VEX Linux
Install Manual

User Manual

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1. VEX Linux Driver Install

The VEX series cards (VEX-112、VEX-114、VEX-142、VEX-144) can be used in Linux. For LinuxO.S, the recommended installation and uninstall steps are given in Sec 1.1~1.2

1.1 Linux Driver Installing Procedure

Do not insert VEX card into motherboard when you power on computer at first time. Power on computer and check your own ttyS device number

(1) You can use command “dmesg | grep ttyS” to get your ttyS device number.

```
root@icpdas:# dmesg | grep ttyS
[    0.204452] serial8250: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
[    0.296537] serial8250: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
[    0.336832] 00:0e: ttyS0 at I/O 0x3f8 (irq = 4) is a 16550A
[    0.420585] 00:0f: ttyS1 at I/O 0x2f8 (irq = 3) is a 16550A
```

In this case, the number of ttyS device is 2 (ttyS0 & ttyS1).

(2) Add “8250.nr_uarts=2” parameter to grub2. (2 means ttyS0 & ttyS1, adjust with your environment), then update grub

Each OS distribution should have different update grub method.
List some examples which tested.

Fedora 21

[1] #vim /boot/grub2/grub.cfg

[2]Find your menuentry, then add 8250.nr_uarts=2 behind vmlinuz.

```
menuentry 'Fedora, with Linux 3.17.4-301.fc21.i686' --class fedora --class gnu-linux --class gnu --class os --unrestricted
$menuentry_id_option 'gnulinux-3.17.4-301.fc21.i686-advanced-c324fe36-cecb-4f55-9c60-3a438bab611a' {
  .
  .
  .
        linux16 /boot/vmlinuz-3.17.4-301.fc21.i686 root=UUID=c324fe36-cecb-4f55-9c60-3a438bab611a ro 8250.nr_uarts=2
rhgb quiet
      initrd16 /boot/initramfs-3.17.4-301.fc21.i686.img}
```

Fedora 31

[1]vim /etc/default/grub

[2]Add 8250.nr_uarts=2 in "GRUB_CMDLINE_LINUX" end of line

```
GRUB_TIMEOUT=5
GRUB_DISTRIBUTOR="$(sed 's, release .*$,,g' /etc/system-release)"
GRUB_DEFAULT=saved
GRUB_DISABLE_SUBMENU=true
GRUB_TERMINAL_OUTPUT="console"
GRUB_CMDLINE_LINUX="resume=/dev/mapper/fedora_localhost--live-swap rd.lvm.lv=fedora_localhost-live/root
rd.lvm.lv=fedora_localhost-live/swap rhgb quiet 8250.nr_uarts=2"
GRUB_DISABLE_RECOVERY="true"
GRUB_ENABLE_BLSCFG=true
```

[3]Update GRUB

On BIOS systems

grub2-mkconfig –o /boot/grub2/grub.cfg

On UEFI systems

grub2-mkconfig –o /boot/efi/EFI/fedora/grub.cfg

[4]Check grub.cfg, ensure “8250.nr_uarts=2” parameter is added in grub2

Ubuntu 16.04

[1]#vim /etc/default/grub

[2]Add 8250.nr_uarts=2 in line “GRUB_CMDLINE_LINUX_DEFAULT”

```
# If you change this file, run 'update-grub' afterwards to update
# /boot/grub/grub.cfg.
# For full documentation of the options in this file, see:
#   info -f grub -n 'Simple configuration'

GRUB_DEFAULT=0
#GRUB_HIDDEN_TIMEOUT=0
GRUB_HIDDEN_TIMEOUT_QUIET=true
GRUB_TIMEOUT=10
GRUB_DISTRIBUTOR=`lsb_release -i -s 2> /dev/null || echo Debian`
GRUB_CMDLINE_LINUX_DEFAULT="quiet splash 8250.nr_uarts=2"
```

[3]#update-grub

```
root@icpdas:/boot/grub# update-grub
Generating grub configuration file ...
Found linux image: /boot/vmlinuz-4.4.0-78-lowlatency
Found initrd image: /boot/initrd.img-4.4.0-78-lowlatency
Found memtest86+ image: /boot/memtest86+.elf
Found memtest86+ image: /boot/memtest86+.bin
done
```

