

Linux USB Gadget Configs Interface

Android Debug Bridge with Serial

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| Introduction

- Imagine a scenario in which NUC980 board does not present neither **the network interface** nor **the USB host interface**. There is only a **USB device interface** on board by which the PC computer can communicate with it.
- By resort to **Android Debug Bridge** (ADB), use Linux USB gadget Function filesystem (FunctionFS) driver configured through configs to establish ADB connection, user can interact with board through ADB shell.

| Android Tools (Android Debug Bridge)

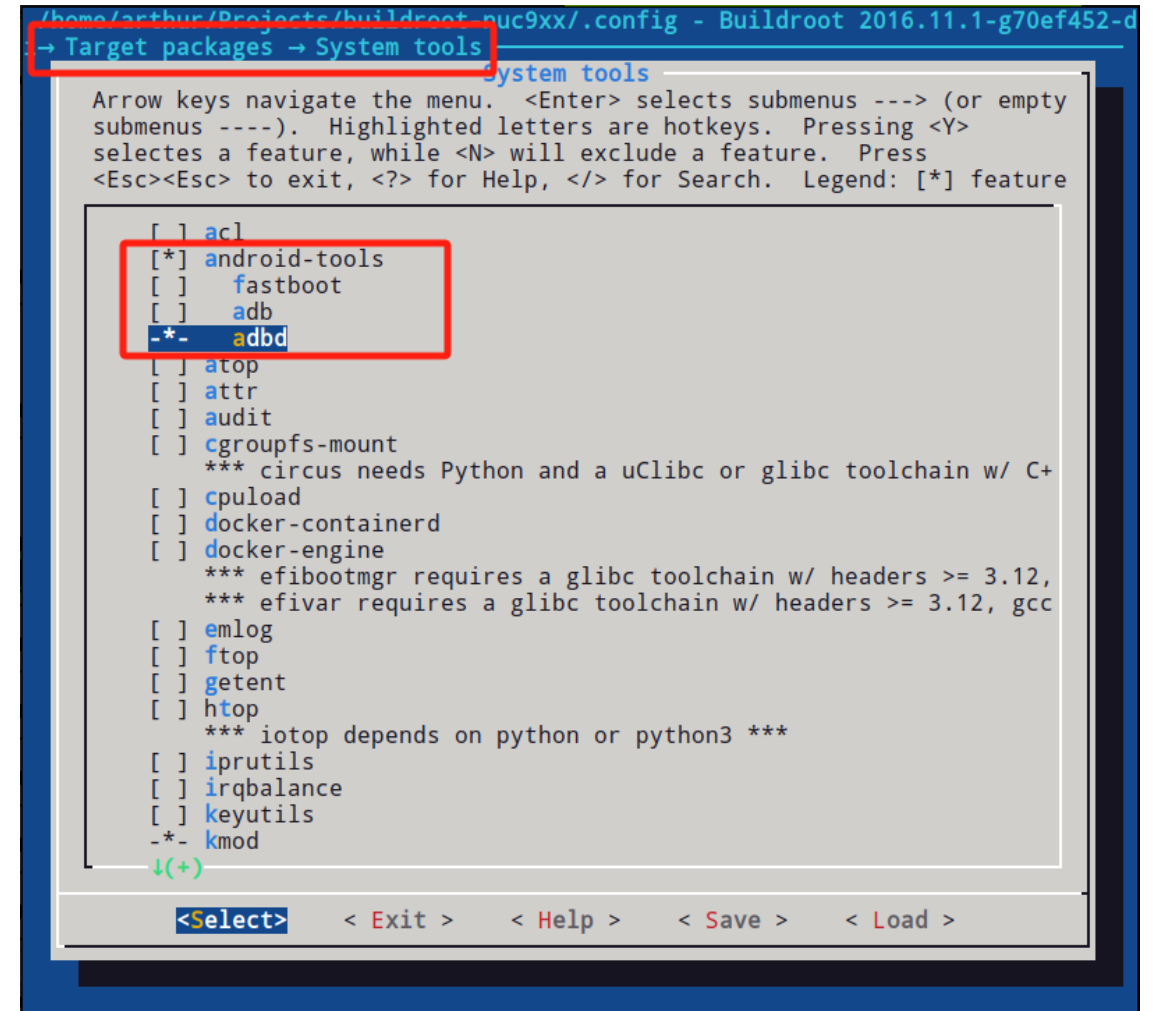
- Configure buildroot to select android tools (adbd)

