

GPORT104/108/116

Serial Router

Owner's Manual

GPORT-004

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-----Chapter 1-----
Introduction

1-1. An introduction to GPORT Serial Router

GPORT Serial Router is one box to support multiple serial ports to be accessed via one IP. We can have different operating mode for each serial port to be accessed. It can be "virtual COM" port in PC server. It can be TCP/IP device in network environment.

1-2. Hardware specification

- *CPU: 100MHz 32bit MIPS CPU.
- *Flash: 8MByte.
- *SDRAM: 16MByte.
- *Serial port: 4 RS232 with DB9 male connector. (GPORT104)
8 RS232 with RJ45 connector. (GPORT108)
16 RS232 with RJ45 connector. (GPORT116)
- *Ethernet port: 10/100Mbps.
- *Console port: RS232 with RJ45 connector.
- *Power input: 9VAC or 12VDC power adaptor (GPORT104)
100--240VAC switching power (GPORT108/116)

Product views



1-3 Software specification:

- *Virtual COM driver for WIN NT/2000/XP/2003 system.**
- *real TTY RTTY driver for SCO Openserver system.**
- *fix TTY GVMODEM driver for Linux, SCO UNIX and other UNIX system.**
- *support TCP server mode to be connected.**
- *support TCP client mode to dedicated server.**
- *support UDP send mode to upto four dedicated server.**
- *support UDP receive mode to get from multiple host.**
- *support WEB setup mode.**
- *support TELNET setup mode.**
- *support CONSOLE setup mode.**
- *support SDK for user to develop their dedicated application. GPORT**
is compact LINUX box for user to use.

Chapter 2. Configuring Hardware

2-1 System components

An GPORT Serial Router includes following components:

- *One GPORT104/GPORT108/GPORT116 box.
- *One GPORT500 RJ45 to DB9 female connector cable for console port of GPORT104 box. Or one GPORT501 RJ45 to DB9 female connector cable for console port of GPORT108/116 box.
- *One power adaptor for GPORT104 box. Or one power cord for GPORT108/116 box.
- *User manual and software CD.

2-2 Installation Procedures

One GPORT box needs one LAN cable to connect with HUB.

The installation procedures are as follows:

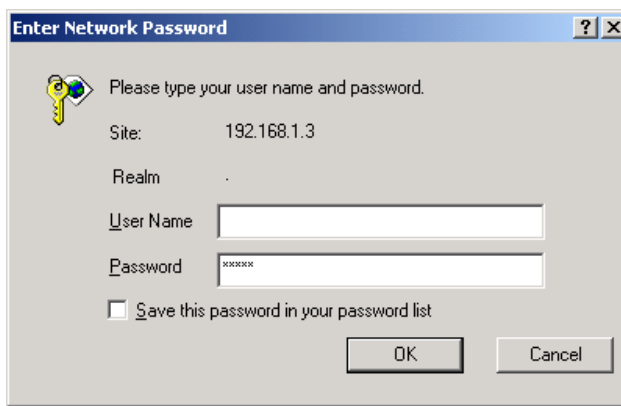
- (1) Turn off the power switch of your GPORT box.
- (2) check the LAN connector type is PC mode or HUB mode. (GPORT104 with one switch to set. GPORT108/116 with HUB mode in default condition)
- (3) Plug the LAN cable between GPORT and HUB. In normal power on condition the LED in LAN connector will light to indicate 10Mbps mode or 100Mbps mode in use.
- (4) Connect console cable between GPORT and one terminal. The default condition for console port will be 115200bps,no parity,8 data bit.
- (5) Connect serial port cable between GPORT and RS232 equipment.
- (7) Turn on the power switch of GPORT box.
- (8) We can see the console out message in console terminal and the status LED flash in GPORT.

Chapter 3 Operating mode setup in GPORT

3-1 Enter setup window

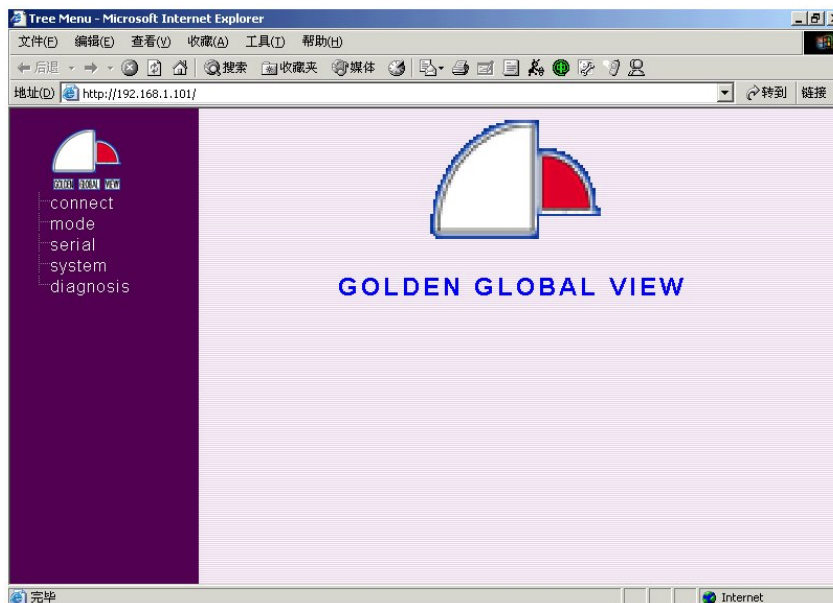
GPORT support three types of method to setup the operating mode of each serial port in GPORT. We can use WEB to setup. We can use Telnet method to setup. We can use console terminal to setup. We will have detail description in following paragraph for WEB setup. The procedure for other setup method is similar.

When you open your browser and type in the IP address of GPORT (the default IP address in factory is 192.168.1.254). Then you can see the "Enter Network Password" dialogue box appeared. You can ignore the user name and input the password directly (the default password in factory is five one 11111).



3-2 Main setup window

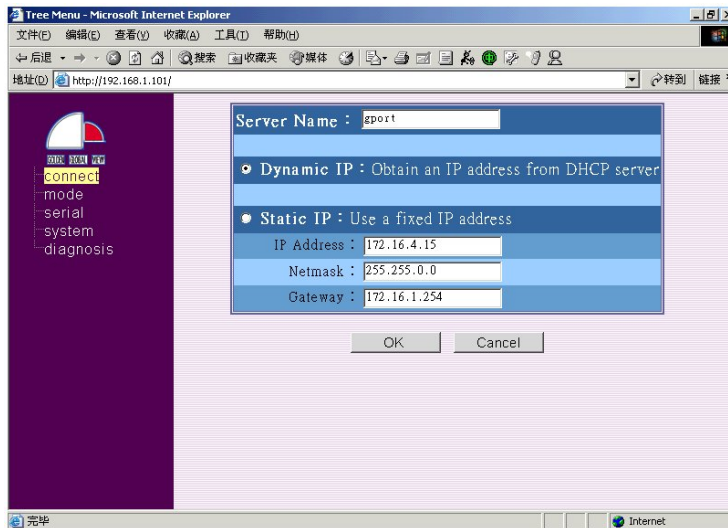
When the password is entered and correct, the main setup window will appear. In the left side of window you can see the function bar there.



Please click the function bar to enter function setup.

