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# **Minitel**

Instructions on how to use a Minitel as a Linux terminal.

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## 1 Introduction

### 1.1 Contributing

**Found an error or have a suggestion?** Please open an issue on GitHub ([github.com/pojntfx/minitel](https://github.com/pojntfx/minitel)):



**Figure 1:** QR-Code to the source code on GitHub

### 1.2 License

This document and included source code is Free Culture/Free Software.



**Figure 2:** Badge of the AGPL-3.0 license

Minitel (c) 2021 Felicitas Pojtinger

SPDX-License-Identifier: AGPL-3.0

## 2 Compatible Minitels

Your Minitel needs to have a Funz or Fnct key and the DIN-5 port at the back side. This includes the following Minitels:

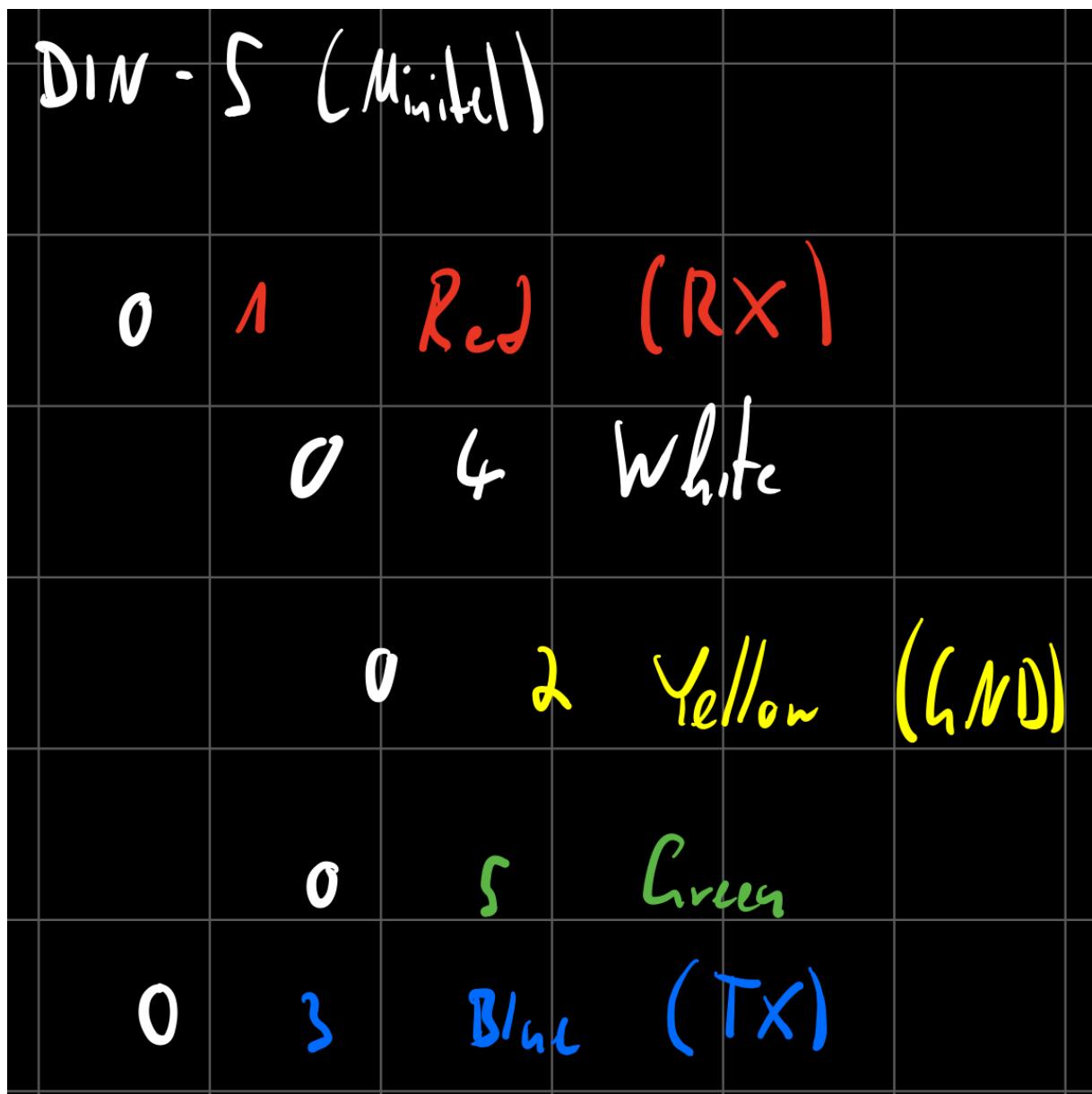
- Minitel 1B
- Minitel 2
- Alcatel ADF 258

