H19 Virtual Terminals
H19serial.jar H19telnet.jar
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Introduction

These terminal emulators provide a virtual H19 terminal to applications running over a serial link or a telnet connection. Copy and paste are supported in a limited fashion.

The H19serial.jar JAVA program requires an external add-on package to support manipulation of serial ports. The package jSerialComm is required. See https://fazecast.github.io/jSerialComm/. See scripts for example syntax to run.

Keyboard Emulation

In general, a modern "PC" keyboard will map logically to the H19 functions. The following special cases are worth pointing out:

H19 Key	Modern Keyboard
RETURN	Enter
LINE FEED	Ctrl Enter
f1-f5	F1-F5
BLUE	F6
RED	F7
WHITE	F8

SHIFT RESET	Shift F9
<cursor>	<cursor>
DC	Delete
DL	Shift Delete
IC	Insert
IL	Shift Insert
DELETE	Shift Backspace
HOME	Home
SCROLL	Scroll Lock

In addition, the modern keyboard numeric keypad mimics the H19 keypad special functions by location (keys 1-9) based on current modes. Shift may be applied as expected.

Terminal emulation

Most functions of the H19 are emulated, including ANSI mode. However, some are not. Changing baud rate, disabling keyboard, and setting keyboard click are ignored but otherwise accepted. Note, it has not been possible to get a decent keyboard click behavior out of JAVA.

H19 Configuration

The server is configured using a "configuration file", which is plan text formatted as "property = value" lines. The configuration file to be used may be specified on the commandline as a file/path. The environment variable **V19_CONFIG** may also specify the configuration file. If nothing is specified, the server will look in the current directory for "**v19rc**" and then the user's home directory for "**.v19rc**". Comments in the file start with '#' as the first non-space character of the line. Property values may use backslash ('\') to extend long values to the following line.

Many properties may be specified on the commandline, using a "parameter=value" format (no spaces around '='). The parameter names are the property names with the "h19_" prefix removed.

The following properties are recognized:

h19_log = *log-file*
> Copies all terminal output to *log-file.*

h19_s401 = *binary-byte*
> Specifies the settings for dipswitch S401. See the H19 documentation for meanings. Note that bit 0 (LSB) of this value corresponds to switch "0". Since these switches deal with the real H19 UART, they are currently ignored. Default is 10001100.

h19_s402 = *binary-byte*

    Specifies the settings for dipswitch S401. See the H19 documentation for meanings. Note that bit 0 (LSB) of this value corresponds to switch "0". Default is 00000110.

h19_font = *ttf-font*

    The name of the (TrueType) font file to use for the H19 CRT screen. Default is "h19a.ttf" which is built-in to the JAR. Note that most TrueType fonts are not suitable for use as terminal fonts.

h19_font_size = *pixel-height*

    Specifies the size of the font on the screen. For the default font, only multiples of 10 look decent. Default is 20.

h19_font_color = *color-spec*

    The color to use for the display text. Format is 6 hexadecimal digits where each pair (octet) represents, respectively from hi to low, red, green, and blue. Default is "00ff00" which is the green. An amber color is "ffc000" and white would be "ffffff".

h19_cursor_color = *color-spec*

    Selects the color to use for the cursor. This can be used to help losing the cursor, especially when it is not blinking.

h19_beep = *wav-file*

    Selects the WAV file to use for the terminal beep sound. The default is the built-in "h19beep.wav" which is the 1/2-second, 1024Hz, beep. Other built-in files allow for different durations, "h19beep250.wav" and "h19beep125.wav", for 1/4 and 1/8 second respectively. Sound file must exist in the JAR file.
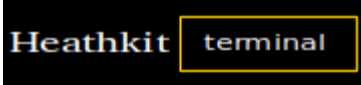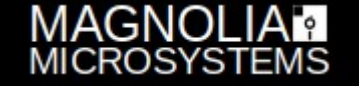
h19_beep_volume = *percent*

    The volume to set when sounding the H19 "beep". Values are percent of maximum volume.

h19_paste_rate = *cps*
h19_paste_cr_wait = *msec*

    Throttles the pasting of text into the terminal window. *Cps* is paste rate in characters per second. *Msec* is for milliseconds delay after RETURN.

h19_nameplate = *png*

    The image to use for the nameplate on the front of the H19. Default is "np-h19.png". The following are included in the jar:

np-h19.png	
np-h19-2.png	
np-heath1.png	
np-heath2.png	
np-zenith1.png	
np-zenith2.png	
np-mms.png	

Serial Properties

h19_tty = *tty-dev*

> The tty device to use for the connection. For example, "/dev/ttyUSB0" or "COM3:".

h19_baud = *baud*

> The baud to use for the connection. For example, "9600".

Telnet Properties

h19_host = *host-or-ip*

> Specifies the host network address of the remote server or "telnet-serial" device.

h19_port = *port-number*

> Specifies the port number of the remote server.

Starting the H19

Typical setup will include creating a configuration file that specifies all the necessary parameters. Then invoke the JAR file while specifying the configuration file.

Because of the need for jSerialComm, the startup command for H19serial.jar is more complicated. See examples for more detail. Assuming a script named "h19s" (or "h19s.bat") has been created for the serial version, and "h19t" for the telnet version, the following commands show some example usage.

Connect terminal (on Windows) to COM3: at 9600 baud and keep a log of all output:

```
h19s com3: 9600 log=file
```

To connect to a "telnet-serial" device at IP address 192.168.0.15, and log all output to a file:

```
h19t 192.168.0.15 log=file
```

Linux Scripts

Serial

```
#!/bin/bash
# Linux example for starting H19serial.jar. May also work on MAC.
# Modify these paths to match locations on your system:
JAR1=/path/to/H19serial.jar
JAR2=/other/path/to/jSerialComm-2.9.3.jar

exec java -cp ${JAR1}:${JAR2} H19serial "${@}"
```

Telnet

```
#!/bin/bash
exec java -jar /path/to/H19telnet.jar "${@}"
```

Windows Scripts

Serial

```
REM modify "path_to" as appropriate for each jar.
set JAR1=C:\path_to\H19serial.jar
set JAR2=C:\path_to\jSerialComm-2.9.3.jar

java -cp %JAR1%;%JAR2% H19serial %*
```

Telnet

```
REM modify "path_to" as appropriate.
java -jar C:\path_to\H19telnet.jar %*
```