

HYPERVERSOR VI

Central Monitoring System

Service Manual

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Contact Information

Manufacturer: Shenzhen Mindray Bio-Medical Electronics Co., Ltd.
Address: Mindray Building, Keji 12th Road South, Hi-tech Industrial Park, Nanshan, Shenzhen 518057 P.R. China
Tel: +86 755 26522479 +86 755 26582888
Fax: +86 755 26582500 +86 755 26582501
Website: www.mindray.com.cn

EC-Representative: Shanghai International Holding Corp. GmbH (Europe)
Address: Eiffestraße 80, 20537 Hamburg Germany
Tel: 0049-40-2513175
Fax: 0049-40-255726

Safety Precautions

1. Meaning of Signal Words

In this service manual, the signal words  **DANGER**,  **WARNING**,

 **CAUTION** and **NOTE** are used regarding safety and other important instructions.

The signal words and their meanings are defined as follows. Please understand their meanings clearly before reading this manual.

DANGER

- Indicates an imminent hazard situation that, if not avoided, will result in death or serious injury.
-
-

WARNING

- Indicates a potential hazard situation or unsafe practice that, if not avoided, could result in death or serious injury.
-
-

CAUTION

- Indicates a potential hazard or unsafe practice that, if not avoided, could result in minor personal injury or product/property damage.
-
-

NOTE

- Provides application tips or other useful information to ensure that you get the most from your product.
-
-

2. Meaning of Safety Symbols

| Symbol | Description |
|---|--|
|  | Type-BF applied part |
|  | "Attention" (Refer to the operation manual.) |

3. Safety Precautions

Please observe the following precautions to ensure patient and operator safety when using this system.

CAUTION

- **Malfunctions due to radio waves**
- **Use of radio-wave-emitting devices in the proximity of this kind of medical electronic system may interfere with its operation. Do not bring or use devices which generate radio waves, such as cellular telephones, transceivers, and radio controlled toys, in the room where the system is installed.**
- **If a user brings a device which generates radio waves near the system, they must be instructed to immediately turn OFF the device. This is necessary to ensure the proper operation of the system.**
- **Do not allow fluids such as water to contact the system or peripheral devices. Electric shock may result.**

DANGER

- **Do not use flammable gasses such as anesthetics, or flammable liquids such as ethanol, near this product, because there is danger of explosion.**

WARNING

- **Do not connect this system to outlets with the same circuit breakers and fuses that control current to devices such as life-support systems. If this system malfunctions and generates an overcurrent, or when there is an instantaneous current at power ON, the circuit breakers and fuses of the building's supply circuit may be tripped.**
-
-

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1 Introduction

1.1 Overview

HYPERVISOR VI Central Monitoring System (CMS) is intended for professional physicians or paramedics to conduct centralized monitoring over multiple patients monitored by individual monitors in hospitals or medical institutions.

The central monitoring system comprises powerful system software and high-performance computer. It constructs a monitoring network by connecting monitors. By collecting, processing, analyzing and outputting the information coming from monitors, the central monitoring system can achieve centralized monitoring over multiple patients so as to greatly promote the efficiency and quality of the monitoring work.

The central monitoring system:

- Is capable of connecting up to 64 monitors that supports the CMS or CMS+ network protocol.
- Is capable of connecting up to 16 telemetry transmitters and supporting 1-16 transmitter frequency configurations.
- Supports multi-screen display mode, including two primary displays and multiple secondary displays.
- Is capable of displaying information from 16 monitors in the single-screen mode and 32 monitors in the dual-screen mode.
- Allows you to view a single patient emphatically.
- Allows you to review up to 240 hours of trend data for each online patient.
- Allows you to review up to 720 alarm events for each online patient.
- Allows you to save and review a 4-hour dynamic short trend for each online patient.
- Allows you to review up to 720 CO measurements for each online patient.
- Allows you to review up to 72 hours of 64 waveforms.
- Allows you to review up to 720 NIBP measurements for each online patient.
- Allows you to search for, review and maintain the data of up to 20,000 history patients.
- Provides the patient information management function.

- Provides four alarm indications: audible alarm, visual alarm, alarm icon and alarm message.
- Provides the functions of drug calculation, titration table calculation and hemodynamics calculation.
- Provides the functions to record, print and save data.
- Provides comprehensive help information, prompts and operational guide.
- Supports 1280×1024 high display resolution.
- Facilitates the setup of language, waveform and parameter color.
- Supports such peripherals as the keyboard, mouse, thermal recorder, laser printer, speaker, etc.
- Supports wire and wireless network.

The central monitoring system has a USB watchdog to protect the copyright. You must plug the watchdog into the system's USB interface before starting the system. Otherwise, the system cannot start.

1.2 System Components

Hardware components of the central monitoring system should be highly reliable and stable. The hardware components of your system should meet the following requirements at least.

| Components | Requirements |
|------------|---|
| System | Meet the IEC60950 requirements defined for ITE equipment, and Comply with CE low voltage directives (LVD) and EMC directives. |
| Host | PC compatible, with CE marking CPU: PIV 2.0GHz 256M RAM 40G Fixed Diskette Network card: 10M/100M Base-T, Ethernet 802.3, RJ45 interface 3 USB interfaces 1 serial port 1 parallel port; |
| Display | 1280×1024 17" TFT, with CE marking. |
| Mouse | PS/2 or other standard interface, with CE marking |
| Keyboard | PS/2 or other standard interface, with CE marking. |
| Recorder | Thermal array, serial port |
| Printer | HP LaserJet series, supporting A4 paper |
| Speaker | Internal speakers (of the computer or the display). |

NOTE

- The configuration above is for reference only.
-

2 Installation

2.1 About the installation of the Central Monitoring System

This installation guide is to introduce how to configure the machine from the very beginning to the state that the Central Monitoring System can be normally operated. The installation includes the following:

- CMOS configuration, partition and installation of Windows XP Professional
- Installation of display card, sound card, and network card drivers
- Installation of printer and recorder
- Installation of USB watchdog driver
- Fire Wall shutoff
- System adjustment
- Installation of MSDE
- Installation of the Central Monitoring System

NOTE

- **Although Windows is public software, due to the particularity of this system, it cannot be set up at one's disposal, even if the people is an expert for installation of Windows system. The relevant installation and setup must be performed in terms of this installation guide, to ensure the correct operation of the system.**
-

The following CDs are needed for the complete installation of the Central Monitoring System:

- Installation CD of Microsoft Windows XP Professional
- Driver CD components
- System software installation CD of the central monitoring system

2.2 Requirements on Environment

1. Hardware environment
 - CPU: above PIV 2.0 GHz.
 - Internal memory: above 256 M.
 - Hard disk: above 40G.
 - Display card, network card, sound card, COM port, USB port, printer, sound box.
 - Display: 17", 65535 color, display setting of 1280×1024.