3-3 Connect setup window

Generally the first one we need to setup is "Connect setup". Because we need to setup the dedicated IP address in GPORT.

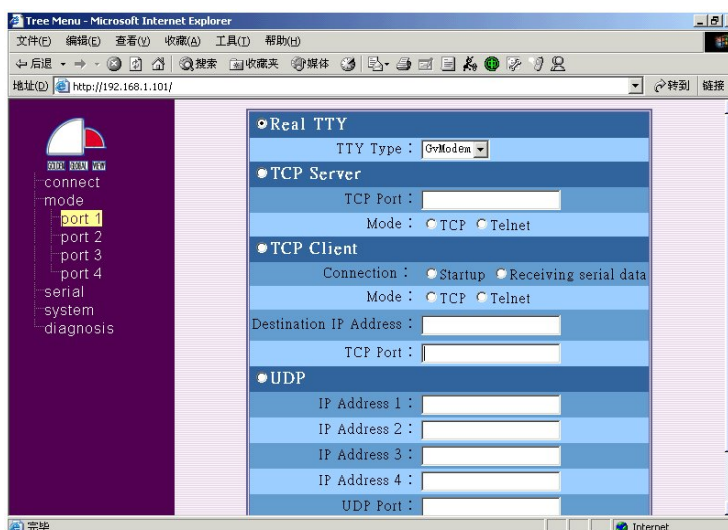


GPORT support two types of IP address. One is Dynamic IP mode to get IP address from DHCP server upon power on. We don't suggest this one. Because you may have different IP address for different condition. And it is not easy for you to maintain this condition for your application software.

The other is static IP mode. We can setup the IP address, Netmask and Gateway for dedicated value. Then it is easy for us to maintain in application software.

3-4 Mode setup window

There are six operating mode for each serial port in GPORT. Different application environment may use suitable mode to meet their requirement. GPORT support GVMODEM Real TTY mode, COM Real TTY mode, TCP Server mode, TCP Client mode, UDP Send/Receive mode.



3-4-1 Real TTY mode

There are two types of Real TTY mode.

The first one is "COM Real TTY mode". In this mode you need to install virtual COM driver in Windows system or RTTY driver in SCO Openserver UNIX system. The serial port in GPORT to be set in this mode will be as standard COM port in Windows system and standard TTY device in SCO UNIX system. The serial port operation parameter (baud rate, data bit and stop bit, parity bit, flow control mode) will be set in application program as normal serial port in PC server. The application software in Windows system and SCO Openserver system will be used in serial port of GPORT box without modification.

The second one is "GVMODEM Real TTY mode". In this mode you need to install driver in UNIX and LINUX system to have fixed virtual terminal port (tty?). Because we can not modify the serial port parameter in virtual terminal port. So user need to set the serial port parameter in GPORT firstly.

3-4-2 TCP Server mode

TCP server mode will let the serial port in GPORT box to be accessed via Telnet or Socket connecting program. We must assign unique TCP port number for each serial port. If user need to use standard TELNET negotiation in connection procedure, we need to set "Telnet" mode in setup. If user don't need the TELNET negotiation procedure in connection, we need to set "TCP" mode in setup. Normally we will use "TCP" mode for simple TCP connection application program.

3-4-3 TCP Client mode

TCP Client mode will let GPORT to connect with dedicated server with assigned TCP port number. So we need to setup the Destination IP address to connect and the target TCP port number. If user need to use standard TELNET negotiation procedure in connection, we need to set "Telnet" mode in setup. If user don't need the TELNET negotiation procedure in connection, we need to set "TCP" mode in setup. Normally we will use "TCP" mode for simple TCP connection application program.

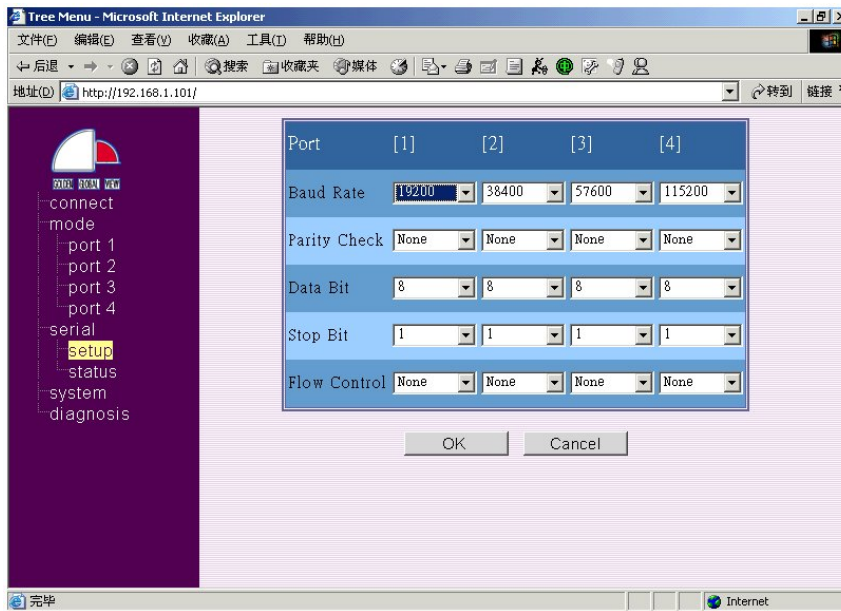
Due to GPORT need to connect with dedicated server and different application program may have different requirement. So the timing for GPORT to connect with dedicated server is important. We can select "startup" mode to let GPORT will try to connect with dedicated server upon power on. It means that we can transmit and receive data in serial port upon GPORT power on and connected. Sometimes we may need to know the equipment connected in GPORT's serial port ready to receive data or not. In this requirement we can set "Receiving serial data" mode for this serial port. It means that we need to wait the equipment connected in serial port send data firstly. Then we start to connect with dedicated server. After connection dedicated server will send data to GPORT's serial port. In this condition we can promise the equipment in serial port is ready to receive data from remote server.

3-4-4 UDP mode

We need to set the UDP port number to receive UDP packet. We can also setup the dedicated server to send serial port's data. Upon receiving the data from serial port we can send UDP packet to upto four dedicated server. So we can get data from multiple host and send to serial port. But we can only get serial port data and send to upto four dedicated host. User can assign the dedicated server's IP upto four host and left blank for unused server.

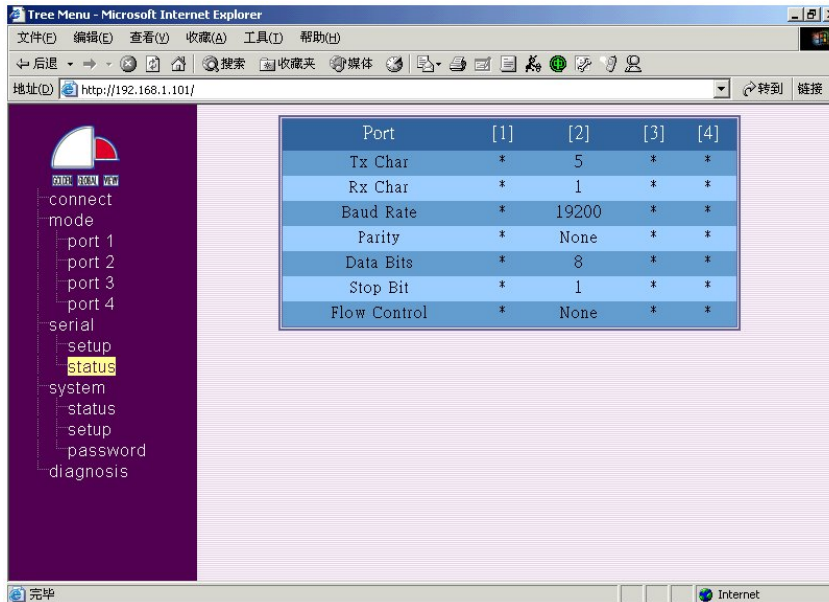
3-5 Serial port parameter setup

We can assign the serial port parameter in serial setup window. This setup value will be used in GVMODEM Real TTY mode, TCP Server mode, TCP Client mode and UDP mode.



