

Notice

This guide is designed for experienced users to setup the system in the shortest time.

Safety Precautions

Warning!



Always completely disconnect the power cord from your board whenever you are working on it. Do not make connections while the power is on, because a sudden rush of power can damage sensitive electronic components.

Caution!



Always ground yourself to remove any static charge before touching the board. Modern electronic devices are very sensitive to static electric charges. Use a grounding wrist strap at all times. Place all electronic components on a static-dissipative surface or in a static-shielded bag when they are not in the chassis



Product Warranty

First of all, thank you for purchasing PER-C20N Mini-PCI CAN Bus Module. This Quick Installation Guide will help you on the process of the installation. Please read it thoroughly before you start to install it. You may visit AAEON website for the latest version of the instruction. Please refer to [Http://www.aaeon.com](http://www.aaeon.com)

All products in AAEON are designed as the strictest specifications to ensure that the products will own the reliable performance in the typical industrial environments. Whether your purchase from AAEON is made to the purpose of the laboratory or the factory facility, you can be assured that every purchase in AAEON will provide the reliability and stability of operation.

Technical Support

For the most frequently asked questions, you can easily find solutions in your product documentation. The guide is detailed specified and please refer to it first. We strongly suggest you to read it before asking for a customer service over the phone. If you still cannot find the answer, please give a call to your dealer. All dealers of AAEON are well-trained and ready to provide you as many supports as we can. Based on the customer service we've encountered until now, most of problems are minor and able to be easily solved over the phone. We are always pleased to give advice regarding any installation and operation for AAEON products.

Ordering Information

- **TF-PER-C20N-A10**

Mini-PCI CAN Bus Module, SJA 1000, Rev. A1.0

Packing List

- 1 TF-PER-C20N-A10
- 1 Utility CD
- 1 Cable Kit

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Features

- Dual CAN Channel with SJA 1000 CAN Controller
- Dual CAN Channels CAN 2.0B
- Mini PCI Type IIIA Interface Card

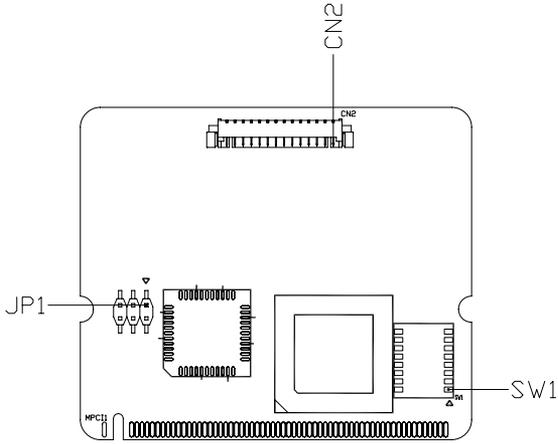
Specification

- | | |
|-------------------------|---|
| • Form Factor | Mini-PCI Type III A 2" x 2.35"
(50.8mm x 59.6mm) |
| • Controller | SJA1000 |
| • Transfer Chipset | ITE8888 |
| • Isolation | 1600VDC |
| • Power Requirement | +3.3V and +5V |
| • Operating Temperature | 32°F~140°F (0°C~60°C) |

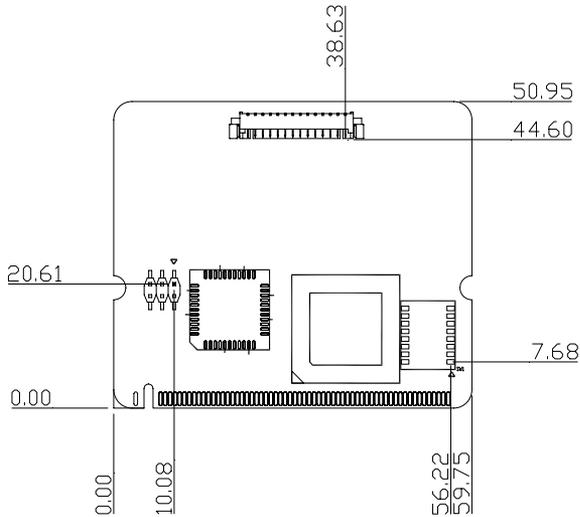
Note:

AAEON suggests you to use PER-C20N on the following 3.5" SubCompact boards (GENE-8310 A1.1 or GENE-5315 A1.1). If you are going to use PER-C20N on other modules, please contact with AAEON sales to customize it.

Location of Jumper and Connectors



Mechanical Drawing



List of Jumper

The board has a jumper that allows you to configure your system to suit your application. The table below shows the function of each board's jumper:

Label	Function
JP1	Address Condition

List of Connectors

The board has a number of connectors that allow you to configure your system to suit your application. The table below shows the function of each board's connectors:

Label	Function
CN2	CAN Connector
SW1	IRQ setup

Address Condition (JP1)

JP1	Function
1-3, 2-4	DC00
1-3, 4-6	DB00
3-5, 2-4	DA00 (Default)
3-5, 4-6	CC00

Mini-PCI 124-pin Slot

Pin	Signal	Pin	Signal
1	N.C.	2	N.C.
3	N.C.	4	N.C.

