



ExP2 Fintek Series

mPCIe/M.2 to Serial COM

User Manual

Rev 1.0

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Revision History

Revision	Date	Description
1.0	2023/03/28	Initial Release

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Overview

This manual describes how to implement ExP2 Fintek series mPCIe/M.2 to Serial COM cards of the following products.

Product No.	RS232	RS485	RS422	Switch Method
EMP2-X206	O	O	O	Software
EMP2-X406	O	O	O	Software
EMP2-X207	O	X	X	Fixed Mode
EMP2-X407	O	X	X	Fixed Mode
EGP2-X203	O	X	X	Fixed Mode
EGP2-X403	O	X	X	Fixed Mode
EGP2-X204	O	O	O	Software
EGP2-X404	O	O	O	Software

1. Windows

1.1. Install Driver

This section is applicable to ALL products. Double click the driver package to start. Need reboot after installing the driver.

FPCIECOM_20221205.00_WHQL

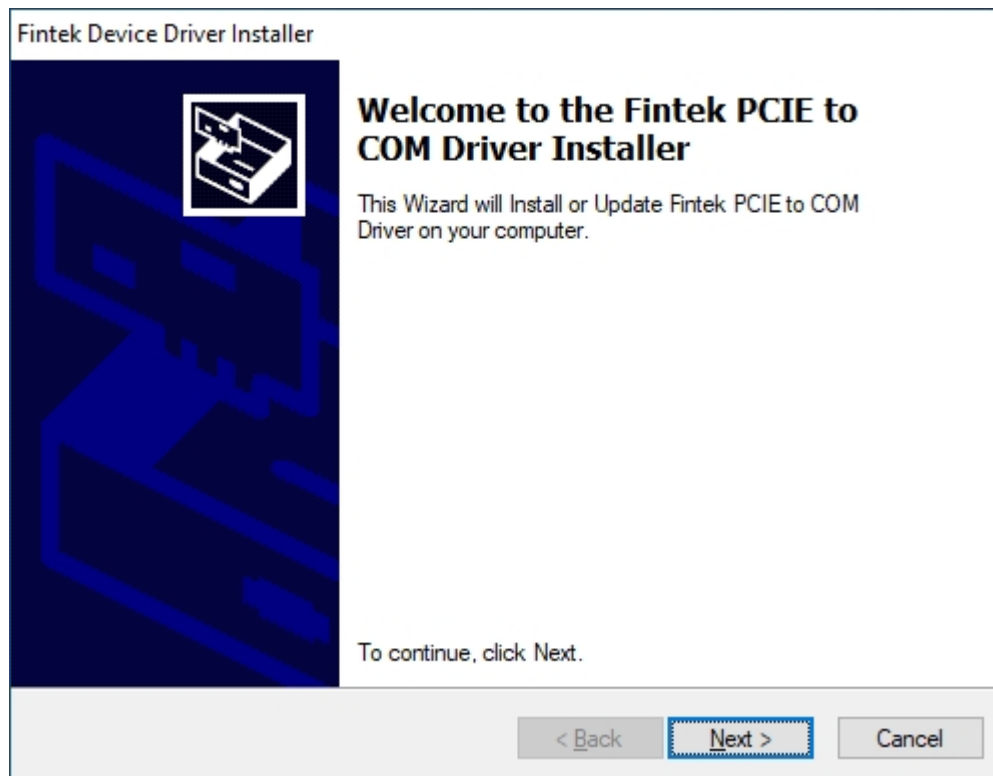
Name

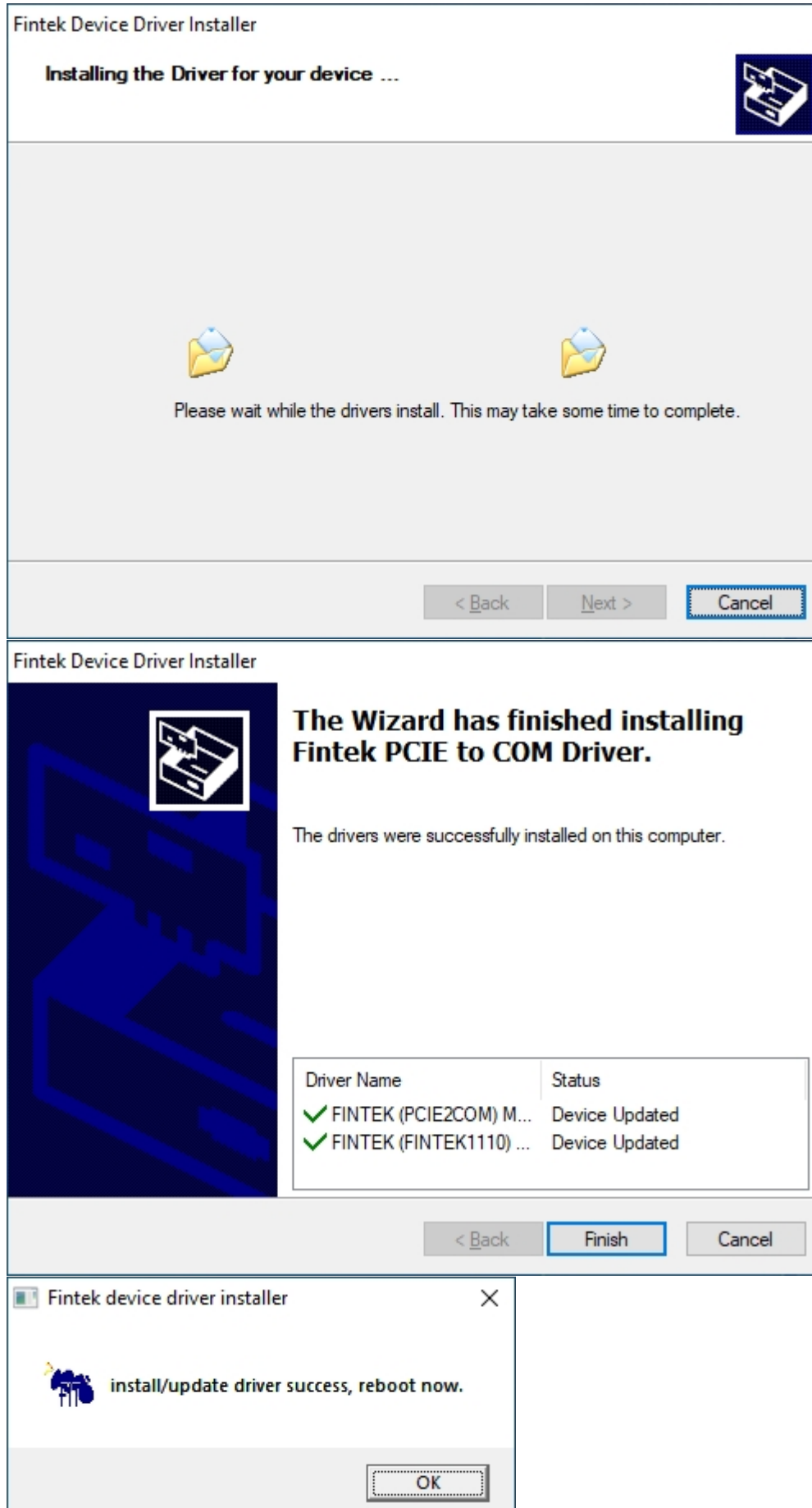
X64

X86

FPCIE2COM.cfg

Setup





1.2. Fix mode module

Can use directly after installing driver.

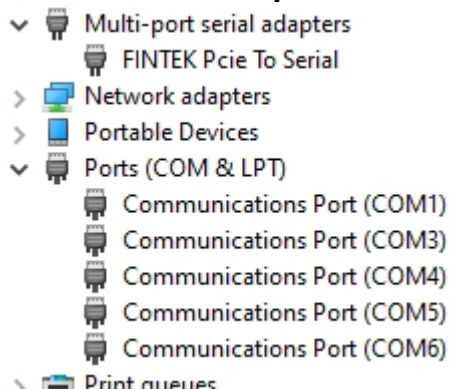
Product No.	RS232	RS485	RS422	Switch Method
EMP2-X207	O	X	X	Fixed Mode
EMP2-X407	O	X	X	Fixed Mode
EGP2-X203	O	X	X	Fixed Mode
EGP2-X403	O	X	X	Fixed Mode

1.3. Switch Mode Module by Software

This section is applicable to following products.