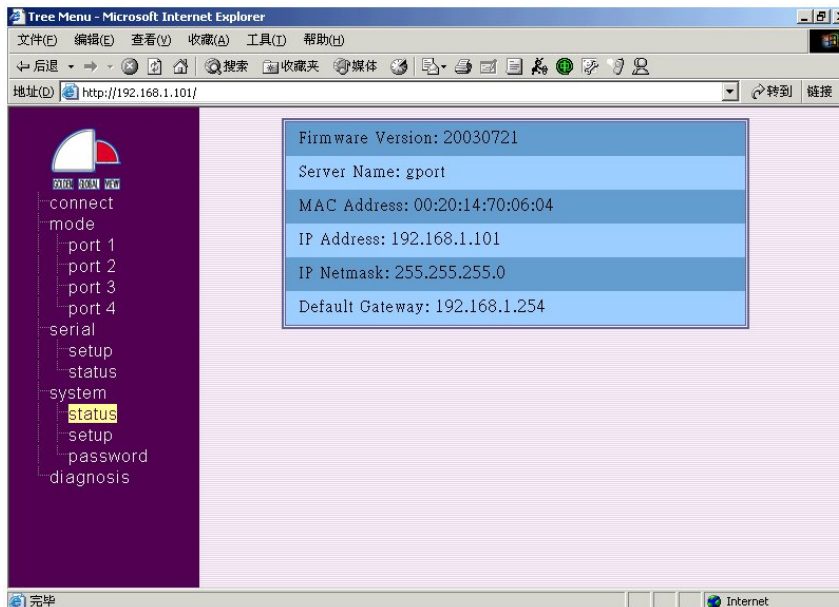
3-6 Serial port connection status

We can check the connection status for each serial port. We only show the connected serial port status. The disconnected port will be shown * only. We will show the parameter of serial port with transmit data count (TX Char) and receive data count (RX Char). But the data count is not updated in real time basis. User need to click "status" again to update the new data count.



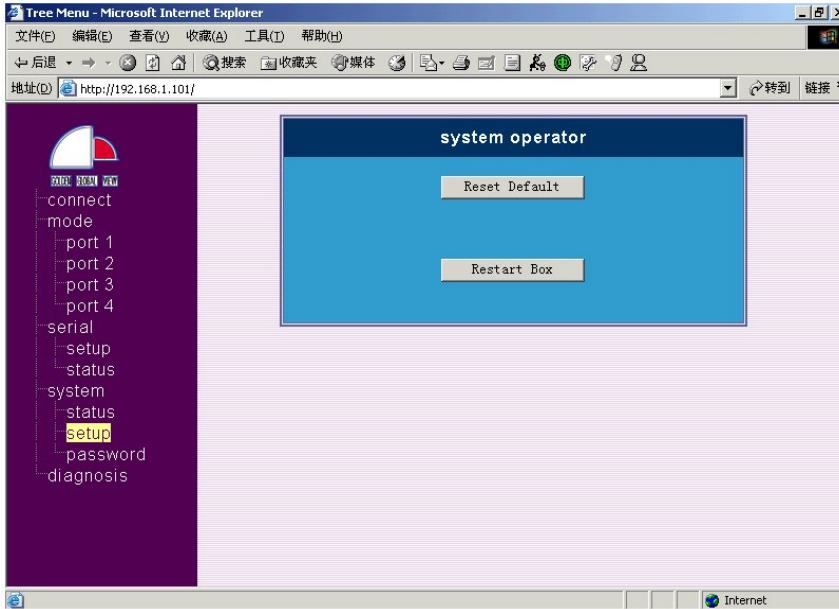
3-7 Status of GPORT system

We can check the status of GPORT system. The displayed information includes version of Firmware, Server name of GPORT box, MAC address, IP address, IP netmask and default Gateway address.



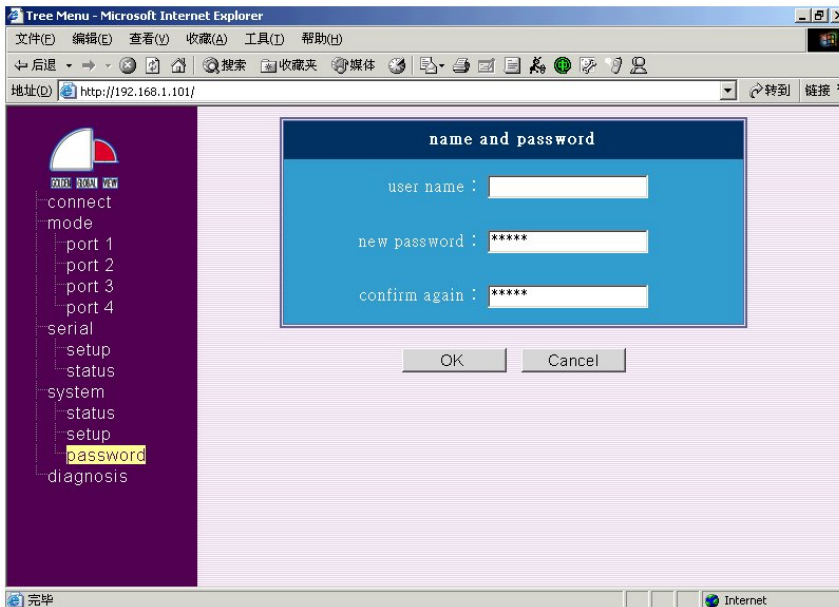
3-8 Reset and restart GPORT

When we setup and modify some parameter in GPORT, we will restart GPORT to let such value available. Sometimes we need to let GPORT with factory default parameter setting, we will click "Reset Default".



3-9 Change user name and password

In factory default condition we do not have user name setting and password is five one 11111. We can setup the user name and password for GPORT. Next time you will need to use such value to enter setup screen.



3-10 Check network connection

When we need to check the LAN connection in GPORT, we will use "ping" command to know IP server for diagnosis. When such IP server is reachable we will show "ping success". Or we may have "ping failure" to show.

Chapter 4 Windows NT Installation

4-1 Driver Installation

There are two components in Windows system virtual COM driver installation. One is the driver. The other is the configuration file for GPORT.

In our CD you can find following files under NT4 driver directory.

- a) APORT.SYS =====> GPORTIOP driver for GPORT box.
- b) APORT_AP.EXE =====> parameter setting file.
- c) APORTRUI.RAY =====> setup file for GPORTIOP driver.
- d) OEMSETUP.INF =====> installation file for GPORTIOP driver.

