MILLENNIUM PRO

NOVAK Racing Electronics

THE MILLENNIUM PRO

The Millennium Pro takes the dependability of the original Millennium charger to new levels for even better battery performance, new or old. With large backlit display, battery conditioning, and charge history, you get vital information that is easy to comprehend.

The Millennium Pro is equipped with *Ni-Cd Linear Mode* for all Ni-Cd cells, *Ni-Cd Reverse Pulse Mode* for Ni-Cd cells, and the new *NOVAK Ni-MH2 Mode* for the ultimate charge of all sizes of Ni-MH cells. All modes have easy to understand user-adjustable charge parameters.

SPECIFICATIONS

Case Size	4.00" x 4.38" x 2.33" *(10.16 x 11.13 x 5.92 cm)*
Weight	14.2 ounces *(402 grams)*
Input Voltage *(Power Source)*	12-15 volts DC
Charging Modes	Ni-Cd Linear*(Ni-Cd)* • Ni-Cd Rev.Pulse*(Ni-Cd)* • Ni-MH2*(Ni-Cd/Ni-MH)*
Charging Capability	4-8 cells *(1.2 VDC/cell)*
Ni-Cd Charge Rate *(Linear & Reverse Pulse)*	0.5-7.0 amps *(adjustable)*
Trickle Charge Rate *(Linear/after peak)*	0.1-0.4 amp *(adjustable)*
Reverse Pulse Duration *(Reverse Pulse)*	5-20 milliseconds
Ni-MH Charge Rate	0.5-7.0 amps *(adjustable)*
Circuit Protection	Input & Output RVP/Short-Circuits, Shorted Batteries, Thermal Overload

IMPORTANT PRECAUTIONS

The following precautions will help to prevent possible damage to the Millennium Pro, the battery pack, or the input power source.

• **Charge only nickel-cadmium or nickel-metal hydride** rechargeable battery packs—Damage will occur from charging other battery types *(lead-acid, lithium-ion, gel cells, etc.)*.

• **Never allow water, moisture, or other foreign materials to enter Millennium Pro.**

• **Do not use automobile battery chargers** to power the Millennium Pro—False peaks can occur, and excessive voltage spikes can damage the Millennium Pro.

• **Do not obstruct the air intake** on the bottom of the Millennium Pro—This will cause overheating and thermal shut down. *Be careful if putting Millennium Pro on a pit towel.*

• **Do not charge batteries with fewer than 4 or more than 8 cells**—connected in series.

• **Do not charge battery packs connected in parallel**—Batteries will be damaged.

• **Enhanced-voltage** *("zapped")* **batteries charge erratically**—Consult the battery matching company for charging recommendations.

• **Excessive charge current can damage batteries**—Follow battery maker recommendations.

• **Never exceed 15 volts DC input power source** to power the Millennium Pro.

• **Gases from a lead-acid battery may ignite** if sparks occur when connecting or disconnecting the Millennium's alligator clips—Using a lead-acid battery as a power source may generate hydrogen gas and should only be used in a well ventilated area. Avoid open flames and sparks which may ignite battery gases.

PLEASE FOLLOW ALL INSTRUCTIONS CAREFULLY

INPUT POWER SOURCE VOLTAGE & CONNECTION

Input power source voltage should be 1.5 volts DC above peak-voltage of the battery.
Example 1: (6 cell Ni-Cd pack peak-voltage≈10.5 volts) + (1.5 volts) = 12 volts DC
Example 2: (8 cell transmitter pack peak-voltage≈13.5 volts) + (1.5 volts) = 15 volts DC
Remember that older battery packs peak at higher voltages.
If power supply's voltage is not high enough to peak battery, charge 8 cell packs as two, 4 cell packs.
Input power source connection on the Millennium Pro is located on the lower corner of the back of the case. The supplied power harness has a matching connector attached to it, and will plug directly to the panel-mounted connector on the back of the Millennium Pro.
When looking at the input power connector, *the pin marked with a raised rib in the plastic is the positive (+) connection* as shown below.

Panel-mounted input connector

Positive (+) pin (Rib in plastic)

Install rubber feet (4)

Acceptable Input Power Sources: DC power supply* or lead-acid battery**
*Output current of power source should meet/exceed desired charge rate.
**Connect input power harness to lead-acid battery before connecting harness to Millennium Pro.
If using Millennium Pro with power supply, cut wires of included input power harness to the desired length and secure them to the output terminal screws of the power supply.
If your power supply has post-style output terminals, or if using Millennium Pro with a lead-acid battery, you can solder the included alligator clips to the input power harness. Solder the red alligator clip to the wire that goes to the Millennium Pro's positive (+) pin *(rib in plastic of connector)*. Solder the black alligator clip to other wire.
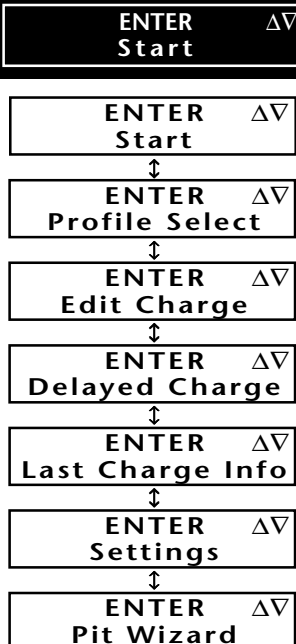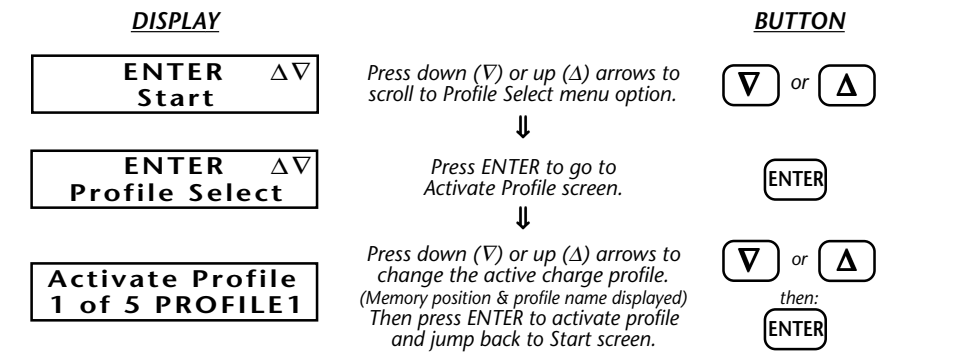
MAIN SELECTION MENUS

