



## Installation and Operation Instructions

### Electronic Boost Controller (Rev. F1)

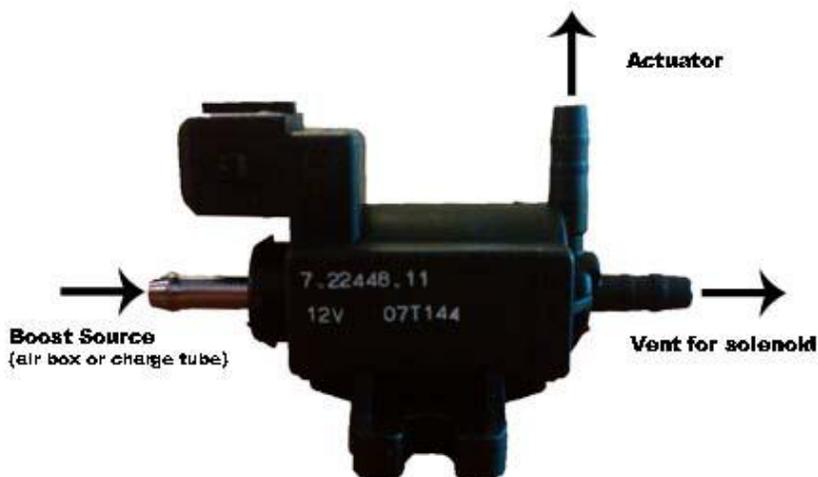
#### Contents list:

Before installation of your Boondocker Electronic Boost Controller (EBC), check the contents of your kit. Find the appropriate list for your application in the Appendix.

#### Installation

After installation, calibration is required! (See page 2.)

Install the boost solenoid in a pressure line between the air box (or charge tube) and wastegate actuator. Attach the metal port of the solenoid with a 3/16" hose to the air box (or charge tube) fitting (see the figure below). Connect the right-angle port of the solenoid with a 3/16" hose to the wastegate actuator. Attach a short length of hose to the third port and point it downward so that it won't get water in it. This is the actuator vent hose. Attach the solenoid so that it is supported. Use small zip ties to secure the hoses to the ports.



## **Installation** (continued)

Attach the electronic boost controller (EBC) mounting bracket to a convenient location on the console or handlebars. Slide the EBC onto the bracket.

Connecting the EBC harness to power is different for every sled:

For **Polaris Dragon**, the EBC harness plugs into accessory power near the top of the firewall. This connector has a red/white and brown wire. Be sure that the molded rubber EBC connector having the male pin with the red wire plugs into the sled harness, aligning with the red/white wire. The other EBC connector having the female pin with the red wire can be used for the oil pump and/or fan. Be sure that red (or red/white) wires go to red wires and brown wires go to brown wires.

For **Polaris RMK Pro**, the EBC harness plugs into accessory power under the left side panel. It is the white connector labeled “DC Power”.

For **Polaris RZR**, the EBC harness plugs into the accessory power provided by the relay that powers the intercooler fan. Be sure that the molded rubber EBC connector having the male pin with the red wire plugs into the relay harness so the colors line up. The other mating rubber molded connector with the pin with the brown wire that is exposed will plug into the fan wiring harness. The two position connector with the brown and blue wires will plug into the new supplied turbo harness going to the fuel control box. This will provide the boost pressure signal to the fuel control box.

For **Arctic Cat M8 and M1000 WITHOUT a fuel pump booster**, unplug the fuel pump at the right side of the firewall and plug the EBC harness in line so that all the black connectors are used.

