iCharger Synchronous Balance Charger/Discharger

1010B/106B

Upgrade Guide

Contents

Background

The original iC106B and iC1010B chargers from JunSi from early 2008 were not shipped with a connector for supporting connection to a PC for firmware upgrades. However, the capability was indeed present and JunSi provided information about how to add a connector and connect the units to a PC. They made available an Upgrader utility (MS Windows only) to communicate with the charger and perform the download. Since then they have provided firmware updates to both fix bugs and provide new or enhanced features.

In the future these chargers might ship from the factory with a suitable connector installed but as of July 2008 it is still up to the user to perform the simple modification themselves.

The interface to the charger is a 3-wire, 5V serial connection. You can get a TTL-to-RS232 converter board to allow connection to a PC serial port but most people these days only have or prefer to use USB ports. To do this you need a TTL_serial-to-USB adapter (more about this later).

This document provides instructions about candidate adapter interfaces, how to add a connector to the chargers and how to install and run the upgrader utility. The information was taken from various sources, including contributions made by members of RCGROUPS including Julez, badger-b, eheli and others. Many thanks to all that willing shared their knowledge and experience to help us all out.

The information in this document was accurate as of July 2008, however things might have changed since then!

References

RCGROUPS thread "10S 10A 200W charger/discharger (1010B)":
http://www.rcgroups.com/forums/showthread.php?t=839657

(Check the first post of this thread for links to the latest manual, upgrader software and firmware images)

JunSi website:

   http://www.jun-si.com/

   106B: http://www.jun-si.com/EnProductShow.asp?ID=89

   1010B: http://www.jun-si.com/EnProductShow.asp?ID=87

   Manual: http://www.jun-si.com/UploadFiles/iCharger-english.pdf

   Upgrader software: http://www.jun-si.com/UploadFiles/Upgrader_V11.rar

Document History

Version	Date	Notes
1.4	18 July 2008	Original

What you will need

The following items are required to modify the charger and perform the upgrade.

Standard items：
- Soldering equipment (fine tip for electronics work)
- USB/TTL converter and drivers (see more info below)
- Philips #2 screwdriver
- USB cable that fits the converter and your PC (eg a lead from a camera or printer)

Junsi items:
- 106B or 1010B charger
- Upgrader program
- Latest firmware image file

Process overview

The main steps are:
1. Purchase a USB/TTL adapter and install the drivers on your PC.
2. Add a connector to the charger.
3. Power-up the charger (finger on the Stop button if it is a 106B).
4. Connect the charger to the adapter and the adapter to the PC.
5. Run the Upgrader software, select the adapter from the list and select the new firmware image file.
6. Press "Update…" and wait for the process to complete (about 1 minute).
7. Disconnect the adapter from the charger.

Do not disconnect the data cable or remove power from the charger or the PC while the upgrade is in progress or you will lock up the charger and it will have to be returned to the manufacturer to be repaired.

USB/TTL adapter

Like most hobby equipment with embedded microcontrollers, these chargers have an on-board 3-wire (Tx, Rx, Gnd) serial interface which operates at 5V. To connect this to a PC USB port requires an adapter that provides TTL-serial on one side and USB on the other. Since this is such a common requirement, there are quite a lot of these around. Information about a few is provided here. The instructions given below are for one particular adapter but in general, will apply to any.

You will need to buy a suitable adapter and install the drivers for it on your PC before you can use the Upgrader program to upgrade your charger. You will need a USB cable with the correct connectors for the adapter at one end the PC at the other. Some adapters use the micro-USB socket found on some phones and cameras and some use the square USB socket found on some printers. The appropriate cables are easy to find.

Popular ones that have been proven to work include the ones listed below. There are probably many others that will work. The Hyperion and Bantam charger PC cables appear to be suitable but this is not confirmed.

NBGLIN FT232

Simple, cheap (~$20) and easy to get working. Drivers are available for all Windows versions (including Vista) as well as Mac and Linux.