The *MAIN MENU* screens are the first level of navigation in the Millennium Pro. The available screens are shown here →

In each of the *MAIN MENU* screens the top line of the LCD displays the available button choices. *ENTER* and the *up* (Δ) and *down* (∇) arrows to prompt you to use one of these keys to continue navigation.

The bottom line displays your current software location. To go the second level of the Millennium's software, simply push the *ENTER* button at any of the *MAIN MENU* screens.

When in the *Start* menu screen, the display will alternate between the *Start* option and Active Profile screen which shows the active Charge Profile *(bottom line)* and the profile's stored settings *(the top line shows charge mode, # of cells, & current)*.

The *Start* option begins the charge process, while the other options take you to the next software level where you can change charge modes and various other parameters.

<u>SHORTCUT:</u> *At the Start option screen, pressing the BACK button takes you directly to the Activate Profile Screen to let you quickly change the Active Profile.*

ENTER Δ∇	Start
ENTER Δ∇	Profile Select
ENTER Δ∇	Edit Charge
ENTER Δ∇	Delayed Charge
ENTER Δ∇	Last Charge Info
ENTER Δ∇	Settings
ENTER Δ∇	Pit Wizard

PROFILE SELECT OPTION
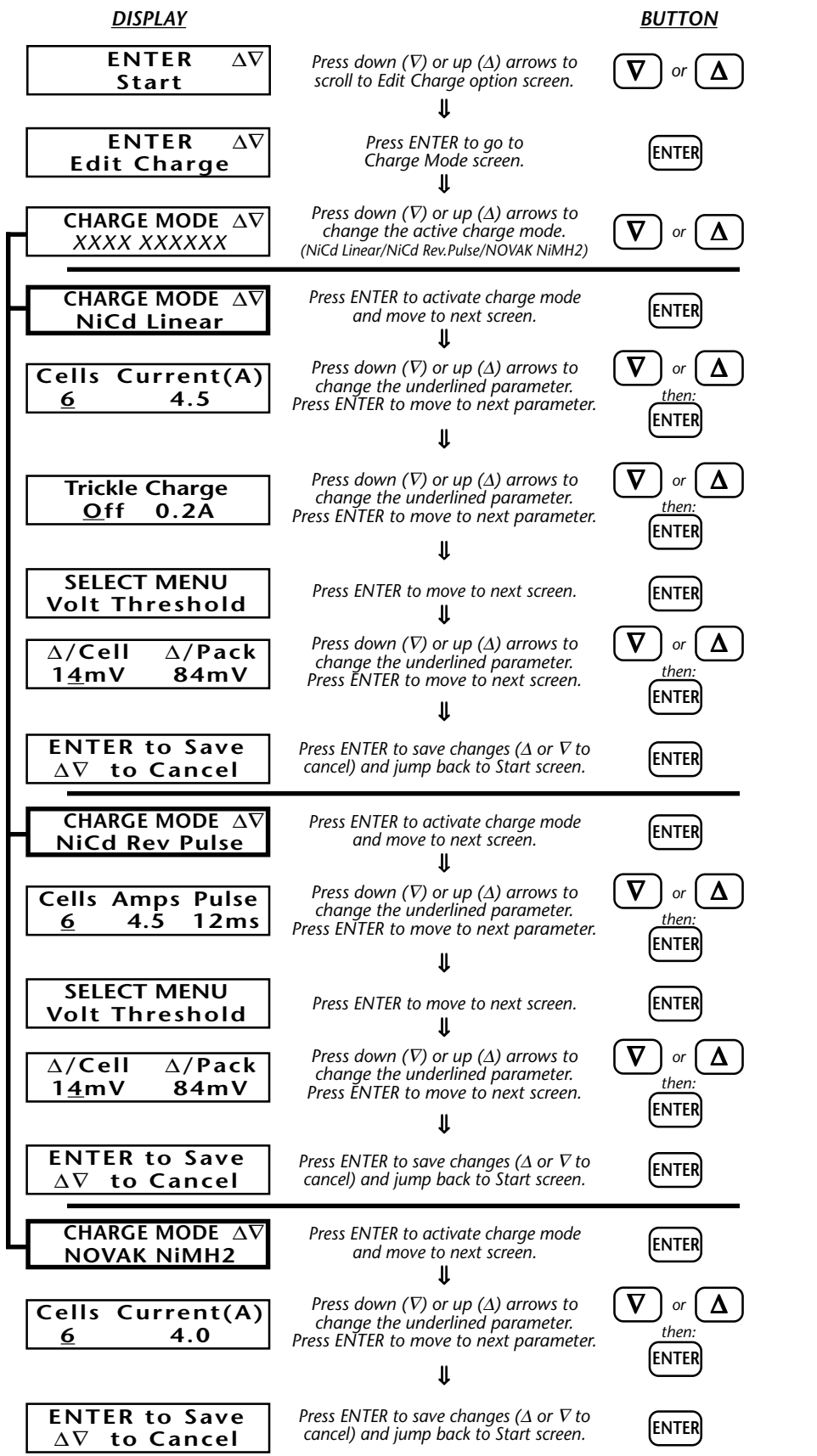
ENTER   Δ∇
Profile Select

The Millennium Pro has the ability to store five custom charge profiles in the software's memory, and to quickly change the active profile and begin charging. Follow the steps below to navigate through the sub menus of the *Profile Select* option and change the active profile. For each screen displayed, follow the given button inputs as shown.

