

PIT WIZARD



PIT WIZARD INSTRUCTION MANUAL

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INTRODUCTION

When designing an electronic speed control, the Novak engineers are put to the task of setting design parameters such as how wide the Deadband should be, what percentage of Full Drive should be applied with the first pulse of transmitter information, or what Brake and Drive Frequencies to use. In the past, our engineers would determine the best possible compromise for these parameters based on different vehicles and driving styles. While these fixed designs were perfect for some applications and some drivers, they were not right for others. It became clear that a speed control was needed that allowed the driver to modify several of the design parameters to fit their differing applications and needs.

During testing, our engineers found that different vehicles required different parameter values, just as each individual driver required different parameters to obtain the type of feel that they desired.

With this criteria in mind, Novak Electronics proudly brings you the Cyclone Programmable Speed Control (Part #1765) and the Pit Wizard Hand-Held Programmer (Part #1035).

WHAT'S INCLUDED

- **PIT WIZARD**

Comes complete and ready to program your Cyclone speed control right at the track where you need it most. Just add batteries, connect the D•LINK to speed control, and program. Also comes with sample Profiles to start you on the right track.

- **PROFILE SOFTWARE**

The same customized profiling software that comes with the Novak DataLink is already inside the Pit Wizard. Allowing you to customize the adjustable parameters of the Novak Cyclone Electronic Speed Control, including Deadband width, Minimum Drive percentage, Drive & Brake PWM Frequencies, and more.

ABOUT THE PIT WIZARD

2 Line/16 Character LCD displays menu position and options for easy navigation.

Novak's exclusive ESC Profile Software allows you to modify the design parameters of your Cyclone and store ten different racing Profiles.

{UP} & {DOWN} buttons let you scroll thru the main menu sub-screens and the user-adjustable parameter values.

{MODE} button takes you through the available main menu selections.

{ENTER} button makes your selection once the menu mode or parameter value you want is displayed.

This button {•} is for future growth and is not currently used.

Ergonomic design fits comfortably in your hand and sturdy nylon case stands up to tough environments.



D•LINK harness for communicating with Cyclone ESC.



Molded-in loop for adding a neck or wrist strap.

Label shows main menu items and lists all of the user-adjustable Cyclone parameters.

ADJUSTABLE PARAMETERS

The Pit Wizard's Profile Software accesses the Cyclone speed control's previously hidden fourth Profile. The user-programmable fourth Profile gives you the ability to customize several design parameters of the speed control. This adjustability will allow you to custom tailor the speed control's response and feel to your preference for different applications. This section lists the user-adjustable parameters, their descriptions, and applications:

- **NEUTRAL**

- Measured in microseconds (μs).

- Position at which the speed control is at rest, with no Drive or Brake being applied.

- Initial value is taken from the transmitter, as recorded in the One-Touch Set-Up memory of the speed control.

- **FULL THROTTLE**

- Measured in microseconds (μs).

- Trigger position at which speed control reaches Full Drive.

- Initial value is taken from the transmitter, as recorded in the One-Touch Set-Up memory of the speed control.

- **FULL BRAKE**

- Measured in microseconds (μs).

- Trigger position at which speed control reaches Full Brake.

- Initial value is taken from the transmitter, as recorded in the One-Touch Set-Up memory of the speed control.

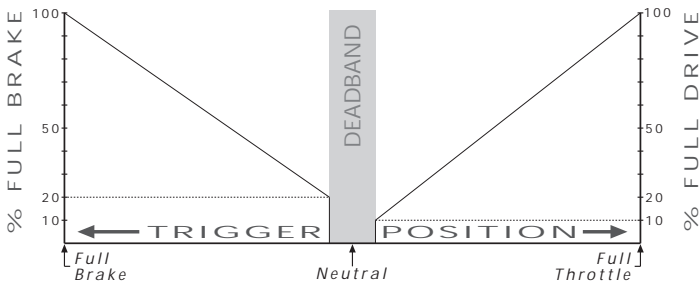


Figure 1: Neutral, Full Throttle, and Full Brake shown graphically by percent of drive or brake applied at a given trigger position.

ADJUSTABLE PARAMETERS (CONT.)

- **DEADBAND**

- Measured as percentage (%) of Full Throttle trigger position.
- Space between Minimum Brake and Minimum Drive, with Neutral located at the center of this space (Figure 2).
- Changing the Deadband value will change the point at which forward Drive begins with respect to Neutral.
- Increasing Deadband will require more trigger movement away from Neutral to reach both the first pulse of Drive and the first pulse of Brake. Example: Adding 10% to the value of Deadband will in turn add 5% Deadband in the Full Throttle trigger direction, and 5% Deadband in the Full Brake trigger direction.
- Decreasing Deadband will require less trigger movement to reach the first pulses of Drive and Brake.

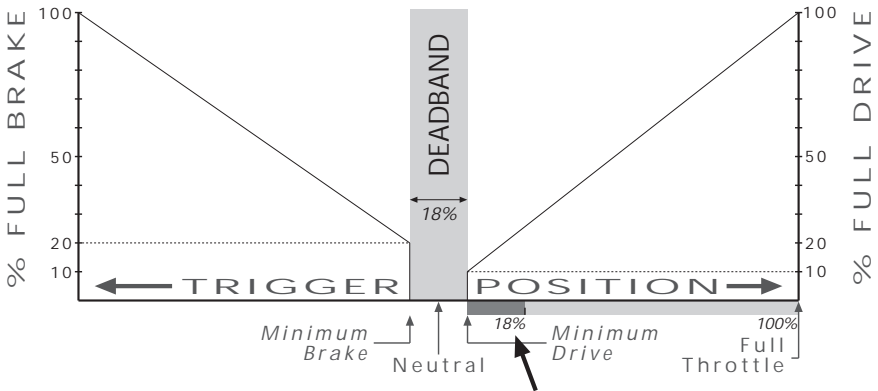


Figure 2: Deadband graphically displayed as a percentage of the Full Throttle trigger position, which is measured in microseconds.