\$ make menuconfig

→Target packages →System tools

[*] android-tools

-*- adbd



| Patching Android Tools

- Fetch the patches
 1. https://raw.githubusercontent.com/symfund/NUC970_Buildroot/master/package/android-tools/0008-fix-adbd-failed-to-startup.patch
 2. https://raw.githubusercontent.com/symfund/NUC970_Buildroot/master/package/android-tools/S99adb%2Bserial
 3. https://raw.githubusercontent.com/symfund/NUC970_Buildroot/master/package/android-tools/adbd
 4. https://raw.githubusercontent.com/symfund/NUC970_Buildroot/master/package/android-tools/android-tools.mk
- Put the new files *0008-fix-adbd-failed-to-startup.patch*, *S99adb+serial*, *adbd* into directory ***$\${BR2_DIR}$ /package/android-tools***
- Replace with the new file *android-tools.mk*
- Clean the build of package android-tools
\$ make android-tools-dirclean

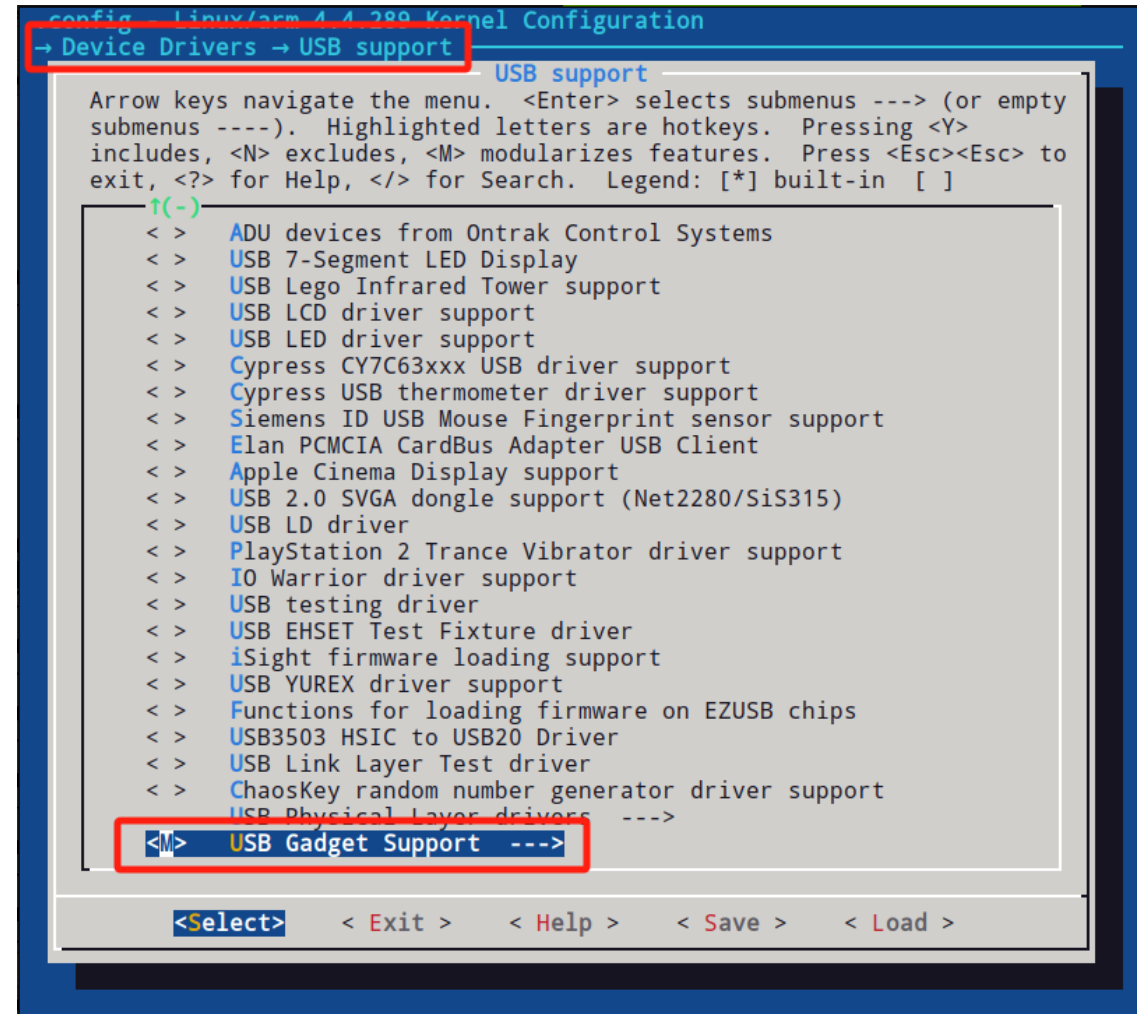
| Configuring Linux

- Configure Linux to enable USB Gadget Support

\$ make linux-menuconfig

→ Device Drivers → USB support

<M> USB Gadget Support (compiled as module)



| Configuring Linux

→ Device Drivers → USB support → USB Gadget Support

--- USB Gadget Support

USB Gadget Drivers

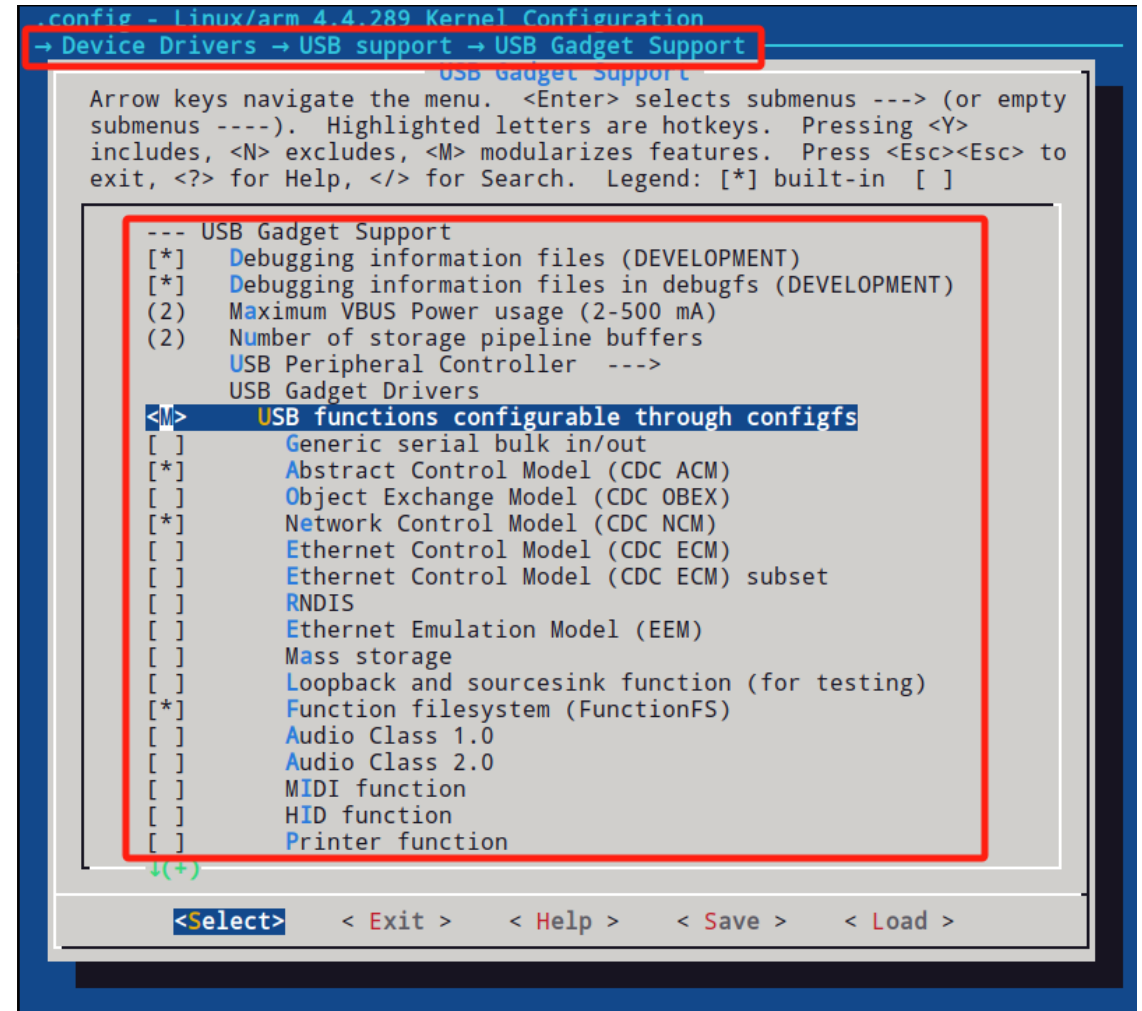
<M> USB function configurable through configs

