Electroknit Technical Information

From Antitronics

Contents

Brother Electroknit KH-930E Technical information

Disk Drive/Computer Connection Notes

The external floppy drive for this machine was the same as a Tandy PDD1 (Portable Disk Drive 1). This drive is connected using a serial port. There is documentation on the internet about how to connect these drives to computers, but the connector pinout on the knitting machine is different than the drive, and I didn't find that documentation to be helpful.

I was able to figure out the connector pinout by examining the knitting machine PCB.

Knitting Machine/Computer Connection Notes

The knitting machine drive connection uses CMOS voltage levels, not RS-232.

Here is the pinout of the drive connector on the knitting machine:

The pin numbering is shown as they are labeled on the knitting machine PCB, and does not agree with other documents I found on the web.

Connector Pinout			
Pin	**Signal**	**I/O**	**Notes**
1	Ground		
2		Out	Tied to 5, Pulled up through 1K resistor
3	CTS?	In	(Tie to pin 2)
4	No Connection		
5		Out	Tied to 2, Pulled up through 1K resistor
6	RXD	In	
7	TXD	Out	
8	RTS?	Out	Follows state of Pin 3 (buffered)

I have pulled pin 3 high, and am not using flow control in my software. I have not had problems with data loss while sending to the knitting machine, and the machine I am using is fast enough to always keep up with data received from the knitting machine. The data rate is 9600 bps, and the largest amount of data sent at once is 1024 bytes.

Here is the cable I am using to connect the knitter with a USB 9 pin serial port:

Cable connections	
Knitter	**9 pin connector**
1	5
2 tie to 3	
6	3
7	2

The knitting machine uses 5V Logic level signals on the serial port. I have successfully used a FTDI USB to 5V serial adapter cable to communicate with the knitting machine. I had to invert the TXD and RXD signals, but it's possible to reprogram the serial adapter to invert those signals.

The adapter I used is the FTDI TTL-232R-5V, which is available from Mouser electronics here: FTDI Adapter (http://www.mouser.com/Search /ProductDetail.aspx?qs=sGAEpiMZZMt4a%252bVKO2jOrfSrr7sUIV2jkj0OYybDD%2fA%3d) . The FTDI MProg utility to reprogram the adapter can be found here (http://www.ftdichip.com/Resources /Utilities.htm) .

MProg only runs under windows.

Software Interface Information

There are a number of documents on the web about the Tandy PDD1 and the serial API for it, Most of them are incomplete. The knitter places the drive into a mode called "FDC emulation Mode", which allows access to raw sectors. This document is the most complete documentation I was able to find:

- Media:Tandy-Disk-Reference.pdf

External Disk Drive Emulator

I have written software that emulates the external disk. It runs under Linux and keeps the data as files on the linux file system. This allows knitting designs to be saved and restored using the emulation computer. I am using these files to reverse-engineer the knitting machine file format.

The emulator is written in Python, and released under the GPL. It has only been tested under Ubuntu Linux 9.04 (Jaunty).

The source code is here (http://www.antitronics.com/source/)

Software for manipulating Brother data files

I have begun a python class which will provide an API to the brother data files. The source code is here (http://www.antitronics.com/source/)

Knitting Machine File Format

A lot of the file format is now understood. It is documented here: BrotherFileFormat

Work on this continues.

This work was greatly helped by prior work performed by John R. Hogerhuis and posted on the kminternals yahoo group.

Related Links and Documents

Your mileage may vary.

- Media:Portable_Disk_Drive_Operation_Manual.pdf

BL5 Brotherlink 5 serial or USB cable Brotherlink information (http://www.softbyte.co.uk/brothl.htm)

Yahoo group dedicated to hacking brother machines (http://groups.yahoo.com/group/kminternals/)

Brother Liberation Front (http://www.k2g2.org/wiki:blf) is working on open source interfaces

Info and protocols (http://www.k2g2.org/wiki:brother_fb-100) for the FB-100 interface

KE-100 motor drive (not sure that this is the right model drive for the KH-930E)

Nice youtube video about how the motor drive works (http://www.youtube.com /watch?v=cuiudDNqdvwn)

Various units for sale (http://www.newtons.com/brother_knitking.htm)