Device: http://www.nbglin.com/ft232.htm (usually found on eBay, just search for: USB TTL)
Drivers: http://www.ftdichip.com/FTDriver.htm
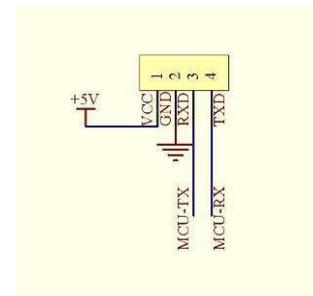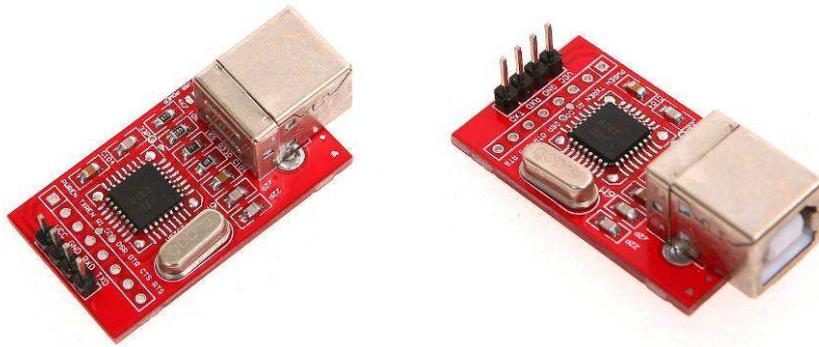
This device will draw power from the USB port. In order to provide 5V to the charger from the USB port, or alternatively to the adapter from the charger, then you have to link two pads on the board as shown below and use a four wire connection (Tx, Rx, Vcc, Gnd) to the charger. Note that if you provide input power to the charger as normal then this link is not required and only a three wire connection (Tx, Rx, Gnd) to the charger is needed.
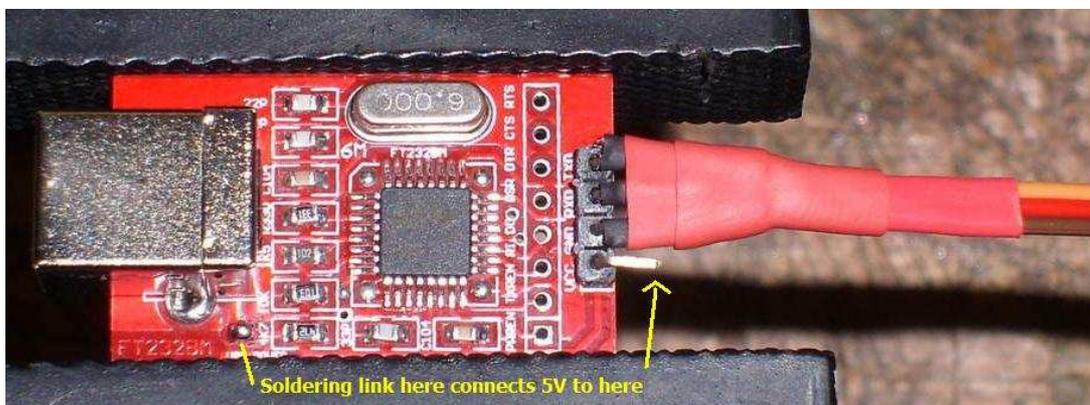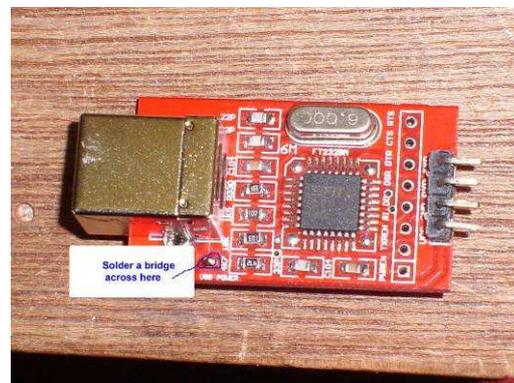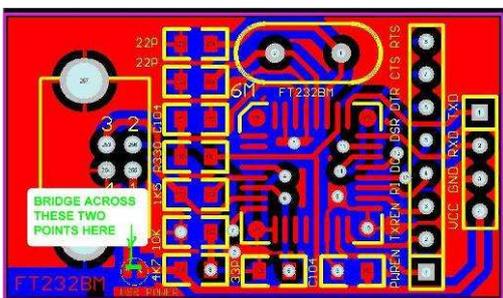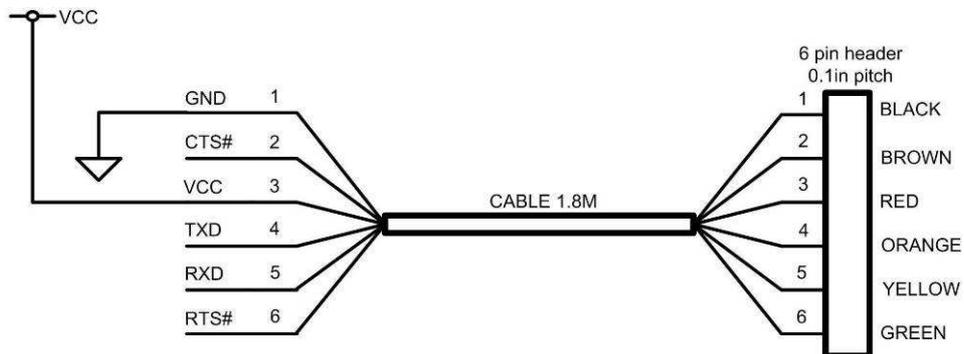
FTDI TTL-232R5V0

