

# MallinCam Hyper Color RS-485 USB Interface

© Colin Haig astronomer (at) cogeco.ca  
2012-04-03

## Can I control my MallinCam Hyper Color from my PC ?

Have you got an older MallinCam ? If you have an older camera with the GREEN LED on the back, then this little project is for you!

With the advent of newer cameras from Rock Mallin at Pro Com Electronics, and better control software, I wanted to find an easy way to add computer control to my older MallinCam.

The older GREEN LED cameras (like my Hyper Color, came out before the Plus or Extreme versions) use an RS-485 serial interface. This is NOT electrically compatible with the common RS-232 interface people usually call a serial port. RS-485 is a serial bus scheme with differential data leads and a ground line. Transmit and received data flow over a pair wires, not separate Receive (RX) and Transmit (TX) wires like RS-232.

Most PC's today have USB ports, and so this interface is a simple way to get RS-485 to USB, without the need for a USB-to-RS-232 interface and a separate RS-232 to RS-285 converter.

## What you need

To make the interface, you will need a standard 8-pin mini DIN male plug, and the FTDICHIP USB to RS-485 interface. Mouser electronics ([www.mouser.com](http://www.mouser.com)) stocks them both.

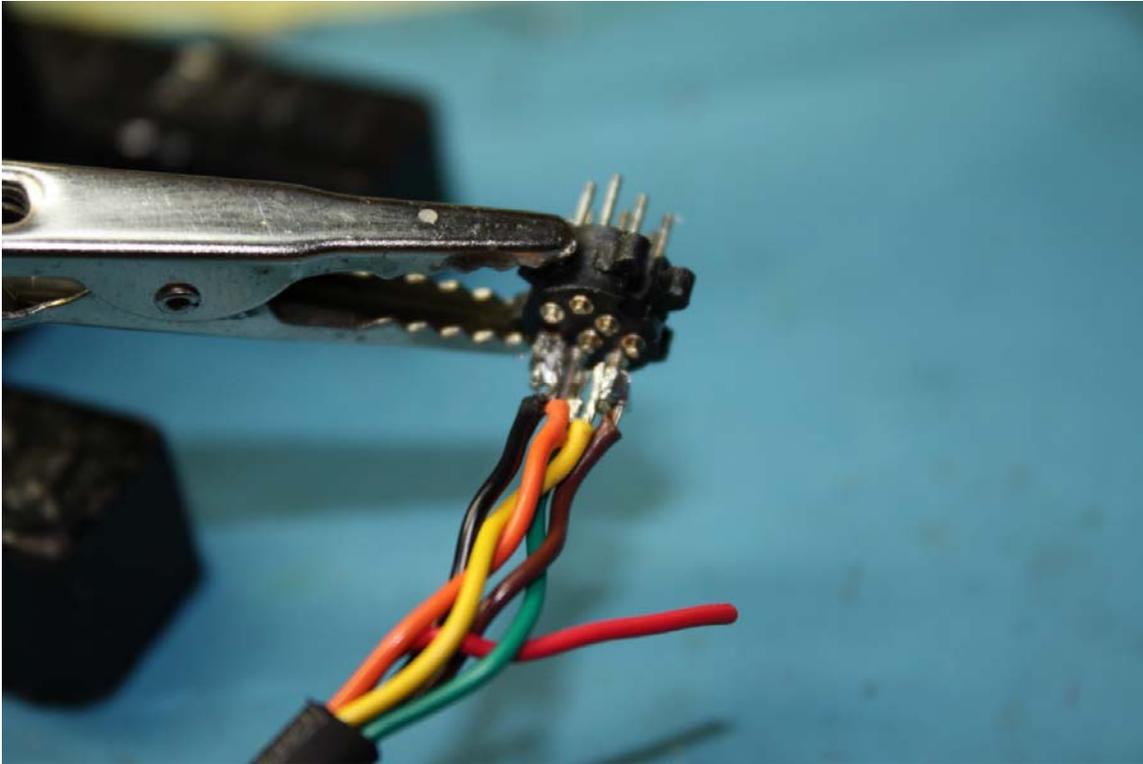
<u>Manufacturer</u>	<u>Description</u>	<u>Part Number</u>	<u>Est. Price</u>
Kobiconn	8 pin mini-DIN plug	171-2608	\$2.00
FTDICHIP	USB-485 bare wire interface	USBRS485WE1800BT	\$30.00

See the photo below.



## Construction

1. First off, disassemble the mini-DIN plug. Slide the black cover boot off, and then take apart the inner shells.
2. On the bare-wire end of the USB interface, there is a small piece of heat-shrink tubing that protects the end of the wires. Slide this off, and you will want to keep it for later, unless you replace with new heatshrink.
3. Next, slide the big cover boot over the cable, with the narrow end facing the USB end, and the big opening toward the bare wires.
4. Slide the heatshrink back on, before you do any soldering!