For **Arctic Cat M8 and M1000 WITH a fuel pump booster**, only the fuel booster connects in line between the fuel pump and its power connector. **DO NOT CONNECT THE EBC IN LINE WITH THE STOCK HARNESS. DO NOT PLUG THE EBC INTO THE FUEL BOOSTER CONNECTOR WITH THE RED AND BLACK WIRES.** One of the black connectors on the EBC harness plugs into the extra connector on the fuel pump booster. The other black connector on the EBC harness is used only for the optional auxiliary injectors. **DO NOT ATTEMPT TO USE POWER FROM THIS CONNECTOR OR FROM THIS POWER CIRCUIT FOR ANY OTHER PURPOSE.**

The rest of the connections are the same for every sled:

Attach the handlebar button in a convenient location on the left side of the handlebar and plug it into the EBC harness. This is your Push-to-Pass button. According to your Plus HP button setting (SET +HP), this gives more boost when the button is pressed. Plug this button into the mating connector on the EBC harness.

Plug the EBC harness into the boost solenoid. Plug the 6-pin connector of the EBC harness into the EBC pigtail.

## Installation (continued)

### Connections (continued):

The supplied ADA (Air Density Advantage) harness attaches to the Boondocker Control Box. (If you are not using a Boondocker fuel control box, then this harness is not needed.) If using the EBC to provide a boost pressure signal to the Fuel Control Box, plug the remaining two-pin connector into the mating connector on the ADA Harness. Refer to the ADA instructions to install the remainder of the ADA kit.

For TPS Smart feature (explained later), plug the blade connector on the white wire into the short pigtail from the ADA harness. If not using a Boondocker fuel control box, then tap this into the TPS *signal* wire (not +5V and not ground). To find this signal without a schematic, it is the wire that will usually be about 1V at idle and about 4V at full throttle. This hook-up is optional. Without it, you will regulate at full boost regardless of throttle position.

Install the supplied push to connect 90° fitting into the threaded hole in the BoonDocker airbox or intercooler.

Feed one end of the 1/8" poly line through the EBC pigtail sheath and insert it into the push-to-connect fitting marked "B" on the back of the EBC. On Polaris, route this line to the air box, cut to length and insert it into a similar fitting. On an Arctic Cat, "Y" into the fuel pressure boost line.

Finally, plug the six-pin plug of the EBC harness into the EBC. **For Polaris RMK, be aware that there are other six-pin connectors of the same type. Do NOT plug the EBC or EBC harness connector into the Boondocker EFI harness or stock EFI harness.**

## Calibration

If you are using a Boondocker Fuel Control Box and the EBC will be providing the pressure signal (i.e., you are NOT using a separate pressure transducer), then calibration of the EBC is required.

The EBC provides an electrical signal to the Boondocker Fuel Control Box that represents boost pressure. The Control Box uses this signal to determine how much fuel to add for boost air. It is vital that when boost is zero, the Control Box reads zero. This is to avoid adding fuel at idle or failing to add enough fuel when on boost. This signal is calibrated at the factory so will be close, but might need minor adjustment.

Go to the first "STATS" screen on the Fuel Control Box. Notice the boost reading on the Fuel Control Box. With the motor idling scroll down the EBC menu (short button pushes to "CFG PT CAL" in the configuration menu. If "CFG PT CAL" does not appear, go to the altitude screen and hold the button for five seconds until it advances to "CFG". After "PT" and "CAL" are displayed, the screen will display a number. Hold the button one second to make this number flash. Use short pushes of the button on the EBC face to adjust this value up or down. Hold the button down for one second to change direction, shown by the "+" or "-" sign. Change the number until control box reads zero boost. It is preferred to use the lowest setting that reads zero or a setting that alternates between -0.3 and 0.0psi. This will avoid

adding fuel at idle. Changing the direction twice without making an adjustment will lock the calibration and the flashing will stop.

More information on using the buttons and menus follows.