Perhaps the simplest of all, the electronics for this adapter are enclosed in the USB plug! You have to wire the serial connector with a plug to suit whatever you install on the charger. Again, you can connect just Tx, Rx and Gnd or if you want to power the charger from the USB port, connect Vcc as well.
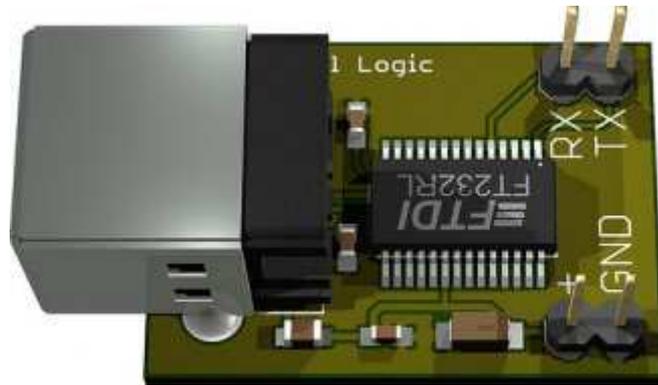
    Device: http://www.dontronics-shop.com/ftdi...rter-cable.html
    Drivers: http://www.easysync.co.uk/index.htm...target=d34.html

Fundamental Logic

Similar to the Nbglin device.

Device:	http://store.fundamentallogic.com/ecom/ (follow the link to
Drivers:	http://www.easysync.co.uk/index.htm...target=d34.html