Please run "aport_ap.exe" file firstly. We can set the target total port number of serial port need to be installed in this system. Currently we can set 1 upto 64 serial ports. Then we need to set the target IP address of GPORT box and serial port number in this GPORT for each serial port. We can use "search" function to find the IP address of each GPORT box available in your network.

Now we can start to install our driver in "control panel". We will choose "Network" and "add adaptor" (Please don't choose "add Software"). Then we can put our driver diskette or CD to install our GPORTIOP driver. Please use "<other> requires disk from manufacture" and specify correct path for our driver.

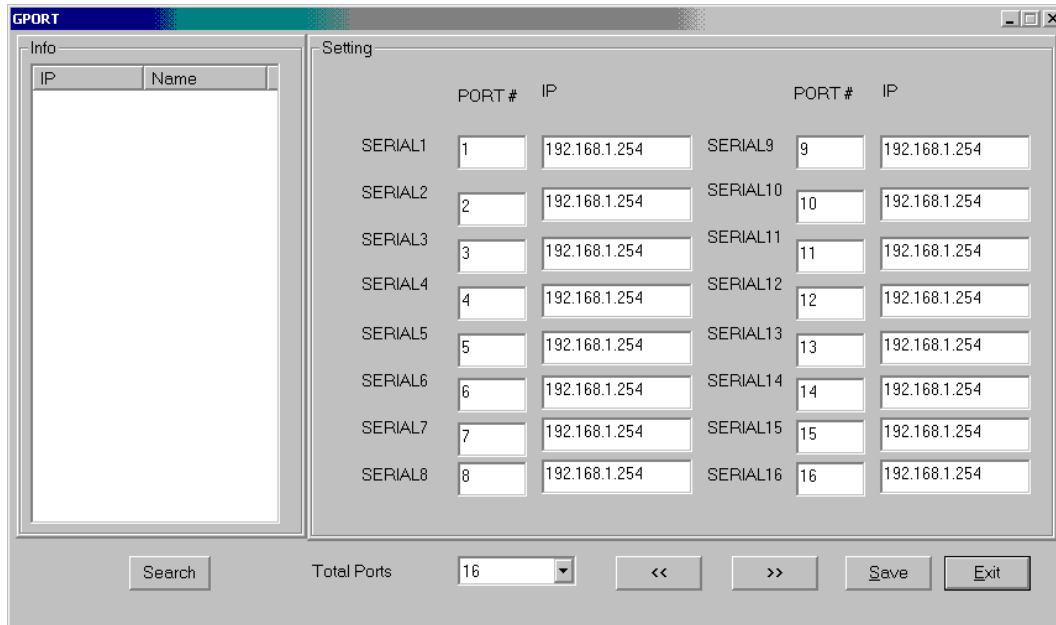
Follow the normal procedure we can install the driver successfully.

Now you can find extra COM port in your system. But you must reboot your system to let such COM port available.

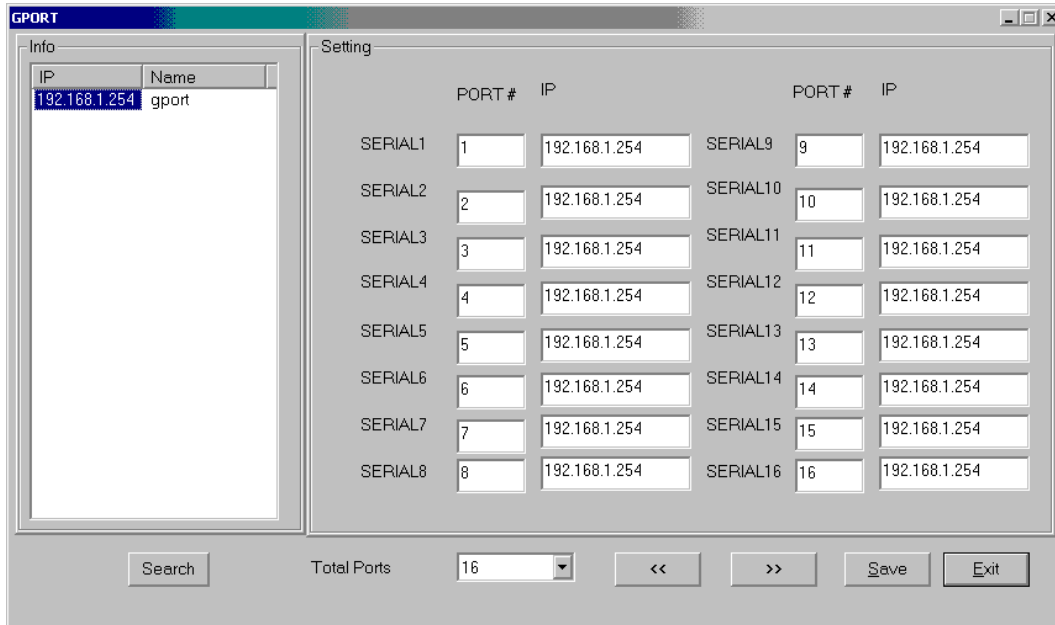
*****Please keep in mind that you must remove old version driver firstly. Then you can install our new version driver.*****

4-2 How to set GPORT as COM port.

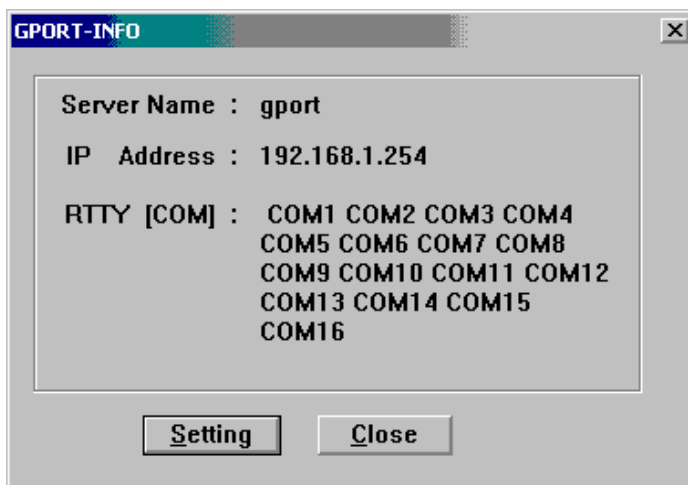
When we need to set GPORT as COM port in Windows system, we need to run "aport_ap.exe".



When we run "aport_ap.exe", we will see the setup screen for serial port. In the left side of screen is "Info" display for all GPORT connected to LAN. We can double click "Search" to find all GPORT connected to LAN. We will show all GPORT connected to LAN with IP address and Server name.