5	N.C.	6	N.C.
7	N.C.	8	N.C.
9	N.C.	10	N.C.
11	N.C.	12	N.C.
13	N.C.	14	N.C.
15	N.C.	16	N.C.
17	INTB#	18	+5V
19	+3.3V	20	INTA#
21	SERIRQ	22	N.C.
23	GND	24	N.C.
25	CLK	26	RST#
27	GND	28	+3.3V
29	REQ#	30	GNT#
31	+3.3V	32	GND
33	AD31	34	N.C.
35	AD29	36	N.C.
37	GND	38	AD30
39	AD27	40	+3.3V
41	AD25	42	AD28
43	N.C.	44	AD26
45	C/BE3#	46	AD24
47	AD23	48	IDSEL
49	GND	50	GND
51	AD21	52	AD22
53	AD19	54	AD20

55	GND	56	PAR
57	AD17	58	AD18
59	C/BE2#	60	AD16
61	IRDY#	62	GND
63	+3.3V	64	FRAME#
65	N.C.	66	TRDY#
67	SERR#	68	STOP#
69	GND	70	+3.3V
71	PERR#	72	DEVSEL#
73	C/BE1#	74	GND
75	AD14	76	AD15
77	GND	78	AD13
79	AD12	80	AD11
81	AD10	82	GND
83	GND	84	AD9
85	AD8	86	C/BE0#
87	AD7	88	+3.3V
89	+3.3V	90	AD6
91	AD5	92	AD4
93	N.C.	94	AD2
95	AD3	96	AD0
97	+5V	98	N.C.
99	AD1	100	N.C.
101	GND	102	GND
103	N.C.	104	GND

105	N.C.	106	N.C.
107	N.C.	108	N.C.
109	N.C.	110	N.C.
111	N.C.	112	N.C.
113	GND	114	GND
115	N.C.	116	N.C.
117	GND	118	GND
119	GND	120	GND
121	N.C.	122	N.C.
123	+5V	124	N.C.

Note:

If the signal of Mini-PCI Slot Pin 21 is not SERIRQ, this card cannot support IRQ mode.

CAN Connector (CN2)

Pin	Signal
1	+5V
2	CAN0H
3	CAN0L
4	N.C.
5	GND
6	CAN1H
7	CAN1L
8	N.C.
9	GND
10	N.C.

11	N.C.
12	N.C.
13	N.C.
14	SERIRQ

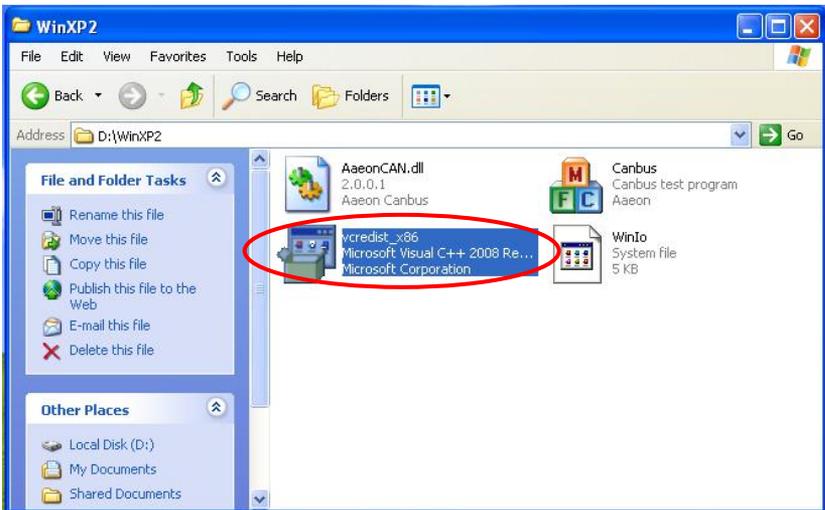
IRQ Setup (SW1)

SW1	Function
1	On for Port1 IRQ5
2	On for Port1 IRQ7
3	On for Port1 IRQ10
4	On for Port1 IRQ11
5	On for Port2 IRQ5
6	On for Port2 IRQ7
7	On for Port2 IRQ10
8	On for Port2 IRQ11