Product No.	RS232	RS485	RS422	Switch Method
EMP2-X206	O	O	O	Software
EMP2-X406	O	O	O	Software
EGP2-X204	O	O	O	Software
EGP2-X404	O	O	O	Software

In Device Manager, right click the mouse to enter “properties” in **“Communications ports”**.



Communications Port (COM3) Properties

General
Advance Setting
Driver
Details
Events
Resources

 Communications Port (COM3)

Communications Parameters

Bits per second: 115200

Data bits: 8

Parity: none

Stop bits: 1

Flow control: none

Restore Defaults


COM Port Mode: 232

COM Port Num: 232

OK
Cancel

Communications Port (COM3) Properties

General
Advance Setting
Driver
Details
Events
Resources

 Communications Port (COM3)

Communications Parameters

Bits per second: 115200

Data bits: 8

Parity: none

Stop bits: 1

Flow control: none

Restore Defaults


COM Port Mode: 485
☒ Enable Termination

COM Port Num: COM3(Using)

OK
Cancel

Communications Port (COM3) Properties

General Advance Setting Driver Details Events Resources

 Communications Port (COM3)

Communications Parameters

Bits per second: 115200

Data bits: 8

Parity: none

Stop bits: 1

Flow control: none

Restore Defaults

COM Port Mode: 422 ☒ Enable Termination

COM Port Num: COM3(Using)

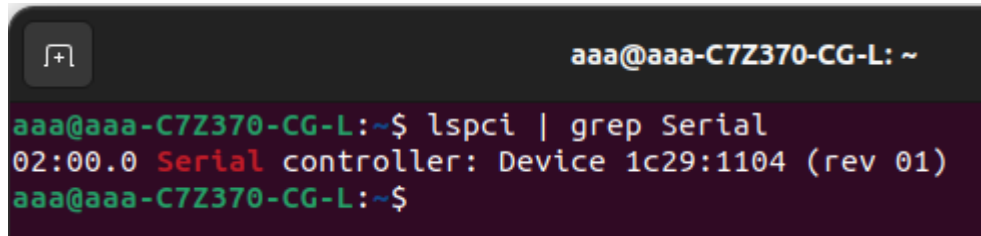
OK Cancel

2. Linux

Here we use Ubuntu 22.04 for example.

2.1. lspci

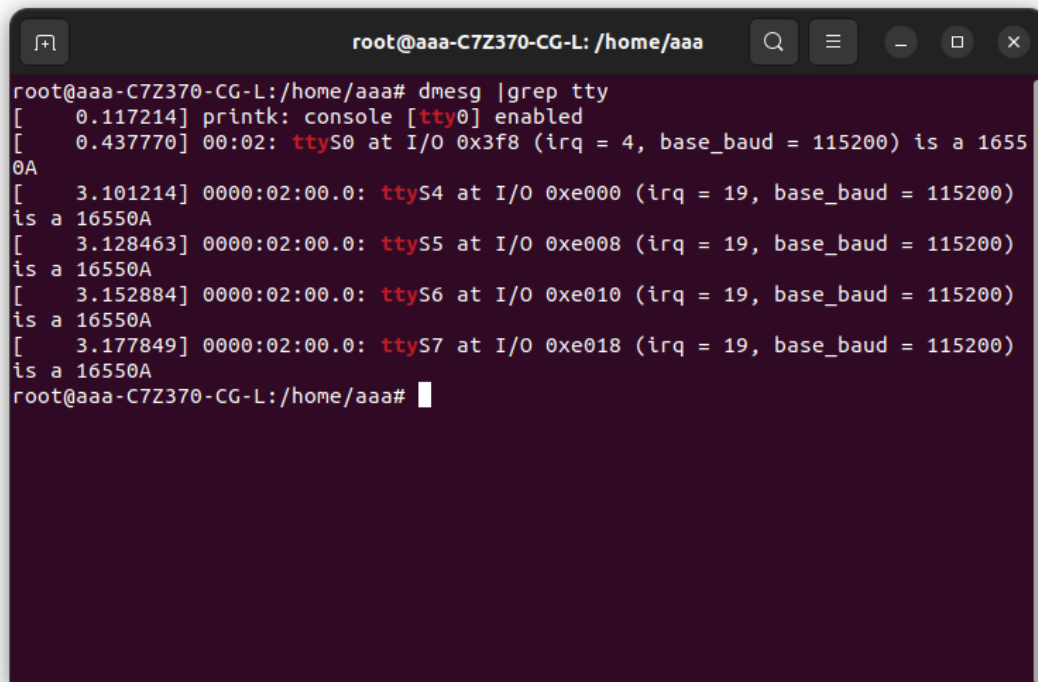
Check if the device exists in the system.



```
aaa@aaa-C7Z370-CG-L: ~  
aaa@aaa-C7Z370-CG-L:~$ lspci | grep Serial  
02:00.0 Serial controller: Device 1c29:1104 (rev 01)  
aaa@aaa-C7Z370-CG-L:~$
```