ADJUSTABLE PARAMETERS (CONT.)

• DRIVE PWM FREQUENCY

–Measured in Hertz (Hz).

–Frequency at which the duty cycle information is being sent from speed control to motor (How many times per second the motor is being cycled on and off to control it's speed).

–Drive PWM Frequency controls acceleration characteristics of your vehicle with respect to trigger movement in the Full Throttle direction (Figure 3). By changing the value of Drive PWM Frequency you change the manner in which the vehicle responds to transmitter trigger input.

–Increasing Drive PWM Frequency requires more initial trigger movement to obtain the same given speed. Light vehicles feel more controllable / Heavy vehicle more sluggish.

–Decreasing Drive PWM Frequency requires less initial trigger movement to obtain the same given speed. Light vehicles are harder to control at the low end (possibly spinning the rear wheels) / Heavy vehicles are more reactive.

–This parameter can be used as a valuable tuning asset for different types of motors and track conditions.

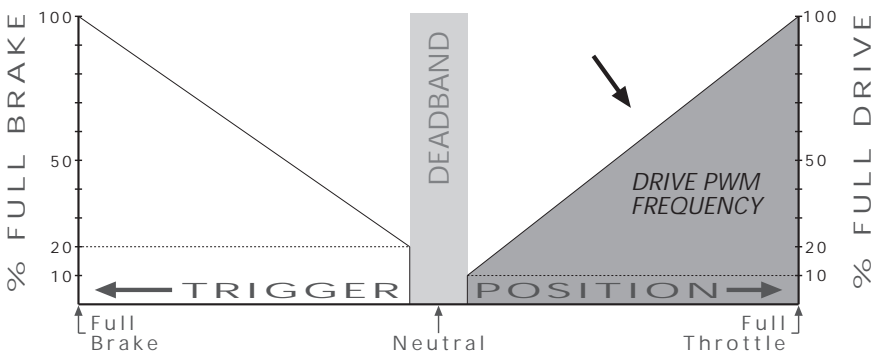


Figure 3: Graphical location of area affected by Drive PWM Frequency.

ADJUSTABLE PARAMETERS (CONT.)

- **MINIMUM DRIVE**

- Measured as percentage (%) of the Drive value.
- Amount of Drive applied with the first pulse of transmitter throttle information (Figure 4).
- Increasing the Minimum Drive will make the speed control begin at a greater percentage of Full Drive. This is useful for tracks with good traction and for heavier vehicles to eliminate 'dead' trigger movement before the motor can actually move the vehicle (and will increase the vehicle's minimum rolling speed).
- Decreasing the Minimum Drive will make the speed control start at a smaller percentage of Full Drive. This is useful for tracks with low-bite and lighter vehicles where lower initial power will give more controllability. This parameter is also a valuable tuning asset for different types of motors.

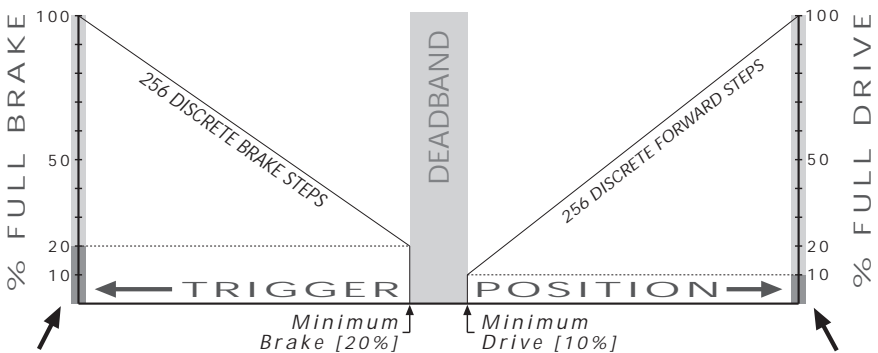


Figure 4: Graphical representation of Minimum Drive and Minimum Brake as percentage of Full Drive and Full Brake, respectively.

ADJUSTABLE PARAMETERS (CONT.)

- BRAKE PWM FREQUENCY

 - Measured in Hertz (Hz).

 - Frequency at which the duty cycle information is being sent from speed control to motor for braking.

 - Brake PWM Frequency controls deceleration characteristics of your vehicle with respect to trigger movement in the Full Brake direction (Figure 5). Changing Brake PWM Frequency allows you to change the manner in which the vehicle responds to brake trigger input.

 - Increasing the Brake PWM Frequency will require more initial trigger movement to obtain a given amount of braking. Light vehicles brake more controllably under initial braking / Heavy vehicles brake less reactively.

 - Decreasing the Brake PWM Frequency will require less initial trigger movement to obtain a given amount of braking. Light vehicles are harder to control under initial braking (possibly locking up the wheels) / Heavier vehicle are more reactive to initial braking efforts.

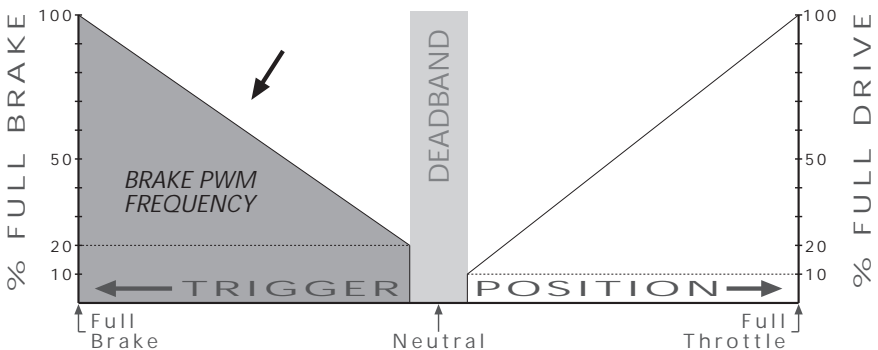


Figure 5: Graphical location of area affected by Brake PWM Frequency.