5. Clamp the mini-DIN plug part in something. For easier soldering, I trimmed off the unused pins on the solder side first – the photo shows 6,7,8 are cut off and oriented toward the upper right. 4,5 are also cut off in the middle row. You'll want to turn the connector around for easier soldering. Be aware the metal shield cannot contact the pins, so no excess solder please!
6. Solder the Black ground wire to Pin 2, GND. As you look at the back of the connector, this is the lower one of the 2 pins on the right side.
7. There is a Terminating resistor built into the USB device. It has to be connected across the DATA leads or else communication will not happen. This involves connecting the terminator wires to the data wires, as explained in the next step.
8. Solder Brown (terminator 1) to Yellow (Data -) to Pin 3, which is at the top of the middle row.
9. Solder Green (terminator 2) to Orange (Data +) to Pin 1, which is at the top of the 2 pin row on the right.
10. Cut off the end of the red wire- its not needed.
11. At this point, you'll want to configure the adapter and test it operates properly, BEFORE reassembling the connector.

#### Configure and Test

12. You will need to get the software drivers from FTDICHIP's web site at :  
<http://www.ftdichip.com/Drivers/VCP.htm>

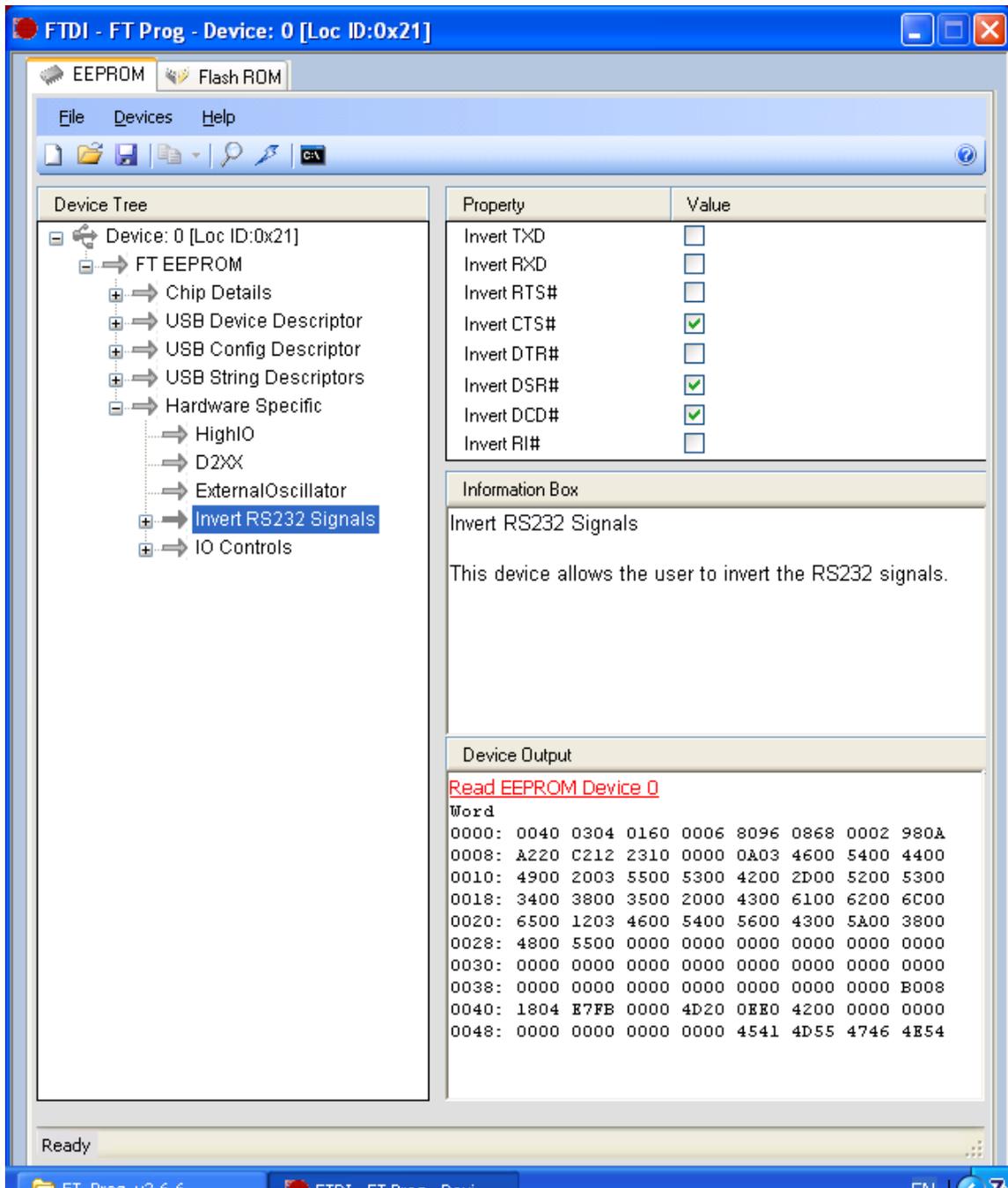
These drivers allow you to run the USB device like a regular serial port, COM1-COM9 for the Mallincam software. You may already have these drivers installed on your

computer if you are controlling your scope via a serial adapter. I recommend updating to the latest version. Follow the FTDI-supplied instructions to install these drivers on your PC.