2.2. dmesg |grep tty

Shows how many Fintek serial ports are in the system, in this case ttyS4 to ttyS7.



```
root@aaa-C7Z370-CG-L: /home/aaa  
root@aaa-C7Z370-CG-L:/home/aaa# dmesg |grep tty  
[ 0.117214] printk: console [tty0] enabled  
[ 0.437770] 00:02: ttyS0 at I/O 0x3f8 (irq = 4, base_baud = 115200) is a 16550A  
[ 3.101214] 0000:02:00.0: ttyS4 at I/O 0xe000 (irq = 19, base_baud = 115200) is a 16550A  
[ 3.128463] 0000:02:00.0: ttyS5 at I/O 0xe008 (irq = 19, base_baud = 115200) is a 16550A  
[ 3.152884] 0000:02:00.0: ttyS6 at I/O 0xe010 (irq = 19, base_baud = 115200) is a 16550A  
[ 3.177849] 0000:02:00.0: ttyS7 at I/O 0xe018 (irq = 19, base_baud = 115200) is a 16550A  
root@aaa-C7Z370-CG-L:/home/aaa#
```

2.3. Install Driver

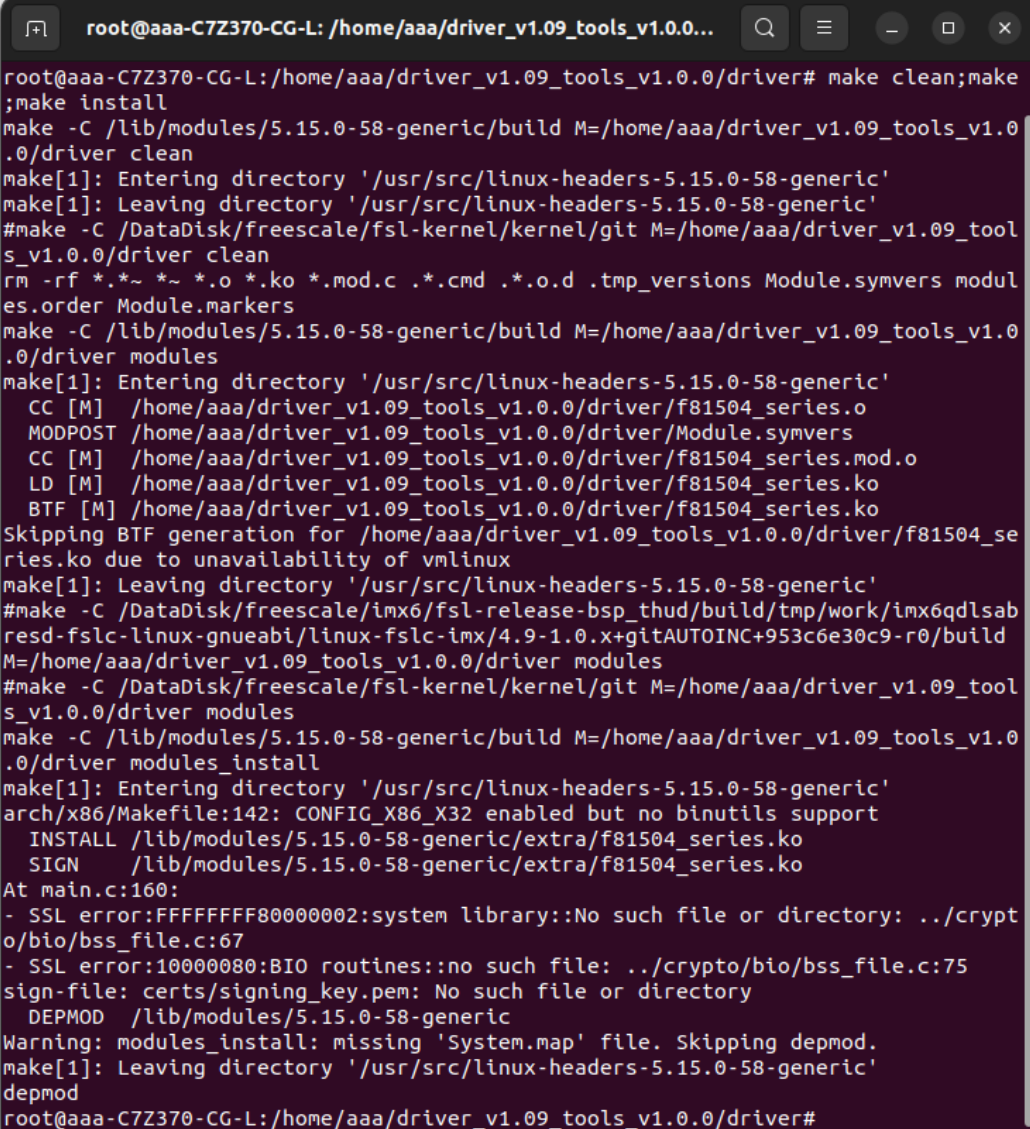
This section is applicable to ALL products.