[*] Abstract Control Model (CDC ACM)

[*] Network Control Model (CDC NCM)

[*] Function filesystem (FunctionFS)

<M> Function Filesystem



The screenshot shows the 'config - Linux/arm 4.4.289 Kernel Configuration' window. The navigation path 'Device Drivers → USB support → USB Gadget Support' is highlighted at the top. The main menu lists various USB gadget drivers, with 'USB functions configurable through configs' selected and highlighted in blue. A red rectangle encloses the entire list of options. At the bottom, navigation buttons like '<Select>', '<Exit>', '<Help>', '<Save>', and '<Load>' are visible.

```
config - Linux/arm 4.4.289 Kernel Configuration
→ Device Drivers → USB support → USB Gadget Support

--- USB Gadget Support
Arrow keys navigate the menu. <Enter> selects submenus ---> (or empty
submenus ----). Highlighted letters are hotkeys. Pressing <Y>
includes, <N> excludes, <M> modularizes features. Press <Esc><Esc> to
exit, <?> for Help, </> for Search. Legend: [*] built-in [ ]

--- USB Gadget Support
[*] Debugging information files (DEVELOPMENT)
[*] Debugging information files in debugfs (DEVELOPMENT)
(2) Maximum VBUS Power usage (2-500 mA)
(2) Number of storage pipeline buffers
    USB Peripheral Controller --->
    USB Gadget Drivers
    <M> USB functions configurable through configs
    [ ] Generic serial bulk in/out
    [*] Abstract Control Model (CDC ACM)
    [ ] Object Exchange Model (CDC OBEX)
    [*] Network Control Model (CDC NCM)
    [ ] Ethernet Control Model (CDC ECM)
    [ ] Ethernet Control Model (CDC ECM) subset
    [ ] RNDIS
    [ ] Ethernet Emulation Model (EEM)
    [ ] Mass storage
    [ ] Loopback and sourcesink function (for testing)
    [*] Function filesystem (FunctionFS)
    [ ] Audio Class 1.0
    [ ] Audio Class 2.0
    [ ] MIDI function
    [ ] HID function
    [ ] Printer function

<Select> <Exit> <Help> <Save> <Load>
```

| Android Platform Tools (adb)

- Download SDK Platform-Tools for Windows/Linux/Mac

<https://developer.android.com/tools/releases/platform-tools>

- Repeat reconnect to make board online

\$./adb.exe reconnect

```
symfu@DESKTOP-OT9ITVM MSYS /d/Products/NUC980/USB Gadget Serial Driver/adb/platform-tools
$ ./adb.exe reconnect
no devices/emulators found

symfu@DESKTOP-OT9ITVM MSYS /d/Products/NUC980/USB Gadget Serial Driver/adb/platform-tools
$ ./adb.exe reconnect
reconnecting nuvoton-usb-dev [device]
```