NOTE

- **The selection of the display card depends on the mode of the central monitoring system. For the dual-screen function, select the dual-screen display card, and the two displays shall be of same type. The two displays are respectively connected to the “1” port and “2” ports of the dual-screen display card.**
-

2. Software environment
 - Operating system: Microsoft Windows XP Professional
 - Database: MSDE

2.3 Installation of Windows XP Professional

Prior to the installation of Windows XP Professional, CMOS shall be set up:

1. Set the administrator's password to "Hypernet" (pay attention to lower and upper case).
2. Set the system to boot from CD. However, after the system installation is completed, set the system to boot from the hard disk.

Select a specific language version of the operating system according to the user's requirement, and then use the installation CD of Windows XP Professional to initiate the installation. The procedures of the installation are shown as follows:

1. Create C partition, whose size is 10G, and the file system is NTFS. Partition the remaining space into D and E, and the space of E is 5G, and the file system is FAT32. The space left is D partition, and the file system is NTFS.
2. In the installation program of Windows, enter the names of the user and company: "Hypervisor" and "Company".
3. In the installation program of Windows, enter the name of the computer and Administrative Password: "HYPERVISORVI" and "Hypernet" (pay attention to lower and upper case).
4. In the components of Windows installation program, select the default installation.
5. After the system is installed, activate the operating system of Windows XP, either by means of telephone or network. Enter the screen of activation, and then select the mode of activation, and perform the operations according to the prompts.

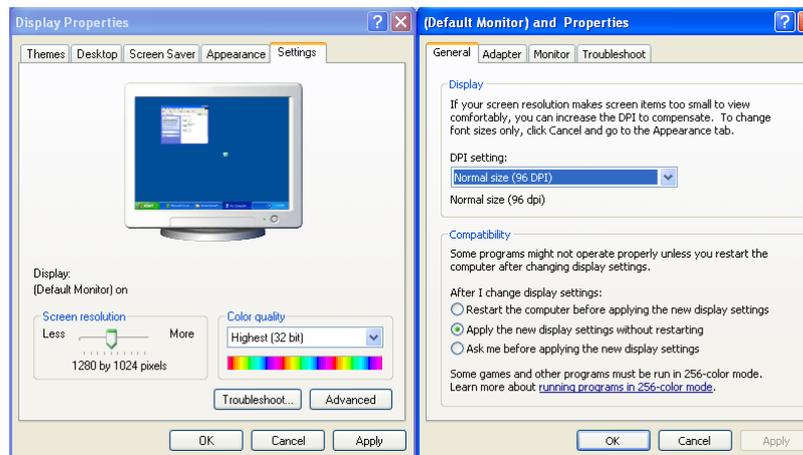
2.4 Installation of the Drivers

The installation of the drivers depends on the hardware.

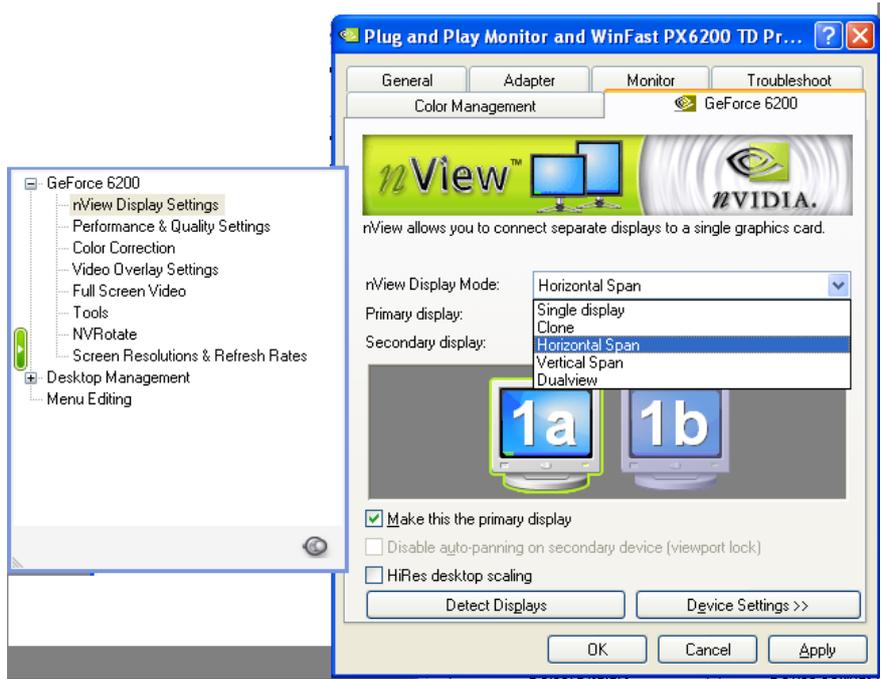
2.4.1 Driver of the display card

The installation of the display card driver depends on the modes of the central monitoring system. If it is single-screen, select the installation program of single-screen mode. If it is dual-screen, select the installation program of dual-screen mode.

In the single-screen mode, install the driver and restart the system, and then set the display properties. Right click the mouse in the Windows background, choose "Properties", go to "Display Properties", Set the color in the single-screen mode to real color (32 bits), and set the screen area to 1280×1024 in "Setting"; in the advanced options, set DPI to normal size in "General"; set the refresh frequency to 75Hz in "Monitor".