## 3 Minitel DIN-5 to USB/RS232/Serial Adapter

To build the adapter to connect the Minitel to a PC, you need the following (cheap) components:

- 220 kΩ resistor
- 22 kΩ resistor
- 10 kΩ resistor
- 2N2222 transistor
- Male DIN-5 plug
- PL2303HX USB to UART TTL converter

You will need to check the pinout of the DIN-5 plug/cable; in my case, the following mapping is present:



**Figure 3:** DIN-5 port mapping

Connect like so:



**Figure 4:** Schematic and breadboard layout

In my case, the breadboard prototype ended up looking like this:



**Figure 5:** Breadboard prototype

I got this layout from [Pila's blog](#).

## 4 Minitel Shortcuts

Minitel terminals show the integrated phonebook by default; for them to be usable serial terminals, use the following shortcuts:

### French Minitel 1B/2:

1. Fnct + T A: Enables ASCII mode
2. Fnct + T E: Disables local echo
3. Fnct + P 4: Sets baud rate to 4800 Baud (the maximum)

More info can be found on [Pila's blog](#).

**Italian Minitel (Alcatel ADF 258):**

1. Funz + Mem: Switches to terminal mode
2. Funz + M A: Enables ASCII mode
3. Funz + M E: Disables local echo
4. Funz + B 4: Sets baud rate to 4800 Baud (the maximum)

More info can be found on [Retronomicon](#).

## 5 Testing the Adapter

First, plug the PL2303HX into a USB port on your PC, then run the following:

```
1 $ sudo stty -F /dev/ttyUSB0 4800 istrrip cs7 parenb -parodd brkint  
    ignpar icrnl ixon ixany opost onlcr cread hupcl isig icanon echo  
    echoe echok
```

This will initialize the terminal. Now, set up the Minitel using the shortcuts, and try to display something on it:

```
1 $ echo 'Hello, Minitel!_' | sudo tee /dev/ttyUSB0
```

If the \_ did not print correctly, run the following and try again:

```
1 $ echo 'ă' | sudo tee /dev/ttyUSB0 # Fixes # and _ etc.
```

You may use [Minicom](#) for further debugging: Start it using `sudo minicom -s -D /dev/ttyUSB0` and use 4800 Baud, 7 data bits, even parity bit, 1 stop bit and disable hardware flow control.

## 6 Setting up the Keymap

Alexandre Montaron has worked on improved support for the Minitel on Linux by providing a `terminfo` file; to get and use it, run the following:

```
1 $ curl -L -o /tmp/mntl.ti http://canal.chez.com/mntl.ti  
2 $ tic /tmp/mntl.ti -o /etc/terminfo
```

You can also find a mirror [on GitHub Gist](#).