DISPLAY — *BUTTON*

ENTER   Δ∇
Start
Press down (∇) or up (Δ) arrows to scroll to Profile Select menu option.
[∇] or [Δ]

ENTER   Δ∇
Profile Select
Press ENTER to go to Activate Profile screen.
[ENTER]

Activate Profile
1 of 5 PROFILE1
Press down (∇) or up (Δ) arrows to change the active charge profile. (Memory position & profile name displayed) Then press ENTER to activate profile and jump back to Start screen.
[∇] or [Δ]
then:
[ENTER]

EDIT CHARGE OPTION

ENTER   Δ∇
Edit Charge

The Millennium Pro is equipped with three charge modes: **Ni-Cd Rev.Pulse** *(larger Ni-Cd cells)*, **Ni-Cd Linear** *(all sizes Ni-Cd)*, & **NOVAK Ni-MH2** *(all sizes Ni-MH cells)*. Each charge mode has various user-adjustable settings. To customize and activate the desired charge mode, follow the steps below to navigate through the *Edit Charge* sub menus.

DISPLAY — *BUTTON*

ENTER   Δ∇
Start
Press down (∇) or up (Δ) arrows to scroll to Edit Charge option screen.
[∇] or [Δ]

ENTER   Δ∇
Edit Charge
Press ENTER to go to Charge Mode screen.
[ENTER]

CHARGE MODE Δ∇
XXXX XXXXXX
Press down (∇) or up (Δ) arrows to change the active charge mode. (NiCd Linear/NiCd Rev.Pulse/NOVAK NiMH2)
[∇] or [Δ]

CHARGE MODE Δ∇
NiCd Linear
Press ENTER to activate charge mode and move to next screen.
[ENTER]

Cells Current(A)
6   4.5
Press down (∇) or up (Δ) arrows to change the underlined parameter. Press ENTER to move to next parameter.
[∇] or [Δ]
then:
[ENTER]

Trickle Charge
Off   0.2A
Press down (∇) or up (Δ) arrows to change the underlined parameter. Press ENTER to move to next parameter.
[∇] or [Δ]
then:
[ENTER]

SELECT MENU
Volt Threshold
Press ENTER to move to next screen.
[ENTER]

Δ/Cell   Δ/Pack
14mV   84mV
Press down (∇) or up (Δ) arrows to change the underlined parameter. Press ENTER to move to next screen.
[∇] or [Δ]
then:
[ENTER]

ENTER to Save
Δ∇ to Cancel
Press ENTER to save changes (Δ or ∇ to cancel) and jump back to Start screen.
[ENTER]

CHARGE MODE Δ∇
NiCd Rev Pulse
Press ENTER to activate charge mode and move to next screen.
[ENTER]

Cells Amps Pulse
6   4.5   12ms
Press down (∇) or up (Δ) arrows to change the underlined parameter. Press ENTER to move to next parameter.
[∇] or [Δ]
then:
[ENTER]

SELECT MENU
Volt Threshold
Press ENTER to move to next screen.
[ENTER]

Δ/Cell   Δ/Pack
14mV   84mV
Press down (∇) or up (Δ) arrows to change the underlined parameter. Press ENTER to move to next screen.
[∇] or [Δ]
then:
[ENTER]

ENTER to Save
Δ∇ to Cancel
Press ENTER to save changes (Δ or ∇ to cancel) and jump back to Start screen.
[ENTER]

CHARGE MODE Δ∇
NOVAK NiMH2
Press ENTER to activate charge mode and move to next screen.
[ENTER]

Cells Current(A)
6   4.0
Press down (∇) or up (Δ) arrows to change the underlined parameter. Press ENTER to move to next parameter.
[∇] or [Δ]
then:
[ENTER]

ENTER to Save
Δ∇ to Cancel
Press ENTER to save changes (Δ or ∇ to cancel) and jump back to Start screen.
[ENTER]

DELAYED CHARGE OPTION

The Millennium Pro allows you to set the charger to begin charging after a preset amount of time. Follow the steps below to navigate through the sub menus of the *Delayed Charge* option, set countdown time, and activate the delayed charge.

DISPLAY		BUTTON
ENTER △▽ Start	Press down (▽) or up (△) arrows to scroll to Delayed Charge option screen.	△
⇓		
ENTER △▽ Delayed Charge	Press ENTER to go to presets screen.	ENTER
⇓		
Time 0hr 1min Timer Off	Press down (▽) or up (△) arrows to change the underlined value. *(Hours, Minutes, & ON/OFF)* Press ENTER to move to next setting.	▽ or △ then: ENTER

Pressing *ENTER* while "On" is underlined will activate the timer and begin counting down. The Millennium Pro will automatically start charging with the active charge profile at the end of the countdown time. No changes may be made to the charger during the Delayed Charge countdown. To cancel the Delayed Charge timer, press the *BACK* button on the keypad.

LAST CHARGE INFO OPTION

This option provides vital statistics that let you manage your battery pack's performance and life. Keeping record of this information will let you track the peak charge voltage "*V*", charge time "*sec*", capacity "*mAh*" *(milliamp hours)*, and energy "*J*" *(joules)* of the battery. Follow the steps below to navigate to the *Last Charge Info* screen.