For the dual-screen mode, install the dual-screen display card, and then connect the display, and respectively connect the primary display and secondary display to the "1" port and "2" port of the dual-screen display card. After the driver is installed, restart the system, and set up the display properties. Right click mouse in the Windows background,, then choose "Propertie", go to "Display Properties", Set the color to real color (32 bits), and set the screen area to 1280×1024; in the advanced options, set DPI to normal size; set the refresh frequency to 75Hz, and set the display to horizontal span.

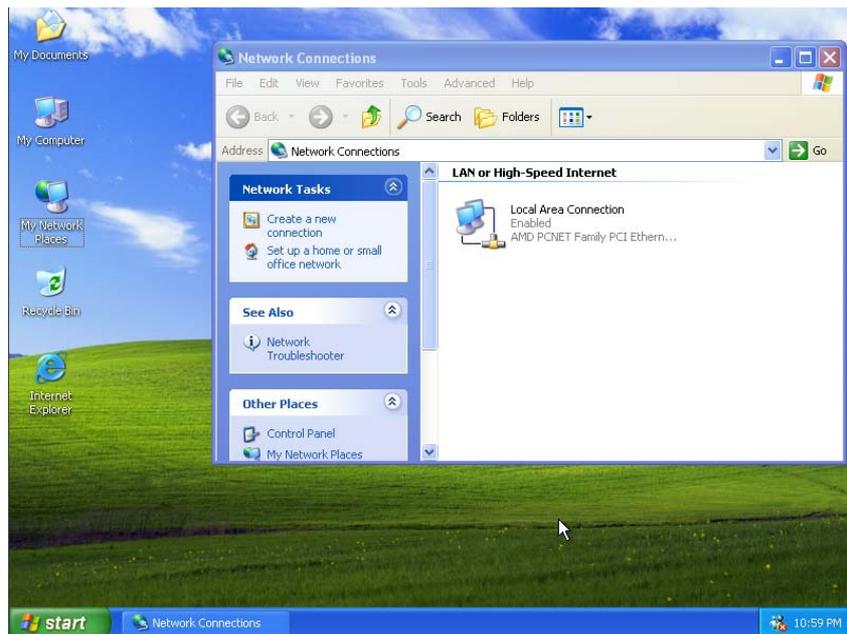


Note: The setting of display card is just for reference, there may be some difference according to different display card, for more information, please reference the your display card reference manual.

2.4.2 Driver of network card

Set the TCP/IP protocol after installation of the corresponding network card driver.

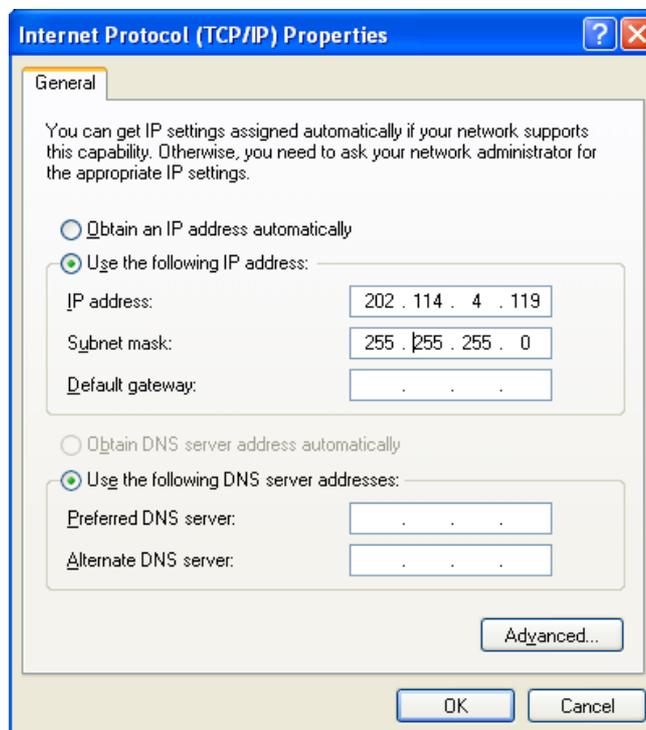
1. “Start”→”All Programs” →”Accessories” →”windows Explorer” go to windows explorer, right click the mouse, choose “Properties” in “My Network Places”, you can see:



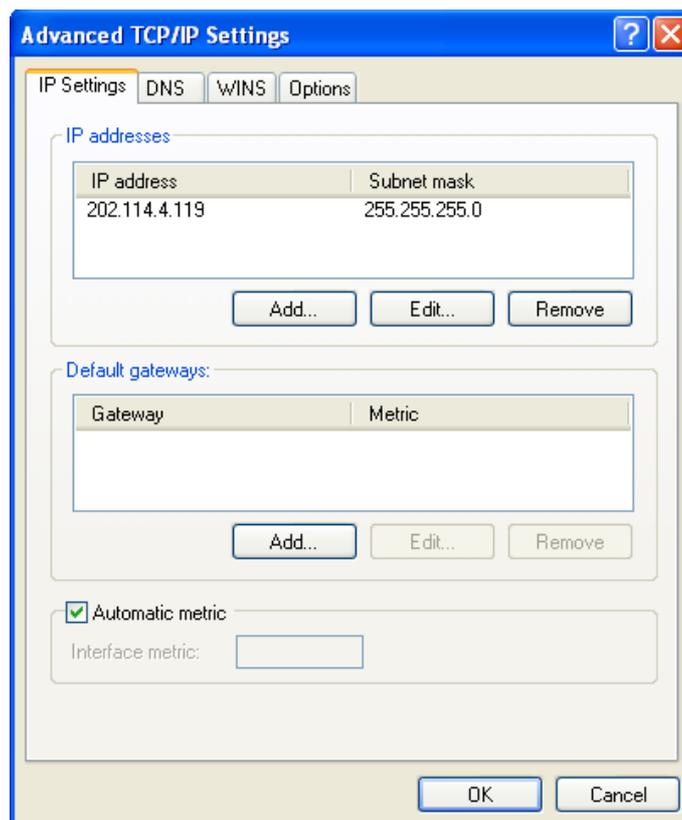
2. Choose “Local Area Connection”, then right click the mouse, and choose “Properties”,you can see the following interface:



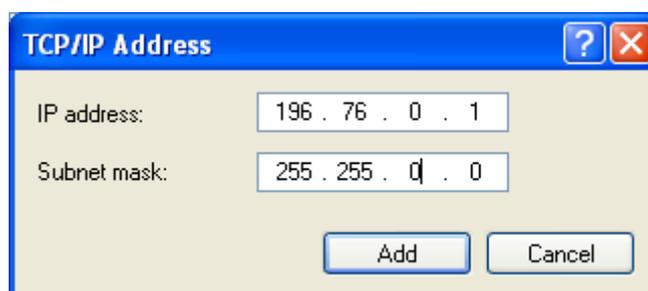
3. Choose “Internet Protocol (TCP/IP)”, click “Properties”, then you can see:



4. Set as the picture, click “Advanced...”, you can see:

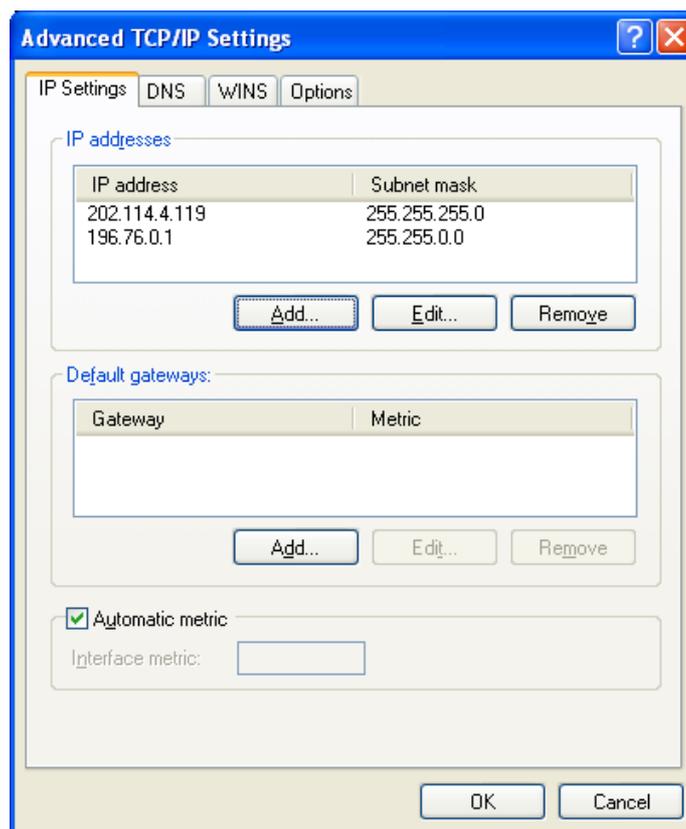


5. Click “Add...” bellow “IP addresses”, then you can see:



NOTE: Submask code for 196.76.0.1 must be 255.255.0.0

6. Click “Add”, return to the following interface:



7. Click “OK” to finish.

2.4.3 Driver of sound card

It only needs to install the driver, with no other setups required.

2.4.4 Installation of printer

After the driver of the printer is installed, set the name of the printer to HyperPrinter. The sharing mode is “No share”.

2.4.5 Installation of recorder

Since there isn't software driver for the recorder, the recorder will be directly driven by the central monitoring system.

2.4.6 Installation of USB watchdog driver

The USB watchdog driver is located at the USB directory in CD components of “the system software of the central monitoring system”. After the driver of USB watchdog is installed, insert the USB watchdog into the USB interface of the machine.

2.4.7 Shutoff of Windows XP Fire Wall

1. “Start”→”Control Panel” go to “Control panel”. Choose “Security Center”, you can see:



2. Choose “Windows Firewall”, you can see:



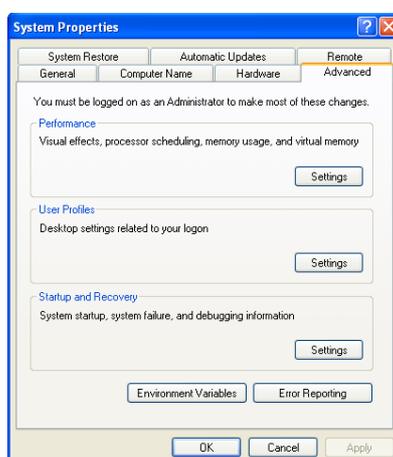
3. Set as the picture, click “OK” to finish.

2.5 Adjusting the System

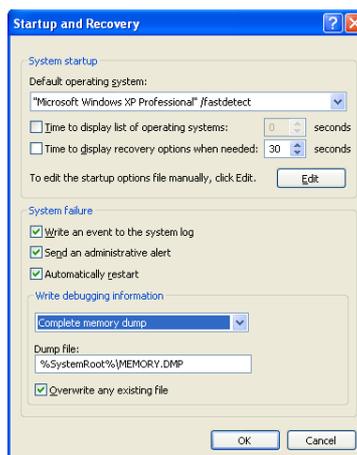
After the installation is completed, it is necessary to adjust some setups to ensure the normal operation of the system.

2.5.1 Setting the time delay of the system startup and recovery

1. “Start”→”Control Panel”
2. Go to ”Performance and Maintenance” then choose “System”, open” Advanced”, you can see:



3. Click setting “Startup and Recovery”, you can see:

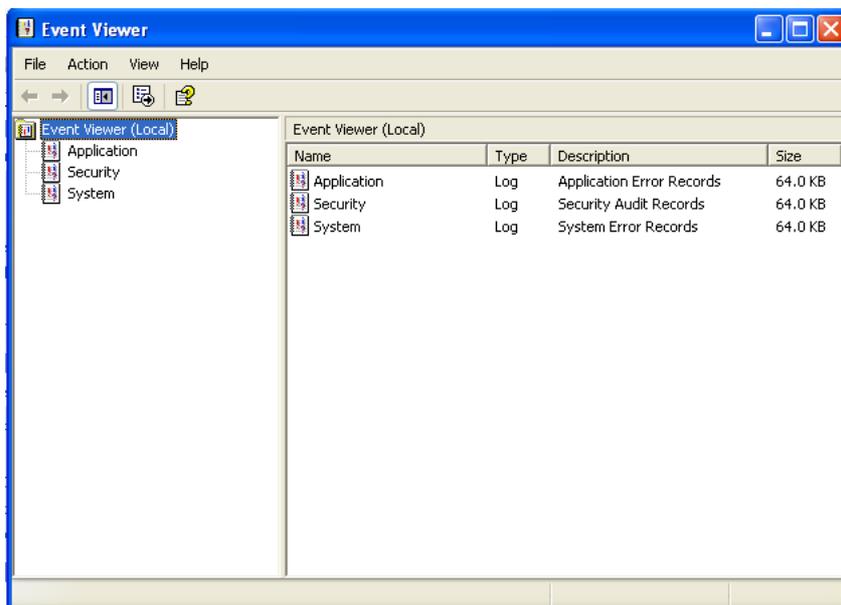


4. Set as the picture, click “OK”.

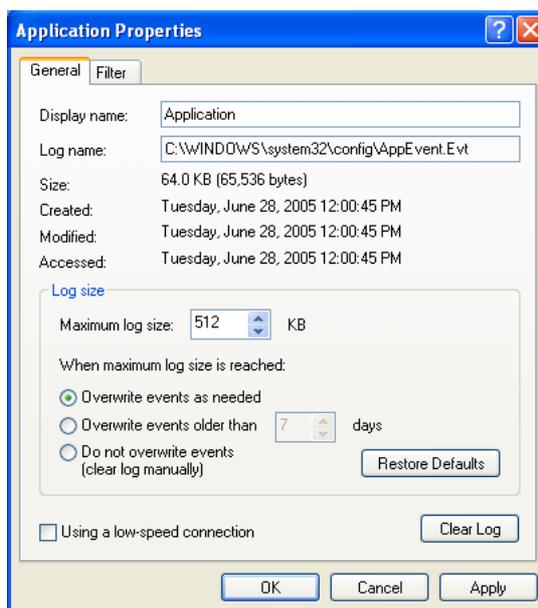
2.5.2 Overwriting Mode of Log Files

1. Go to “Start”→”Control Panel”.

2. Choose “Performance and Maintenance”, the choose “Administrative Tools”, open “Event Viewer”,you can see :



3. Choose”Application” “Security””System”seperately, right click mouse, choose “Properties”, you can see:



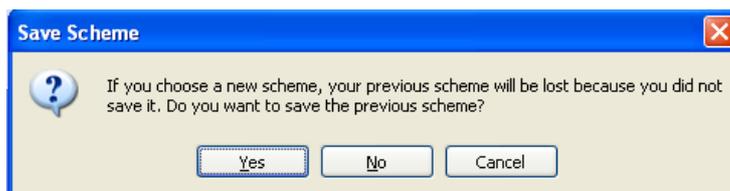
4. Set “System” ”Security” “Application” log siz to “Overwrite events as needed” seperately..

2.5.3 Disabling sound

1. Go to “Start”→”Control Panel”
2. Choose “Sounds,Speech,and Audio Devices”,choose “Sounds and Audio Devices”, open “Sounds”, you can see::



3. Set as the picture, then there will be a pop up window:

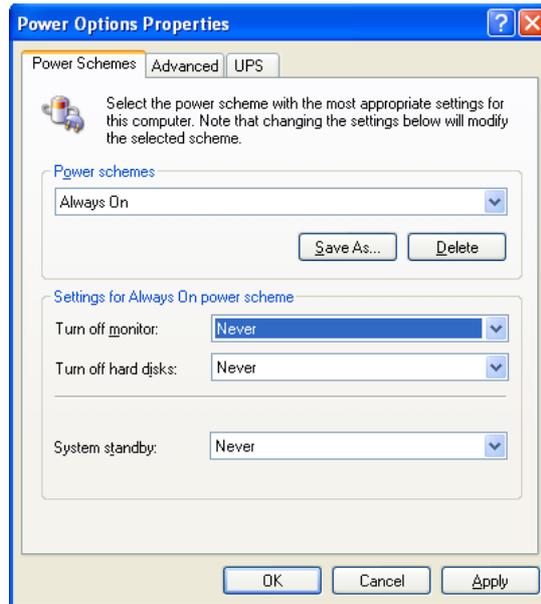


4. Click “No”, then click “Ok”.

Note: After finish setting, there should not a shape of small speaker befor any of the item.

2.5.4 Setting Power Management Property

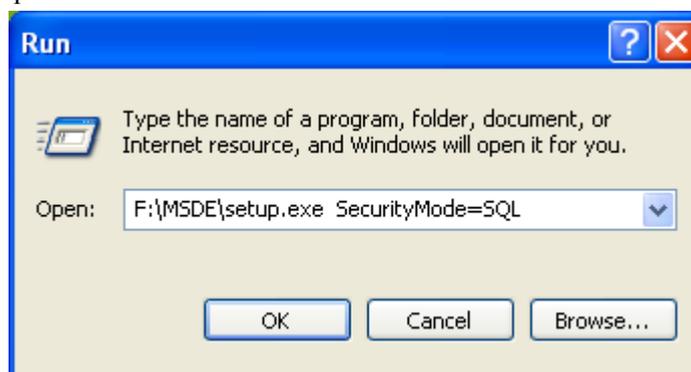
1. Select “Start”→”Control Panel” go to “control pannel”
2. Choose “Performance and Maintenance”, then choose “Power Options”, you can see:



3. You can set as the up picture., then click “OK”.

2.6 Installation of MSDE

After the operating system of Windows XP Professional is installed, and restarted, installation of MSDE can be started if the system is normal. The central monitoring system needs the support of database, so the system is applied with the MSDE database system. MSDE is located at the MSDE directory of CD components of “the system software of the central monitoring system”. Enter “Start” → “Run” → “X:\MSDE\setup.exe SecurityMode=SQL”, As show in the picture (in the “Run” dialog box, enter CD to select setup.exe by the Browse button, input the SecurityMode=SQL manually) . X represents the installation CD symbol of MSDE 2000. Click “OK” to start the installation, and restart the system after the installation is completed.