From the PCB design it appears that the 5V is permanently connected to the V+ pin on the serial side.
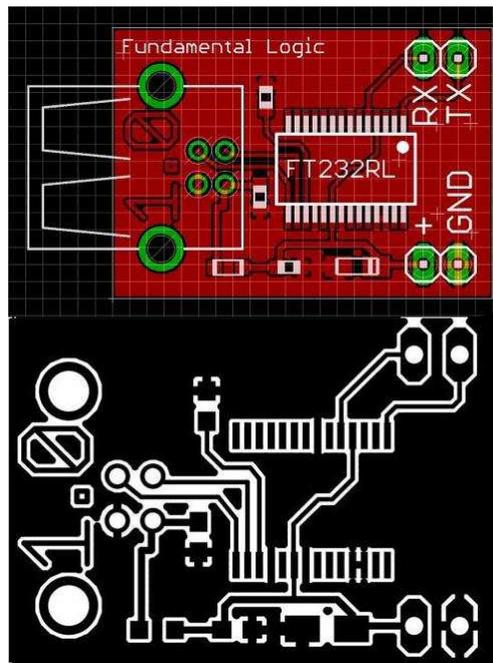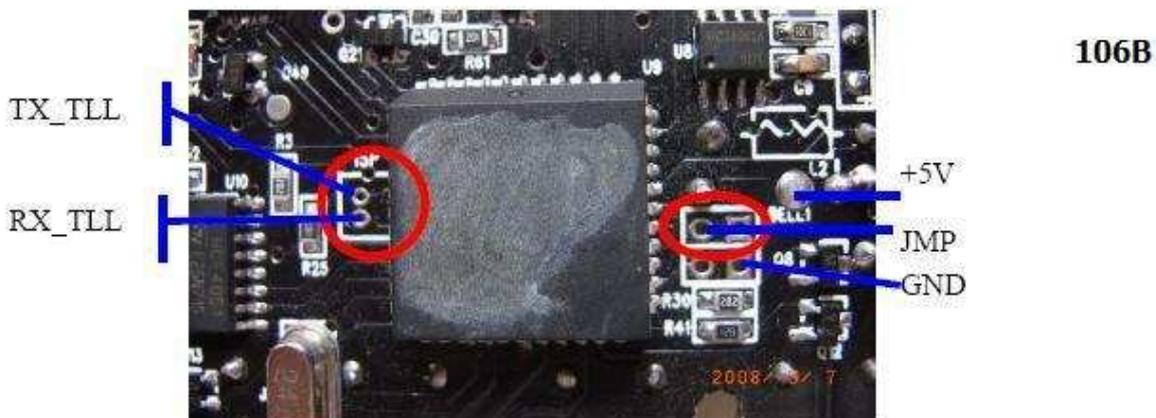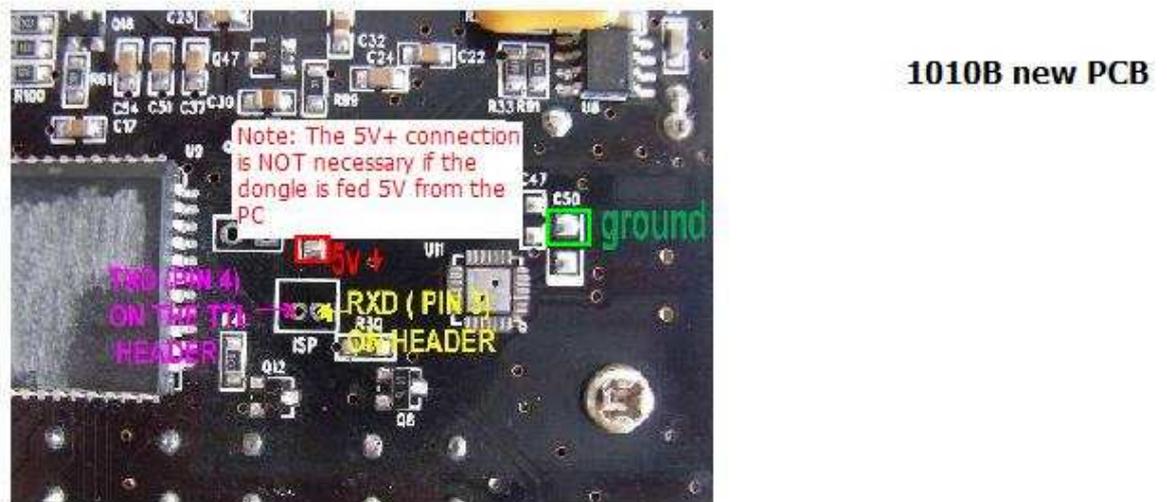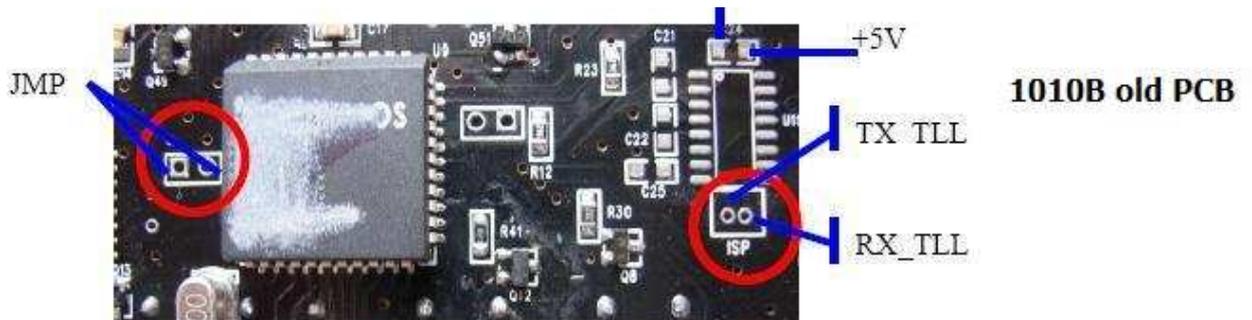
Adding a connector to the charger