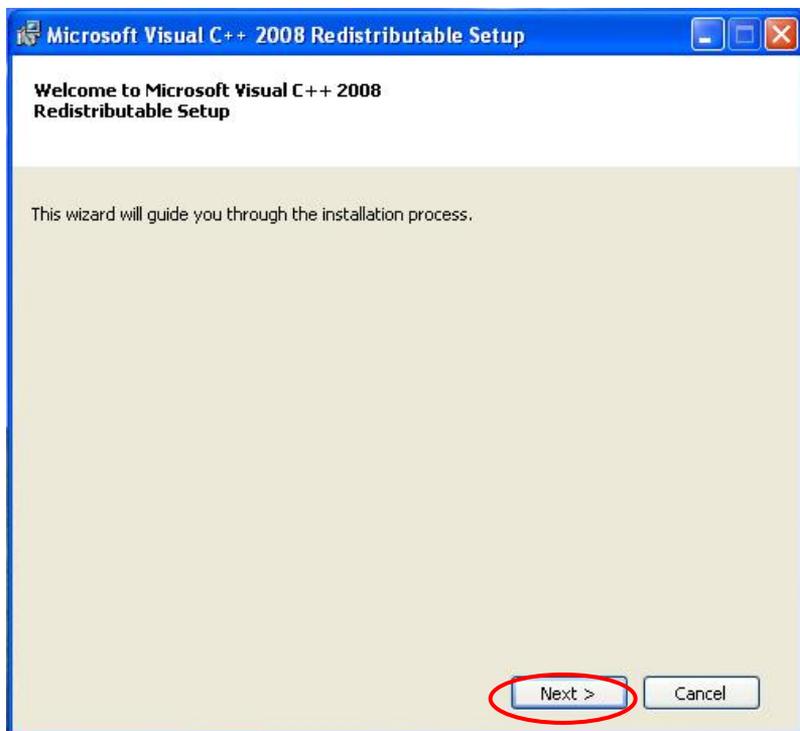
Driver Installation and Module Setup

Windows XP Installation

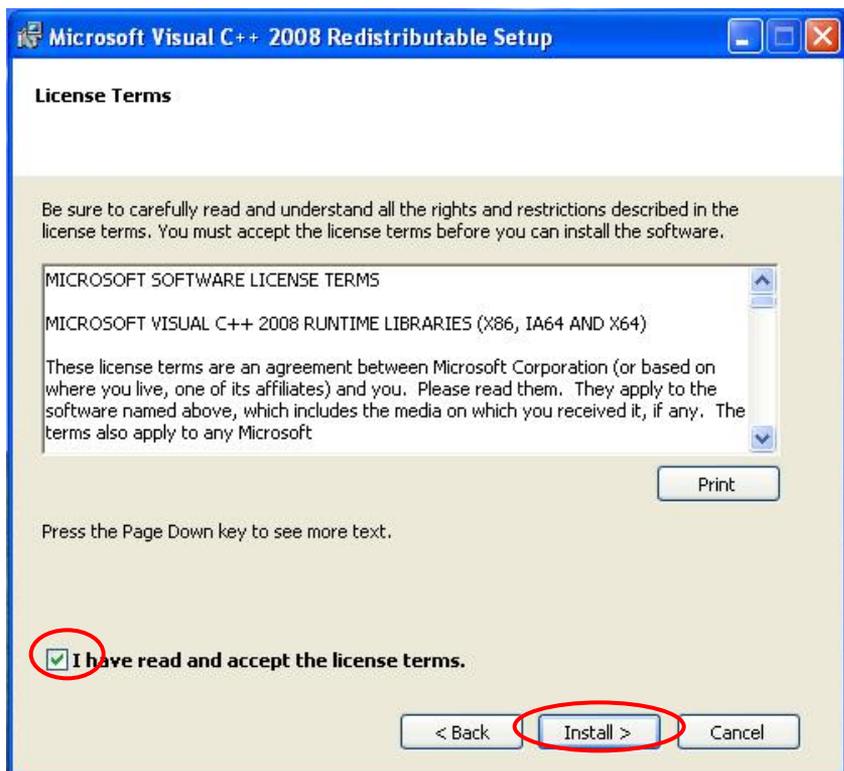
Step1: Open the “WinXP2” folder and click on “vcredist_x86.exe” to start installing VC2008 Redistributable.