ADJUSTABLE PARAMETERS (CONT.)

• DRAG BRAKE VALUE

- Measured as percentage (%) of Full Brake value.
- Adjusts amount of Drag Brake applied within the Deadband when throttle trigger is in the Neutral position (Figure 6).
- When the Drag Brake value is greater than zero, Drag Braking is applied in the Deadband area. When the throttle trigger is returned to Neutral, braking information is sent to the motor. This can be used to obtain Drag Brakes without shifting the Neutral position of the transmitter with the throttle trim, and will in turn eliminate the Deadband (now 'dead' trigger) space that has also been shifted toward the Full Throttle side of the trigger movement before Drive can be applied.
- When the Drag Brake Toggle is set to ON position, the Brake Pot on the Cyclone adjusts the Drag Brake Value. Drag Brakes during Neutral/Deadband are now set at the same level as Minimum Brake. With Drag Brake Toggle ON, the Drag Brake Value can NOT be set with the Pit Wizard, only with the Brake Pot on the Cyclone.
- When Drag Brake Toggle is OFF, the Brake Pot on the Cyclone adjusts only the Minimum Brake value. Drag Brake Value can now be set above zero with the Pit Wizard to obtain Drag Brakes. Minimum Brake value can now be independently set higher or lower than the Drag Braking (Figure 8).

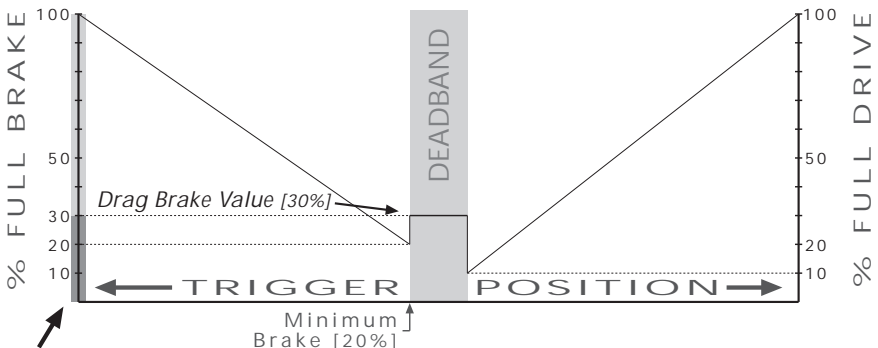


Figure 6: Graphical representation of Drag Brake Value as a percentage of Full Brake.

ADJUSTABLE PARAMETERS (CONT.)

- **DRAG BRAKE TOGGLE**

- Switches Brake Pot of the Cyclone ESC from Minimum Brake adjustment to Drag Brake Value & Minimum Brake adjustment.
- When Drag Brake Toggle is ON, Drag Braking is applied in the Neutral/Deadband area at the same frequency as Brake PWM Frequency is set (Figure 7). When the trigger is returned to the Neutral position, braking information is sent to the motor.

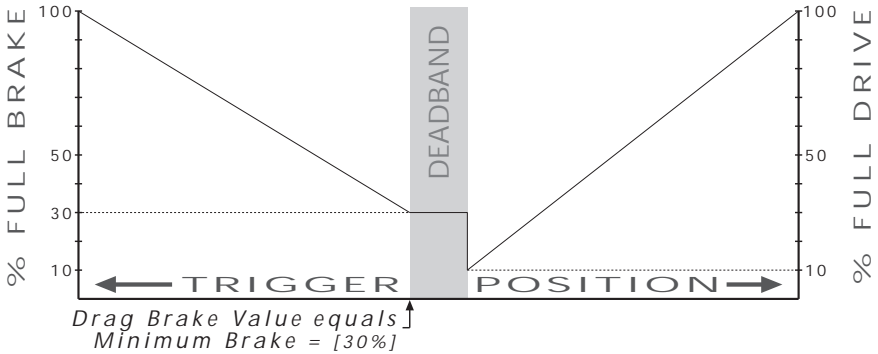


Figure 7: Drag Brake Toggle ON—Drag Brake Value = Minimum Brake (Both are set with Brake Pot). Drag Brake Frequency = Brake PWM Frequency (Both are set with Brake PWM Frequency adjustment).

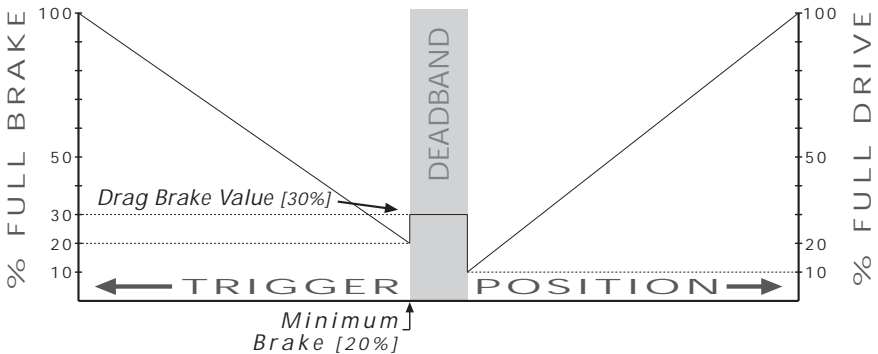


Figure 8: Drag Brake Toggle OFF—Independent adjustment of Minimum Brake via Brake Pot, and Drag Brake Value, Brake PWM Frequency, and Drag Brake Frequency with Pit Wizard.