All that is needed is to connect 3 wires, Tx, Rx and Gnd to the appropriate pads on the charger circuit board. Some people have mounted sockets either inside the charger or the end plate, using the "usb" cutout. Others have used a servo lead and left it hanging out the end of the case or simply folded it back inside the case when not in use. Certainly that is simplest.

The photos below show the connection points for the 106B and both versions of the 1010B circuit board.
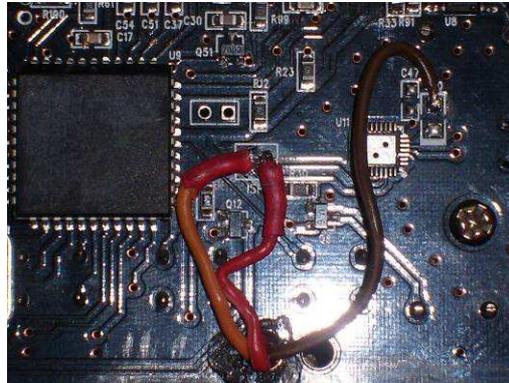
There is a 2Pin "ISP" socket on the PCB board of iCharger, which must be connected with the TX_TTL pin and RX_TTL pin of the adapter along with the GND pin.
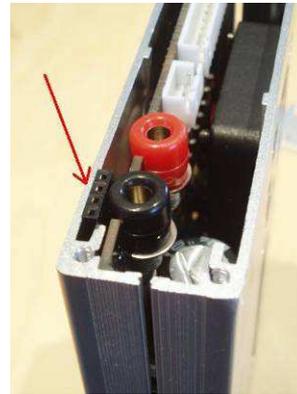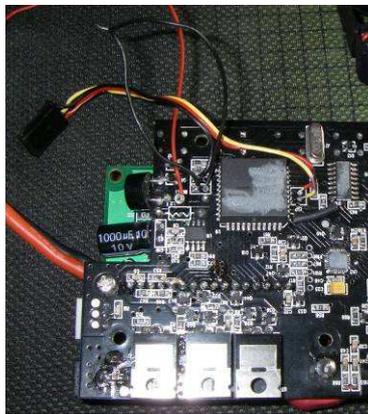