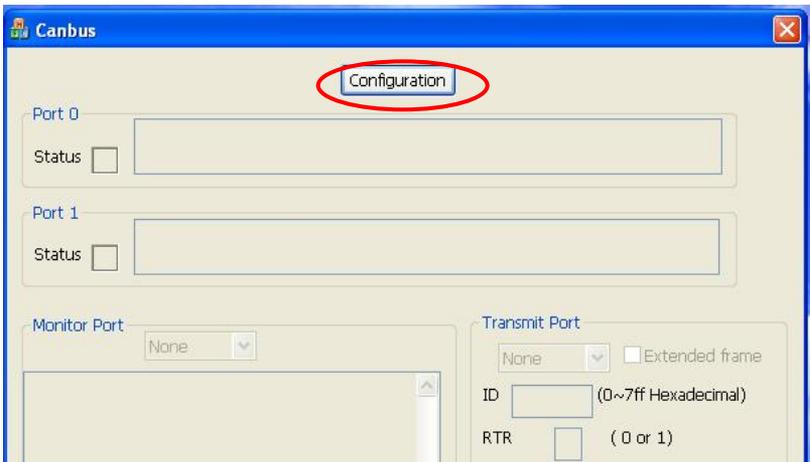


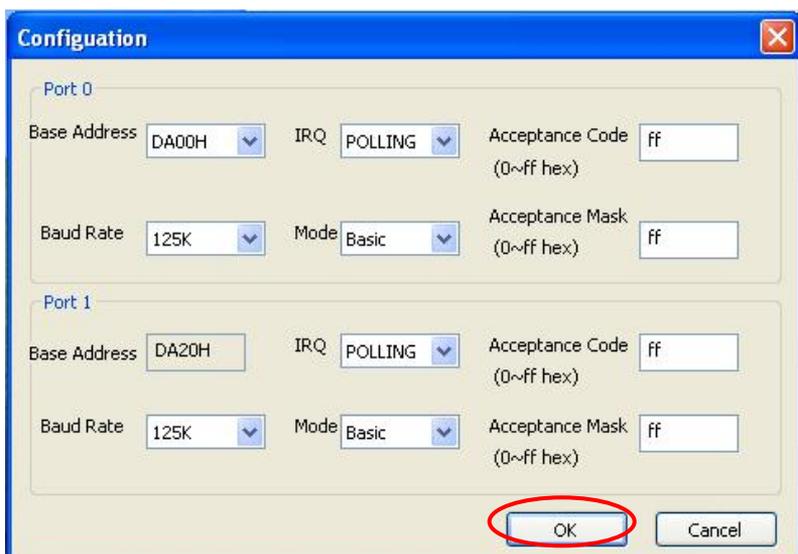
Click "Next " to continue.



Check the check box and click on “Install” to follow the instruction until the computer shows to “Finish”



Step 2: Double click on the “Canbus.exe” file**Step 3:** Click on “Configuration,” to setup setting



The setting of **Base Address** has to be the same as Jumper setting.

IRQ only support POLLING.

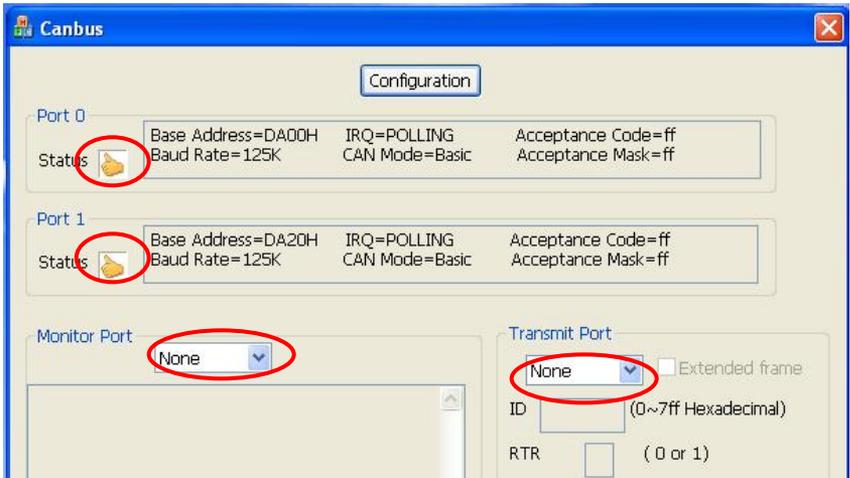
The **Baud Rates** of Transmit Port and Monitor Port have to be the same.

For **Mode**, you may choose “Basic” or “Peli” (only Peli can transmit “Extended frame”). The default setting of “Mode” is “Basic.”

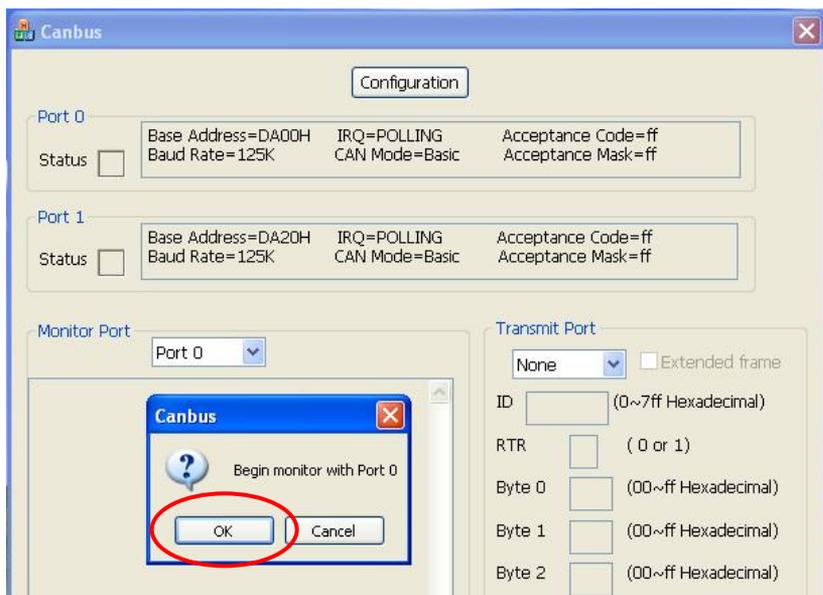
The **Acceptance Code** and **Mask** will be varied by the “Mode” you set. For example, “Basic” is 8 bits, Peli is 32 bits. You may choose the default setting if the application has no specific request.

