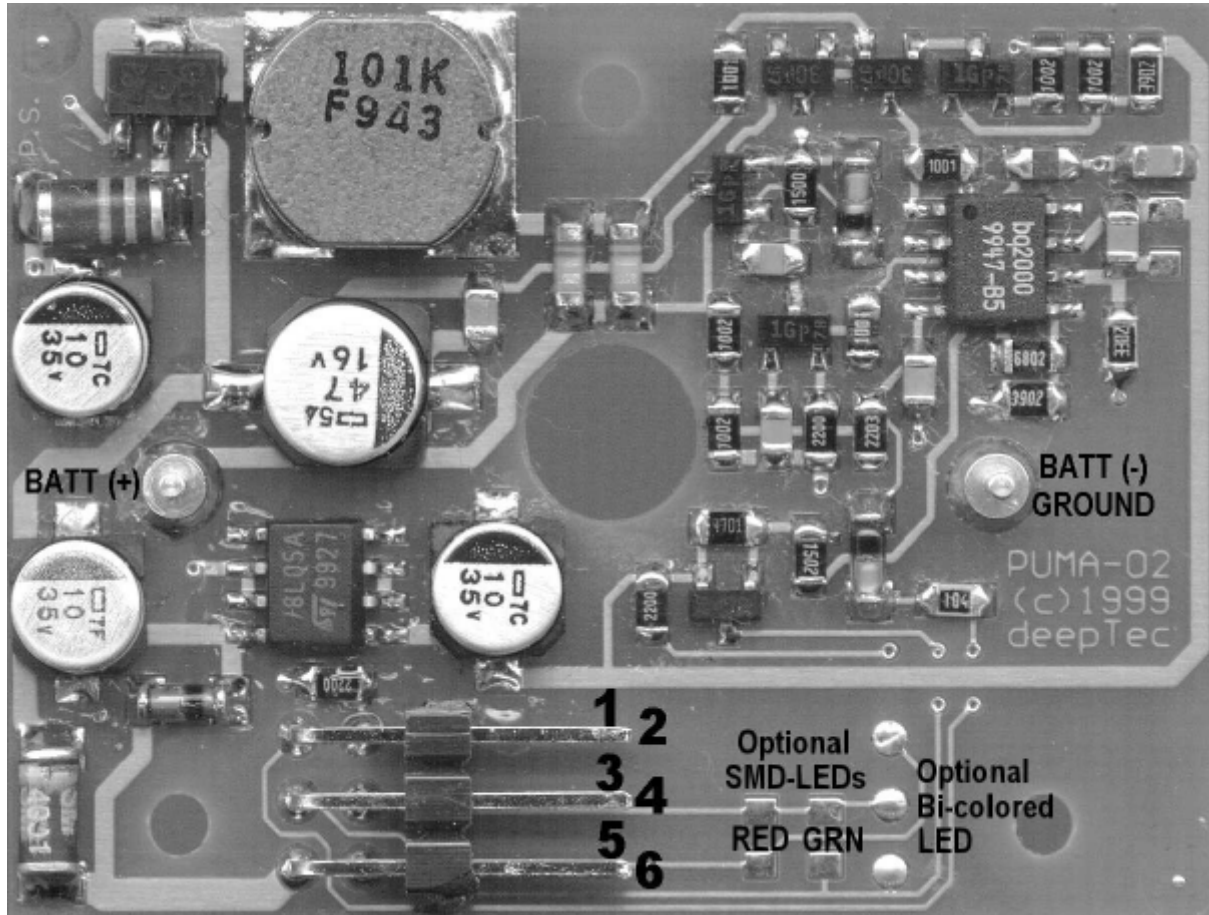




FIC-2 NiMH Battery Pack Charger Manual and Specifications

The FIC-2 charging circuit is designed for charging the PCS™ NiMH battery pack for PalmOS™ handheld computers and is used in the Power UniMount product family from Revolve Design.

Board Layout



NOTE: The even numbered pins are the lower row of the pin-header.

Pin-outs

- 1 Optional fast-charge trigger input (see explanation below).
- 2 Common CATHODE for bi-colored LED.
- 3 ANODE for RED LED
- 4 ANODE for GREEN LED
- 5 +Ub, Power Supply 12V
- 6 -Ub, Common GROUND

NOTE: The optional SMD LEDs are single-colored, size 0805. The optional bi-colored LED is a conventional through-hole LED with a common CATHODE.

Operational Description

On power-up, the LED illuminates (circuit power indicator). Without a battery connected, the LED is green but flashes red about every 2 seconds ("seek mode").

Once a battery is connected, a fast-charge cycle is started and the LED turns red. The charger detects a full battery condition by the voltage peak detection method and terminates fast-charge mode - the LED changes to a steady green as long as the battery stays connected.

Fast charging a PCS™ battery pack (2-cell AAA; 700mAh) takes between 7 and 100 minutes, depending on its state of discharge. The minimum charge time of 7 minutes is a 'hold-off' period. During the hold-off period, the charger ignores voltage peaks to avoid faulty charge termination. (NiMHs, especially aged cells, tend to produce a spurious peak right after the beginning of a fast charge.)

If for any reason the peak detection fails, an independent security timer shuts off the fast-charge cycle after about 130 minutes. This could happen due to very old cells or an out-of-specification temperature situation.

After a fast charge cycle ends, the unit switches to the 'top-off' state. The top-off charge current is slightly higher than trickle-charge current and ensures the battery is filled up to 100% capacity. The top-off charge duration is equal to the remaining time of the security timer after the fast charge is terminated by the peak detection. (If the security timer terminates the fast charge, no top-off cycle is performed.)

After the top-off phase, the charger enters a continuous trickle-charge phase. The trickle charge current level is compliant with all major NiMH manufacturers' recommendations, and can be applied indefinitely without damaging NiMH cells. A new fast-charge cycle is initiated by either power-cycling the charger or by disconnecting and reconnecting the battery. (If desired, an optional third possibility is discussed in the following section). The battery pack can be recharged anytime - overcharging is not possible.

The charger output is fully protected from short-circuits and can detect deep-discharged (below 1.8V or 0.9V / cell) battery packs. If either of these conditions occurs, the LED alternates between red and green and a low 'pre-qualifying' current is applied to the output. The battery pack is first "pre-qualified" with this low current until its voltage reaches 1.8V, then a fast-charge cycle is started.

External fast-charge trigger (optional)

In cases where external power management requires initiation of a new fast-charge cycle, neither power cycling the charger nor disconnecting and reconnecting the battery is a desirable option. Therefore, the charger offers an optional TTL-compatible trigger input. Any logic output can trigger a fast charge with a short HIGH (+5V) pulse at the trigger input. The minimum pulse width to trigger a fast charge cycle is approximately 100 mSec. The input must be LOW (0 - 0.4V) or left open for normal operation - if the trigger input is kept HIGH, the charger will stay in an idle state.

Technical Specifications

Supply voltage	8VDC - 16VDC (30VDC optional)	
Supply current (at 12V)	11 mA	(Idle mode)
	20 mA	(Trickle Charge mode)
	200 mA	(Fast Charge mode)
Charging current	450 mA +/- 20%	(Fast Charge mode)
	30 mA	(Top-off Charge mode)
	8 mA	(Trickle Charge mode)
Battery voltage (nominal)	2.4V (2 NiMH cells)	
Current Control	High-side current measurement. Supply ground and battery ground are internally connected.	
Dimensions	47.5 x 35 x 7 mm	
Operation temperature	-30 to +70 degree Celsius	

[Disclaimer: The preceding information is subject to change without notice.]