DISPLAY		BUTTON
ENTER △▽ Start	Press down (▽) or up (△) arrows to scroll to Last Charge Info screen.	▽ or △
⇓		
ENTER △▽ Last Charge Info	Press ENTER to go to presets screen.	ENTER
⇓		
9.26V 2653sec 3026mAh 90836J	Press ENTER or any button to return to Last Charge Info screen.	ENTER

SETTINGS OPTION

The Millennium Pro allows the user to define various parameters for personal preference. Follow the steps below to enter customize charge profile names, change the alarm tone, turn the button tone on or off, adjust the contrast, and enter a personalized user name.

DISPLAY		BUTTON
ENTER △▽ Start	Press down (▽) or up (△) arrows to scroll to Settings screen.	▽ or △
⇓		
ENTER △▽ Settings	Press ENTER to go to the Settings sub menu.	ENTER
⇓		
ENTER △▽ XXX XXX XXX	Press down (▽) or up (△) arrows to scroll through available Settings.	▽ or △
ENTER △▽ Name Profile 1	Press ENTER to modify name of active* charge profile. *(*change active profile & repeat for others)*	ENTER
Save Profile 1 Name As PROFILE1	Use down (▽) or up (△) arrows to change underlined character. Press ENTER to move to next character. *(jumps back to Start screen after last character)*	▽ or △ then: ENTER
ENTER △▽ Alarm Tone	Press ENTER to change Alarm Tone.	ENTER
Select 1 of 10 Alarm Tones	Use down (▽) or up (△) arrows to sample various tones ("X" is off). Press ENTER to select Alarm Tone and jump back to Start screen.	▽ or △ then: ENTER
ENTER △▽ Button Tone	Press ENTER to go to Button Tone ON/OFF sub screen.	ENTER
Button Tone On	Use down (▽) or up (△) arrows to toggle Button Tone On or Off. Press ENTER to make selection and jump back to Start screen.	▽ or △ then: ENTER
ENTER △▽ Contrast	Press ENTER to go to Contrast adjustment sub screen.	ENTER
Select 1 of 8 Contrasts	Use down (▽) or up (△) arrows to adjust contrast level. Press ENTER to make selection and jump back to Start screen.	▽ or △ then: ENTER
ENTER △▽ User Name	Press ENTER to modify User Name. *(User Name appears during start-up)*	ENTER
Save UserName As NOVAK RACING	Use down (▽) or up (△) arrows to change underlined character. Press ENTER to move to next character. *(jumps back to Start screen after last character)*	▽ or △ then: ENTER

NAVIGATION NOTE:

At almost any place in the Millennium Pro's software, you can use the *BACK* button to return to the last screen without making any changes to the screen that you are on. If you repeatedly press the *BACK* button, you will eventually work your way back to one of the 7 *MAIN MENU* screens.

PIT WIZARD OPTION

The Millennium Pro has Novak's Pit Wizard Software built-in, and can be used with the included *MP D•LINK2* harness to connect to and customize the throttle profiles in the Cyclone C2 and TC2 *(Cyclone, CycloneTC, & Atom with the "MP Classic D•LINK" harness/See attached coupon)*.

Refer to instruction sheet 2 for Pit Wizard software operation.

RECOMMENDED CHARGE SETTINGS

We have already programmed our recommendations for the five most common charging set-ups into the Millennium Pro's five charge profile locations. The following is our complete list of recommendations for charging different packs, cell sizes, and types of batteries.

BATTERY TYPE	CELL SIZE	# CELLS	CURRENT	DELTA-PEAK	PULSE	CHARGE MODE
Ni-Cd	sub-C & D	4-8	4.5A	14mV/cell	–	Ni-Cd Linear
Ni-Cd	sub-C & D	4-8	4.5A	14mV/cell	12ms	Ni-Cd Rev.Pulse
Ni-Cd	AA & smaller	4-8	1.5A	8mV/cell	–	Ni-Cd Linear
Ni-MH	sub-C & D	4-8	4.0A	–	–	Ni-MH2
Ni-MH	AA & smaller	4-8	1.0A	–	–	Ni-MH2

Note: To reset all user-adjustable parameters in the Millennium Pro to factory defaults, press & hold the BACK button during start-up.

RE-PEAKING BATTERIES

Ni-Cd CELLS

If you prefer to re-peak your Ni-Cd cells after charging, wait a short amount of time after the initial charge is complete to allow the individual cells to equalize, then re-start the charger to bring all the cells up together until they peak.

Ni-MH CELLS

We DO NOT recommend re-peaking Ni-MH cells. Use these immediately after initial charge.

TROUBLE-SHOOTING GUIDE

The following messages may appear on the Millennium Pro's display. Check the various causes and solutions to solve the problem. If you are unable to solve the problem, check our website or call our Customer Service Department.

Message	Causes/Solutions
Condition . . . In Progress	• Battery voltage too low to begin charge process. • One or more cells shorted. • Number of cells set too high. • Output leads/alligator clips are shorted.
Battery Not Connected	• Charging attempted with no battery connected or disconnected while charging. • Charging attempted with no power source connected. • Battery pack has open cell or bad connection—Check pack. • Battery voltage too close to power source voltage—Increase input power source voltage. • Output leads un-shorted during conditioning.
Power Supply Not Connected	• Power source disconnected while charging.
Outputs Shorted	• Output leads un-shorted during conditioning, then re-shorted—Check output leads for short. • Output leads shorted during charging—Check for short.
Battery Failure	• Number of cells set too high. • After conditioning, battery voltage still too low to begin charge process—try new battery. • Battery pack connected backwards. • Output leads shorted and no battery pack attached.
Charger Shutoff Due to Overheat	• Internal temperature above 203°F—Check intake grill for blockage. Will go to Start screen when cool.
Select X of 10 Alarm Tones	• No alarm tone is heard—Alarm tone set to OFF (X).
Calibration Data Is Invalid!	• Factory programmed software calibration data has been damaged—Contact Novak Customer Service.
X XXXXXX XXXX COMM ERROR	• MP D•LINK2 harness not connected to ESC—Check harness and connection. Make sure ESC DataLink socket is clean.

