PHANTOM TETH-AIR ™

DESCRIPTION

The ***Phantom Teth-Air*** is a technologically advanced, Patent Protected "Smart Tether", designed for the power sports industry. (Patent # US 7,034,696 B2) Primarily designed for snowmobiles and similar vehicles where the rider/driver may get separated from the controls. This system is designed to shut off the engine in a runaway or roll-over condition. When the engine RPM's are above the user defined Tachometer setting and the Proximity sensor does not sense the riders hand on the throttle or if the vehicle is upside down for a preset time, the engine will shut down.

The ***Phantom Teth-Air*** is comprised of three components:

1. Upper throttle block mounted, control module. 2.5" x 7/8" x 1.5" (3.5 ounce)

2. Lower Output/Power Supply Module and interconnecting wiring. 6" x 1.25" x 1.5" (6.4 ounce)

Source Innovations Ltd.

3. Infrared Remote Control - 8.7cm x 4cm x 0.7cm (3 1/4" x 1 1/2" x 1/4)

Recommended Program Values for initial installation:

Proximity Delay #3 (1.5 seconds)
Roll Over Delay #2 (2 seconds)
Tachometer 300-500 RPM below clutch engagement.

4. The Universal Install kit includes:

- Installation and operation manual
- 2 sided adhesive foam tape (may be pre-stuck to enclosures)
- 6 wire ties

- 5 Scotchlok connectors (may not look exactly as shown)
- 1 Phantom Teth-Air Decal

The upper control module is to be mounted to the throttle block with a Proximity Antenna sitting above the riders hand while it is on the right handlebar grip. The control module utilizes a RGB (multi-colour) LED that provides continual feedback status to the rider while the power is applied. The module also has an infrared detector that accepts code from the supplied IR remote control for programming settings for the operator while the system is powered up and the output relay is not activated. CAUTION: DO NOT MAKE SETTING CHANGES WHILE RIDING, as loss of control may occur.

The primary mode/feature of operation is to shut off the vehicle engine when the rider is ejected or falls off the vehicle. When the Proximity sensor fails to sense the riders right hand and the engine RPM's exceed the users Tachometer setting, the engine will be shut off via an electrical relay in the lower output module. This condition occurs when the distance of the riders hand has become too great. (RED LED condition) and the engine RPM is above the Tach. setting (BLUE LED) The ideal set-up condition allows uninterrupted operation of the vehicle as long as the operators hand is on the right hand handlebar grip OR if the engine speed is below the Tachometer setting, (GREEN LED condition or BLUE when RPM's exceed Tach. Setting) There is also a user defined delay that can be set to reduce the incidences of shutdowns from quick excursions outside of the Proximity detection range. The delay can be set in 5 steps of approximately 0.5 second increments. Additionally, ZERO can be set to turn off the Proximity sensor.

The secondary mode/feature of operation is to provide shutdown if the vehicle is tipped over more than 90 degrees from the upright position. This feature also allows for a delay to be set in case the tipped position is an instantaneous condition that is to be considered normal or acceptable during normal riding. This may include conditions such as jumps or drops that may be falsely sensed by the roll-over switch as a roll over condition. The delay is also in 5, 1 second steps plus 0 to disable the Roll-Over mode.

CERTIFICATION

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CAUTION

The Phantom Teth-Air is a safety tool to make your power sport more enjoyable and safer. Source Innovations Ltd. strongly recommends that you take ample time to familiarize yourself with the functions and features so that you can set up the product to best suite your riding style. Failure to do so may cause engine shut downs and Source Innovations Ltd. is not responsible for any damages caused by loss of control that could result. In addition improper setting could also cause the unit not to shut down the engine when it should. CAUTION: DO NOT MAKE SETTING CHANGES WHILE RIDING, as loss of control may occur.

PATENT PROTECTION

This device is protected under the following patent(s): Patent License US 7,034,696 B2

INSTALLATION

The upper control module must be securely fastened to the front side of the throttle block with the 2 wire ties provided. The installation must not interfere with the throttle flipper or cable. It is also recommended that the wire ties do not directly pull, rub or wear on any wires. E.g. heated grip wiring.

