modes, wait 4 seconds and the speaker will chirp to identify what the range is set to. For example, if it was in the Dwell Setting Mode and the Dwell was set to 30, after 4 seconds the speaker would chirp 30 times.
- 5 If you decide to leave the adjustment table without making any changes, simply pull and release the trigger one time, and the board will go back into its base (non-vision) firing mode. **CAUTION: If there is air charged in the gun, it will not be able to fire while in Adjustment Mode. However, as soon as you release the trigger, you will be able to fire the gun.**
- 6 To change one of the settings while the board is in any of the modes listed in the adjustment table, complete the following steps:
  1. Pull and hold the trigger for 3 seconds; the speaker will chirp 5 times to indicate that you can make adjustments.
  2. While the trigger is still being held, navigate through the range of settings by pressing the Mode Down Button to adjust down, or the Mode Up Button to adjust up. The speaker will make a high pitched chirp for each adjustment up, and a low pitched chirp for each adjustment down.
  3. Once you have reached your desired setting, releasing the trigger will put the board back into base fire mode and save your new setting. The board will chirp rapidly when it can't go any higher or lower in an adjustment mode.



## ADJUSTMENT TABLE

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Firing Modes	Single Blink Green	Down	Up	1 – 4
Debounce	Single Blink Red	Down	Up	0 – 25
BSA (Bolt Stick Adjust)	Double Blink Green	Down	Up	0 – 25
Kick-In Rate Adjust	Double Blink Red	Down	Up	1sps – 10sps
Sustain Rate Adjust	Fast Blink Green	Down	Up	1sps – 10sps
Number of Shots to Enter Firing Mode	Fast Blink Red	Down	Up	1 pulls – 10 pulls
Shortcut Key *	Green & Red	Both	Both	N/A

\*Shortcut Key: When both buttons are depressed for 1 second, the board will chirp and the red and Green lights will stay on to identify that your fire rate has been set to 14.7 SPS.

## MODE DESCRIPTIONS

**DWELL:** This adjusts how long the bolt stays forward on each firing cycle. Too low of a Dwell will not allow the marker to fire. If the Dwell is set too high you will lose gas efficiency. Refer to your Impulse manual for instructions to set your Dwell.

**RATE OF FIRE (ROF):** This can also be labeled "Pause Time," because with every adjustment, you are increasing or decreasing the pause time between each shot. This is why this mode is the only mode where you press the "down" Mode Button to increase the setting. Adjusting up (increasing the pause between shots) will turn your ROF down and adjusting down (decreasing the pause between shots) will increase ROF.

**FIRING MODE:** There are 4 different modes that you can cycle through while in the Firing Mode adjustment stage. Here are the different modes and their descriptions:

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2. **[3 Shot Burst]** This firing mode is mostly for fun, and generally not legal at any tournaments. For each pull of the trigger the gun will fire 3 shots.

3. **[NXL Full-Auto]** The name is just what it suggests, it is full auto after you pull the trigger the set amount of times and then continue to hold the trigger. If you happen to release the trigger, you have just under one second to pull it again and jump right back into Full Auto without the normally required kick-in shots. This mode is fully adjustable with KICK-IN RATE, NUMBER OF SHOTS TO ENTER FIRING MODE and ROF.

**NXL IDEAL SETTING:** *Kick-In Rate:* 1, *Number of Shots to Enter Firing Mode:* 3, *ROF:* 14.7

4. **[Rebound]** This firing mode makes it much easier for any user to reach the max fire rate. This mode can be fully adjusted with KICK-IN RATE, SUSTAIN RATE, NUMBER OF SHOTS TO ENTER FIRING MODE and ROF. This is the best mode for the Millennium Series and PSP.

**PSP IDEAL SETTING:** *Kick-In Rate:* 1, *Sustain Rate:* 1, *ROF:* 14.7, *Number of Shots to Enter Firing Mode:* 3.

**MILLENNIUM SERIES IDEAL SETTING:** *Kick-In Rate:* 8, *Sustain Rate:* 8, *ROF:* 14.7, *Number of Shots to Enter Firing Mode:* 3.

**DEBOUNCE:** This setting will affect all firing modes, although it is normally only effective in Semi-Auto Mode. The lower you set the Debounce, the more sensitive it makes the trigger. If you set the Debounce too low and pull the trigger slowly, the kick back might make it shoot more than once. At many tournaments, that would be an illegal gun. Also, if you set the Debounce to 0, it will shoot at Full Auto, which isn't legal at many fields and tournaments.

**BSA (Bolt Stick Adjustment):** This setting affects all firing modes and is used to help compensate for any first shot drop. (First shot drop is when a gun's first shot is very low in velocity compared to the following shots.)

After the gun sits for 10 seconds, the board will increase the Dwell setting to alleviate any first shot drop. The increase is based on the level of your current BSA setting. If you do not experience any drop, then you would be at the lowest setting within the BSA to avoid any hot gun penalties.

**KICK-IN RATE:** This setting affects REBOUND and NXL FULL AUTO; it refers to the shots per second you must reach by pulling the trigger before the board will "kick-in" to NXL Full Auto or Rebound. The higher the setting, the harder it will be to kick into either of the modes. The lower the setting, the easier it will be to kick in.

**SUSTAIN RATE:** This setting affects REBOUND; it refers to the shots per second you must sustain by pulling the trigger to keep the board "kicked in" to Rebound. The higher the setting, the faster you will have to pull the trigger to sustain the Rebound.

**NUMBER OF SHOTS TO ENTER FIRE MODE:** This setting affects REBOUND and NXL FULL AUTO; it adjusts how many shots are needed to be pulled in order for it to kick into Full Auto or Rebound Modes. You can adjust it from 1–10 pulls. This means that if it is set to 10, you must pull the trigger 10 times before it will kick into the chosen mode.

**SHORTCUT KEY:** This affects all firing modes—and is a handy feature. If you adjust your rate of fire to something higher than the tournament-legal 15 balls per second, all you have to do is push the Mode Up and Mode Down buttons simultaneously for one second. This will put your rate of fire back to 14.7 balls per second. (The board will chirp and both lights will stay on.)