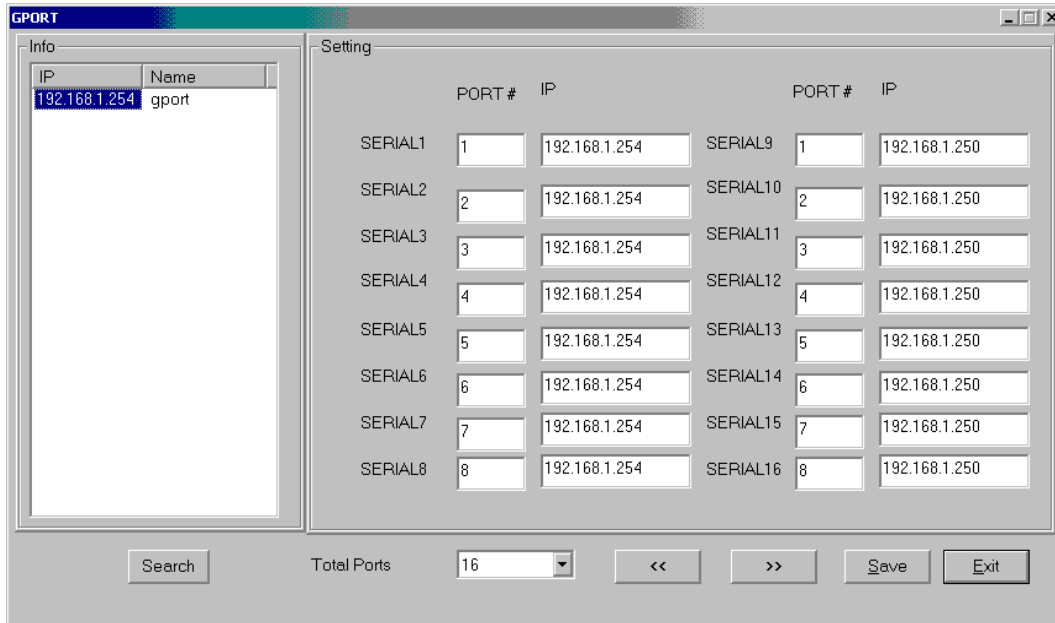


If we selected one IP address and double click, we will see the "RTTY COM" mode in this GPORT box. The serial port in GPORT box to be set in "RTTY COM" mode will be displayed as COM1--COM16 (corresponding to serial port 1--16 in GPORT box). If you need to setup this GPORT box, you can click "Setting" to connect with GPORT box via HTTP.



In the right side of screen is "Setting" display for virtual COM port in Windows system. Here we can set serial1--serial64 to map in GPORT box. Because we can only have 16 serial port information displayed in screen. We can use "<<" or ">>" column to set other serial port. In each virtual COM port for Windows system we need to set the map value of target GPORT box's IP address and serial port number (1--16). The "PORT #" column in display will be assigned the serial port number in GPORT box.

In the right side of screen is "Setting" display for virtual COM port in Windows system. Here we can set serial1--serial16 to map in GPORT box. Because we can only have 16 serial port information displayed in screen. We can use "<<" or ">>" column to set other serial port. In each virtual COM port for Windows system we need to set the map value of target GPORT box's IP address and serial port number (1--16). The "PORT #" column in display will be assigned the serial port number in GPORT box.



When we had set the information of GPORT for each serial port, we need to save. In next boot procedure we can have virtual COM port available.

Chapter 5
Windows 2000/XP/2003/Vista Installation

5-1 Driver Installation

There are two components in Windows system virtual COM driver installation. One is the driver. The other is the configuration file for GPORT.

In our CD you can find following files under WIN2000 driver directory.

- a)APORT_AP.EXE ==> parameter setting file.
- b)APORTB.SYS ==> GPORTIOP box driver
- c)APORTP.SYS ==> GPORTIOP serial port driver
- d)APORTRUI.DLL ==> setup file for GPORTIOP driver.
- e)R2KPORT1.INF ==> installation file for GPORTIOP box driver.
- f)R2KPORT2.INF ==> installation file for GPORTIOP serial port driver.

Please run "aport_ap.exe" file firstly. We can set the target total port number of serial port need to be installed in this system. Currently we can set 1 upto 64 serial ports. Then we need to set the target IP address of GPORT box and serial port number in this GPORT for each serial port. We can use "search" function to find the IP address of each GPORT box available in your network.

Now we can start to install our driver in "control panel". Following procedure is used for ver3.0.0 later driver.

*****Please keep in mind that you must remove old version driver firstly. Then you can install our new version driver.*****

5-2 How to set GPORT as COM port.

When we need to set GPORT as COM port in Windows system, we need to run "aport_ap.exe".

When we run "aport_ap.exe", we will see the setup screen for serial port. In the left side of screen is "Info" display for all GPORT connected to LAN. We can double click "Search" to find all GPORT connected to LAN. We will show all GPORT connected to LAN with IP address and Server name. If we selected one IP address and double click, we will see the "RTTY COM" mode in this GPORT box. The serial port in GPORT box to be set in "RTTY COM" mode will be displayed as COM1--COM16 (corresponding to serial port 1--16 in GPORT box). If you need to setup this GPORT box, you can click "Setting" to connect with GPORT box via HTTP.

In the right side of screen is "Setting" display for virtual COM port in Windows system. Here we can set serial1--serial64 to map in GPORT box. Because we can only have 16 serial port information displayed in screen. We can use "<<" or ">>" column to set other serial port. In each virtual COM port for Windows system we need to set the map value of target GPORT box's IP address and serial port number (1--16). The "PORT #" column in display will be assigned the serial port number in GPORT box.

When we had set the information of GPORT for each serial port, we need to save. In next boot procedure we can have virtual COM port available.

5-3. Installation procedure in WIN2000 system

- a) In "control panel" we can click "Add/Remove Hardware" to select "Add/Troubleshoot a device".
- b) Then WIN2000 system will start "New hardware Detection". We will select "Add a new device" and it is "No, I want to select the hardware from a list". Now we choose the type "Multi-port serial adapters" and use "have disk" to install driver.
- c) We will specify the path for our driver (ex., A:\WIN2000) and system will show "RAYON GPORT IOP Driver" for your choice.
- d) After we choose "RAYON GPORT IOP Driver", the driver installation procedure start. We will install serial port driver automatically.
- e) After the driver installation procedure is finished, we can check "Device Manager" to find the COM port number for each serial port in GPORT. It will be no confliction with other device. Because P&P manager can handle such condition. If the COM port number assigned value did not meet our target, we can also modify such value in "RAYON GPORT IOP Driver" setup.

5-4. Installation procedure in WIN XP system

- a) In "control panel" we can click "Add Hardware" and select "Yes, I have already connected the hardware".
- b) Now we will specify "Add a new hardware device" and choose "Multi-port serial adapters".
- c) We use "have disk" method to install driver. Now we need to specify correct path for driver (ex., A:\WIN2000) to install.
- d) System will find "RAYON GPORT IOP Driver". We will choose this one and start to install driver.
- e) After "RAYON GPORT IOP Driver" driver installed, we will start to install driver for every serial port.

5-5. Installation procedure in Windows Vista system

- a) In "control panel" we can click "Add Hardware" and select "Install the hardware that I manually select from a list (Advanced)".
- b) Now we can choose "multi-port serial adapters" and "have disk".
- c) We need to specify correct path for driver (ex., A:\WIN2000).
- d) System will find "RAYON GPORT IOP Driver". We will choose this one and start to install driver.
- e) then we will start to install driver for each serial port.

5-6. Special consideration in Windows Vista system

- a) When we need to run "aport_ap.exe", we must use "Run as administrator" mode to run. If we did not use such mode to run, then all the setting is no use.
- b) Because Vista system may have "firewall" to block IP access to GPORT box. We can use the "search" function in "aport_ap.exe" to find GPORT box. The "firewall" will ask us to enable GPORT IP address access or not. We must enable GPORT IP access. Then our GPORTIOP driver will be run without problem.