The Proximity Antenna is to be bent back and out towards the end of the handlebar so that it sits right above the rider's hand. Ideal location will be close enough that no false shutdowns take place and far enough that it does not interfere with the throttle or hand grip access. Usually failure to position the coax properly will result in shutdowns during transition from standing to sitting as this rotates the hand down and away from the Proximity Antenna. To aid in positioning of the Proximity Antenna, a hair dryer is a useful tool to warm and shape it. NOTE: DO NOT CUT THE PROXIMITY ANTENNA AS THIS MAY RESULT IN UNEXPECTED ENGINE SHUTDOWNS.

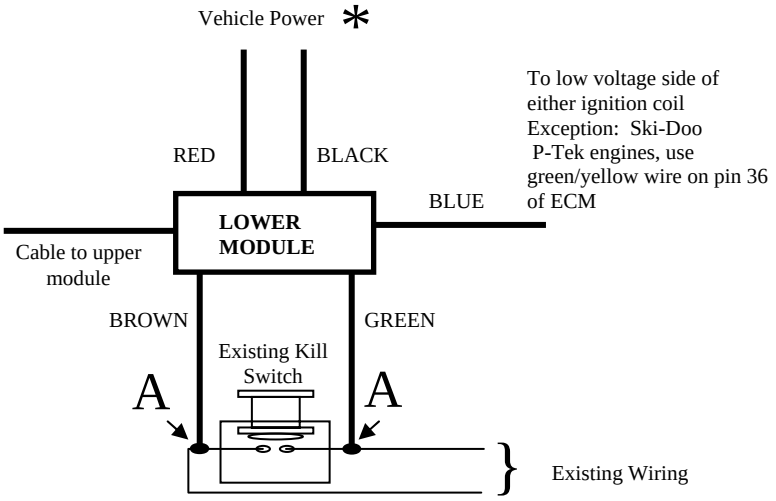
The lower module is to be wire tied to the vehicle under the hood in a location that is away from extreme heat, wetness and moving parts. The ideal location also permits close connection to the vehicles wiring harness which includes connection to the factory kill switch, power, ground and low voltage side of one ignition coil. (exception Ski-Doo P-Tek, see wiring diagram)

NOTE: The 4" shrink tubing supplied must be located centrally over the male/female cable connector to provide water-proofing of the connector. The shrink tubing must be shrunk tight to the cables with a heat gun. Failing to adequately seal this connector may void warranty. This tubing requires a substantially high shrink temperature and the installer must be careful not to damage the cables or other parts while installing.

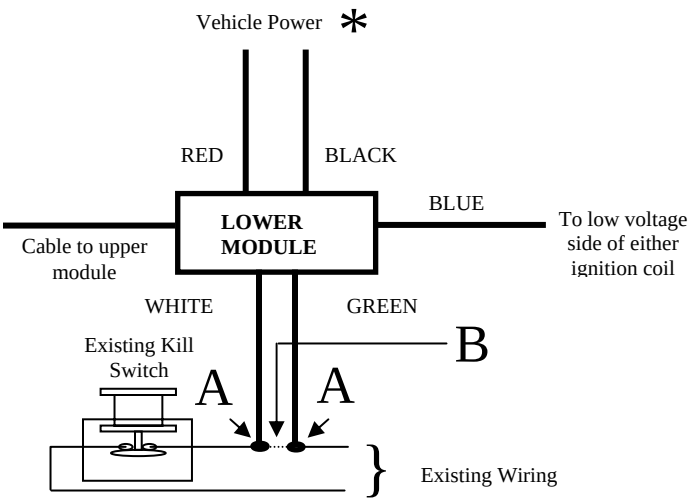
See installation photo's for most snowmobile manufacturers at: www.sourceinnovations.ca

WIRING DIAGRAM

Normally Open Configuration
e.g. Ski-doo, Polaris 2 stroke Artic Cat



Normally Closed Configuration
e.g. 4 stroke Arctic Cat, Yamaha & Battery Ignition Systems



PLEASE SEE SPECIAL INSTALLATION NOTE FOR 4 STROKES, AT THE END OF THIS MANUAL

POWER (12V to 18V AC/DC)