CUSTOMER SERVICE & REPAIRS

NOVAK ELECTRONICS, INC.
18910 Teller Avenue
Irvine, CA 92612

(949) 833-8873
FAX (949) 833-1631
www.teamnovak.com

Monday-Thursday: 8:00am-5:00pm (PST) • Friday: 8:00am-4:00pm *(closed every other Friday)*
Before sending your Millennium Pro for service, review the Trouble-Shooting Guide and instructions. After reviewing instructions, if you feel your charger requires service, please obtain the most current product service options and pricing by one of the followings methods:

WEBSITE: We have an abundance of information available for all of our products. Print a copy of the **PRODUCT SERVICE FORM** from the *SERVICE* section of the website. Fill out the needed information on this form and return with the Novak product that requires servicing.

PHONE/FAX/E-MAIL: If you do not have access to the internet, contact our customer service department by phone, fax, or e-mail as listed above, and they will supply you with current service options and send you a **PRODUCT SERVICE FORM**.

WARRANTY SERVICE: For warranty work, you *MUST CLAIM WARRANTY* on the **PRODUCT SERVICE FORM** and include a valid cash register receipt with purchase date on it, or a previous service invoice. If warranty provisions have been voided there will be service charges.
• Hobby dealers/distributors are not authorized to replace product thought to be defective.
• If a hobby dealer returns your product for service, submit a completed **PRODUCT SERVICE FORM** to the dealer and make sure it is enclosed with the product.
• Novak Electronics does not make any electronic components *(transistors, etc.)* available for sale.
• MP D•LINK2 harness must also be included for claims regarding Pit Wizard software programming/problems.

PRODUCT WARRANTY

IM-4490-1 8-2001

PIT WIZARD SOFTWARE

Novak Racing Electronics
MILLENNIUM PRO

PIT WIZARD OPTION

The Millennium Pro has Novak's Pit Wizard Software built-in, and can be used with the included **MP D•LINK2** harness to connect to and customize the throttle profiles in the Cyclone C2 and TC2 *(Cyclone, CycloneTC, & Atom require the "MP Classic D•LINK" harness)*. The Pit Wizard software enables a hidden fourth throttle profile in any one of the Novak programmable ESCs, and allows you to modify various speed control parameters.

ADJUSTABLE SPEED CONTROL PARAMETERS

NEUTRAL *(µs)*—Position at which ESC is at rest with no Drive or Brake being applied.

FULL THROTTLE *(µs)*—Trigger position at which ESC reaches Full Drive.

FULL BRAKE *(µs)*—Trigger position at which ESC reaches Full Brake.

> *Note: Neutral, Full Throttle, & Full Brake are programmed into ESC during One-Touch Set-Up. These values are NOT usually changed, as this changes the One-Touch programming.*

DEADBAND *(% of Full Throttle)*—Space between Minimum Brake & Minimum Drive.
Increasing Deadband requires more trigger to reach the first pulse of Drive & Brake.
Decreasing Deadband requires less trigger to reach the first pulse of Drive & Brake.

DRIVE PWM FREQUENCY *(Hz)*—Frequency ESC sends drive information to motor.
Increasing Drive Frequency requires more initial trigger to obtain given speed.
(Smoother response with light vehicles; Heavy vehicles feel more sluggish)
Decreasing Drive Frequency requires less initial trigger to obtain given speed.
(Light vehicles are harder to control at low end; Heavy vehicles are more reactive)

MINIMUM DRIVE *(% of Full Drive)*—Amount of Drive applied with initial trigger movement.
Increasing Minimum Drive applies more Drive with initial trigger movement.
(High traction conditions; Eliminates 'dead' trigger with heavy vehicles)
Decreasing Minimum Drive applies less Drive with initial trigger movement.
(Low traction conditions; Makes light vehicles more controllable)

BRAKE PWM FREQUENCY *(Hz)*—Frequency ESC sends braking information to motor.
Increasing Brake Frequency requires more initial trigger to obtain given braking.
(Light vehicles more controllable during initial braking; Heavy vehicles brake less reactively)
Decreasing Brake Frequency requires less initial trigger to obtain given braking.
(Light vehicles harder to control during initial braking; Heavy vehicles are more reactive)

**DRAG BRAKE VALUE** *(% of Full Brake)*—Amount of Drag Brake applied during Neutral.

DRAG BRAKE TOGGLE—Switches ESC's BRAKE pot between Drag Brake & Minimum Brake.
Drag Brake Toggle ON: ESC BRAKE pot adjusts Drag Brake Value & Minimum Brake Value to same level. Drag Brake & triggered braking both operate at Brake PWM Frequency.
(Drag Brake Value can NOT be set with Pit Wizard software when toggle is ON)
Drag Brake Toggle OFF: Independent adjustment of Drag Brake & Brake PWM frequencies.

DRAG BRAKE FREQUENCY *(Hz)*—Frequency ESC sends drag brake information to motor.
Increasing Drag Brake Frequency makes braking more subtle during Neutral/Deadband.
Decreasing Drag Brake Frequency makes braking more reactive during Neutral/Deadband.