### **Using the EBC**

There are several user menus, some having numbers or selections that are adjustable by the user. Each value or selection is preceded by one or more scrolling labels that describe the value or selection. These descriptive labels along with the value comprise one element. The button on the box can be used to display the element description, make adjustments, or advance to the next element. For example, the boost-setting element works like this:

*SET*                    These first two labels (“SET” and “BST”) each show for a fraction of a second each, then the display stops on the value (“8.5” in this example). If the number is showing, a quick button push will display “SET” and “BST” again, to remind you which value is currently displayed. Since this number is adjustable, holding the button for one second causes the “5” to flash. While it is flashing, quick presses of the button will cause this digit to scroll zero through nine. Holding a button for one second will advance to the next digit (“8” in this example) which will then flash. Quick button presses adjust this value. When the third digit value is set, holding the button for one second locks in the value and the flashing stops. The new boost setting will not be locked in unless you pass through all three digits. While any label such as “SET” or “BST” are showing, a quick button press will advance to the next element. You can advance through several elements quickly by repeated presses of the button.

Some elements have text selections, such as “YES” and “NO”, rather than numbers. Press and hold the button one second to make the selection flash, then use quick button presses to toggle or scroll through the choices. A one second button push locks it in.

There are three elements in normal mode: Set Boost (SET BST), Set Plus HP (SET +HP), and Altitude (ALT). Whenever you are on boost, actual boost pressure is displayed. When off boost, the last menu shows again.

There are six elements in user configuration mode. To get to user configuration mode, go to the altitude screen, then press the button for five seconds until CFG is displayed. You now have access to all the configuration elements. You can exit configuration mode so that the menu only shows the three elements of the normal user menu.

## Theory

The Boondocker EBC is a true PID controller. The user chooses a desired boost (SET BST), called a set point. The controller evaluates the error between the set point and actual boost, watches the rate of approach to the set point, and changes the amount of air pressure allowed to the wastegate actuator to achieve the desired boost level. The advantage of this approach is that the wastegate can be held completely shut during spool-up to achieve minimum lag. By comparison, a boost tee will gradually open the wastegate as boost comes up, slowing boost rise time. This controller can also open the wastegate more quickly than a boost tee to avoid boost spikes when going from partial to full throttle. The Boondocker EBC is safer for your engine AND gives superior performance.

According to the user-selected configuration, the boost set point can be fixed or it can compensate for altitude. If Altitude Compensation is off and the set point is 8.5psi, then no matter what the altitude is, the controller will always control to 8.5psi. But when going from 5000 feet to 7300 feet altitude, you will lose horsepower because you have lost one PSI of ambient air pressure. To keep total air to the engine constant, turn on Altitude Compensation (found in the configuration menu). Then if the boost is set at 8.5psi when you are at 5000 feet altitude, it will control to 9.5psi at 7300 feet altitude.

The handlebar button is used to add extra boost on demand. The amount of extra boost is set with Set Plus HP (SET +HP).

**WARNING: Add SET +HP and SET BST values to get total boost. Don't exceed safe boost for your setup and fuel octane!**

New for 2012 is Boondocker's TPS Smart feature. Engines can tolerate higher boost at higher RPMs, so TPS Smart adjusts the boost set point proportional to throttle position. For example, full set point is reached at full throttle. At 75% throttle, regulation will occur at 75% of the boost set point.

The two boost settings above plus actual boost can be configured to read in PSI or bar. Use Boost Units of Measure (BST U-M) in the configuration menu to make this selection.

Altitude can be configured to read in either thousands of feet or thousands of meters. Use Altitude Units of Measure (ALT U-M) in the configuration menu to make this selection.

The EBC provides a boost pressure signal to the Fuel Control Box which is calibrated to give zero boost at an idle. Use Pressure Transducer Calibration (PT CAL) in the configuration menu for this calibration.

The boost solenoid can be tested by advancing to SOL TST in the configuration menu. When the EBC display shows BZZ, the solenoid should be buzzing or vibrating. This is not usually audible above engine noise, but can be felt with your hand.

## Menu Description

SCREEN  
DISPLAY

DESCRIPTION

*SET*

SETTING BOOST LEVEL

*BST*

*8.5*

Set this value for the boost you want at your present altitude. The number displayed will change with altitude and weather if Altitude Compensation is turned on. If Altitude Compensation is on, then when you set this value, the current ambient pressure is automatically captured. Ambient pressure is used as the reference point when adding or subtracting the compensating boost.