You may click on “OK” after finish setting these values.

Step 4: The system will show the configuration information on “Port 0” and “Port 1” windows and detect the hardware status automatically. If the status is OK, it will show . The Monitor Port and Transmit Port will be selectable. If the status is Fail, the situation will be contrary.



Step 5: Setup the “Monitor Port”: Please select “Port 0” or “Port 1” as the Monitor Port. After setting, the pop out will ask you if the setting is correct or not. Select “OK” to start monitoring CANBUS. If you want to stop monitoring just click on “Stop” button.



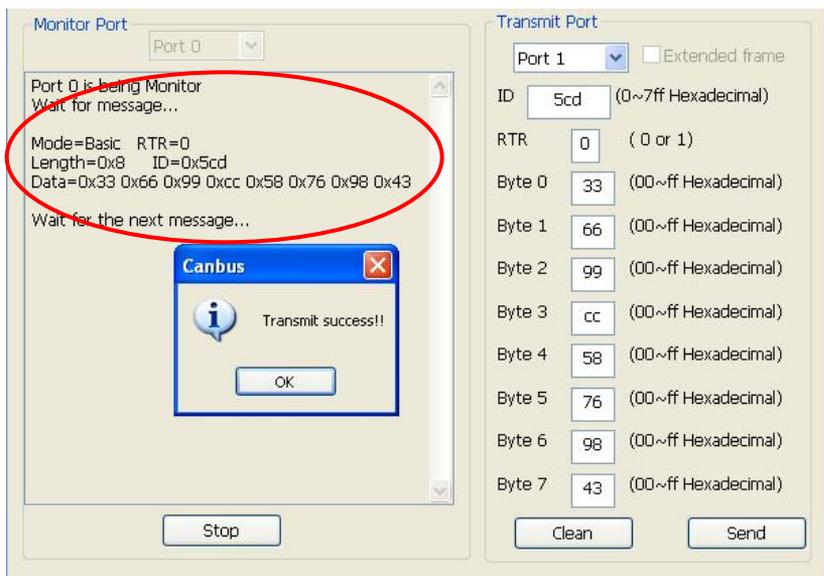
Step 6: Setup the “Transmit Port”: When you setup the “Transmit Port,” please select the different port from the “Monitor Port.” If the “Monitor Port” is “Port 0,” and the “Transmit Port” should be “Port 1.” Otherwise, it will cause error messages.

Step 7: Data Translation: Please fill out the boxes of ID, RTR and Data in order. All the setting numbers are hexadecimal. The **ID** of Standard frame (the box of Extended frame not be checked.) can be keyed in “0~0x7ff.” The **ID** of Extended frame is “0~0x1ffffff.” (The Extended frame can be selectable in “Peli” Mode only.)

For **RTR**, please key in “0” or “1.”

For **Data**, you may key in “0~8 Bytes” and please fill out from the “Byte 0” to “Byte 7” in order.

After filling, please click on “Send.” There is a pop-up to show if it is a successful transmitting or not. Meanwhile, the “Monitor Port” will receive the information you fill and show the related information on “Monitor Port” window. You also can click on “Clean” to erase all data you key in.



Linux Installation

Step 1: Please log in as “root” when you start the computer. (If you log in other identities, you have to command “sudo” to switch the identity, or you cannot insert/remove module.

Below use Fedora5 as example (GENE-5315 + PER-C20N)

Step 2: Copy the Fedora5 folder

(../PER-C20N/Linux/5315/FedoraCore5/Fedora5) to the root's home.



Open the Terminal: Applications->Accessories (Fedora4 in System tool ->Terminal) and type command:

```
uname -n  
[root@localhost~]# uname -n  
localhost.localdomain
```

※ If it does not show "localhost.localdomain," you have to continue to the following step 2-A. If it shows properly, please go to Step 3.