CONNECTION TO SPEED CONTROL

Included with your Millennium Pro is the *MP D•LINK 2* harness for direct connection to Novak's Cyclone C2 & TC2. Connect the harness between the ESC & charger as follows:

1. Connect C2/TC2 to charged battery pack. *ESC requires power for all Pit Wizard functions.*
2. Connect the DataLink end of harness to C2/TC2. *The connector has offset pins that will only go into the ESC's socket in one direction.*
3. Connect the other end of harness to the pins inside the rectangular opening of the Millennium Pro's front panel—*Install connector with the* **WHITE WIRE TOWARD THE LEFT**.

Note: If harness is installed backwards into Millennium Pro, a COMM ERROR will occur when data transmission is attempted. No damage will occur—simply reverse connector and retry.

white wire
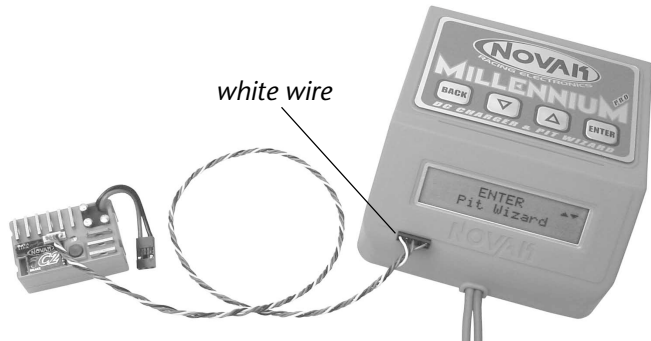
4. For the Monitor Trigger function, ESC must also be connected to a receiver. *Receiver and transmitter must have correct matching crystals, or be connected with a DSC cord.*

MP Classic D•LINK COUPON

Return this coupon for FREE "MP Classic D•LINK" harness.

If you own an original Novak Cyclone, CycloneTC, or Atom ESC and would like to utilize the ultimate programmability of the Pit Wizard software that is now built-into the Millennium Pro charger, **send us a self-addressed stamped envelope** *(with sufficient postage)* & this coupon *(no photo copies)* with following information completed:

name:			
address 1:			
address 2:			
city:	**state:**	**zip:**	**country:**
date purchased:	**where purchased:**		

ACQUIRING DEFAULT PARAMETERS

Before you can edit Profiles, customize Profiles, or even monitor the transmitter's trigger position, you *MUST* upload the Neutral, Full Throttle, and Full Brake settings that are stored in your speed control's One-Touch memory.
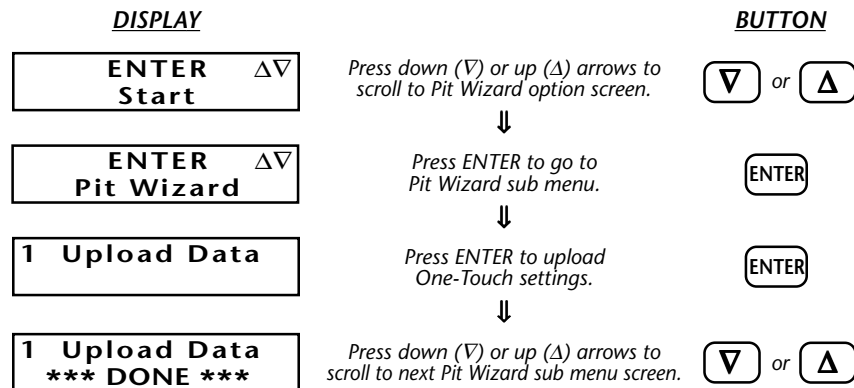
If you do not do this, you will download incorrect values for these settings into the your speed control's One-Touch memory for all four Profiles.

UPLOAD 1-TOUCH DATA

With the *MP D•LINK2* harness connecting C2/TC2 to the Millennium Pro, and a charged battery pack connected to the C2/TC2, follow the steps below to upload the One-touch values from the speed control's memory.

Note: Default values for each of the 'Adjustable Parameters' (listed in column to the left) will be uploaded from the throttle profile that is currently active in the speed control. So if you plan on modifying Profile 3, you will have less work if you upload Profile 3 to the Pit Wizard software.

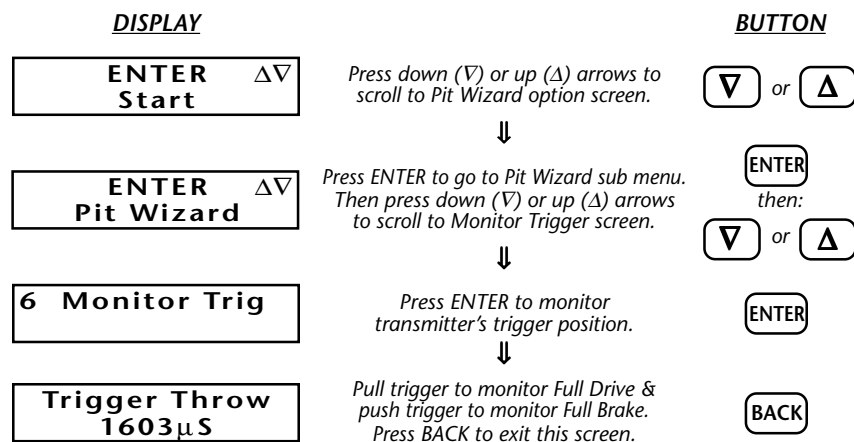| DISPLAY		BUTTON
ENTER △▽ **Start**	Press down (▽) or up (△) arrows to scroll to Pit Wizard option screen.	▽ or △
ENTER △▽ **Pit Wizard**	Press ENTER to go to Pit Wizard sub menu.	ENTER
1 Upload Data	Press ENTER to upload One-Touch settings.	ENTER
1 Upload Data * DONE *** **	Press down (▽) or up (△) arrows to scroll to next Pit Wizard sub menu screen.	▽ or △

VERIFYING TRANSMITTER THROW

If your transmitter is not set-up to provide the proper amount of Full Throttle and Full Brake throw, you will not get the full potential out of your Novak speed control. Follow the steps in the Monitor Trigger section to determine your transmitter's throw.