NOTE

- You can not click setup.exe to insall.
 - In the “Run” column, do not forget to input “SecurityMode=SQL”.
-

2.7 Installation of the Central Monitoring System

For the system software installation of the central monitoring system, first copy all files under the setup directory of “the system software of the central monitoring system” CD to the D partition, and then run the configuration program “HyperVI Config Tool.exe”, and select the language and the name of the OEM company. Finally a new “setup” folder is generated in this folder, and then run the installation program in this newly generated folder. During installation, it only needs to select the default language of the central monitoring system, and input the names of hospital and office, and then the database is generated. For other options, install as defaulted.

After the installation is completed, delete the copied “setup” folder and all files under it.

NOTE

- **If you select the generation of the database, the data in the database will be deleted. If you only want to resume the software of the central monitoring system, it is not necessary to select the generation of the database, thus the previous data can be remained. But if it is your first time to install the software of the central monitoring system, you must select the generation of the database.**
 - **For the background wallpaper of single- or dual-screen, enter the installation directory of the central monitoring system and select “1280X1024” or “2560X1024” (depending on the single-screen or dual-screen mode), and select “Layout” for the wall paper display. Set the screen saver to “None”.**
-

3 Quick Recovery

3.1 Overview

This guide is intended for quick recovery installation of the central monitoring system, so as to restore the system to its initial factory configuration.

3.1.1 Application Scope

It is a must to confirm the cause of system failure before using this tool. If the system failure relates to hardware, this tool will be inapplicable. For example, the computer cannot be started due to hard disk fault. In this case, you must replace the hard disk before re-installing the operating system and the CMS software.

If the system failure relates to software (including the operating system and CMS software) and the partition of the hard disk still meets the factory requirements, this tool will be applicable.

3.1.2 Precautions

All files used for quick recovery installation are saved under Disk E; therefore, any operation on the E partition by the user is forbidden:

Deleting a file

Adding a file

Modifying a file name

Formatting

Changing a drive symbol

Format of partition. The E partition must be in the FAT32 format whereas the C and D partitions must be in the NTFS format.

Changing the hard disk partition information, including drive symbol for each partition, format and size of partition.

In case the recovery fails due to incomplete files on Drive E or changed partition information,,you must re-install the operating system and the central monitoring system.

In addition, the user must backup the “MAKEBOOT.exe” file under the Disk E (used for making the recovery boot disk) on other storage media (like PC, mobile hard disk, CD) and ensure that a recovery boot disk (see 2.1 for the making procedure) is available at any time. By doing so, the recovery start floppy disk can still be made when the Windows operating system is inaccessible.

NOTE

- **Quick recovery will format the C and D partitions of the hard disk; therefore, backup your desired data in the C and D partitions before performing the recovery operation. Our company assumes no responsibility for loss of data during the recovery process.**
-

3.2 Installation Procedure

3.2.1 Making the Recovery Start Floppy Disk

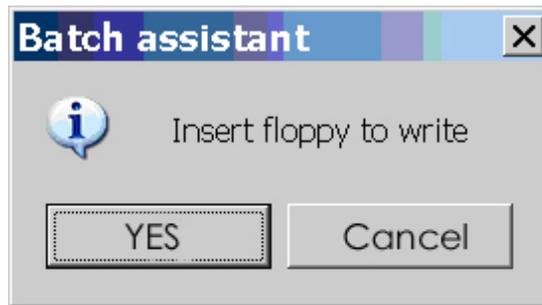
This recovery start floppy disk is used to start the computer, thus starting the quick recovery procedure.

1. Make sure the floppy drive and floppy disk (1.4M) are available.

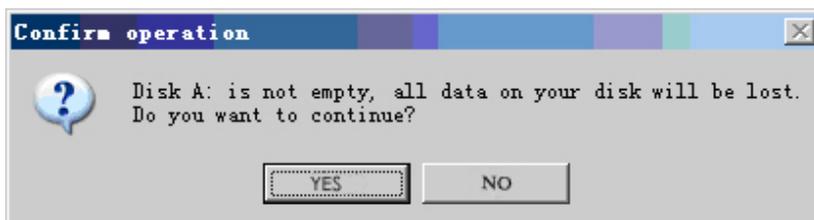
Enter the Windows system and insert the 1.4M floppy disk; then, double-click the “E:\MAKEBOOT.exe” file as shown below.



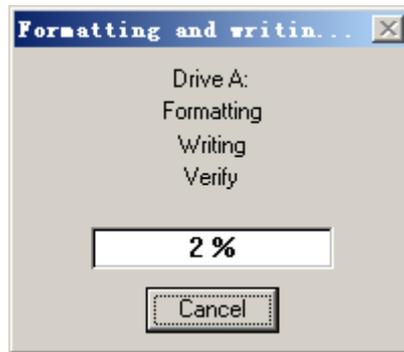
2. Click “YES” in the message box as shown in Figure 2.



3. The following message box will be displayed as shown in Figure 3. Click “YES”.



4. The system writes the floppy disk. At the end, the screen automatically disappears. See Figure 4

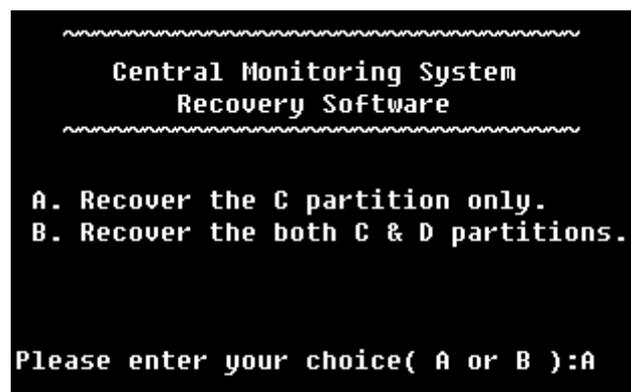


3.2.2 Quick Recovery Procedure

Preparation

Verify the start order of the main board CMOS. The first one must be the floppy drive. Make sure the recovery start floppy disk is already made.