ADJUSTABLE PARAMETERS (CONT.)

• DRAG BRAKE FREQUENCY

–Measured in Hertz (Hz).

–Frequency at which duty cycle information is being sent from Cyclone to motor for Drag Braking during Neutral/Deadband.

–The Drag Brake Frequency (Figure 9) controls deceleration characteristics of vehicle with Drag Brake during Neutral/Deadband. Changing the Drag Brake Frequency changes the manner in which the vehicle responds to Drag Brake.

–The Drag Brake Frequency affects the Drag Brake only when the Drag Brake Toggle is OFF.

–Decreasing the Drag Brake Frequency makes the braking more reactive during the Neutral/Deadband.

–Increasing the Drag Brake Frequency makes the braking more subtle during Neutral/Deadband.

–With Drag Brake Toggle OFF, Drag Brake can be used with a higher setting of Drag Brake Value (on Pit Wizard) along with a high setting of Brake PWM Frequency, and increased Minimum Brake setting (Brake Pot), to obtain battery regeneration without noticeable increased braking effects. With Drag Brake Toggle ON, Brake PWM Frequency is adjusting the frequencies of both the brakes in the Neutral/Deadband area and the brakes controlled by brake trigger movement.

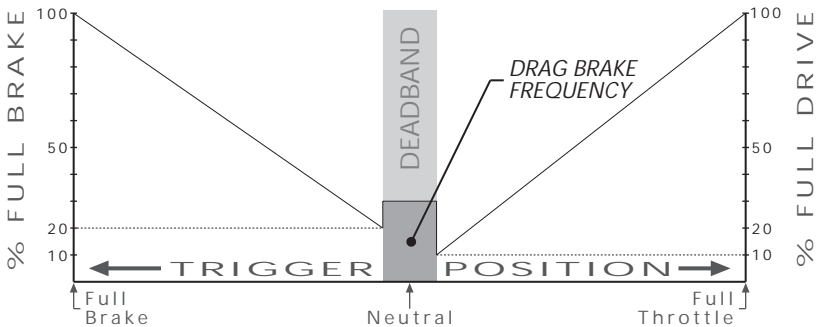


Figure 9: Graphical location of area affected by Drag Brake Frequency when the Drag Brake Toggle is OFF.

HARDWARE CONNECTION

1. Install four (4) 1.5 volt LR6 (AA) Batteries

–Remove the two (2) screws from bottom edge of the top-side of Pit Wizard case with a number 1 Phillips screwdriver, turn the unit over and remove the two (2) remaining Phillips-head screws that secure the lower portion of the case bottom.

–Insert four (4) 1.5 volt LR6 (AA) batteries (*Not included*) into the battery box—Cell orientation is illustrated in battery box.

–Replace the lower portion of the case bottom install all four (4) Phillips-head screws—Be careful not to overtighten.

2. Connect the D•LINK harness

–Connect the Pit Wizard's D•LINK harness to your Cyclone's DataLink socket (Figure 10) located on the top of the speed control. *The D•LINK connector can only clear the transistors on the speed control if the "D•LINK" lettering is right side up.* If external heat sinks are installed, be sure that they do not extend beyond the front edge of the transistors—You may need to reposition heat sinks to gain proper access to connector.

Note: The motor will be disabled as soon as the Pit Wizard is connected. Cyclone must be connected to a charged battery pack to supply power during Uploading, Downloading, or Monitoring Transmitter Trigger.

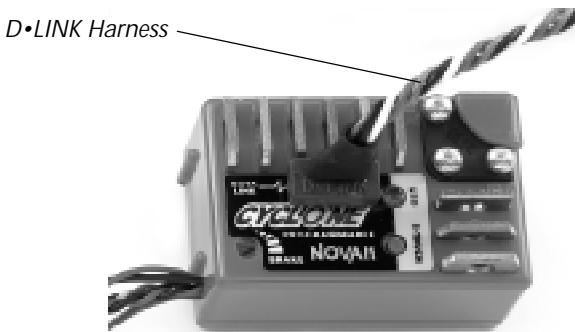


Figure 10: Photo showing connection of D•LINK Harness.

PRECAUTIONS

In addition to using basic common sense, please take special note of the following precautions:

- Water and electronics DO NOT mix.
- DO NOT allow solvents to come in contact with the Pit Wizard to avoid damage to the case and electronics.
- DO NOT allow connector pins on D•LINK harness to contact transistor tabs or heat sinks on speed control.
- DO NOT touch connector pins on D•LINK harness to avoid static electricity damage to the electronics.
- Be careful when connecting or disconnecting D•LINK harness to DataLink socket on speed control to avoid damage.

ACQUIRING DEFAULT PARAMETERS

In order to edit and customize Profiles, you must first upload the default parameter values from your Cyclone speed control. When you upload the default parameters you will be reading Profile 1, 2, or 3 from your Cyclone (The Profile that is currently active). Neutral, Full Throttle, and Full Brake are the default parameters that were programmed into the Cyclone's One-Touch memory, based on the available throw of your transmitter. These values are the standards for what will be the newly created Profile 4.

In most cases, you will not want to modify the values for Neutral, Full Throttle, and Full Brake. These values set the exact point of Neutral, and give you the complete range of throttle in both the forward and brake directions. However, there are some instances that will be discussed later in the *Editing Parameters* section, in which changing these values could be useful.

Note: Before creating custom Profiles, it is important to check the available throw of your transmitter by following the steps in the Monitoring Transmitter Trigger section (next page). If there is not sufficient throw you will need to change your transmitter's set-up.