MONITORING TRIGGER

The *Monitor Trigger* option of the Pit Wizard software allows you to monitor the position *(position is measured in µS)* of your transmitter. Connect Millennium Pro, ESC, receiver, & transmitter as described in 'CONNECTION' section to left and follow the steps below to determine the Neutral to Full Throttle & Neutral to Full Brake throw of your transmitter.

DISPLAY		BUTTON
ENTER △▽ **Start**	Press down (▽) or up (△) arrows to scroll to Pit Wizard option screen.	▽ or △
ENTER △▽ **Pit Wizard**	Press ENTER to go to Pit Wizard sub menu. Then press down (▽) or up (△) arrows to scroll to Monitor Trigger screen.	ENTER *then:* ▽ or △
6 Monitor Trig	Press ENTER to monitor transmitter's trigger position.	ENTER
Trigger Throw 1603µS	Pull trigger to monitor Full Drive & push trigger to monitor Full Brake. Press BACK to exit this screen.	BACK

The difference between the values displayed for the Neutral & Full Throttle trigger positions should be a minimum of 550µS. The difference between the Neutral & Full Brake positions should be a minimum of 350µS.

> **IMPORTANT: If you do not get 550µS Drive & 350µS Brake throw, your ESC will not operate at its full potential. Increase transmitter's ATV, EPA, or ATL settings to get more throw.**

RECOMMENDED THROTTLE PROFILES

We have already programmed our recommended settings for the three most common set-ups for the given programmable ESC type into its main throttle profile locations. The following is a general list of recommendations for different car set-ups and driving conditions.

We suggest uploading one of the three main throttle profiles from your speed control and using it along with the profiles listed below as the basis for creating your own custom profiles. With these recommended starting points, you will minimize your set-up time by reducing the trial and error of changing various parameters

DRAG BRAKE TOGGLE OPTION OFF—individual freqs. for brake & drag brake (ESC's BRAKE pot adjusts min.brake)

VEHICLE	MOTOR	GRIP	DRIVE FREQ.	MIN. DRIVE	BRAKE FREQ.	DRAG BR.FREQ.	DRAG BR.VALUE
BUGGY	MOD	HIGH	11.7	4%	3.9	–	0%
BUGGY	MOD	LOW	15.6	2%	3.9	–	0%
BUGGY	STOCK	HI/LO	11.7	9%	3.9	–	0%
TRUCK	MOD	HI/LO	11.7	7%	3.9	–	0%
TRUCK	STOCK	HI/LO	7.8	9%	3.9	–	0%
1/10 ONROAD	MOD	HI/LO	23.4	8%	3.9	–	0%
1/10 ONROAD	MOD	HI/LO	23.4	8%	3.9	5.86	4%
1/10 ONROAD	STOCK	HI/LO	15.6	9%	3.9	–	0%
4WD SEDAN	MOD	HI/LO	23.4	6%	3.9	–	0%
FORMULA 1	MOD	HI/LO	23.4	3%	5.86	–	0%
1/12 ONROAD	6C MOD	HI/LO	23.4	4%	3.9	–	0%
1/12 ONROAD	4C MOD	HI/LO	5.86	7%	3.9	–	0%
4WD BUGGY	MOD	LOW	11.7	6%	3.9	3.9	15%
BUGGY	MOD	LOW	11.7	2%	3.9	3.9	15%

DRAG BRAKE TOGGLE OPTION ON—brake freq. = drag brake freq. (ESC's BRAKE pot adjusts drag brake value)

VEHICLE	MOTOR	GRIP	DRIVE FREQ.	MIN. DRIVE	BRAKE FREQ.	DRAG BR.FREQ.	DRAG BR.VALUE
BUGGY	MOD	HIGH	15.6	4%	5.86	(5.86)	(@ BRAKE pot)
BUGGY	MOD	LOW	23.4	6%	5.86	(5.86)	(@ BRAKE pot)
1/10 ONROAD	MOD	HI/LO	23.4	8%	5.86	(5.86)	(@ BRAKE pot)
4WD SEDAN	MOD	HI/LO	23.4	6%	3.9	(3.9)	(@ BRAKE pot)

EDITING PARAMETERS

This is where you will be able to edit and customize the various adjustable parameters of Profile 4 in the Novak programmable ESCs *(Note: Any changes to Neutral, Full Throttle, & Full Brake will overwrite the One-Touch programming in all 4 ESC throttle profiles).* You do not need to connect the ESC to the Millennium Pro to work in the *Edit Profile* mode.