5-7.The problem for "service name is used"

- a)If we did not remove old version GPORTIOP driver and start to install ver3.0.0 driver, then we may have "service name is used" problem. Or the system may be "blue screen" and reboot.**
- b)In "blue screen" and reboot condition we may always have same problem in normal mode boot procedure. So we must use "safe mode" boot procedure.**
- c)After boot we can enter "device manager" to remove the driver for "RAYON GPORT IOP Driver". Then we need to reboot in normal mode.**
- d)Now we need to remove old version GPORTIOP driver and reboot.**
- e)Now we can install our ver3.0.0 driver without problem.**

Chapter 6
UNIX/Linux system fix TTY GVMODEM driver Installation

6-1. Procedure in GPORT box

a) we need to set serial port in REALTTY mode and set in "GVMODEM".

6-2. Procedure in UNIX & LINUX system

a) you may get "gvmodem_???.tar" driver package from CD.

It is gvmodem_linux.tar for Linux system directory.

It is gvmodem_sco.tar for SCO UNIX system directory.

b) Please create one directory "/etc/gtstcpd" for this driver.

c) please extract "gvmodem_???.tar" in this directory

tar xvf gvmodem_???.tar (it may be gvmodem_linux.tar for LINUX)

d) Now, we need to modify "gtstcpd.cf" file. This is the most important thing in driver. Because we need to fix every pseudo TTY device to its IP address and serial port number for GPORT box.

e) You need to input all data as following format.

R /dev/ttyp?? GPORT_IP GPORT_SERIAL_PORT_NUMBER

For example, you need to set the serial port number 1--4 as device name /dev/ttyp[1--4] and your GPORT with IP 192.168.1.3. So you may have following text line in "gtstcpd.cf" file.

R	/dev/ttyp1	192.168.1.3	1
R	/dev/ttyp2	192.168.1.3	2
R	/dev/ttyp3	192.168.1.3	3
R	/dev/ttyp4	192.168.1.3	4

f) Now you can run following command to enable "gvmodem" daemon to fix the pseudo TTY for each serial port.

./gtstcpd.rc start

g) Then you can use following command to confirm every process enabled.

ps -ef | grep gvmodem

h) So you can modify "/etc/inittab" to add "ttyp??" device and enable.

i) If you did not need to run such driver, you can run following command to stop it.

./gtstcpd.rc stop

j) You can also let "gtstcpd" to be run in boot procedure.

In Linux system it may be put in /etc/rc.d/rc.sysinit

In SCO system it may be put in /etc/rc2.d

For more information or problem you can send mail to rayon@ms1.hinet.net
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Chapter 7
SCO OpenServer real TTY RTTY driver Installation

7-1. Procedure in GPORT

- a) we need to set serial port in REALTTY mode and set in "COM".

7-2. Procedure in SCO UNIX system

- a) you may get "rtty100.tar" driver package from CD.
- b) Please create one directory for this driver.
ex., /etc/gport
- c) please extract "rtty100.tar" in this directory
tar xvf rtty100.tar
- d) you will have "rtty100" directory in this directory.
- e) please goto "rtty100" directory and run "install" to install driver.
- f) you will be asked to modify "nasd.rc" file. In this file you need to specify IP address for each GPORT. You will have box number for each GPORT. We can accept 1--16. It means that we can have upto 16 GPORT in this SCO UNIX system.
- g) after driver installation we will have "S99nasd" process in directory /etc/rc2.d and it will be run automatically in boot procedure.
- h) if you did not need to enable REALTTY driver now, you can remove above process. When you need to enable REALTTY driver later, you can run /etc/nasd.rc to activate.

7-3. The device name for GPORT

- a) the device name for each serial port in GPORT is
/dev/tty[01--16][a--p]
- b) [01--16] is the box number defined in nasd.rc file
- c) [a--d] is the serial port 1--4 in GPORT104.
[a--h] is the serial port 1--8 in GPORT108.
[a--p] is the serial port 1--16 in GPORT116.
- d) ex., we have one GPORT104 with IP address 192.168.1.3 to be defined in "nasd.rc" file as "1" box number. So we have following device name for each serial port in GPORT104.
serial port 1 is /dev/tty01a
serial port 2 is /dev/tty01b
serial port 3 is /dev/tty01c
serial port 4 is /dev/tty01d

We may have following command line in "nasd.rc" file.
/etc/nasd 192.168.1.3 1 &

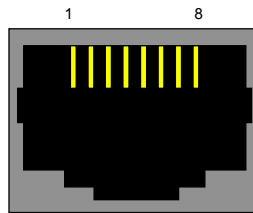
For more information or problem you can send mail to rayon@ms1.hinet.net
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**Appendix A
Pin assignments and Cable Wiring**

A-1: GPORT104 console port RJ45 Connector Pin assignment

We can use GPORT500 cable to convert RJ45 connector to DB9 female connector. The DB9 female connector pin definition is as following:

The console port of GPORT is formatted as RJ-45 connector. You can use the 8-lines cable to easily arrange your serial lines. The pin assignment of RJ-45 is described as follow.



RJ45 female connector

RJ45 Pin #		Signal Name	Direction
2	RxD	Receive Data	Input
3	TxD	Transmit Data	Output
5	SGND	Signal Ground	Common

RJ-45 pin assignment

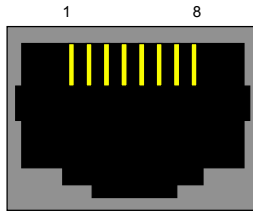
We can use GPORT500 cable to convert RJ45 connector to DB9 female connector. The DB9 female connector pin definition is as following:

DB9F Pin #		Signal Name	Direction
2	TxD	Transmit Data	Output
3	RxD	Receive Data	Input
5	SGND	Signal Ground	Common

A-2 : GPORT104 serial port DB9 male connector Pin assignment

9-pin serial port (DB9M)		
Pin No.	Features	Abbr.
1	Data Carrier Detection	DCD
2	Receive Data	RXD
3	Transit Data	TXD
4	Data Terminal Ready	DTR
5	Ground	GND
6	Data Set Ready	DSR
7	Request to Send	RTS
8	Clear to Send	CTS
9	RING	RI

A-3: GPORT108/116 console port RJ45 Connector Pin assignment



RJ45 female connector

RJ45 Pin #		Signal Name	Direction
3	TxD	Transmit Data	Output
5	SGND	Signal Ground	Common
6	RxD	Receive Data	Input

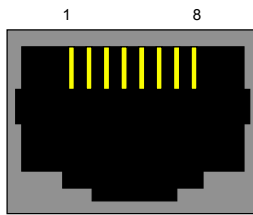
We can use GPORT501 cable to convert RJ45 connector to DB9 female connector. The DB9 female connector pin definition is as following:

DB9F Pin #		Signal Name	Direction
2	TxD	Transmit Data	Output
3	RxD	Receive Data	Input
5	SGND	Signal Ground	Common

Note: The direction for output is data transmit out from GPORT.

Note: The direction for input is data receive in to GPORT.