MONITORING TRANSMITTER TRIGGER

This function allows you to monitor the values of your transmitter's positions for Neutral, Full Brake, and Full Throttle (*measured in μS*). This is used to determine if your transmitter has the proper amount of throw that is needed by your Cyclone speed control.

1. Turn on your transmitter, then turn on your speed control.
2. Turn on the Pit Wizard's power switch—Slide to ON position. The display will show the start-up screen as shown on page 15.
3. Connect the Pit Wizard's D•LINK harness to the DataLink socket on top of the Cyclone. The D•LINK connector will only clear the transistors of the speed control if the "D•LINK" lettering is right side up (Figure 10). If external heat sinks are installed, be sure that they do not extend beyond the front edge of the transistors (*they may have to be repositioned to access connector*).

Note: Motor will be disabled as soon as Pit Wizard is connected. You can use a DSC cord to disable transmitter's RF section (To avoid interference).

***At this time the Cyclone's LED should be illuminated solid red.*

4. Press {MODE} button until you reach the *Monitor Trigger* mode:

6 Monitor Trig

5. Press {ENTER} button to display transmitter's trigger position:

6 Monitor Trig
1498 μS

6. Move transmitter trigger to Full Throttle. The difference between the Full Throttle and Neutral values (*Drive Throw*) should be at least 350 μS and up to 550 μS .

7. Move transmitter trigger to Full Brake. The difference between the Full Brake and Neutral values (*Brake Throw*) should be at least 350 μS and up to 550 μS .

IMPORTANT: *If you do not get 350 μS of Drive AND Brake throw, your Cyclone will not operate at it's full potential. You need to increase your transmitter's ATV, EPA, or ATL settings to get more throw.*

UPLOADING PARAMETERS FROM CYCLONE

The following steps will allow you to upload the Parameters from the Cyclone speed control. The values for the Profile (1, 2, 3, or 4) that is currently active in the Cyclone will be uploaded.

You must upload the values for Neutral, Full Throttle, and Full Brake that are stored in your Cyclone's One-Touch memory, otherwise new/incorrect settings will be downloaded with any new Profile.

1. Turn on your transmitter, then turn on your speed control.

Note: You can use a DSC cord to disable the transmitter's RF section (For use at a track/in the pits to avoid interference).

2. Turn on the Pit Wizard's power switch—slide to ON position. The display will show the start-up screen:

TEAM NOVAK
PIT WIZARD (rev#)

Note: We recommend that you turn off the Pit Wizard's power when not in use to extend the life of the batteries.

3. Connect the Pit Wizard's D•LINK harness to your Cyclone's DataLink socket located on the top of the speed control. The D•LINK connector can only clear the transistors on the speed control if the "D•LINK" lettering is right side up. If you have external heat sinks installed, be sure that they do not extend beyond the front edge of the transistors—You may need to reposition heat sinks to gain proper access to the connector.

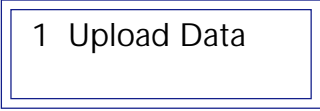
Note: The motor will be disabled as soon as the Pit Wizard is connected.

***At this time the Cyclone's LED should be illuminated solid red.*

(CONT.)

UPLOADING PARAMETERS (CONT.)

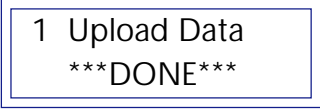
4. From the start-up screen on the Pit Wizard, press the {MODE} button once. The display will read:



1 Upload Data

The number "1" indicates menu item one.

5. Press the {ENTER} button to upload the default parameters from the Cyclone speed control. When the parameters have been uploaded the display will read:



1 Upload Data
DONE

7. Press {MODE} button to move to the *Edit Profile* Mode.

Note: If at any time during Uploading, Downloading, or Monitoring Transmitter Trigger the display reads "COMM ERROR", press and hold the {MODE} button until you hear a steady tone, then release. You will exit back to the Pit Wizard's start-up screen, no Profile data will be lost.

EDITING PARAMETERS

This function of the Pit Wizard's Profile Software is where you will be able to edit and customize Profile 4 of the Cyclone and its parameters. You can work in the *Edit Profile* mode at any time, you do not need to have the Cyclone connected to the Pit Wizard.

1. Press the {MODE} button on the Pit Wizard until you reach the *Edit Profile* mode. The display will read:



2 Edit Profile

Edit Profile refers to editing the version of Profile 4 that is currently active in the Pit Wizard's Profile Software.

2. Press the {ENTER} button to display the first of the available parameters:



21 Neutral

Use the {UP} and {DOWN} buttons to scroll through and display the available user-adjustable parameters.

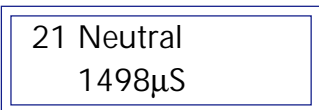
"21" indicates that you are on sub-screen one of menu item two.

3. Press the {ENTER} button to display the current parameter value.

Note: Neutral, Full Throttle, and Full Brake parameters should not be modified for typical applications.

•One example for changing these parameters would be for Drag Racing, where a shorter trigger throw may be desirable in order to reach Full Drive faster by pulling the trigger a shorter distance. You would do this by decreasing the value for Full Throttle (Figure 11).

4. Use the {UP} or {DOWN} buttons to change the parameter value:



21 Neutral
1498µS

(CONT.)

EDITING PARAMETERS (CONT.)

- Press the {ENTER} button to register the parameter value. The display will change back to the *Neutral* sub-screen:

21 Neutral

OPTIMUM SETTINGS: For optimum performance, your Cyclone settings should be $1350\mu\text{S}$ for Neutral, $1850\mu\text{S}$ for Full Throttle, and $1000\mu\text{S}$ for Full Brake. This will display as $500\mu\text{S}$ for full Throttle and $350\mu\text{S}$ for Full Brake in the Edit Profile mode.