Step1. Go to driver folder.

Step2. Type command `#make`.

Step3. Type command `#make install`

Step4. Type command `#reboot`



```
root@aaa-C7Z370-CG-L: /home/aaa/driver_v1.09_tools_v1.0.0/driver# make clean;make
;make install
make -C /lib/modules/5.15.0-58-generic/build M=/home/aaa/driver_v1.09_tools_v1.0
.0/driver clean
make[1]: Entering directory '/usr/src/linux-headers-5.15.0-58-generic'
make[1]: Leaving directory '/usr/src/linux-headers-5.15.0-58-generic'
#make -C /DataDisk/freescale/fsl-kernel/kernel/git M=/home/aaa/driver_v1.09_tool
s_v1.0.0/driver clean
rm -rf *.~ *.o *.ko *.mod.c *.cmd *.o.d .tmp_versions Module.symvers modul
es.order Module.markers
make -C /lib/modules/5.15.0-58-generic/build M=/home/aaa/driver_v1.09_tools_v1.0
.0/driver modules
make[1]: Entering directory '/usr/src/linux-headers-5.15.0-58-generic'
CC [M] /home/aaa/driver_v1.09_tools_v1.0.0/driver/f81504_series.o
MODPOST /home/aaa/driver_v1.09_tools_v1.0.0/driver/Module.symvers
CC [M] /home/aaa/driver_v1.09_tools_v1.0.0/driver/f81504_series.mod.o
LD [M] /home/aaa/driver_v1.09_tools_v1.0.0/driver/f81504_series.ko
BTF [M] /home/aaa/driver_v1.09_tools_v1.0.0/driver/f81504_series.ko
Skipping BTF generation for /home/aaa/driver_v1.09_tools_v1.0.0/driver/f81504_se
ries.ko due to unavailability of vmlinux
make[1]: Leaving directory '/usr/src/linux-headers-5.15.0-58-generic'
#make -C /DataDisk/freescale/imx6/fsl-release-bsp_thud/build/tmp/work/imx6qdlSab
resd-fslc-linux-gnueabi/linux-fslc-imx/4.9-1.0.x+gitAUTOINC+953c6e30c9-r0/build
M=/home/aaa/driver_v1.09_tools_v1.0.0/driver modules
#make -C /DataDisk/freescale/fsl-kernel/kernel/git M=/home/aaa/driver_v1.09_tool
s_v1.0.0/driver modules
make -C /lib/modules/5.15.0-58-generic/build M=/home/aaa/driver_v1.09_tools_v1.0
.0/driver modules_install
make[1]: Entering directory '/usr/src/linux-headers-5.15.0-58-generic'
arch/x86/Makefile:142: CONFIG_X86_X32 enabled but no binutils support
INSTALL /lib/modules/5.15.0-58-generic/extra/f81504_series.ko
SIGN /lib/modules/5.15.0-58-generic/extra/f81504_series.ko
At main.c:160:
- SSL error:FFFFFFFF80000002:system library::No such file or directory: ../crypt
o/bio/bss_file.c:67
- SSL error:10000080:BIO routines::no such file: ../crypto/bio/bss_file.c:75
sign-file: certs/signing_key.pem: No such file or directory
DEPMOD /lib/modules/5.15.0-58-generic
Warning: modules_install: missing 'System.map' file. Skipping depmod.
make[1]: Leaving directory '/usr/src/linux-headers-5.15.0-58-generic'
depmod
root@aaa-C7Z370-CG-L: /home/aaa/driver_v1.09_tools_v1.0.0/driver#
```

2.4. Install Mode-Control Tool “serial_f81504_tool”

This section is applicable to following products.