1010B old PCB

1010B new PCB

Note: The 5V+ connection is NOT necessary if the dongle is fed 5V from the PC

106B

Here are photos of how some users have added connectors:

Wiring on the bottom of the board:

Using a servo lead:

**Socket mounted in the end plate:**

Socket mounted inside the case:

Running the Upgrader

Connect the PC to the charger via the adapter and run Upgrader.exe, Choose the appropriate communications port form the list. Then open the upgrade image file and click the Download button to start the upgrade process. When the download is complete the charger will reboot. All memories will have been cleared and all settings returned to their default values.
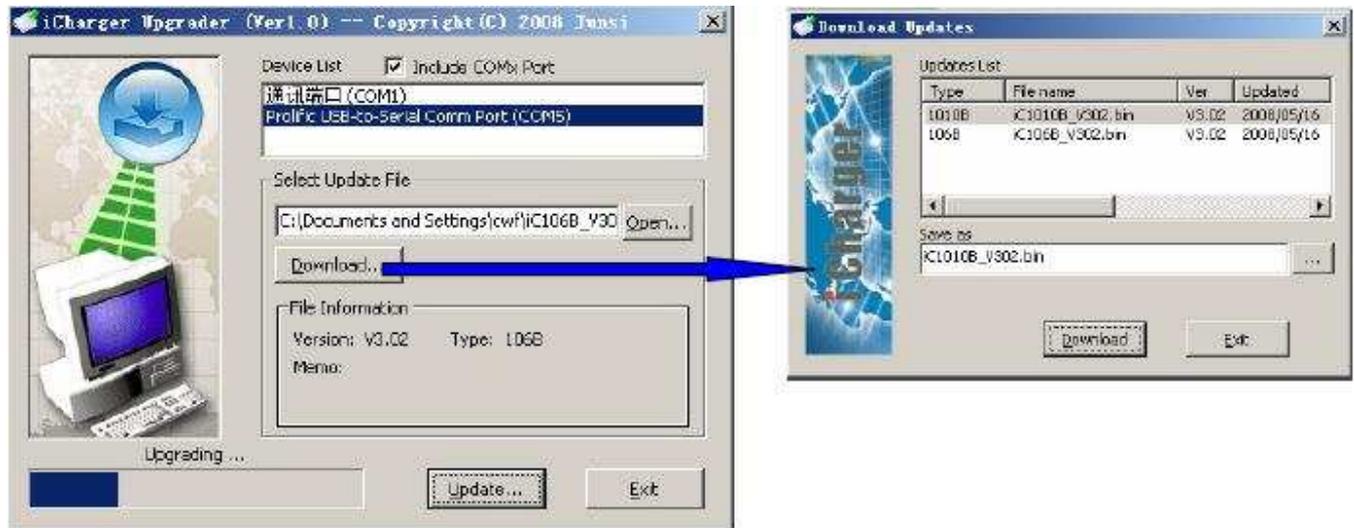
Notes

1. For the **106B**, hold down the Stop key **before** turning on the power to the charger to put the charger into upgrade mode. The LCD will be blank in this mode. This is not needed for the 1010B. If you want to exit upgrade mode without upgrading the firmware, simply turn off the power to the charger.

2. If your charger (either 106B or 1010B) has a firmware version earlier than 3.02 then you will need to briefly short the pins shown as JMP before turning on the power to the charger to put the charger into upgrade mode. Simply carefully short the pins together (for example by using the end of a flat bladed screwdriver), turn on the power and then remove the short. The LCD will be blank in this mode. If you want to exit upgrade mode without upgrading the firmware, simply turn off the power to the charger.

Warnings

Any incorrect operation may lock up the hardware and require you to return the charger to the manufacturer for repair.

1. Do NOT disconnect the adapter cable from the charger or the PC while the download is in progress.
2. Do NOT remove power from the charger or the PC while the download is in progress.