*SET*

SETTING PUSH-TO-PASS

*+HP*

*2.0*

You can set how much extra boost you desire when you press the handlebar button.

*ALT*

ALTITUDE ABOVE SEA LEVEL

*2.7*

This is shown in thousands of feet or thousands of meters. Under normal weather conditions it will be accurate within about +/-300 feet or +/-100m. Good or improving weather is associated with high pressure which will make the gauge read low. Bad or declining weather will make the gauge read high.

*CFG*

CONFIGURATION MODE

In normal mode (showing only the three elements above), a short button press while ALT is displayed will take you back to the top of the menu (SET HP). Holding the button for five seconds while the Altitude value is displayed will display CFG and take you to the configuration menu, described below.

*PT*

PRESSURE TRANSDUCER CALIBRATION

*CAL*

*48*

Calibrate the pressure transducer input to your Boondocker Control Box for proper fuel regulation, but only if you are not using a separate Boondocker pressure transducer. Set the Fuel Control Box to show boost by going to the first "STATS" screen, then adjust this value up or down until control box reads zero boost. See the calibration procedure above for more details.

**ALT** **YES/NO**  
ALTITUDE COMPENSATION

**CMP** To turn Altitude Compensation off, choose NO. Then the boost set point will remain constant regardless of weather or altitude, though horsepower will drop with altitude due to less ambient air. To turn Altitude Compensation on, choose YES. This will give one-to-one compensation, where one pound of lost ambient air pressure will result in a one pound increase in boost set point. To get two-to-one compensation, choose 2X. This will result in more total horsepower at higher altitudes. Be careful when setting this at a lower altitude than you will be riding. You must leave margin so that boost at high altitude doesn't exceed your system's capability with the fuel you are burning. (Pressure change with altitude is about 0.5psi per 1000ft under 5000ft altitude and 0.4psi per 1000 from 5000ft to 10,000ft. In metric units, it is about 0.011bar per 100m under 1500m and about 0.009bar per 100m from 1500m to 3000m.)

**NO/YES/2X**

**SOL**  
SOLENOID TEST

**TST** While BZZ is showing, the boost solenoid is operating at 50% duty cycle (on half the time). This is provided so you can test the solenoid operation.

**BZZ**

**BST**  
BOOST UNITS SELECTION

**U-M** Choose English or metric units for boost pressure. When changing these units you must re-enter your SET BST in order to properly capture ambient pressure.

**PSI/BAR**

**ALT**  
ALTITUDE UNITS SELECTION

**U-M** Choose English or metric units for altitude, displayed in thousands of feet or thousands of meters.

**KFT/KM**

**REV**  
REVISION

**E0** This shows the current revision of the EBC code. Have this available whenever contacting Boondocker or your dealer with questions.

**XIT**  
EXIT CONFIGURATION MODE

**CFG** After calibrating and configuring your EBC, select "YES" to exit configuration mode. Then you will see only the three main user elements.

## **Appendix**

### **Kit Contents list for Arctic Cat M8 and M1000 (2011 and Older):**

- |  |                                     |
|--|-------------------------------------|
| 1- Electronic Boost Controller (EBC)   | 2- 24" length x 1/8" O.D. Poly line |
| 1- Boost Solenoid  | 24" length x 3/16" I.D. vacuum line |
| 1- Mounting bracket (Velcro)   | 4- small zip ties                   |
| 1- Handlebar Push Button (optional)  | 4- large zip ties                   |
| 1- Push-to-Connect Y   | 1- Push to connect 90               |
| 1- Arctic Cat EBC Harness (w/6 pin connector)                                      |                                     |
| 1- ADA harness (w/10 pin connector, only for use with Boondocker Fuel Control Box) |                                     |