Any parameters modified in this section are making changes to the Pit Wizard software's active throttle profile. *You must save the active profile to one of the Pit Wizard's memory locations (0-9), or they will be lost when you turn off the Millennium Pro or exit the Pit Wizard software screens.*

DISPLAY   **BUTTON**

Display	Instruction	Button
ENTER △▽ **Start**	Press down (∇) or up (△) arrows to scroll to Pit Wizard option screen.	∇ or △
ENTER △▽ **Pit Wizard**	Press ENTER to go to Pit Wizard sub menu. Then press down (∇) or up (△) arrows to scroll to Edit Profile screen.	ENTER then: ∇ or △
2 Edit Profile	Press ENTER to go to Edit Profile sub menu. Then press down (∇) or up (△) arrows to scroll to parameter to edit.	ENTER then: ∇ or △
21 Neutral	Press ENTER to edit Neutral** point. **Not usually changed (One-Touch setting).	ENTER
21 Neutral *1394µS*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
22 Full Throttle	Press ENTER to edit Full Throttle** position. **Not usually changed (One-Touch setting).	ENTER
22 Full Throttle *510µS*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
23 Full Brake	Press ENTER to edit Full Brake** position. **Not usually changed (One-Touch setting).	ENTER
23 Full Brake *351µS*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
24 Deadband	Press ENTER to edit Deadband percentage.	ENTER
24 Deadband *4%*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
25 Drive Freq	Press ENTER to edit Drive PWM Frequency.	ENTER
Select Freq *5.86KHz*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
26 Minimum Drv	Press ENTER to edit Minimum Drive.	ENTER
26 Minimum Drv *5%*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
27 Brake Freq	Press ENTER to edit Brake PWM Frequency.	ENTER
Select Freq *3.90KHz*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
28 Drag Brk Frq	Press ENTER to edit Drag Brake Frequency.	ENTER
Select Freq *3.90KHz*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
29 Drag Brk Val	Press ENTER to edit Drag Brake Value.	ENTER
29 Drag Brk Val *0%*	Press down (∇) or up (△) arrows to change the parameter value. Then press ENTER to store new value.	∇ or △ then: ENTER
2A Toggle Opt.	Press ENTER to edit Toggle Options.	ENTER
Toggle Select *00000000*	Press down (∇) or up (△) arrows to turn toggle ON (1) or OFF (0). Press ENTER for each toggle position, until returning to Toggle Options screen. (Press BACK to go back to previous position)	∇ or △ then: ENTER

TOGGLE POSITION 1 (Drag Brake Toggle)
When ON (1), BRAKE pot on speed control adjusts Drag Brake Value.
(Currently this is the only toggle that controls a feature in the ESC)

TOGGLE POSITION 2 (Throttle Channel Position)
This toggle indicates your transmitter's throttle channel position: *Normal (0)* or *Reversed (1)*.
(If your transmitter throttle channel is reversed, you will also see a number sign "#" displayed to the left of the value on the Full Throttle & Full Brake sub-screens)

DOWNLOAD PROFILE

With the *MP D•LINK2* harness connecting C2/TC2 to the Millennium Pro, and a charged battery pack connected to the C2/TC2, follow the steps below to download the Pit Wizard software's active throttle profile to the speed control's Profile 4 memory position. Note that Profile 4 will be the active profile in the speed control after downloading.

> **IMPORTANT: Did you upload your One-Touch settings?** If you did not first upload a throttle profile from the ESC, and use it as the starting point for the profile you are about to download, your ESC will not be properly adjusted to your transmitter.

DISPLAY   **BUTTON**

Display	Instruction	Button
ENTER △▽ **Start**	Press down (∇) or up (△) arrows to scroll to Pit Wizard option screen.	∇ or △
ENTER △▽ **Pit Wizard**	Press ENTER to go to Pit Wizard sub menu. Then press down (∇) or up (△) arrows to scroll to Download Data screen.	ENTER then: ∇ or △
3 Download Data	Press ENTER to download Pit Wizard's active profile to ESC Profile 4 location.	ENTER
3 Download Data *** DONE ***	Press down (∇) or up (△) arrows to scroll to next Pit Wizard sub menu screen.	∇ or △

RECALL STORED PROFILE

Follow the steps below to recall any of the stored throttle profiles from the Pit Wizard software's ten storage locations *(The ESC does not need to be connected to the charger)*. Once recalled, the profile can be reviewed and modified in the *Edit Profile* mode, or downloaded to the speed control from the *Download Data* mode.

DISPLAY   **BUTTON**

Display	Instruction	Button
ENTER △▽ **Start**	Press down (∇) or up (△) arrows to scroll to Pit Wizard option screen.	∇ or △
ENTER △▽ **Pit Wizard**	Press ENTER to go to Pit Wizard sub menu. Then press down (∇) or up (△) arrows to scroll to Read Profile screen.	ENTER then: ∇ or △
4 Read Profile	Press ENTER to go to Read Profile sub menu.	ENTER
4 Read Profile *0*	Press down (∇) or up (△) arrows to change profile number. Press ENTER to recall stored profile.	∇ or △ then: ENTER
4 Read Profile Read Complete	Press down (∇) or up (△) arrows to scroll to next Pit Wizard sub menu screen.	∇ or △

SAVING PROFILES

The Millennium Pro's built-in Pit Wizard software has the ability to store ten custom ESC throttle profiles. Once stored, the throttle profiles can be recalled at any time from the *Read Profile* mode, modified in the *Edit Profile* mode, or downloaded to the speed control with the *Download Data* mode.

Follow the steps below to save the Pit Wizard's active throttle profile to one of the storage locations *(The ESC does not need to be connected to the charger)*.

DISPLAY   **BUTTON**

Display	Instruction	Button
ENTER △▽ **Start**	Press down (∇) or up (△) arrows to scroll to Pit Wizard option screen.	∇ or △
ENTER △▽ **Pit Wizard**	Press ENTER to go to Pit Wizard sub menu. Then press down (∇) or up (△) arrows to scroll to Save Profile screen.	ENTER then: ∇ or △
5 Save Profile	Press ENTER to go to Save Profile sub menu.	ENTER
5 Save Profile *0*	Press down (∇) or up (△) arrows to change profile number. Press ENTER to save active profile.	∇ or △ then: ENTER
5 Save Profile Profile Saved	Press down (∇) or up (△) arrows to scroll to next Pit Wizard sub menu screen.	∇ or △

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