## 7 Setting up agetty

Using [getty](#), or [agetty](#) in our case, it is possible to log into your PC using the Minitel. Exact setup instructions depend on your distribution, but for [Fedora 35](#) the following works; be sure to set up the Minitel using the shortcuts beforehand:

```
1 $ sudo tee /usr/lib/systemd/system/minitel-getty@.service <<'EOT'
2 # SPDX-License-Identifier: LGPL-2.1-or-later
3 #
4 # This file is part of systemd.
5 #
6 # systemd is free software; you can redistribute it and/or modify it
7 # under the terms of the GNU Lesser General Public License as
8 # published by
9 # the Free Software Foundation; either version 2.1 of the License, or
10 # (at your option) any later version.
11 [Unit]
12 Description=Serial Getty on %I
13 Documentation=man:agetty(8) man:systemd-getty-generator(8)
14 Documentation=http://0pointer.de/blog/projects/serial-console.html
15 BindsTo=dev-%i.device
16 After=dev-%i.device systemd-user-sessions.service plymouth-quit-wait.
    service getty-pre.target
17 After=rc-local.service
18
19 # If additional gettys are spawned during boot then we should make
20 # sure that this is synchronized before getty.target, even though
21 # getty.target didn't actually pull it in.
22 Before=getty.target
23 IgnoreOnIsolate=yes
24
25 # IgnoreOnIsolate causes issues with sulogin, if someone isolates
26 # rescue.target or starts rescue.service from multi-user.target or
27 # graphical.target.
28 Conflicts=rescue.service
29 Before=rescue.service
30
31 [Service]
32 # The '-o' option value tells agetty to replace 'login' arguments with
33 # an
34 # option to preserve environment (-p), followed by '--' for safety, and
35 # then
36 # the entered username.
37 ExecStart=/usr/bin/sh -c "chcon -t tty_device_t /dev/%I && sudo stty -F
    /dev/%I 4800 istrip cs7 parenb -parodd brkint ignpar icrnl ixon
    ixany opost onlcr cread hupcl isig icanon echo echoe echok && /sbin/
    agetty -o '-p -- \\u' -c %I 4800 m1b-x80 $TERM"
38 Type=idle
39 Restart=always
```

```
38 UtmpIdentifier=%I
39 TTYPath=/dev/%I
40 TTYReset=yes
41 TTYVHangup=yes
42 IgnoreSIGPIPE=no
43 SendSIGHUP=yes
44
45 [Install]
46 WantedBy=getty.target
47 EOT
48 $ sudo systemctl daemon-reload
49 $ sudo systemctl enable --now minitel-getty@ttyUSB0
```

You should now get a login prompt (Note the # where there should be a \_):



**Figure 6:** Minitel showing a login prompt

You can show the login prompt again at a later time using the following:

```
1 $ sudo systemctl restart minitel-getty@ttyUSB0
```

After logging in, you should get a fully-featured shell:



**Figure 7:** Minitel showing the shell

We'll fix the #/\_ characters next.

## 8 Setting up tmux

[tmux](#) makes using the Minitel much more enjoyable by providing support for panes and much more. You can use it by running:

```
1 $ tmux
```

It should look like this:



**Figure 8:** Minitel showing tmux

To get started, I recommend taking a look at the [Tmux cheatsheet](#).

To fix the #/\_ characters and enable easy resetting when turning the Minitel on/off, run the following:

```
1 $ echo "bind-key r run-shell \"echo \\'\'; reset; echo 'Terminal has been
      reset, press q to close'\\" >>~/.tmux.conf
```

This will add a new command, Ctrl + b r, which will reset the terminal and fix the character set:



**Figure 9:** Minitel showing tmux after entering Ctrl + b r



**Figure 10:** Minitel showing tmux with the working charset

This now allows running complex software, like Vim, Links, Lynx and cmus:



**Figure 11:** Minitel showing Vim



**Figure 12:** Minitel showing DuckDuckGo on [Links](#)



**Figure 13:** Minitel showing Hacker News on Links



**Figure 14:** Minitel showing this page on Links



**Figure 15:** Minitel showing DuckDuckGo on Lynx



**Figure 16:** Minitel showing cmus