13. You will also need to get the FT\_PROG software to configure the chipset. This is here: <http://www.ftdichip.com/Support/Utilities.htm>

The chipset program utility has to be used with care – it does low level hardware programming of the USB device, and the only thing we need to do is change the default values for the CTS, DSR, DCD lines. I'll explain in the next step.

14. Remove the 8pin connector from the soldering clamp, and DO NOT plug it into anything.
15. Unplug all USB devices from your PC. You don't want to accidentally reprogram the wrong one!
16. Plug the USB-485 device into your PC. The drivers will install. (Or you will need to go back to step 10).
17. Launch the FT-Prog windows application. See the picture below.
18. Hit the Magnifying glass to Scan and Parse the devices. (or use the menu option).
19. It will list one USB 485 device.
20. Click on the Hardware-Specific item in the list window on the left. And expand it out, to show Invert RS232 Signals.
21. In the upper right window, turn on a check box for:
  - a. Invert CTS#
  - b. Invert DSR#
  - c. Invert DCD#
22. Press the Lightning Bolt to program the device. It may prompt you, and just tell it do it.
23. Exit the FT-Prog application.
24. Unplug the USB device. Count to 10. Plug it back in again. The device is now programmed.



25. Go into Control Panel, Device Manager, Ports, and find the device. You will see something like USB Serial Port COM1:
26. If the port number is not COM1 to COM9 you will need to go to the ports, advanced tab, and change the port number to something Mallincam software can see, for example, COM4:
27. Go get the mallincam software: <http://mallincam.tripod.com/id38.html>
28. Install the software.

29. Plug the camera in, and gently push the 8-pin mini-DIN into the connector on the back of the camera.
30. Launch the MControl software.
31. Go to the Config page, and set the com port (e.g. to COM4:) to whatever you picked. Hit SAVE and exit the software, and launch again.
32. On launch, you may see the Red LED on the USB blink once very quickly, and the Green one on the USB blink almost instantly right after – the camera is responding. If no green blink, then you may have a bad soldering job and you will want to fix that.
33. Go to the Advanced tab, and check Colorbars. You should see a blink, and the video output on a monitor will change to colorbars. You can turn this on/off, and see the blink, as well as the camera should respond.
34. If this all works, then shut it all down.
35. Unplug both ends of the USB-485.
36. Wrap the outside of the pins with a tiny bit of electrical tape to protect it from the metal shield of the DIN plug.
37. Reassemble the metal shield watching you have the right orientation.
38. Slide the plastic covers on.
39. Slide the boot down to hold it all together. If you are feeling nervous, don't slide it all the way, until you retest.
40. Your finished arrangement will look like this photo below.



41. Congratulations ! If all that worked, you are in great shape.

## Troubleshooting

If this didn't work for you, start here:

1. In the MallinCam MControl software, pressing Solar or Deep Sky will send a stream of commands to the camera. The CAMERA will light up RED then YELLOW for a few seconds. If it flashes red for a fraction of a second and nothing seems to be happening, then the camera and computer are NOT talking.
2. Disconnect the camera
3. Open up the DIN connector, and use a magnifying glass to check for bad solder jobs or short circuits.
4. Using the Windows Hyperterminal program or equivalent, set up for COM4: (or whatever you picked), 9600, N, 8, 1, No handshaking.
5. Without the camera connected, type your favourite phrase – or hit and hold the spacebar – you will see blinking red light if the adapter is working and all is well. If not, shutdown and power off, and then reboot and try again.
6. With the camera connected, from Hyperterminal, press CTRL-E (that sends an ASCII ENQ), and you should see a red blink and a green blink from the camera, which will respond with an ACK. If you only get a red blink, you have solder problem or have picked the COM port wrong.
7. Assuming Hyperterminal works, and you see the blinks, then its time to check if the FT-Prog setting took. With a real serial port connected to an RS485 adapter, CTS, DSR, DCD must tell the computer the device is ready, and worst case you have to loop RTS-CTS, DSR+DCD-DTR. The reason we changed the FT-Prog settings is to tell the EEPROM to force these lines into the best state. IF you didn't do this step Hyperterminal will work, but MControl will not work.
8. Good luck!