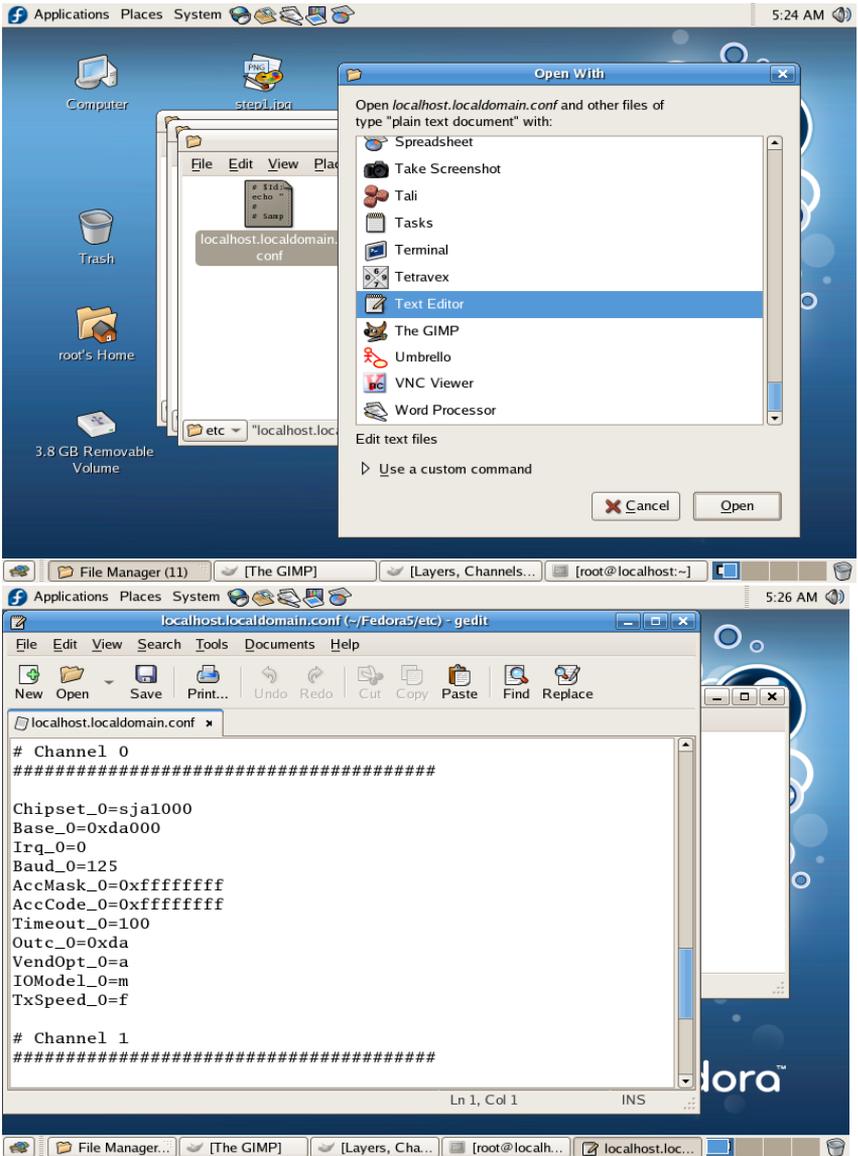
2-A: If you get the output is "aaeon.5315," please command the following instructions.

```
[root@localhost~]# cd Fedora5/etc  
[root@localhost etc]# cp localhost.localdomain.conf aaeon.5315.conf  
[root@localhost etc]# cd ~
```

Step 3: Chang the setting file.

Please open the file of "Fedora5/etc/\$(uname -n).conf" by Text Editor, where the "\$(uname -n)" is the output value that you got in step 2.

For example, the output value you got in Step 2 is "localhost.localdomain," and the file you open is "localhost.localdomain.conf."



The values under Channel 0 are the default setting value of Port 0, and the values under Channel 1 are the default setting value of Port1.

We use Channel 0 as an example below, and it is the same as the Channel 1.

Chipset_0: Default value is "sja1000," please do not change it since the IC is sja1000.

Base_0: It is a complete memory address (segment + offset), please adjust it based on the jumper of the board. (PER-C20N=>JP1)

	2-4	4-6
1-3	DC00	DB00
3-5	DA00	CC00

If it is DA00, you have to set "0xda000." If it is DB00, you have to set "0xdb000."

irq_0: Setup interrupt, you may set "0" as polling mode.

For choosing IRQ of PER-C20N, please use the same settings of SW1 (PORT1 & PORT2). If you set "0," please get rid of the jumper.

The following IRQ is useful for the boards co-work with PER-C20N.