RED
BLACK

RELAY

WHITE (normally closed)
GREEN (common)
BROWN (normally open)

TACHOMETER INPUT

BLUE

NOTES

A: INSTALLER CONNECTIONS

B: CUT EXISTING WIRE

*: THE POWER SUPPLY LOCATION MUST NOT SUPPLY POWER WHEN THE ENGINE IS OFF FOR VEHICLES WITHOUT IGNITION SWITCHES **(SEE INSTALLATION)**. CONNECT **RED** TO POSITIVE AND **BLACK** TO NEGATIVE OF VEHICLES POWER OR VISA VERSA. YOU MAY ALSO CONNECT **RED** AND **BLACK** ACROSS THE VEHICLES AC POWER. DO NOT CONNECT **RED** AND **BLACK** TOGETHER.

Special Installation Note for 4 Stroke Installation:

When installing a Phantom Teth-Air on a 4 stroke snowmobile or any Normally Closed ignition system there must be special consideration given to placement and mounting of the Lower Output/Power Supply Module. When mounting the Lower Output/Power Supply Module it must

be mounted to avoid excessive vibration. This mounting can utilize foam tape to isolate the vibrations from the enclosure. High vibration installations can allow the electromagnetic relay switch to bounce and cause miss-firing or due to loss of power to the snowmobiles ECM, fuel system and or the ignition coils. If relay "Bounce" is experienced, a heavy (30 Ampere) automotive relay can be added to switch the snowmobiles electrical load as these larger relays are usually more immune to the vibration. Please contact Source Innovations for more information if you experience this problem.

Throttle Block and Antenna Positioning

Use 2 wire ties to secure interconnecting cable to handle bars, leave some slack for throttle block movement. CAUTION: DO NOT IMPEDE THE THROTTLE MOVEMENT OR RESTRICT CABLES OR SERIOUS RESULTS CAN OCCUR.

OPERATION / SETUP

After installation, start the motor but **be careful not to have hand or body near the Proximity Antenna while starting** as the Proximity sensor recalibrates every time the unit starts up. If you have an electric starter, you may be more prone to be holding the handlebar while starting and this practice will result in engine shutdown on acceleration.

The motor should start and the LED in the upper module should glow RED indicating that the unit has power but no hand is detected. Do not ride your vehicle yet as set up is not complete. Tachometer and delays must be set at this time.

Tachometer Setting: There are 2 ways to set the Tach Setting.. To set the Tachometer, use the provided IR remote control. Method 1. (auto set) While facing the clear top of the upper control module with the remote control, (engine running and the LED Red) press the Tach button, The LED should flash once, indicating a Tach setting has been entered. If the LED flashes BLUE 3 times, there is no TACH. Input detected. As no hand was present during this Tach. setting, the processor automatically multiplies the Tach setting by 1.8 and saves this to memory. E.g. if the Tach button is pressed at 2000 rpm, when no hand is sensed by the Proximity sensor, the Tach setting will be saved at 3600 RPM.
The second method is to set a user defined Tach setting (custom set) To set the users custom setting follow the same procedure as above except the LED must be Green when setting the Tach. (hand present) The Tach Setting will be saved matching the actual RPM as when the button is pressed.
CAUTION: DO NOT MAKE SETTING CHANGES WHILE RIDING, as loss of control may occur.

NOTE: it is recommended that the Tach Setting always be lower than the clutch engagement RPM.

Delay Settings: There are 2 delay settings that must be set for riding style.

Proximity Delay is set by facing the infrared remote control toward the clear top of the upper control unit. Next the Prox. Button is pressed and if accepted, the LED will glow yellow, after flashing out the current user settings At this time the user can enter a new number or press the Prox. Button again to exit the menu and return to run mode. The new number can be from 0-5. If 0 is selected, the Proximity sensor will be shut off. Each number from 1-5 adds approximately 0.5 seconds to the delay. NOTE: The delay will not take place on the first acceleration after each time the Phantom is powered up, this is a safety feature to prevent run-a-way due to a stuck or frozen throttle on start up.