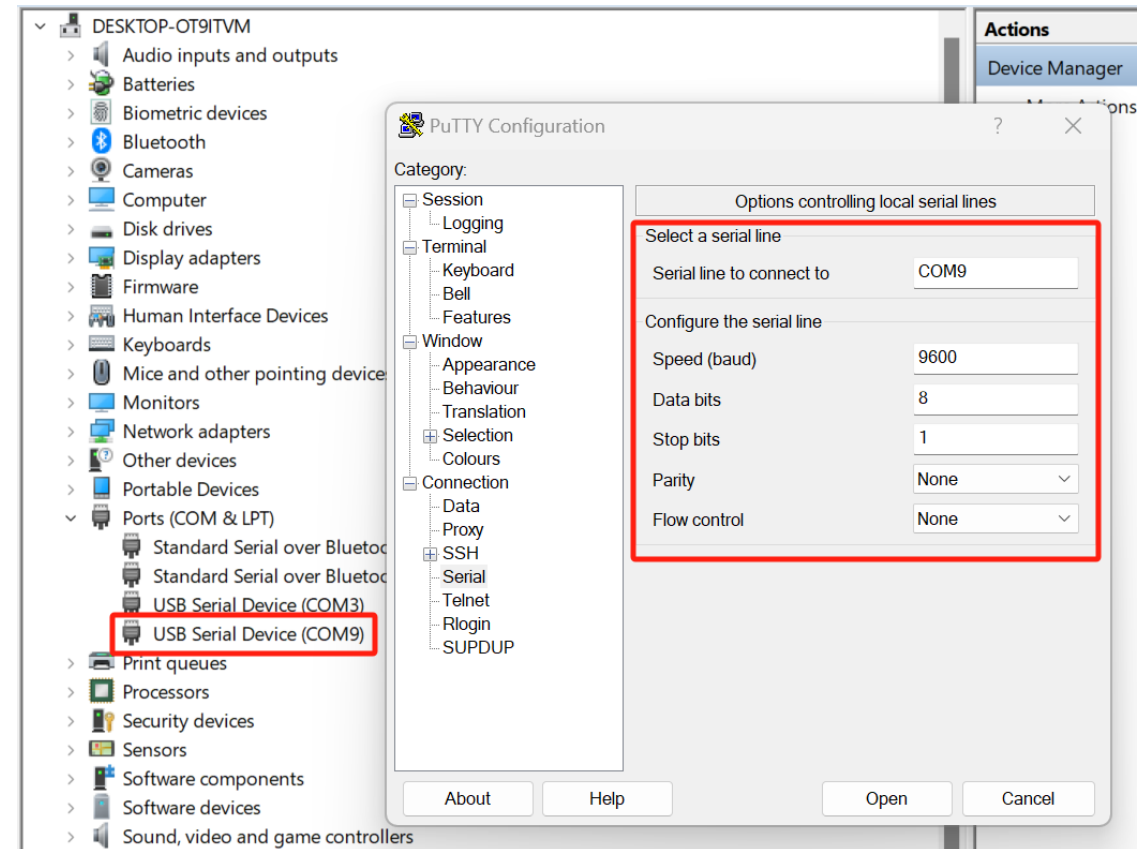
- Use shell to interact with target through command line console

```
symfu@DESKTOP-OT9ITVM MSYS /d/Products/NUC980/USB Gadget Serial Driver/adb/platform-tools
$ ./adb.exe shell
/sys/kernel/config/usb_gadget/demo # echo "hello" > /dev/ttyGS0
```