GENE-5315: IRQ 3.4.5.7.10

GENE-8310: IRQ 5.7.10.11

You may command "cat" in the Terminal to check the occupied IRQ and avoid using the same IRQ.

```
[root@localhost ~]# cat /proc/interrupts
```

Baud_0: can set with 125,250,500,800and1000

AccMask_0: Default=0xffffffff (no need to change)

AccCode_0: Default=0xffffffff (no need to change)

Timeout_0: Default=10 (no need to change)

Outc_0: Default=0xda (no need to change)

VendOpt_0: Default=a (no need to change)

IOModel_0: Default=m (no need to change)

TxSpeed_0: Default=f (no need to change)

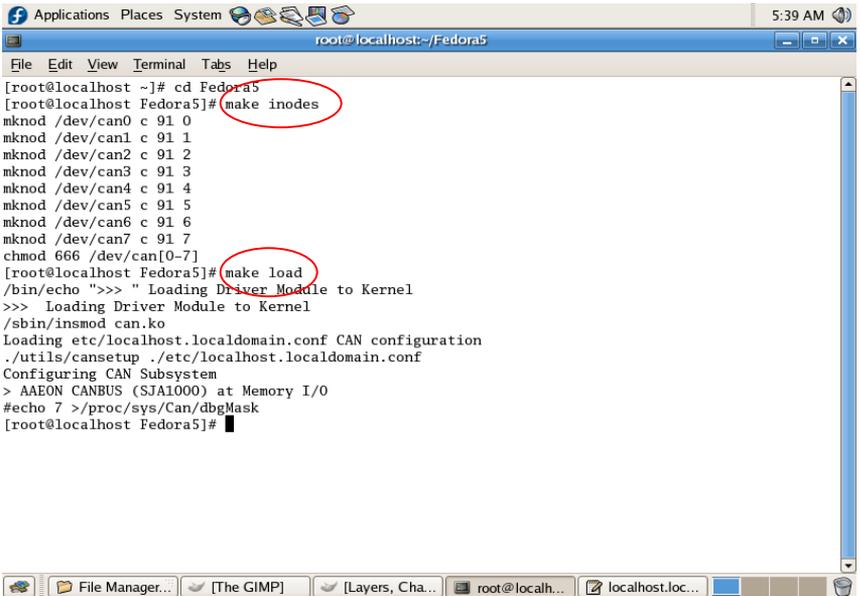
Step 4: Setup inode: please open the terminal again

```
[root@localhost ~]# cd Fedora5
```

```
[root@localhost Fedora5]# make inodes
```

Step 5: install the driver:

```
[root@localhost Fedora5]# make load
```



```

Applications Places System 5:39 AM
root@localhost:~/Fedora5
File Edit View Terminal Tabs Help
[root@localhost ~]# cd Fedora5
[root@localhost Fedora5]# make inodes
mknod /dev/can0 c 91 0
mknod /dev/can1 c 91 1
mknod /dev/can2 c 91 2
mknod /dev/can3 c 91 3
mknod /dev/can4 c 91 4
mknod /dev/can5 c 91 5
mknod /dev/can6 c 91 6
mknod /dev/can7 c 91 7
chmod 666 /dev/can[0-7]
[root@localhost Fedora5]# make load
/bin/echo ">>> " Loading Driver Module to Kernel
>>> Loading Driver Module to Kernel
/sbin/insmod can.ko
Loading etc/localhost.localdomain.conf CAN configuration
./utils/cansetup ./etc/localhost.localdomain.conf
Configuring CAN Subsystem
> AAeon CANBUS (SJA1000) at Memory I/O
#echo 7 >/proc/sys/Can/dbgMask
[root@localhost Fedora5]#

```

Command “grep” to check if the driver setting is the same or not. (you may skip this step)

```
[root@localhost Fedora5]# grep . /proc/sys/Can/*
```

Step 6: Start testing the transmission, you have to create a new terminal (File→Open Terminal) on the existing terminal. And then, command “receive” in one of the terminals to monitor CANBUS and receive data.

```
[root@localhost Fedora5]# ./receive
```

The default Monitor Port is “can0”. You may use the following instructions to assign the Monitor Port to be “can1.”

```
[root@localhost Fedora5]# ./receive can1
```

And then, use the other Terminal to transmit message.

```
[root@localhost Fedora5]# ./can_send 567 0x11 0x22 0x33 0x44  
0x55 0x66
```

The following three digits of “can_send” is ID. (You can key in 000-999, decimal. The example is “567.”)

And then, you may key in 0~8 messages (0x00~0xff, hexadecimal. The example is 0x11...)

The default Transmit Port is “can1.” You also can use the following instructions to assign the Transmit Port.