1. Insert the recovery start floppy disk and restart the computer; then, wait to enter the recovery option menu.
2. Enter the recovery option menu as shown in Figure 5.



Input "a" or "b" (in either lower case or upper case) .

Select "A" to recover the C partition only, i.e., only the operating system and Hypervisor VI central monitoring system are recovered.

Select "B" to recover both C and D partitions, i.e., the operating system, Hypervisor

VI central monitoring system and database are all recovered.

NOTE

- **If the D partition is recovered, all data in the CMS database will be lost and the database will restore the initial factory configuration.**
-

3. After “a” or “b” is input, the following message will be displayed:

```
You chose A,  
Are you Sure?[Y,N]?
```

You can either input “y” (in either lower case or upper case) to confirm the recovery operation, or input “n” to return to the previous step.

4. During the whole recovery process, human interference is undesired. The system will display the recovery screen “Ghost 8.2” indicating the recovery progress. Note that the recovery screen “Ghost 8.2” will be started twice if you select to recover both C and D partitions.

After the recovery is finished, the system will automatically restart. At this time, the recovery start floppy disk must be taken out.

4 Maintenance and Cleaning

4.1 Maintenance

Failure on the part of the responsible hospital or institution employing the use of the central monitoring system to implement a satisfactory maintenance schedule may cause undue equipment failure and possible health hazard.

4.1.1 General Inspection

Before the central monitoring system is put into use and when it is in use, follow these guidelines to inspect it:

Inspect the equipment and its accessories for mechanical damage;

Inspect if the environment and power supply meet the specified requirements;

Inspect all power cords and signal lines for fraying or other damages, and if they are properly connected and insulated;

Inspect if the sound system functions normally;

Inspect if each function of the system is in good condition;

In case of any damage or abnormality, do not use the central monitoring system.

Contact the hospital biomedical engineers or our service personnel immediately.

4.1.2 System Performance Test

When the central monitoring system has software failure or after quick recovery installation is performed, follow this procedure to make sure that the system functions correctly:

- Whole system performance test
- Connection and self-test
- Communication test
- Main menu function
- Basic monitoring function
- Freeze currently displayed waveforms
- Real-time recording
- Recorder control
- Single patient monitoring function

- Patient management
- ViewBed
- Show/hide high/low parameter limits
- Show/hide dynamic short trend
- Set module order
- Show/hide multi-lead ECG
- Show/hide OxyCRG
- Show/hide NIBP groups
- Alarm setup
- Drug calculation
- CO review
- Hemodynamics calculation
- Waveform review
- Trend review
- Alarm review
- Display setup
- Functional test of auto arrange
- Functional test of admitting patient
- Functional test of system setup
- General setup
- System software version
- Print control
- Record control
- Functional test of history review
- System help
- Record and print
- Bi-directional control
- Functional test of Watchdog

- Clear database
- “Resolution notification” function disabled
- Shut down

4.2 Cleaning

Your equipment should be cleaned on a regular basis. If there is heavy pollution in your place or your place is very dusty and sandy, the equipment should be cleaned more frequently. The equipment to be cleaned includes the host, displays, printer, recorder, keyboard and mouse.

The exterior surfaces of the equipment may be cleaned with a clean and soft cloth, sponge or cotton ball, dampened with a non-erosive cleaning solution. Drying off excess cleaning solution before cleaning the equipment is recommended. Following are examples of cleaning solutions:

- Diluted soap water
- Diluted ammonia water
- Hydrogen peroxide (3%)
- Isopropyl alcohol

Follow these rules to clean the equipment; otherwise, it may melt, distort, or dull the finish of the case, blur lettering on the labels, or cause equipment failures.

ALWAYS dilute the solutions according to the manufacturer’s suggestions.

ALWAYS wipe off all the cleaning solution with a dry cloth after cleaning.

NEVER SUBMERGE the equipment into water or any cleaning solution, or POUR or SPRAY water or any cleaning solution on the equipment.

NEVER permit fluids to run into the casing, switches, connectors, or any ventilation openings in the equipment.

NEVER use abrasive materials and erosive or acetone –based cleaners.

5 Troubleshooting

5.1 Recorder/printer-related technical alarm messages

See the instructions for use of HYPERVISOR VI Central Monitoring System, 2.2.

5.2 The CMS fails to display information of a monitor

Make sure that the monitor's local net number is not set repeatedly. Otherwise, the monitor cannot be connected to the CMS normally.

Check if the network is properly connected. If the network is not properly connected or the network cable is broken, the monitor's information cannot be transmitted to the CMS.

5.3 No waveform displayed in waveform review

This symptom indicates that the user does not add the waveforms that need to be saved. To remove this fault, click in the patient window and then select "Display Setup" to enter the "Display Setup" tab sheet, select "Wave Save" and then add your desired waveforms.