Roll-Over Delay is set the same way as the Proximity Delay except the R/O button is pressed and the LED will glow VIOLET after flashing out the current user settings and prior to entering the numbers 0-5. 0 also disables this feature if desired and re-pressing the R/O button exits the menu and returns to run mode. Each number for R/O is equal to approx.. 1 second. (disabled or 1-5 seconds)

ALWAYS TEST OPERATION PRIOR TO USE by starting engine and push on the throttle with figure tip to increase the RPM slowly until the engine shuts down. This must be done so that the hand is kept far enough from the Proximity sensor so that the LED stays RED and shutdown will take place soon after the engine exceeds the Tach. Setting. Remember to expect to experience the Proximity Delay you entered if you have previously accelerated, since powering up the Phantom, before doing this test. NOTE: For safety reasons this test should be done on a snowmobile stand.

Powering Phantom ON/STAND-BY: The Phantom Teth-Air can be powered ON/STAND-BY with the remote control.
To place in STAND-BY when ON: With engine running and remote control facing the clear top of the upper control unit, press the power button once. The Red LED will now flash every 5 seconds in this STAND-BY mode and will not operate.

To turn ON from STAND-BY mode: With engine running and remote control facing the clear top of the upper control unit,, press the power button once. The Red LED will turn solid, recalibrate and the Phantom will be put in to run mode with a temporary high Tach setting. This temporary setting is removed and the saved settings is restored after shutting off and restarting the engine,

IMPORTANT ADDITIONAL SETTING MODES: The power button can be pressed and held during the engine start to put the Phantom in STAND-BY, this is particularly useful when trying to escape from a Tach Setting that is lower than idle RPM as can take place when moving the Phantom from one machine to another. The temporary high Tach Setting that is activated when put back into service gives the user an opportunity to reset to a more usable Tach Setting.

TROUBLE SHOOTING

Experience	LED Status	Possible Cause	Possible Correction
Engine shuts down unexpectedly	Blue to Red	COAX antenna too far from hand or Prox. Delay too short	Bend and keep antenna closer to top of hand, increase Prox delay time or disable Prox. sensor
		Upper control unit or Prox. sensor is mounted too close to metal and this decreases sensitivity	Place foam tape between metal throttle blocks or remove metal hand guard brackets etc.
	Blue or Red to Violet	Roll over condition, or R/O delay too short when jumping or dropping	Increase Roll Over delay or disable. .
Engine shuts down unexpectedly at first acceleration after starting engine	Red to Red	Calibration on start up with hand present	Operator must restart engine without hand or body near the Prox sensor
		Operator not waiting for Prox. Sensor to boot up	Restart and allow enough time for boot up prior to accelerating
Unit fails to function	Flashing Red	Power is off	Turn on with IR remote while engine is running
	No LED visible	No Power to unit, Or unit is defective	Check power supply, replace or return for repair
	Green when no hand is present	Prox. sensor is sensing handle bar or other object	Likely antenna has been bent during operation, reboot to re-calibrate

Unit fails to function after a program change	Yellow or Violet	Operator has failed to enter a delay time	Press 0-5 on IR Remote, Yellow= Prox. and Violet = Roll Over
Unit fails to accept new Tach setting	Blue 3 flashes	No Tachometer input detected while setting	Start engine or check and repair Tach input.
Tach does not arm unit	Green at all speeds with hand present	Tach set too high	Re-program Tach as per instructions in manual
		Tach is off	Re-program Tach as per instructions in manual
Engine will not restart after a shut down	Red during engine cranking	Operator has failed to wait 3 seconds after shut down or failed to remove power source for 3 seconds after shutdown	Wait 3 seconds or if powered with battery, remove power for 3 seconds and then restart
Engine will not start even after waiting 3 seconds or starts and immediately quits	Red or Blue while cranking engine	Tach set too low	Power unit off and on from IR Remote during start and then reset Tach as soon as engine runs. Or disconnect Tach wire to start and with hand at Prox. sensor, reconnect Tach wire and reset Tach setting
		Noisy power supply at start up	See “Delayed Start” menu to add start delay
Roll Over shutdown fails to shut off engine	No Violet LED as expected when upside down	Roll Over sensor is switch off	Re-program R/O as per instructions in manual
		Upper Control Unit installed incorrectly	Re-install with Proximity sensor cable at the top only

SPECIFICATIONS

POWER SUPPLY	12-18 Volts, AC OR DC.
TEMPERATURE	-40 C. TO +40C.
RELAY TYPE	NO/NC 10 Ampere max.
TACHOMETER	15 Hertz TO 350 Hertz.
WARRANTY	1 Year, Repair or Replacement, see warranty for details.