- Press the {UP} or {DOWN} buttons to display the next desired adjustable parameter.
- To display and modify Full Throttle (sub-screen 22), Full Brake (23), Deadband (24), Minimum Drive (26), and Drag Brake Value (29), repeat Steps 3 through 5 .
Note: Deadband, Minimum Drive, and Drag Brake Value are entered as a percentage to the nearest percent (1%) up to 50%. (Display may appear to skip a value due to percentage rounding)
- To display and modify Drive PWM Frequency (25), Brake PWM Frequency (27), or Drag Brake Frequency (28), use Steps 3 through 5. There are 16 frequency values to choose from:

Select Freq
23.4KHz

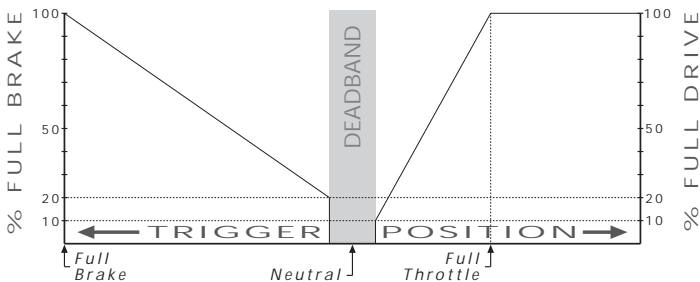


Figure 11: Graphical display of the Full Throttle position shifted toward Neutral for Drag Racing.

EDITING PARAMETERS (CONT.)

9. The Toggle Options are two position switches that turn on and off features in the Cyclone speed control. One (1) indicates that the features is turned on, and a zero (0) is off.

To modify the Toggle Options (2A):

- Press the {ENTER} button at the *Toggle Options* sub-screen:

2A Toggle Opt.

- Eight toggles that can be switched will be displayed:

Toggle Select
00000000

- Press the {UP} or {DOWN} buttons to move left or right and select which toggle to switch (*The toggle with a line under it*).
- Press the {ENTER} button to change the selected toggle.

Note: Currently, only the first toggle from the left controls a feature in the Cyclone. This toggle will allow the Drag Brake Value to be adjusted with the Brake pot on the speed control.

The second toggle from the left indicates whether or not the throttle channel on your transmitter is reversed. If this toggle displays a "1" (rev.), a "#" symbol will also be displayed to the left of the value on the Full Throttle and Full Brake sub-screens.

For Drag Brake ON the display should read:

Toggle Select
10000000

- Press the {MODE} to make Toggle changes and exit back out to the *Toggle Options* sub-screen:

2A Toggle Opt.

10. Press {MODE} button again to exit back out to the main menu.

DOWNLOADING PARAMETERS TO CYCLONE

This section outlines the steps that will allow you to download the parameters that are currently displayed in the Pit Wizard's *Edit Profile* mode into the Cyclone speed control's Profile 4. The downloaded Profile will always be the active Profile in the Cyclone even if this is the first time Profile 4 has been activated. You will now have the original three Profiles that came with the Cyclone, plus the user-programmable Profile (Profile 4) to choose from through the One-Touch button. *Refer to your Cyclone Owner's Manual for instructions on selecting Profiles with the One-Touch button.*

IMPORTANT NOTE: *You must upload Profile 1, 2, or 3 from your Cyclone to get the values for Neutral, Full Throttle, and Full Brake for any new Profile to be downloaded. These values can NOT be re-programmed through the Cyclone's One-Touch Set-Up. If the One-Touch settings from your Cyclone are not used for Profile 4, your speed control will not be properly adjusted to your transmitter.*

1. Turn on your transmitter, then turn on your speed control.
2. Turn on the Pit Wizard's power switch—Slide to ON position.
3. Connect the Pit Wizard's D•LINK harness to your Cyclone's DataLink socket located on the top of the speed control. The D•LINK connector will only clear the transistors of the speed control if the "D•LINK" lettering is right side up (Figure 10). If you have external heat sinks installed, be sure that they do not extend beyond the front edge of the transistors, as they may have to be repositioned to gain access to the connector.

Note: The motor will be disabled as soon as the Pit Wizard is connected. You can use a DSC cord to disable the transmitter's RF section (For use at a track/in the pits to avoid interference).

***At this time the Cyclone's LED should be illuminated solid red.*

DOWNLOADING PARAMETERS (CONT.)

4. Press the {MODE} button until you reach the *Download Data* main menu mode and the following is displayed:

3 Download Data

5. Press the {ENTER} button to download the new parameters. Display will indicate when Profile 4 has been downloaded to the Cyclone speed control:

3 Download Data
DONE

Note: If the display reads "COMM ERROR" when attempting to Download, press and hold the {MODE} button until you hear a steady tone, then release. You will exit back to the Pit Wizard's start-up screen, no Profile data will be lost. Check connections and repeat Download.

6. Press the {MODE} button to exit back out to the main menu. Display will advance to the next main menu option:

4 Read Profile

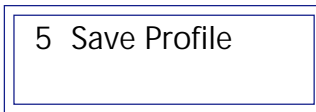
Your custom designed Racing Profile has now been downloaded to your Cyclone and is the active Profile in the speed control!

SAVING PARAMETERS

Profiles that are created or uploaded can be saved into any of ten (10) memory locations in the Pit Wizard by following these steps. You can also keep a written record of the Profiles you make on the Profile pages provided at the back of this manual.

Note: The new Profile will be stored in place of the previous Profile that occupied the chosen memory location in the Pit Wizard.