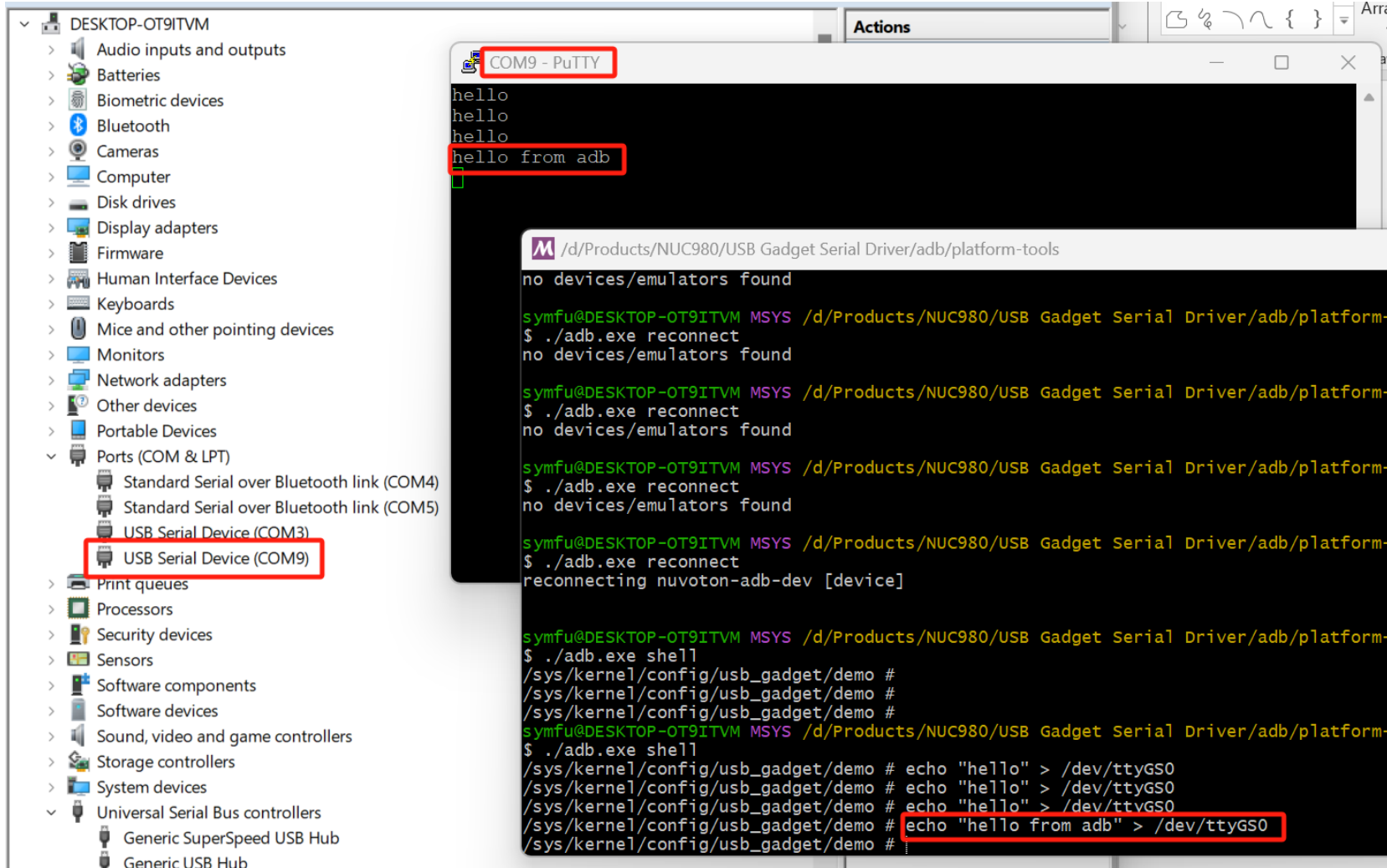

| Configuring Serial Device in PuTTY

- PuTTY Configuration

COM port:	COM9
Baud rate:	9600
Data bits:	8
Stop bits:	1
Parity:	None
Flow control:	None



| Testing ADB with Serial on Windows



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谢谢

謝謝

Děkuji

Bedankt

Thank you

Kiitos

Merci

Danke

Grazie

ありがとう

감사합니다

Dziękujemy

Obrigado

Спасибо

Gracias

Teşekkür ederim

Cảm ơn