Do not use this product unless you agree to the following terms & conditions.

This sets forth the terms and conditions for the use of this product. The installation of this product indicates that the BUYER has read and understands this agreement and accepts its terms and conditions

DISCLAIMER OF LIABILITY

Source Innovations Ltd. and its successors, distributors,, and dealers (hereafter SELLER) shall in no way be responsible for the product's proper use and service. THE BUYER HEREBY WAIVES ALL LIABILITY CLAIMS.

The BUYER acknowledges that he/she is not relying on the SELLER's skill or judgment to select or furnish goods suitable for any particular purpose and that there are no liabilities which extend beyond the description on the face hereof and the BUYER hereby waives all remedies or liabilities, expressed or implied, arising by law or otherwise, (including without any obligations of the SELLER with respect to fitness, merchantability and consequential damages) or whether or not occasioned by the SELLER's negligence.

The SELLER disclaims any warranty and expressly disclaims any liability for personal injury or damages. The BUYER acknowledges and agrees that the disclaimer of any liability for personal injury is a material term for this agreement and the BUYER agrees to indemnify the SELLER and to hold the SELLER harmless from any claim related to the item of the equipment purchased. Under no circumstances will the SELLER be liable for any damages or expenses by reason of use or sale of any such equipment.

The SELLER assumes no liability regarding the improper installation or misapplication of its products. It is the installer's responsibility to check for proper installation and if in doubt, contact the manufacturer.

LIMITATION OF WARRANTY

Source Innovations Ltd. (hereafter "SELLER") gives Limited Warranty as to description, quality, merchantability, fitness for any product's purpose, productiveness, or any other matter of SELLER's product sold herewith. The SELLER shall be in no way responsible for the product's open use and service and the BUYER hereby waives all rights other than those expressly written herein. This Warranty shall not be extended or varied except by a written instrument signed by SELLER and BUYER.

The Warranty is Limited to one (1) year from the date of sale and limited solely to the parts contained within the product's kit. All products that are in question of Warranty must be returned shipping prepaid to the SELLER and must be accompanied by a dated proof of purchase receipt. All Warranty claims are subject to approval by Source Innovations Ltd.

If the BUYER sends back a failed unit that is out of warranty and chooses to buy a refurbished unit, the refurbished unit will only carry a 60 day warranty. If the BUYER purchases a new unit at a predetermined discounted rate, it will have the standard 1 year warranty.

Under no circumstances shall the SELLER be liable for any labour charged or travel time incurred in diagnosis for defects, removal, or reinstallation of this product, or any other contingent expenses.

Under no circumstances will the SELLER be liable for any damage or expenses insured by reason of the use or sale of any such equipment.

This warranty is VOID for any new products purchased through auction websites. WARRANTY IS VALID ONLY FOR NEW PRODUCTS PURCHASED THROUGH AUTHORIZED DEALERS (proof of purchase required for all warranty claims).

IN THE EVENT THAT THE BUYER DOES NOT AGREE WITH THIS AGREEMENT: THE BUYER MAY PROMPTLY RETURN THIS PRODUCT, IN A NEW AND UNUSED CONDITION, WITH A DATED PROOF OF PURCHASE, TO THE PLACE OF PURCHASE WITHIN SIXTY (60) DAYS FROM DATE OF PURCHASE FOR A FULL REFUND.

THE INSTALLATION OF THIS PRODUCT INDICATES THAT THE BUYER HAS READ AND UNDERSTANDS THIS AGREEMENT AND ACCEPTS ITS TERMS AND CONDITIONS.
For further information, please see our web site at: **www.sourceinnovations.ca**