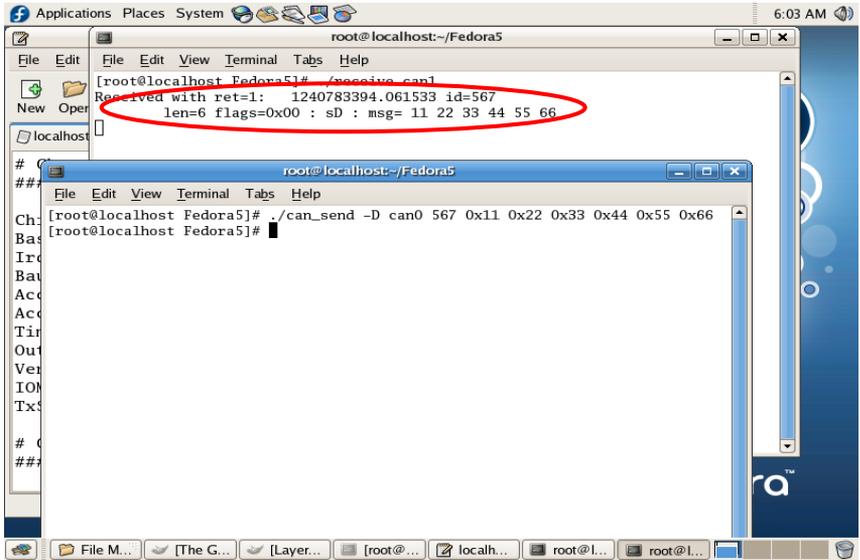
```
[root@localhost Fedora5]# ./can_send -D can0 567 0x11 0x22 0x33  
0x44 0x55 0x66
```

Adding up “-D can0” to command the Transmit Port as “can0” after “can_send.”

If “can0” has been set to be the Monitor Port and it starts to monitor data bus, you cannot assign “can0” as the Transmit Port.

If it is a successful transmission, the Terminal which receives data will

have shown the following message on screen.



```
root@localhost:~/Fedora5
File Edit View Terminal Tabs Help
[root@localhost Fedora5]# ./receive_can1
Received with ret=1: 1240783394.061533 id=567
len=6 flags=0x00 : sD : msg= 11 22 33 44 55 66
#
##
Ch
Bas
Irc
Ba
Acc
Acc
Tit
Out
Ver
IO
Tx
#
##
root@localhost:~/Fedora5
File Edit View Terminal Tabs Help
[root@localhost Fedora5]# ./can_send -D can0 567 0x11 0x22 0x33 0x44 0x55 0x66
[root@localhost Fedora5]#
```

If you want to stop the Monitor Port to monitor data bus, just let the Terminal on focus and press `ctrl+c` to stop. If you did not stop receiving data via the Monitor Port, the resource of the port will be occupied.

Step 7: Cross check

Set `can0` (Monitor Port), `can1` (Transmit Port) \leftrightarrow `can1` (Monitor Port), `can0` (Transmit Port) in terms of the Step 6. To make sure the transmitting and receiving is working OK on `can0` and `can1`.

Step 8: Testing by using different platforms

Using the two boards to test the transmitting and receiving. For example, the can0 of GENE-5315 is the Monitor Port, and the can0 of GENE-8310 will be the Transmit Port. Or the can1 of GENE-8310 is the Monitor Port, and the can0 of GENE-5315 is the Transmit Port. In addition, you may use different systems. One is DOS system and the other one is Windows system, or one is DOS system and the other one is Linux system to test the transmitting and receiving (make sure the Baud Rate setting is the same).

Step 9: Change the setting to test.

After testing, you may want to change the IRQ or Baud Rate for a further testing. Please follow the steps below to activate.

9-1 Uninstall the driver

```
[root@localhost Fedora5]# /sbin/rmmod can.ko
```

9-2 Modify the setting based as the Step 3**9-3 Install the driver again**

```
[root@localhost Fedora5]# make load
```

List of Mating Connectors and Cables

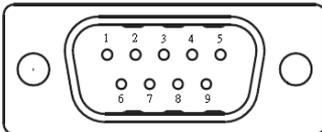
The table notes mating connectors and available cables.

Connector Label	Function	Mating Connector		Available Cable	AAEON Cable P/N
		Vendor	Model no		
CN2	CAN Connector	CATCH	A003-678	CAN Cable	1703140150

CAN Cable Pinout

CN2		DB9	
Pin	Signal	Pin	Signal
2	CAN0H	2	CAN0H
3	CAN0L	7	CAN0L
6	CAN1H	2	CAN1H
7	CAN1L	7	CAN1L

Note: DB-9 Connector Locations



Below Table for China RoHS Requirements

产品中有毒有害物质或元素名称及含量

AAEON Main Board/ Daughter Board/ Backplane

部件名称	有毒有害物质或元素					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
印刷电路板 及其电子组件	×	○	○	○	○	○
外部信号 连接器及线材	×	○	○	○	○	○
<p>O: 表示该有毒有害物质在该部件所有均质材料中的含量均在 SJ/T 11363-2006 标准规定的限量要求以下。</p> <p>X: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 SJ/T 11363-2006 标准规定的限量要求。</p> <p>备注：此产品所标示之环保使用期限，系指在一般正常使用状况下。</p>						