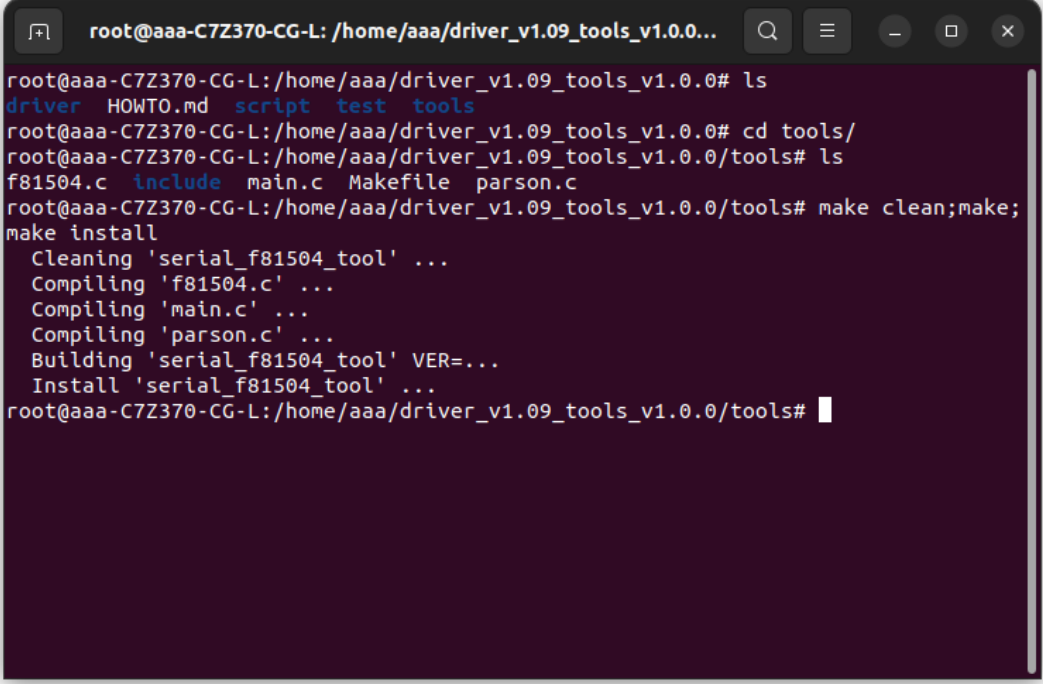
Product No.	RS232	RS485	RS422	Switch Method
EMP2-X206	O	O	O	Software
EMP2-X406	O	O	O	Software
EGP2-X204	O	O	O	Software
EGP2-X404	O	O	O	Software

Step1. Go to tools folder.

Step2. Type command “#make”.

Step3. Type command “#make install”

Step4. Type command “#reboot”



```

root@aaa-C7Z370-CG-L: /home/aaa/driver_v1.09_tools_v1.0.0...
root@aaa-C7Z370-CG-L:/home/aaa/driver_v1.09_tools_v1.0.0# ls
driver HOWTO.md script test tools
root@aaa-C7Z370-CG-L:/home/aaa/driver_v1.09_tools_v1.0.0# cd tools/
root@aaa-C7Z370-CG-L:/home/aaa/driver_v1.09_tools_v1.0.0/tools# ls
f81504.c include main.c Makefile parson.c
root@aaa-C7Z370-CG-L:/home/aaa/driver_v1.09_tools_v1.0.0/tools# make clean;make;
make install
Cleaning 'serial_f81504_tool' ...
Compiling 'f81504.c' ...
Compiling 'main.c' ...
Compiling 'parson.c' ...
Building 'serial_f81504_tool' VER=...
Install 'serial_f81504_tool' ...
root@aaa-C7Z370-CG-L:/home/aaa/driver_v1.09_tools_v1.0.0/tools#