### **Kit Contents list for Polaris Dragon:**

- |  |                                     |
|--|-------------------------------------|
| 1- Electronic Boost Controller (EBC)   | 24" length x 1/8" O.D. Poly line    |
| 1- Boost Solenoid  | 30" length x 3/16" I.D. vacuum line |
| 1- Mounting bracket  | 4- small zip ties                   |
| 1- Polaris Handlebar Push Button (optional)  | 4- large zip ties                   |
| 1- Polaris EBC Harness (w/6 pin connector)   | 1- 1/4-20 x 1" bolt and lock washer |
| 1- ADA harness (w/10 pin connector, only for use with Boondocker Fuel Control Box) |                                     |
| 1- Push to connect 90  |                                     |

### **Kit Contents list for 2011 Polaris RMK:**

- |  |                                     |
|--|-------------------------------------|
| 1- Electronic Boost Controller (EBC)   | 36" length x 1/8" O.D. Poly line    |
| 1- Boost Solenoid  | 24" length x 3/16" I.D. vacuum line |
| 1- Mounting bracket  | 4- small zip ties                   |
| 1- Handlebar Push Button (optional)  | 4- large zip ties                   |
| 1- '11 RMK EBC Harness (w/6 pin connector)   | 2- Small self-tapping screws        |
| 1- ADA harness (w/10 pin connector, only for use with Boondocker Fuel Control Box) |                                     |
| 1- Push to connect 90  |                                     |

### **Kit Contents list for Polaris RZR:**

- |   |                                     |
|---|-------------------------------------|
| 1- Electronic Boost Controller (EBC)  | 96" length x 1/8" O.D. Poly line    |
| 1- Boost Solenoid   | 48" length x 3/16" I.D. vacuum line |
| 1- Mounting bracket (dash mount)  | 4- small zip ties                   |
| 1- Handlebar Push Button (optional)   | 4- large zip ties                   |
| 1- Polaris EBC Harness (w/6 pin connector)  | 1- #28 Hose clamp                   |
| 2- #4 hose clamps   | 1- 7' EBC harness extension         |
| 1- Turbo transducer harness (w/10 pin connector, only for use with Boondocker Fuel Control Box) |                                     |
| 1-Push to connect 90  |                                     |

**Kit Contents list for Nvytro:**

- 1- Electronic Boost Controller (EBC) 36" length x 1/8" O.D. Poly line
- 1- Boost Solenoid 30" length x 3/16" I.D. vacuum line
- 1- Mounting bracket 4- small zip ties
- 1- Handlebar Push Button (optional) 4- large zip ties
- 1- Nvytro EBC Harness (w/6 pin connector) 1- 1/4-20 x 1" bolt and lock washer
- 1- ADA harness (w/10 pin connector, only for use with Boondocker Fuel Control Box)
- 1- Push to connect 90

**Kit Contents list for Arctic Cat M8 (2012):**

- 1- Electronic Boost Controller (EBC) 1- 52" length Clipperd tubing with Poly line ends
- 1- Boost Solenoid 28" length x 3/16" I.D. vacuum line
- 1- Mounting bracket (Velcro) 4- small zip ties
- 1- Handlebar Push Button (optional) 6- large zip ties
- 1- Push to connect 90
- 1- Arctic Cat EBC Harness (w/6 pin connector)
- 1- ADA harness with auxiliary injectors (w/10 pin connector, only for use with Boondocker Fuel Control Box)

**Kit Contents list for Skidoo ETEC:**

- 1- Electronic Boost Controller (EBC) 36" length x 1/8" O.D. Poly line
- 1- Boost Solenoid 30" length x 3/16" I.D. vacuum line
- 1- Velcro for mounting EBC 4- small zip ties
- 1- Polaris Handlebar Push Button (optional) 4- large zip ties
- 1- Skidoo EBC Harness (w/6 pin connector)
- 1- ADA harness (w/10 pin connector, only for use with Boondocker Fuel Control Box)
- 1- Push to connect 90