A-4: GPORT108/116 serial port RJ45 Connector Pin assignment



RJ45 female connector

RJ45 Pin #	Features	Signal Name	Direction
1	RTS	Request to Send	Output
2	DTR	Data Terminal Ready	Output
3	TxD	Transmit Data	Output
4	SGND	Signal Ground	Common
5	DSR	Data Set Ready	Input
6	RxD	Receive Data	Input
7	DCD	Data Carrier Detect	Input
8	CTS	Clear to Send	Input

We can use GPORT502 cable to convert RJ45 connector to DB25 male connector. Or we can use GPORT503 cable to convert RJ45 connector to DB9 male connector. The DB9 and DB25 male connector pin definition is as following:

GPORT503	GPORT502			
DB9 Pin #	DB25 Pin #	Features	Signal Name	Direction
3	2	TxD	Transmit Data	Output
2	3	RxD	Receive Data	Input
7	4	RTS	Request to Send	Output
8	5	CTS	Clear to Send	Input
6	6	DSR	Data Set Ready	Input
5	7	SGND	Signal Ground	Common
1	8	DCD	Data Carrier Detect	Input
4	20	DTR	Data Terminal Ready	Output

Appendix B
How to use SDK

1. When the default function for GPORT can not meet customer's specific application. RAYON offer SDK for customer to develop their dedicated software to meet their target application.
2. In this condition GPORT box will be as one Linux system with LAN port and four/eight/sixteen serial port.
3. Following is the development environment
 - a) User need to prepare one console terminal to connect with console port of GPORT box. This console terminal will use 115200bps, no parity, 8 data bit, 1 stop bit, no flow control.
 - b) User need to prepare one PC Linux system to install cross-compiler. Our SDK offer whole tools to generate image file for GPORT.
4. How to install cross-compiler in your Linux PC host
 - a) use "superuser" to login or use "su" command to enter superuser mode.
 - b) change to root directory
#cd /
 - c) tar our package to your system
#tar xvfz crossdev242_2418_bin.tar.gz

Note: In our CD you can find this file in SDK directory.
 - d) the package will be installed to directory /usr/gv242
 - e) add "/usr/gv242/bin" to "PATH=" environment.
 - f) modify "/etc/profile" to include
PATH="/usr/gv242/bin:\$PATH"
5. The major utility in Makefile
 - a) We must specify following definition in Makefile
 - b) CC=mipsel-linux-gcc
STRIP=mipsel-linux-strip
AR=mipsel-linux-ar
RANLIB=mipsel-linux-ranlib
LD=mipsel-linux-ld
6. Something you need to know in developing application program
 - a) the process in boot procedure
 - 1) /sbin/init will be executed after kernel start up.
 - 2) /etc/inittab will be executed upon existed.
 - 3) /etc/init.d/rcS will be executed.
 - b) Your application program to be set in /etc/inittab file
::respawn:/sbin/Your_Application_here

NOTE: You must run your daemon in FOREGROUND. If it was not in FOREGROUND, "init" thinks it is died and run it again.

c) You can set your application program in /etc/init.d/rcS to be auto start upon power on condition.

d) You can have your configuration files in /etc/init.d/cfg/*.cfg

e) There are some useful tools in following location

/bin/ftp : internet file transfer program

/bin/vi : text editor

/sbin/inetd and /sbin/in.telnet : listen for connection on certain internet sockets for TELNET protocol or not.

/sbin/insmod or rmmod or lsmod : kernel module operation.

7. How to let your normal GPORT serial device server to be Linux box.

a) Because the firmware in normal GPORT box is IP serial device server function. When you need to set GPORT box as normal LINUX system, you need to update the firmware in GPORT.

b) Because we need to protect everyone's software effort, so we let user to set "PRIVATE_KEY" in hardware of GPORT. All the software will be protected by this "PRIVATE_KEY" for illegal access.

c) In your PC LINUX host you will download "GPort116_SDK.tgz" file from our CD in SDK directory. (For GPORT104 you will get GPort104_SDK.tgz).

d) When you "tar" this file in root directory, you will have /GPort16_SDK directory (GPORT104 is /dev_GPort) in your system.

```
# cd /
```

```
# tar xvfz GPort116_SDK.tgz
```

```
# cd /GPort16_SDK
```

e) Now, you can check "creat_image.sh" file and to set your own "Private_Key" value here. (must give eight characters).

f) When you execute "creat_image.sh" , you will have your own Linux system image file. (it is gvlinux.hg file name).

g) Now, we need to let GPORT enter firmware upgrade condition.

1) We need to set your PC LINUX host with IP 192.168.1.111

2) We need to prepare one console terminal to connect with console port of GPORT box. The parameter is set as 115200bps, no parity, 8 data bit, 1 stop bit, no flow control.

3) We need to press "RESET" push button in GPORT box and turn on the power of GPORT box. Now you can see the message in console terminal as following

```
Enter Wait HG Command Mode....
```

```
LAN initialize.....
```

```
External RMII/MII DM9161 PHY, ID=0xb8810181
```

```
PHY Full Duplex mode
```

```
PHY Speed 100M
```

4) Then you can release "RESET" push button.

- 5) Now you need to run in PC LINUX host to update private_key in GPORT box for your own value

```
#!/update_hw_private_key Private_key
```

- 6) After this condition we had updated the private_key value in GPORT box as our target value.
NOTE: this value is set in above "creat_image.sh" file.

- 7) Now we will download the Linux image file to GPORT box.
- ```
tftp 192.168.1.254
Tftp> bin
Tftp> put gvlinux.hg
Tftp> q
```

NOTE: GPORT box in firmware upgrade mode will have IP address 192.168.1.254 and enter TFTP server mode.

- 8) After above procedure GPORT box will be as Linux system box. and you may see following information in console terminal.
- ```
kernel written  
kernel length=[635781]  
kernel chksum=[5265580]  
kernel update completed^_^  
done  
done
```

- 9) Now you can power on GPORT box again and you have LINUX box to be used.

NOTE: when you modify the firmware of GPORT box to be LINUX system box, you need special procedure to go back normal IP serial device server function.

NOTE: generally you can have upto 3Mbyte flash ROM area for your application program and data. You can have upto 8MByte SDRAM area for working process.

8. We can use FTP to put application file to GPORT box.

- a) We can use FTP to put application file generated in PC LINUX host to GPORT and execute it.

- b) If we had PC LINUX host with IP address 192.168.1.100.

- c) Following operation will be done in console terminal.

```
1) #cd /tmp =====> here is in RAMDISK of GPORT  
2) #ftp 192.168.1.100 =====> We need to get from PC LINUX host  
3) gvftp>bin  
4) gvftp>get application_program  
5) gvftp>quit  
6) #chmod +x application_program  
7) #./application_program
```

9. We can use NFS file system to mount in GPORT box.

- a) We can have one PC LINUX host with IP 192.168.1.100 to be setup as NFS server (of course you had setup to enable NFS server in your kernel configuration).
- b) Then you need to setup your PC LINUX host to allow GPORT to access.
 - 1) modify /etc/hosts to include GPORT IP (ex, 192.168.1.254) to access your NFS system.
 - 2) execute `exportfs -ra`
NOTE: `exportfs` normally is in /usr/sbin or /sbin.
NOTE: you can check /proc/fs/nfs/exports file to confirm the export action successfully.
 - 3) execute `/etc/rc.d/init.d/nfs start`
NOTE: we can use `/etc/rc.d/init.d/nfs status` to check current condition in NFS server.
- c) In GPORT site we can work as follow procedure.
 - 1) If we had application program in PC LINUX host on directory /usr/mnt/2417/nfsdir then we need to mount such directory in GPORT.
 - 2) `mount -t nfs -o nolock 192.168.1.100:/usr/mnt/2417/nfsdir /mnt`
 - 3) Now, you can access any files in /mnt directory of GPORT.