```

2.5. serial_f81504_tool README

```

root@aaa-C7Z370-CG-L: /home/aaa
root@aaa-C7Z370-CG-L:/home/aaa# serial_f81504_tool
version: v1.0.0
Syntax: serial_f81504_tool [-option ...]
Option:
-h : Show usage
-c : Target of config path (default: /etc/serial_f81504.cfg)
-t : tty port (ex: ttyS4)
-m : tty mode (ex: RS422 or 0)
    Mode table (M0/M1/M2):
        0: 000 - RS422
        1: 001 - RS232
        2: 010 - RS485
        4: 100 - RS422R (with termination)
        6: 110 - RS485R (with termination)
-w : Without save config
-i : Initialize device by config
-l : Display all tty port and exit
-r : Reset config to default
-o : show option for debug
Sample:
Change tty's mode:
    serial_f81504_tool -t ttyS4 -m RS422
Change tty's mode without save config:
    serial_f81504_tool -t ttyS4 -m RS422 -w
Initialize device by config (default: /etc/serial_f81504.cfg):
    serial_f81504_tool -i
Initialize device by target config
    serial_f81504_tool -i -c ./init.cfg
Display all tty port:
    serial_f81504_tool -l
Reset config to default:
    serial_f81504_tool -r
root@aaa-C7Z370-CG-L:/home/aaa#

```

2.6. Fix mode module

Can use directly after installing driver.

Product No.	RS232	RS485	RS422	Switch Method
EMP2-X207	O	X	X	Fixed Mode
EMP2-X407	O	X	X	Fixed Mode
EGP2-X203	O	X	X	Fixed Mode
EGP2-X403	O	X	X	Fixed Mode

2.7. Switch Mode by Software

This section is applicable to following products.

Product No.	RS232	RS485	RS422	Switch Method
EMP2-X206	O	O	O	Software
EMP2-X406	O	O	O	Software
EGP2-X204	O	O	O	Software
EGP2-X404	O	O	O	Software

After installing driver and control tools, you can simply execute below command to initial the COM ports.

Notice, all serial_f81504_tool control tools need to be executed as root.

- **COMMAND: serial_f81504_tool -i**
The serial_f81504_tool -i will help you check if the driver has been loaded on the system and setup all ports following the configuration file (/etc/serial_f81504.cfg). If the configuration file did not exist, it will create a default one for you, all ports will be configured as RS232 mode by default.

Notice that, the serial_f81504_tool -i must be executed after system boot up every time to make sure the driver loaded well and all ports be configured as you want.

- **COMMAND: serial_f81504_tool -t <port> -m <mode>**
The <port> specify which port you want to configure, And the <mode> specify the target mode, Mode table (M0/M1/M2):
 0: 000 - **RS422**
 1: 001 - **RS232**
 2: 010 - **RS485**
 4: 100 - **RS422R** (with termination)
 6: 110 - **RS485R** (with termination)

```
root@aaa-C7Z370-CG-L: /home/aaa
root@aaa-C7Z370-CG-L:/home/aaa# serial_f81504_tool -t ttyS4 -m RS485
version: v1.0.0
ttyS4 already set mode to RS485 !!
root@aaa-C7Z370-CG-L:/home/aaa# serial_f81504_tool -t ttyS5 -m RS485
version: v1.0.0
ttyS5 already set mode to RS485 !!
root@aaa-C7Z370-CG-L:/home/aaa#
```

- COMMAND: serial_f81504_tool -l
You can check currently setting

```
root@aaa-C7Z370-CG-L: /home/aaa
root@aaa-C7Z370-CG-L:/home/aaa# serial_f81504_tool -i
version: v1.0.0
ttyS4 already set mode to RS485 !!
ttyS5 already set mode to RS485 !!
root@aaa-C7Z370-CG-L:/home/aaa# serial_f81504_tool -l
version: v1.0.0
Address      Name      Transceiver  Mode
E000         ttyS4     F81439       RS485
E008         ttyS5     F81439       RS485
E010         ttyS6     F81439       RS232
E018         ttyS7     F81439       RS232
root@aaa-C7Z370-CG-L:/home/aaa#
```

- COMMAND: serial_f81504_tool -r (need reboot system after setting)
Reset all port to default mode RS232.

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