1. Upload parameters from Cyclone or use the *Edit Profile* mode to create a Profile to save, and return to the main menu.
2. Press the {MODE} button until you reach the *Save Profile* main menu mode:



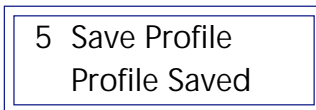
5 Save Profile

3. Press the {ENTER} button once to display the current memory location number:



5 Save Profile
3

4. Press the {UP} or {DOWN} buttons to select the desired memory location (0-9) that you want to store the Profile in.
5. Press the {ENTER} button to save the Profile. The display will indicate that the Save procedure was successful:



5 Save Profile
Profile Saved

6. Press the {MODE} button to exit back out to the main menu. You will advance to the next main menu option:

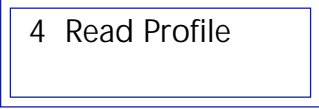


6 Monitor Trig

READING PARAMETERS


Any Profile saved in one of the Pit Wizard's memory locations can be retrieved by following the steps outlined in this section. The Profile can then be viewed, modified, or downloaded from the *Edit Profile* and *Download Data* modes.

1. Press the {MODE} button until the until you reach the *Read Profile* main menu mode:



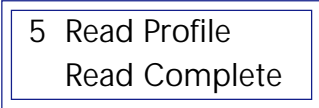
4 Read Profile

2. Press the {ENTER} button once to display the current memory location number:



4 Read Profile
7

3. Press the {UP} or {DOWN} buttons to select the desired memory location (0-9) of the Profile you want to read.
4. Press the {ENTER} button to read the Profile. The display will indicate that the Read procedure was successful:



5 Read Profile
Read Complete

6. Press the {MODE} button to exit back out to the main menu. You will advance to the next main menu option:



5 Save Profile

TROUBLE-SHOOTING GUIDE

Experiencing problems?

Review the instructions and check the following:

- Must turn on transmitter and Cyclone, then connect Pit Wizard.
- If the display does not come on with the Pit Wizard's switch in the ON position or reads "BATTERY LOW", replace batteries.
- If the display reads "COMM ERROR" when attempting to upload or download a Profile or monitor trigger position, press and hold {MODE} button to return to start-up screen. Check the D•LINK connection and condition of D•LINK pins and sockets.
- Pit Wizard's D•LINK harness must make a good connection with the Cyclone's DataLink socket. Make sure socket is clean.
- All D•LINK harness pins must plug into the DataLink socket.
- Be sure D•LINK harness has all five pins (none bent or broken).
- Make sure all wiring is in good condition.

PRODUCT WARRANTY

PIT WIZARD WARRANTY: Novak Electronics, Inc. guarantees the Pit Wizard to be free from defects in materials and workmanship for a period of 120 days from original date of purchase (*verified by dated, itemized sales receipt*). Warranty does not cover incorrect installation; components worn by use; splices to the Pit Wizard's D•LINK harness or; damage from excessive force when using ONE-TOUCH button, Minimum Brake adjustment pot, or Pit Wizard's ON/OFF switch; or tampering with internal electronics; allowing water, moisture, or any other foreign material to enter the Pit Wizard or get onto its PC board.

We reserve the right to modify warranty provisions without notice.

LIMITATION OF LIABILITY: Because Novak Electronics, Inc. has no control over the connection and use of the Profile Software and Pit Wizard, no liability may be assumed nor will be accepted for damage resulting from use of product. Every Pit Wizard is thoroughly tested before leaving our facility and is, therefore, considered operational. By the act of installing/connecting/operating the Profile Software and Pit Wizard, user accepts all resulting liability. Under no circumstances, including negligence, shall Novak Electronics, Inc. be liable for any incidental, special, or consequential damages that result from use or inability to use Profile Software or Pit Wizard. Novak's total liability for all damages and losses shall not exceed the product's original cost.

SERVICE PROCEDURES

If your Pit Wizard is not working properly, please review the Trouble-Shooting Guide (page 20) and all instructions before returning the unit for service.

WHAT TO SEND

Completely fill out all the information on the *SERVICE RETURN SHEET* (next page) and return it with the Pit Wizard. It is not necessary to send instruction manual, box, or speed control.

If a hobby dealer returns your Pit Wizard for service, submit a completed copy of the *SERVICE RETURN SHEET* to the hobby dealer, and give instructions to have it included with the package.

WARRANTY WORK

For unit to be considered under warranty, you must claim warranty on the *SERVICE RETURN SHEET*, and attach a valid, dated sales receipt, or a previous service invoice dated within the last 120 days. If any warranty provisions have been voided, there will be a service charge. *NOTE: Dealers and/or distributors are not authorized to replace units thought to be defective.*

SERVICE COST

If Unit is Serviced Under Warranty: The unit will be replaced or repaired (at Novak's discretion) at no charge.

If Unit is Not Serviced Under Warranty: The unit will be replaced or repaired (at Novak's discretion) and charged all applicable service costs (parts, labor, and shipping/handling charges).

If Unit Operates Normally: The unit will be returned and charged a minimum inspection fee of \$15.00 plus shipping and handling.

SERVICE TIME

Normal turnaround time is approximately 5 working days from the date your unit is received. Service time does not include the return shipping time. If you are in a hurry, you can ship the items to Novak Electronics by a one or two day shipping service—such as UPS 2-Day Air or Federal Express Overnight. Customer assumes all shipping charges.

CUSTOMER SERVICE

(714) 833-8873 • FAX (714) 833-1631

HOURS (PST): Mon-Thurs: 8:00 am to 5:00 pm

Friday: 8:00 am to 4:00 pm (*Closed every other Friday*)



SERVICE RETURN SHEET

IF YOUR PIT WIZARD IS NOT OPERATING PROPERLY, COMPLETE ALL INFORMATION ON THIS SHEET (OR A COPY), AND RETURN IT WITH YOUR PIT WIZARD.

SHIP DATA LINK TO:

NOVAK ELECTRONICS, INC. 18910 Teller Avenue, Irvine, CA 92612 USA • Attn: Service Dept.

