

ls2k3000-ai-boot-run 部署说明文档

1. 前置动作

本章没交代的场景，默认不需要执行前置动作。

1.1. 对于 Loongnix 20.6 系统

正常安装完毕之后，可能普通用户用不了 `sudo`，因为没给予权限。

下面这个示例命令，如果能够正常执行，代表有 `sudo` 权限，本节无需再阅读。

```
sudo echo hello
```

当然，如果不想给 `sudo` 权限，那么下面部署 `ls2k3000-ai-boot-run.tar.gz` 时，先进入 `root` 用户即可。

1.1.1. 切换到 root 用户

系统安装过程中，需要填入管理员密码，那个就是 `root` 密码。

```
su root
```

之后输入密码，即可切换为 `root` 用户。

1.1.2. 普通用户添加可用 `sudo` 权限

切换到 `root` 用户后，编译 `/etc/sudoers` 文件。

```
vim /etc/sudoers
```

文件的内容是

假设普通用户是 `loongson`。

那么在该文件的“`root ALL=(ALL:ALL) ALL`”后添加一行。

“`loongson ALL=(ALL:ALL) ALL`”，效果如下：

```
... 省略 ...

# User privilege specification
root    ALL=(ALL:ALL) ALL
loongson        ALL=(ALL:ALL) ALL

# Allow members of group sudo to execute any command
%sudo  ALL=(ALL:ALL) ALL

... 省略 ...
```

然后保存（按 `Esc`，然后按冒号，然后输入 `wq!`）

然后发现普通用户就能使用 `sudo` 了。

2. 部署展示

新系统安装完毕之后，复制 `ls2k3000-ai-boot-run.tar.gz` 到系统中。

解压并终端进入解压后的文件夹 `ls2k3000-ai-boot-run`，运行 `./deploy.sh`（期间可能需要输入密码）

日志输出参考见于附录的《`ls2k3000-ai-boot-run.tar.gz` 安装参考日志》一节。

然后重启机器。

附录

关于网口

配置名称	对应网口	位置
有线连接 1	网口0	靠近USB, HDMI的那个网口
有线连接 2	网口1	靠近SD卡插槽的那个网口

关于串口

系统内节点	实际串口说明	位置
<code>/dev/ttyS0</code>	debug的串口	电源隔壁的type-C口
<code>/dev/ttyS2</code>	TTL	J213 和 minipcie里面使用
<code>/dev/ttyS1</code>	RS232-1	J212 pin 1 2 3
<code>/dev/ttyS7</code>	RS232-2	J212 pin 4 5 6
<code>/dev/ttyS6</code>	RS485-1	J214 pin 1 2
<code>/dev/ttyS3</code>	RS485-2	J214 pin 4 5

