

# RS423-USB Adaptor

---

*For the BBC Microcomputer*

---

## User Manual

---



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



## Description

This device facilitates the connection of a vintage BBC Microcomputer to a PC or any other computer with standard USB ports.

This gives the ability to transfer files direct from your PC to the BBC and vice versa, take control of the BBC from the PC (using suitable, freely downloadable software) and more.

Designed and built in the UK, it comes with approximately 500mm cable terminated with a 5-pin "domino" DIN plug for the BBC end, and a mini-USB socket at the other end of the module to receive a standard USB cable from the PC.

The adaptor works with the full range of speeds available on the RS423 port, including 19200 baud. *Be aware, though, that 19200 baud transmission was not guaranteed by Acorn (the company that designed and sold the BBC series of microcomputers), so may be a limitation of your particular machine.*

## Use

Connection of the adaptor is straight forward, simply plug the 5-pin DIN plug into the RS423 port of the BBC and connect the adaptor to the PC using a standard USB to mini USB cable. Note that it is possible to insert the DIN plug in two orientations: the correct way is with the gap in the metal shield uppermost or, in the case of plugs with no gap, there is a dimple in the shield which should face towards the UHF and Video sockets. No harm will be done to either the adaptor or the BBC Micro if the plug is inserted upside down – it simply will not work.



### *At the BBC Microcomputer*

Issue the necessary \*FX commands to enable the BBC to communicate over the RS423 port. By default, the port is set to send and receive at 9600 baud, so if that's a suitable speed simply typing the following will suffice in order to redirect input and output streams via the RS423 port:

- \*FX3,7 [Return] (sends output to RS423 instead of screen)
- \*FX2,1 [Return] (receives input from RS423, keyboard disabled)

If you wish to set up a different transmission speed, \*FX7,x and \*FX8,x can be used **before** issuing the \*FX3 and \*FX2 commands. Transmission speeds available to the BBC are in the table on the next page.

## BBC Microcomputer serial transmission rates

### \*FX7 - Receive rate

*FX7,1	75 baud receive
*FX7,2	150 baud receive
*FX7,3	300 baud receive
*FX7,4	1200 baud receive
*FX7,5	2400 baud receive
*FX7,6	4800 baud receive
*FX7,7	9600 baud receive
*FX7,8	19200 baud receive

### \*FX8 - Transmit rate

*FX8,1	75 baud transmit
*FX8,2	150 baud transmit
*FX8,3	300 baud transmit
*FX8,4	1200 baud transmit
*FX8,5	2400 baud transmit
*FX8,6	4800 baud transmit
*FX8,7	9600 baud transmit
*FX8,8	19200 baud transmit

### *At a Windows PC*

Connection of the adaptor to a Windows PC will cause the operating system to create a “virtual” serial (com) port, the ID of which will vary but can be found by doing the following:

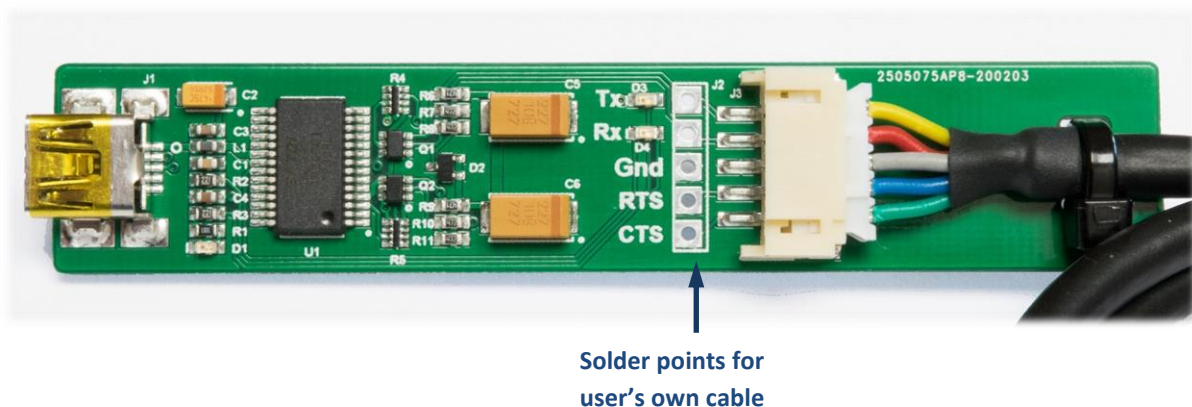
1. Go to **Settings -> Device Manager**
2. Click **Ports**
3. Find your Serial USB Adapter in the list

Open your preferred terminal application on the PC, select the com port, set it for the data speed to match that to be set up at the BBC, and set hardware handshaking to RTS/CTS.

If all settings are correct, the transmission speeds and hardware handshaking/flow control set at the BBC and the PC Terminal software match, you should now be able to communicate between the two machines.

### **Alternative installation**

This adapter can be mounted inside the BBC’s case. To make this easier, from revision 4 the cable is connected to the adapter with a small plug allowing it to be easily removed, and separate solder points to allow the user to solder his/her own wires to connect directly to the BBC’s circuit board. The labelling next to the solder points indicate the data direction at the adapter, so the pad marked “Tx” should be wired to the BBC’s “Rx” terminal, and so on.



## Troubleshooting

If after setting everything up you are not able to communicate between machines, there are a few things to check.

1. Is the red LED on the adaptor illuminated? If not, check the connection to the PC's USB port. Until that LED is lit the adaptor will not work.
2. Is the RS423 DIN plug at the BBC is the correct way round? The gap in the metal shroud of the plug should be uppermost.
3. Have the correct **\*FX** commands been issued and accepted? Try pressing <Break> and typing **\*FX3,7** [Return] and **\*FX2,1** [Return] again. Note that after you type **\*FX3,7** you will not see anything on the BBC's screen whilst you type **\*FX2,1** as that will be being sent to the RS423 port. Don't forget the [Return] keystrokes!
4. Having completed suggestion (3), the BBC will be at its default transmission speed of 9600 baud, so check that your PC Terminal software is also set to send and receive at 9600 baud.
5. Is the flow control (hardware handshaking) correct. There is nothing to set at the BBC end as it's done by default, but the Terminal software at the PC should be set to **RTS/CTS**. If it is, but still nothing is happening, try setting flow control to **none**. This will cause the software to ignore handshaking signals and send data regardless of whether the BBC is ready or not. Check the next step...
6. Is the PC Terminal program sending to the correct virtual serial port? With the terminal software set for no flow control (as in step (5)), sending keystrokes through the terminal software should cause the "Rx" LED of the adaptor to flash. If it doesn't it's likely that the terminal software is not "talking" to the correct port.
7. If you still cannot get things working, please feel free to contact me via my website or directly at: [colin@circuitsurgery.co.uk](mailto:colin@circuitsurgery.co.uk)