NOTE: Please read the Trouble-Shooting Guide and all instructions before sending in your Pit Wizard for service. If the unit operates normally when received, a \$15.00 inspection fee will be charged. Be sure to check the batteries before returning.

CUSTOMER'S RETURN SHIPPING ADDRESS

NAME		DAYTIME PHONE ()	DATE
ADDRESS (UPS will not deliver to a PO Box)		<input type="checkbox"/> Residential <input type="checkbox"/> Commercial	CITY
STATE	ZIP CODE	COMPANY (if applicable)	

1 DESCRIPTION OF PROBLEM

Has this unit ever worked properly? Yes No
 Has unit ever been sent in for service? Yes* No
 *Attach a copy of the previous service invoice to this sheet.

2 CLAIMING WARRANTY?

- YES An itemized sales receipt or previous service invoice dated within the last 120 days must be stapled to this sheet. Please read the Warranty Statement. If no provisions have been voided, the unit will be replaced/repaired at no charge.
- Purchase Date _____
 Purchased From _____
 Dealer's PH# () _____
- NO Unit will be replaced/repaired for applicable service costs plus shipping and handling.

3 RETURN SHIPPING

Please select a UPS shipping method**:

- GROUND 3-DAY 2-DAY NEXT DAY

**If method is not selected, unit will be shipped UPS Ground.

Units Serviced Under Warranty: Units shipped back to one of the 48 continental U.S. states will be shipped UPS Ground at no charge. However, if 3-Day, 2-Day, or Next Day Air is indicated, or if the warranty repair is being sent outside of the 48 continental states, current UPS rates will be charged. All International repairs are shipped Air-Mail.

Units Not Covered Under Warranty: Current UPS shipping fees will be added to the service cost.

4 PAYMENT INFORMATION

Select payment method[†].

- COD Cash COD Check

[†]If COD is indicated, UPS COD fees will be added to shipping charges. If a payment method is not indicated (or if charge card/check is not approved) unit will be shipped back COD Cash.

PAYMENT BY CREDIT CARD:

Credit Card# _____
 Card Holder's Name _____
 Exp. Date _____ Signature _____

PAYMENT BY COD CHECK (info. from your check):

Name _____ Phone _____
 Address _____ City _____
 State _____ Zip _____ D.L. # _____

5 AUTHORIZATION TO SERVICE UNIT

I authorize Novak Electronics, Inc. to service the enclosed Pit Wizard as I have indicated.

Signature _____ Date _____

Pricing and policy information subject to change without notice.

PROFILES

VEHICLE	MOTOR	PROFILE	DEAD BAND	DR. PMW	MIN. DRIVE	BR. PMW	DRAG BR. TOGGLE	DRAG BRAKE
			%FullIIFwd	FREQ. KHZ	%FullIIFwd	FREQ. KHZ	ON/OFF	FREQ./VALUE KHZ/%Full Br.

PROFILES

VEHICLE	MOTOR	PROFILE	DEAD BAND	DR. PMW	MIN.	BR. PMW	DRAG BR.	DRAG BRAKE
			%FullI/Fwd	FREQ. KHZ	DRIVE %FullI/Fwd	FREQ. KHZ	TOGGLE ON/OFF	FREQ./VALUE KHZ/%Full Br.

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SAMPLE PROFILE DATA

Below is sample data for Profiles that were developed by the Novak Racing Team at various racing events with different vehicle/motor combinations. Use the Profile data in this table as a reference for creating your own custom Profiles.

PROFILE•VEHICLE•CONDITIONS	DR. PWM FREQ.	MIN. DRIVE	BR. PWM FREQ.	DRAG BR. TOGGLE	DRAG BRAKE FREQ./VALUE
	<i>Khz</i>	<i>%Full Fwd</i>	<i>Khz</i>	<i>ON/OFF</i>	<i>Khz/%Full Br.</i>
Buggy-Modified-High Traction	11.7	4	3.9	OFF	-/0%
Buggy-Modified-Low Traction	15.6	2	3.9	OFF	-/0%
Buggy-Stock	11.7	9	3.9	OFF	-/0%
Truck-Modified	11.7	7	3.9	OFF	-/0%
Truck-Stock	7.8	9	3.9	OFF	-/0%
1/10 Onroad-Modified	23.4	8	3.9	OFF	-/0%
1/10 Onroad-Mod-Drag Brake	23.4	8	3.9	ON	5.86/4%
1/10 Onroad-Stock	15.6	9	3.9	OFF	-/0%
4WD Touring Sedan-Modified	23.4	6	3.9	OFF	-/0%
Formula 1	23.4	3	5.86	OFF	-/0%
1/12 OnRoad-Modified-6 Cell	23.4	4	3.9	OFF	-/0%
1/12 OnRoad-Modified-4 Cell	5.86	7	3.9	OFF	-/0%
1/12 OnRoad-Stock-4 Cell	2.93	8	3.9	OFF	-/0%
4WD Buggy-Mod-Lo.Trac.-Dr.Br.	11.7	6	3.9	OFF	3.9/15%
Buggy-Mod-Low Traction-Dr.Br.	11.7	2	3.9	OFF	3.9/15%
Buggy-Mod-High Traction-Dr.Br.	15.6	4	5.86	ON	N/A
Buggy-Mod-Low Traction-Dr.Br.	23.4	6	5.86	ON	N/A
1/10 OnRoad-Mod-Drag Brake	23.4	8	5.86	ON	N/A
4WD Touring Sedan-Mod-Dr.Br.	23.4	6	3.9	ON	N/A
Formula 1-Drag Brake	23.4	3	11.7	ON	N/A

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NOVAK ELECTRONICS, INC.
18970 TELLER AVENUE
IRVINE, CA 92612

USA