关于 SPI

J48 接口

系统内操作节点为 `/dev/spidev0.0`

关于 CAN

只是引出 CAN1 CAN2 使用。位于 J225（也就是靠近电源的那个绿色端座）

位置	对应信号
PIN 1	CAN H1
PIN 2	CAN L1
PIN 4	CAN H2
PIN 5	CAN L2

关于 loongnix 下 SSH 启用

loongnix 系统安装后 ssh 服务是默认关闭的。以下是一些设置参考命令：

启动 ssh 服务

```
sudo systemctl start ssh
```

设置开机启动 ssh 服务

```
sudo systemctl enable ssh
```

ls2k3000-ai-boot-run.tar.gz 安装参考日志

```
Loongson@loongson-pc:~/ls2k3000-ai-boot-run$ ./deploy.sh
正在进行 I2S 驱动更新...
i2s内核模块安装...
cur info
kernel      : Linux ls-pc 4.19.0-19-loongson-3 #1 SMP 4.19.190.8.25 Thu Jul 3
07:02:40 UTC 2025 loongarch64 loongarch64 loongarch64 GNU/Linux

info
kernel      : Linux loongson-pc 4.19.0-19-loongson-3 #1 SMP 4.19.190.8.22 wed Jul
10 01:32:32 UTC 2024 loongarch64 loongarch64 loongarch64 GNU/Linux
source code: linux_4.19.190.8.22.orig.tar.gz

make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328
clean
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328
modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-es8328/es8328.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-es8328/snd-soc-es8328.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC      /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-es8328/snd-soc-es8328.mod.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-es8328/snd-soc-es8328.ko
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328
modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
sudo mkdir -p /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/codecs || true
```

```
sudo cp snd-soc-es8328.ko /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/codecs/ || true
sudo depmod -a || true
sudo insmod snd-soc-es8328.ko || true
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c clean
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/es8328-i2c.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.o
  Building modules, stage 2.
  MODPOST 1 modules
WARNING: "es8328_probe" [/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.ko] undefined!
WARNING: "es8328_regmap_config" [/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.ko] undefined!
  CC /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.mod.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.ko
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  Building modules, stage 2.
  MODPOST 1 modules
WARNING: "es8328_probe" [/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.ko] undefined!
WARNING: "es8328_regmap_config" [/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-es8328-i2c/snd-soc-es8328-i2c.ko] undefined!
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
sudo mkdir -p /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/codecs || true
sudo cp snd-soc-es8328-i2c.ko /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/codecs/ || true
sudo depmod -a || true
sudo insmod snd-soc-es8328-i2c.ko || true
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci clean
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci modules
```

```
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci/loongson_i2s_pci.o
  CC [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci/loongson_i2s.o
  CC [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci/loongson_pcm.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci/snd-soc-loongson-i2s-pci.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci/snd-soc-loongson-i2s-pci.mod.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-i2s-pci/snd-soc-loongson-i2s-pci.ko
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-
loongson-i2s-pci modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
sudo mkdir -p /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/loongson || true
sudo cp snd-soc-loongson-i2s-pci.ko /lib/modules/4.19.0-19-loongson-
3/kernel/sound/soc/loongson/ || true
sudo depmod -a || true
sudo insmod snd-soc-loongson-i2s-pci.ko || true
insmod: ERROR: could not insert module snd-soc-loongson-i2s-pci.ko: File exists
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-
loongson-card clean
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-
loongson-card modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-card/loongson_card.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-card/snd-soc-loongson-card.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-card/snd-soc-loongson-card.mod.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-
AI-i2s-driver-kit-20-6/snd-soc-loongson-card/snd-soc-loongson-card.ko
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/i2s/ls2k3000-AI-i2s-driver-fix/ls2k3000-AI-i2s-driver-kit-20-6/snd-soc-
loongson-card modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
```

```
sudo mkdir -p /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/loongson || true
sudo cp snd-soc-loongson-card.ko /lib/modules/4.19.0-19-loongson-3/kernel/sound/soc/loongson/ || true
sudo depmod -a || true
sudo insmod snd-soc-loongson-card.ko || true
insmod: ERROR: could not insert module snd-soc-loongson-card.ko: File exists
alsa配置文件部署...
MOTTY X11 proxy: No authorisation provided
xcb_connection_has_error() returned true
结束...
请重启验证
I2S 驱动更新完毕 重启生效...
正在更新无线网卡驱动...
make ARCH=loongarch CROSS_COMPILE= -C /lib/modules/4.19.0-19-loongson-3/build
M=/home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_cmd.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_security.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_debug.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_io.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_ioctl_query.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_ioctl_set.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_ieee80211.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_mlme.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_mlme_ext.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_wlan_util.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_vht.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_pwrctrl.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_rf.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_recv.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_sta_mgt.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_ap.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_xmit.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_p2p.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_tdls.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_br_ext.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_io1.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_sreset.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_btcoex.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_beamforming.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_odm.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/core/rtw_efuse.o
  CC [M] /home/1s/1s2k3000-ai-boot-run/rt18723/rt18723bu-master/os_dep/osdep_service.o
```

```
