

# **INSTRUCTION MANUAL**

**Important! Read Instruction Before Use  
16X2 Is Designed For Expert Users Only**

## **16X2** *Digital Ni-Cd Maintenance System*

One Button Operation VESC & Fuzzy Logic Program  
INDI Multitasking Full Charge Detection Algorithm  
Minus Delta Voltage Full Charge Termination Method  
Dual Peak Slope Full Charge Termination Method  
Pulse Count 16-Bit Analog to Digital Converter  
65536 Steps Ultra High Resolution Counter  
1 Amp Conditioning Discharging Current  
0.5-4.5 Amps Adjustable Charging Current  
Auto Detect Smart Lockout Timer  
16-Bit Digital Signal Processing



[www.integy.com](http://www.integy.com)

**MICROPROCESSOR BASED 16-BIT DIGITAL CHARGER**

## Operation

The INDI 16X2 will operate from a 12 volt automobile battery or any 110-120V AC outlet with a minimum of 2 amps capacity. It will operate with less amperage, but the charge current will be limited to the maximum capacity of the supply. If the power source is not rated for at least 50% of the charge current set on the INDI 16X2, the charge may terminate early.

**CAUTION:** If you use an automotive battery as the power source, make sure you have good ventilation. Lead-acid batteries release explosive hydrogen gas when they are being charged.

If an overload occurs or improper connection is made, the fuse will blow. In this case, disconnect the power and send the unit to a service center for repair. We charge a flat fee of \$20.00 to reset the unit. NEVER attempt to repair or open the charging unit, the unit contains no user replaceable part.

The long 6 foot lead must connect to an 110V AC outlet first. Then connect the 3 foot lead to the back of the charger, the unit will beep and the mode LED will be on. This indicates the charger is operational. The leads supplied for the battery pack hook-up are the larger alligator type. Be sure to observe polarity when connecting to your battery pack (Positive to red and negative to black). Damage may result if polarity is reversed. Do not change connectors or wires on the unit. Changing connector(s) or wires on the unit can affect performance drastically and void the mfg. warranty.

The INDI 16X2 is equipped with four optimized charge & discharge profiles. There are 4 different user selectable operational modes of operation on the INDI 16X2. You can select the different modes by pressing the start button differently. Each time the start button is pressed, the charger waits 2 seconds to see which mode you would like to select. You may select the 4 different charge modes as follow:

### Mode 1, VESC Charge

#### Press Once:

This mode will charge the battery pack until the pack reaches a predetermined capacity. Then, it will trickle charge the pack for about 2 minutes before going into fast charge again. When a peak voltage is detected, the fast charge will stop and trickle charge begins. This is the best possible charging method ever developed for racing. For best performance, run this mode again 2 times approx. 8 minutes before a race. Always observed pack temperature during charging, when the temperature becomes too hot, disconnect the charging.

### Mode 2, Fuzzy Logic Charge

#### Press 2 Times:

This mode will discharge the battery pack at 1 amp until the pack reaches 2.6 volts. Then it will trickle charge the pack for 10 seconds before going into fast charge. During charging, the INDI 16X2 constantly collects data, input voltage, output voltage and current, and stores them in its memory. Then, the unit generates high resolution moving averaged data sets. The fuzzy logic program then monitors the stored data sets and compares them to its built-in memory bank. When a matched pattern is detected, the unit stops fast charging and beeps every 30 seconds to remind the user that fast charging is completed. The unit trickle charges the battery pack after fast charging.

### Mode 3, Discharge At 1 Amp

#### Press 3 Times:

This mode will discharge the battery pack at 1 amp and automatically cut-off when the pack reaches 2.6 volts. The 1 amp discharge rate is good for conditioning any Ni-Cd battery packs.

### Mode 4, Pack Conditioning

#### Press 4 Times:

This mode will perform an extended pack maintenance function. Complete cycling takes much longer than mode 3, often, it may take up to 3 hours.

## Safety Precautions

1. Do not leave the battery and charger unattended while in use.
2. Do not operate the charger near water.
3. It is the users responsibility to follow battery mfg. suggested charging rate. Users must also closely monitor the pack temperature during fast charging. Overcharging may occur if the 16X2 malfunction or, when user does not follow battery mfg. recommended charge rate.
4. Never connect the charger to an automobile while its engine is running.
5. This charger is not intended for use by unsupervised children.
6. This charger is designed for R/C car high power Ni-Cd battery only.
7. When charging, also monitor the temperature of the charger. If the unit becomes too hot, disconnect the unit.

## Warranty and Repair

Your INDI charger is guaranteed against workmanship and manufacturing defects for a period of 30 days from the original date of purchase. This warranty is limited to the original purchaser of the charger and is not transferable. Warranty repair will not cover units which have been modified, missed or serviced by an unauthorized service center.

NOTE: Freight charges are not covered by warranty.  
Repair fee within 30 to 90 days of purchase: \$15.00  
Repair fee within 90 to 180 days of purchase: \$30.00

If your INDI charger needs repair:

1. Ship the charger in its original box, freight prepaid to:

INTEGY INC.  
1140 Centre Dr #E

**Distributed by Integy Inc.**

or you may call us at (909)444-2766 for our current street address.

Include your complete name and address information inside the box, and write address on the outer label/return address area.

2. Include a brief summary of the difficulty. Date your correspondence and be sure your name and address appear on this enclosure. Also, include a phone number where you can be reached during the day time.

To receive warranty service you must include your original dated sales receipt to verify your proof-of-purchase date. Providing that warranty conditions have been met, your charger will be repaired free of charge. We charge a flat fee of \$20.00 for handling, shipping & diagnostic if we can not detect any problem with the unit and the unit will only be returned via UPS GROUND C.O.D. Should your repair cost exceed 40% of the retail purchase cost, you will be provided with an estimate advising you of your options. Any return freight for non-warranty repairs will be charged to the customer. For non-warranty repairs, please advise us of the payment method you prefer to use. Specify Visa or MasterCard, or we can return C.O.D. cash only. (C.O.D. charges are \$5.00 extra.) If you prefer to use a credit card, include your card number and expiration date.

In no case shall our liability exceed the product's original cost. We reserve the right to modify the provisions of this warranty without notice.

Because Integy Inc. has no control over the use of the charger, no liability may be assumed nor will liability be accepted for any damage resulting from using this product. Every INDI charger is thoroughly tested and cycled before leaving our distribution facility and is, therefore, considered operational. By the act of operating this charger, the user accepts all resulting liability.