[4]Check grub.cfg, ensure “8250.nr_uarts=2” parameter is added in grub2

```
menuentry 'Ubuntu' --class ubuntu --class gnu-linux --class gnu --class os $menuentry_id_option 'gnulinux-simple-f1ccffa4-
738f-4ddf-b154-35b9e88d67ca' {
        .
    linux   /boot/vmlinuz-4.4.0-78-lowlatency root=UUID=f1ccffa4-738f-4ddf-b154-35b9e88d67ca ro  quiet splash
8250.nr_uarts=0 $vt_handoff
    initrd  /boot/initrd.img-4.4.0-78-lowlatency}
```

(3) After add parameter to grub2, shutdown the computer and install VEX-series card, then power on computer again.

(4) Install VEX driver.
You can follow below steps to compile driver and install driver module

[1]Download VEX driver
https://www.icpdas.com/en/download/show.php?num=2175&model=VEX-112

[2]Decompress ixvex.tgz
#tar zxvf ixvex.tgz

[3]Compile driver source. For example, my kernel source is 3.17
#cd ixvex
#cd 3.17

#make

```
[root@icpdas ~]# cd ixvex/
[root@icpdas ixvex]# ls
3.17  4.1.13  Changelog  Readme
[root@icpdas ixvex]# cd 3.17/
[root@icpdas 3.17]#make
make -C /usr/src/kernels/3.17.4-301.fc21.i686 M=/root/ixvex/3.17 modules
make[1]: Entering directory '/usr/src/kernels/3.17.4-301.fc21.i686'
  CC [M]  /root/ixvex/3.17/icpdas_8250.o
  CC [M]  /root/ixvex/3.17/8250_pci.o
  Building modules, stage 2.
  MODPOST 2 modules
  CC      /root/ixvex/3.17/8250_pci.mod.o
  LD [M]  /root/ixvex/3.17/8250_pci.ko
  CC      /root/ixvex/3.17/icpdas_8250.mod.o
  LD [M]  /root/ixvex/3.17/icpdas_8250.ko
make[1]: Leaving directory '/usr/src/kernels/3.17.4-301.fc21.i686'
[root@icpdas 3.17]#
```

[4]Install driver module

#./install.sh

```
[root@icpdas 3.17]# ./install.sh
0000:01:00.1 is VEX144 unbind VEX144
Install OK!
[root@icpdas 3.17]#
```

[5]Check device file name “ttySV*” is exist.

#dmesg | grep ttySV

```
[root@icpdas 3.17]# dmesg | grep ttySV
[ 1377.491411] ttySV4: detected caps 00000700 should be 00000500
[ 1377.491415] 0000:01:00.1: ttySV4 at MMIO 0xe1a01000 (irq = 17, base_baud =
4000000) is a 16C950/954
[ 1377.492158] ttySV5: detected caps 00000700 should be 00000500
[ 1377.492162] 0000:01:00.1: ttySV5 at MMIO 0xe1a01200 (irq = 17, base_baud =
4000000) is a 16C950/954
[ 1377.492667] ttySV6: detected caps 00000700 should be 00000500
[ 1377.492671] 0000:01:00.1: ttySV6 at MMIO 0xe1a01400 (irq = 17, base_baud =
4000000) is a 16C950/954
[ 1377.492823] ttySV7: detected caps 00000700 should be 00000500
[ 1377.492825] 0000:01:00.1: ttySV7 at MMIO 0xe1a01600 (irq = 17, base_baud =
4000000) is a 16C950/954
[root@icpdas 3.17]#
```

[6]You now can use /dev/ttySV4、/dev/ttySV5、/dev/ttySV6 and /dev/ttySV7 four RS-422/485 port.

1.2 VEX Linux Driver Uninstall

You can just shutdown your computer or use script “remove.sh” to uninstall driver module.

(1)Execute script “remove.sh” to unload driver module.

```
[root@icpdas 3.17]# ./remove.sh
Remove OK!
[root@icpdas 3.17]#
```

(2)Check device file name “ttySV*” does not exist

```
[root@icpdas 3.17]# ll /dev/ttySV*
ls: cannot access /dev/ttySV*: No such file or directory
[root@icpdas 3.17]#
```