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/os_intfs.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/usb_intf.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/usb_ops_linux.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/ioctl_linux.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/xmit_linux.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/mlme_linux.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/recv_linux.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/ioctl_cfg80211.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/wifi_regd.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/rtw_android.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/os_dep/rtw_proc.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-master/hal/hal_intf.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-master/hal/hal_com.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/hal_com_phycfg.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-master/hal/hal_phy.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-master/hal/hal_btcoex.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-master/hal/hal_usb.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/hal_usb_led.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/HalPwrSeqCmd.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/Hal8723BPwrSeq.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_sreset.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_hal_init.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_phycfg.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_rf6052.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_dm.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_rxdesc.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723b_cmd.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/usb_halinit.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723bu_led.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rt18723/rt18723bu-  
master/hal/rt18723bu_xmit.o
```

```
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/rtl8723bu_recv.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/usb_ops.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/odm_debug.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/odm_AntDiv.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_interface.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_HWConfig.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/odm.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/HalPhyRf.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_EdcaTurboCheck.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/odm_DIG.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_PathDiv.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/hal/odm_RaInfo.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_DynamicBBPowerSaving.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_DynamicTXPower.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_CfoTracking.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_NoiseMonitor.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalBtc8723b1Ant.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalBtc8723b2Ant.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalHWImg8723B_BB.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalHWImg8723B_MAC.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalHWImg8723B_RF.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalHWImg8723B_FW.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_RegConfig8723B.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/HalPhyRf_8723B.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/hal/odm_RTL8723B.o  
CC [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-  
master/platform/platform_ops.o  
LD [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/8723bu.o  
Building modules, stage 2.  
MODPOST 1 modules  
CC /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/8723bu.mod.o  
LD [M] /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/8723bu.ko  
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”  
make INSTALL_MOD_DIR=kernel/drivers/net/wireless/ -C /lib/modules/4.19.0-19-  
loongson-3/build M=/home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master  
modules_install  
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”  
INSTALL /home/ls/ls2k3000-ai-boot-run/rtl8723/rtl8723bu-master/8723bu.ko
```

```
DEPMOD 4.19.0-19-loongson-3
Warning: modules_install: missing 'system.map' file. Skipping depmod.
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
/sbin/depmod -a 4.19.0-19-loongson-3
install rtl8723b_fw.bin -D /lib/firmware/rtl_bt/rtl8723b_fw.bin
insmod /lib/modules/4.19.0-19-loongson-3/kernel/drivers/net/wireless/8723bu.ko
更新无线网卡驱动结束，重启生效
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/sd2068 modules
make[1]: 警告: jobserver 不可用: 正使用 -j1。添加 “+” 到父 make 的规则。
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/ls/ls2k3000-ai-boot-run/sd2068/rtc-sd2068.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC /home/ls/ls2k3000-ai-boot-run/sd2068/rtc-sd2068.mod.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/sd2068/rtc-sd2068.ko
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/sd2068 modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
sudo mkdir -p /lib/modules/4.19.0-19-loongson-3/kernel/drivers/rtc/ || true
sudo cp rtc-sd2068.ko /lib/modules/4.19.0-19-loongson-3/kernel/drivers/rtc/ ||
true
sudo depmod -a || true
sudo insmod rtc-sd2068.ko || true
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/watchdog modules
make[1]: 警告: jobserver 不可用: 正使用 -j1。添加 “+” 到父 make 的规则。
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  CC [M] /home/ls/ls2k3000-ai-boot-run/watchdog/ls2x-wdt.o
  Building modules, stage 2.
  MODPOST 1 modules
  CC /home/ls/ls2k3000-ai-boot-run/watchdog/ls2x-wdt.mod.o
  LD [M] /home/ls/ls2k3000-ai-boot-run/watchdog/ls2x-wdt.ko
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
make -C /lib/modules/4.19.0-19-loongson-3/build M=/home/ls/ls2k3000-ai-boot-
run/watchdog modules
make[1]: 进入目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
  Building modules, stage 2.
  MODPOST 1 modules
make[1]: 离开目录“/usr/src/linux-headers-4.19.0-19-loongson-3”
sudo mkdir -p /lib/modules/4.19.0-19-loongson-3/kernel/drivers/watchdog/ || true
sudo cp ls2x-wdt.ko /lib/modules/4.19.0-19-loongson-3/kernel/drivers/watchdog/ ||
true
sudo depmod -a || true
sudo insmod ls2x-wdt.ko || true
Created symlink /etc/systemd/system/sleep.target → /dev/null.
Created symlink /etc/systemd/system/suspend.target → /dev/null.
Created symlink /etc/systemd/system/hibernate.target → /dev/null.
Created symlink /etc/systemd/system/hybrid-sleep.target → /dev/null.
Created symlink /etc/systemd/system/multi-user.target.wants/bootrun2k3000-
ai.service → /lib/systemd/system/bootrun2k3000-ai.service.
完成开机服务安装
```

2025年8月7日17点09分

此次更新点如下:

1. 添加sd2068驱动
2. 添加内部看门狗驱动
3. mdio设置网口灯光
4. 本文档添加关于网口的描述
5. 添加CAN驱动和CAN描述