10. How to build you private Linux system to include dedicated application

- a) When you had finished to develop your application program. Then we can bind this application program to Linux image file.
- b) Now you can create your own directory in /GPort16_SDK/rootfs_gport_sdk directory (ex., /GPort16_SDK/rootfs_gport_sdk/RAYON). Then we can put all private application program in this directory.
- c) Then we can run "`creat_image.sh`" to generate "vmlinux.hg" file.
- d) Now you need to update image file of GPORT as above procedure.
- e) When the GPORT is power on again. You can check your application program in console terminal.
`cd /RAYON` =====> the directory name we set in above b) step.
`ls -l` =====> to confirm your files here.

11. How to chage back your LINUX box to normal IP SERIAL ROUTER.

- a) One day you may find our IP SERIAL ROUTER firmware is better than your application program. Or you may just need to use GPORT as training kit for LINUX system. So you need to use GPORT box in our normal application. Then you need to recover your GPORT in factory default condition.
- b) You need to open the top cover of GPORT box.
- c) You need to short the jumper in J1 location. (For GPORT104 box it is in J3 location).

- d) Turn on the power of GPORT. Of course you may see something wrong in console terminal. Don't care such message.
- e) Now you can follow the firmware upgrade procedure as normal condition.
 - 1) You can get newest version firmware from www.rayontech.com
 - 2) You need to press "RESET" push button switch in GPORT box and turn on power. Then GPORT will enter firmware upgrade mode. It is in TFTP server mode. And the IP is 192.168.1.254 for GPORT box now.
 - 3) You need to set your PC with IP 192.168.1.111. Then you can use TFTP to send new image file to GPORT box. In Windows system you may run "wftft8.exe". In LINUX/UNIX you may run "tftp".

For more information or problem you can send mail to rayon@ms1.hinet.net
#####

Appendix C
How to upgrade firmware in GPORT

C-1. Procedure in GPORT box.

- a) prepare one console terminal to connect with console port in GPORT.
- b) we need to set this terminal in 115200bps, no parity, 8 data, 1stop.
- c) press the "reset" push button in GPORT box's front panel and turn on the power for GPORT to enter firmware upgraded mode.
- d) When you see "Enter Wait HG Command Mode" message in your console terminal, you can release the "reset" push button.

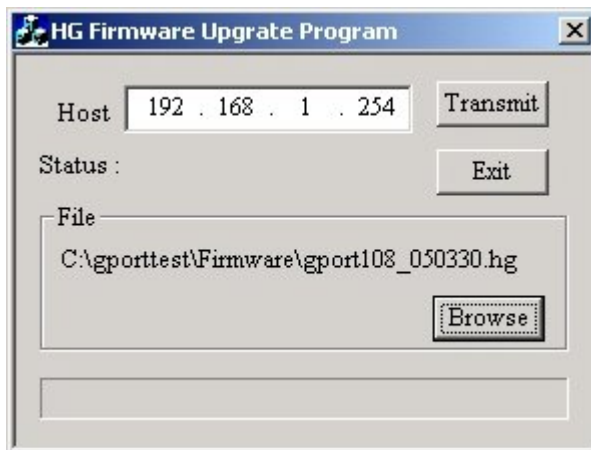
NOTE: If you did not have console terminal to connect, you can not confirm GPORT is ready in firmware upgraded mode. You need to wait about three minutes to release push button.

NOTE: GPORT is in tftp server mode and wait tftp client device to send firmware image file to GPORT.

NOTE: GPORT is in tftp server mode with IP 192.168.1.254. Please confirm there are no other device with this IP and your system can reach this IP address.

C-2. Procedure in Windows environment

- a) Please set your Windows system with IP address in 192.168.1.111
- b) you may get new firmware image from CD or your supplier.
It may have file name as gport116_050330.hg
- c) you may have our utility with file name as "wftp8.exe" in our CD's firmware directory.
- d) you just need to run "wftp8.exe".
- e) you can specify to download the new firmware image file "gport116_050330.hg" and start to send.



NOTE: our GPORT in this firmware upgraded condition always have IP address in 192.168.1.254. So it is good for this environment just GPORT and Windows system in LAN.

C-3. Procedure in UNIX/LINUX environment

- a) Because GPORT is in tftp server condition, so we just need to run tftp client procedure.
- b) tftp 192.168.1.254
tftp> binary
tftp> put gport116_050330.hg

C-4. How to confirm you have new firmware version

- a) We can enter WEB setup (the new firmware may have default IP address 192.168.1.254 and password 11111).
- b) In "system" "status" you can see the firmware version display.

For more information or problem you can send mail to rayon@ms1.hinet.net
#####

Appendix D
Troubleshooting procedure for GPORT

1. Please confirm your GPORT with correct power input.
We can check the POWER LED in front panel turned ON upon power on.
2. Please connect one terminal to console port.
Because GPORT box is based on Linux system. So we can see the console out message for Linux boot procedure.
3. Please confirm the LAN connection is reachable.
Generally we will use "ping" function to confirm.
4. The serial port data transmission is correct or not.
In each serial port we have LED display to indicate data transmit or receive condition.
5. In WEB setup screen we can check the serial port data transmission condition.
6. Q: When we use "Hyperterm" as console port terminal, we can not have correct display.
A: Please use "Hyperterm" as following setting
Function,arrow & ctrl key ==> Terminal keys.
Backspace Key ==> Ctrl+H
VT100 emulation
ASCII sending ==> no special setting
ASCII receiving ==> no special setting.

Appendix E
RAYON REPAIR PROCEDURE

1. RETURN MATERIAL AUTHORIZATION (RMA or RA)

RAYON requires that you provide the following information :

- * Model number
- * RAYON serial number
- * The reason for returning the products

```
#####
# We strongly suggest that you can check with RAYON by E_mail before #
#you can confirm the reason for returning the products. Because some #
#problem may be due to wrong software usage or setup only #
# rayon@ms1.hinet.net #
#####
```

- * Your purchase-order number

You will be given the following information from your RAYON Service Representative:

- * Your Return Material Authorization Number (RMA or RA Number)
- * Information regarding applicable charges
- * The address to which you will return the products

2. REPAIR CHARGES

All RAYON products have a one year warranty. Products that are damaged or modified are not covered.

This limited warranty covers defects in materials and workmanship in your RAYON-branded hardware products. This limited warranty does not cover problems that result from:

- *external causes such as accident,abuse,misuse,or problems with electrical power.
- *Servicing not authorized by us.
- *Usage that is not in accordance with product instructions.
- *Failure to follow the product instructions or failure to perform preventive maintenance.

Products that are covered under the original warranty and that are found defective by RAYON will be repaired at no cost. A standard handling and testing charge will be assessed for products returned for warranty repair that are found to be operating properly.

Products that are no longer covered under warranty will be repaired, if deemed repairable, for a flat rate charge regardless of the repair work required.

Please contact the nearest RAYON Service Center for current pricing information.