5.4 "Display Mode Error" appears on the dual-screen CMS

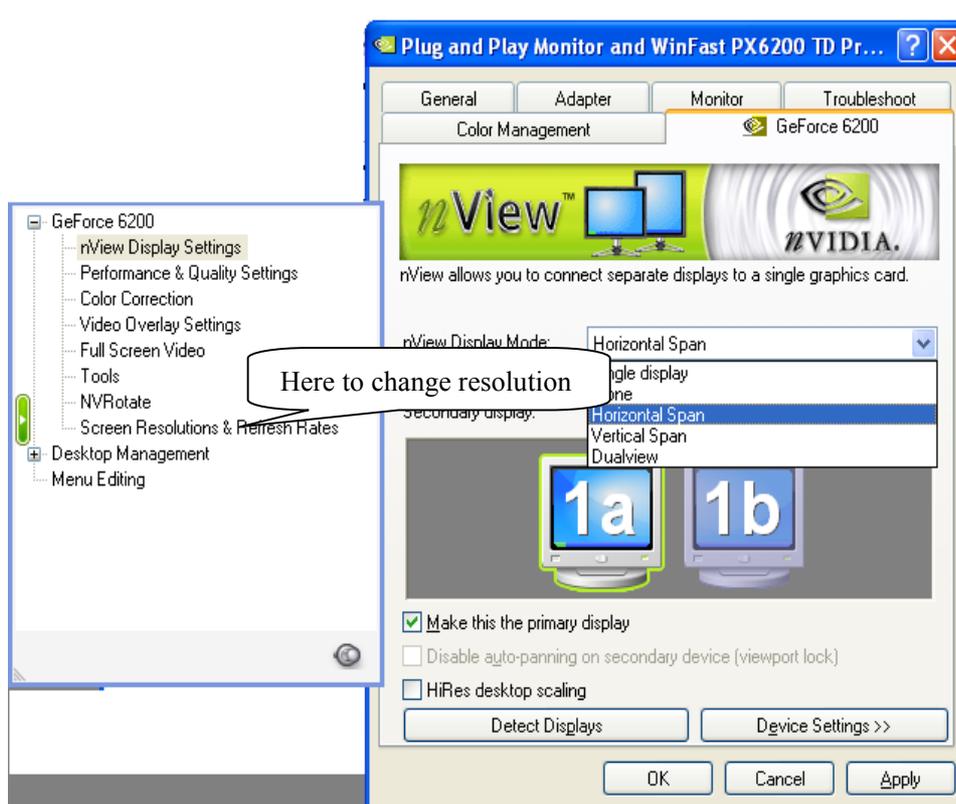
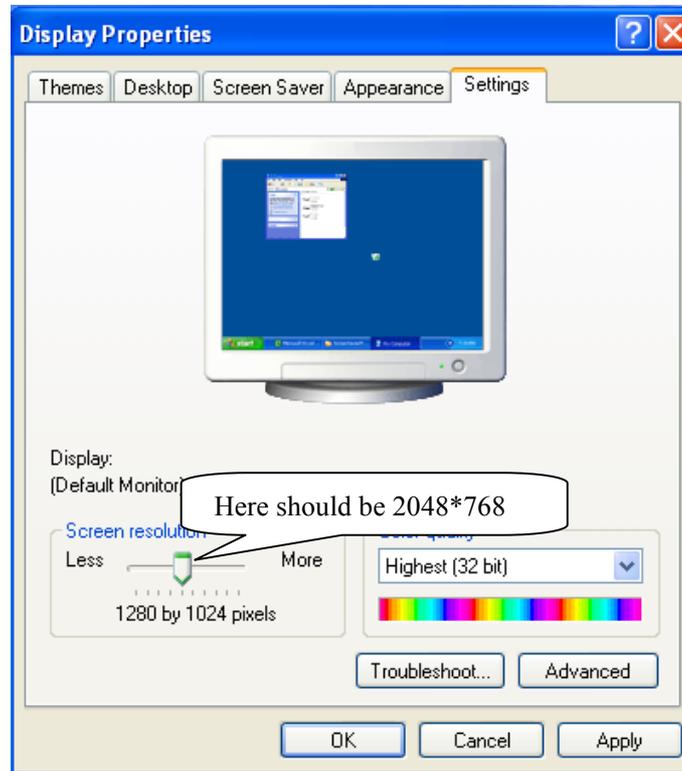
This symptom indicates that the video adapter is set incorrectly. To remove this fault, UNPLUG the USB watchdog and restart the system; when "Please Insert USB Watchdog" appears on the screen, click "Property"→"Setup"→"Advance"→"Dualhead"→"Feature" (double click) or "+"→"Dualhead multi-display"→"Ok" after changing the settings→"Apply" after setting the screen size as 2560X1024→"Ok".

5.5 Dual-screen changes to Single-screen during the CMS installation

Note: The following setting of display card is just for reference, there may be some

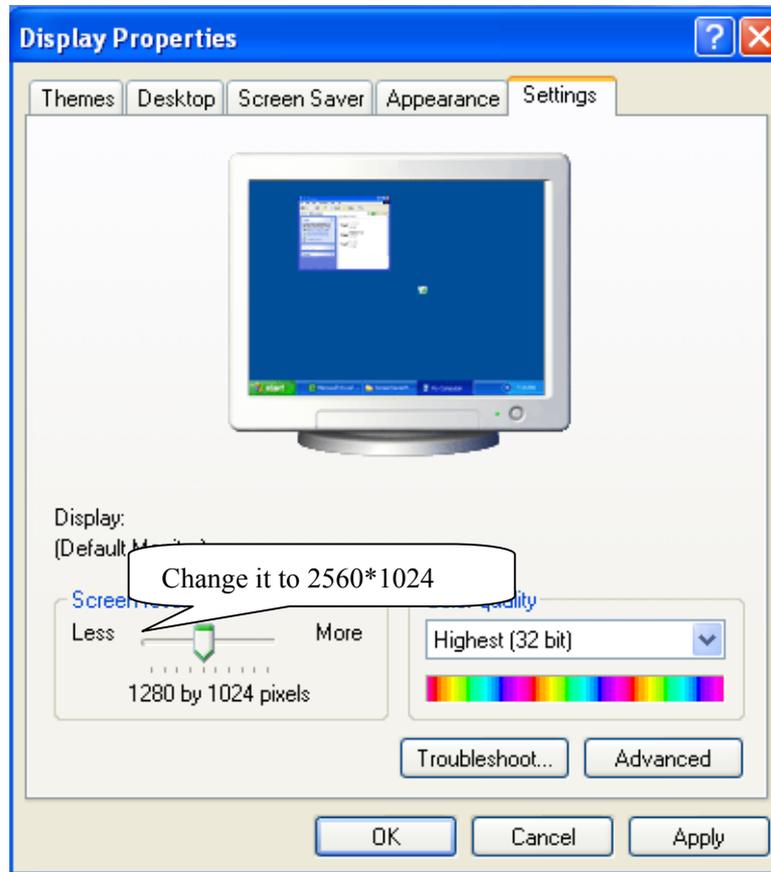
difference according to different display card, for more information, please reference the your display card reference manual.

Plug the watchdog and restart the computer. Then, click “Start”→“Setup”→“Control Panel”→“Display”→“Advanced”;

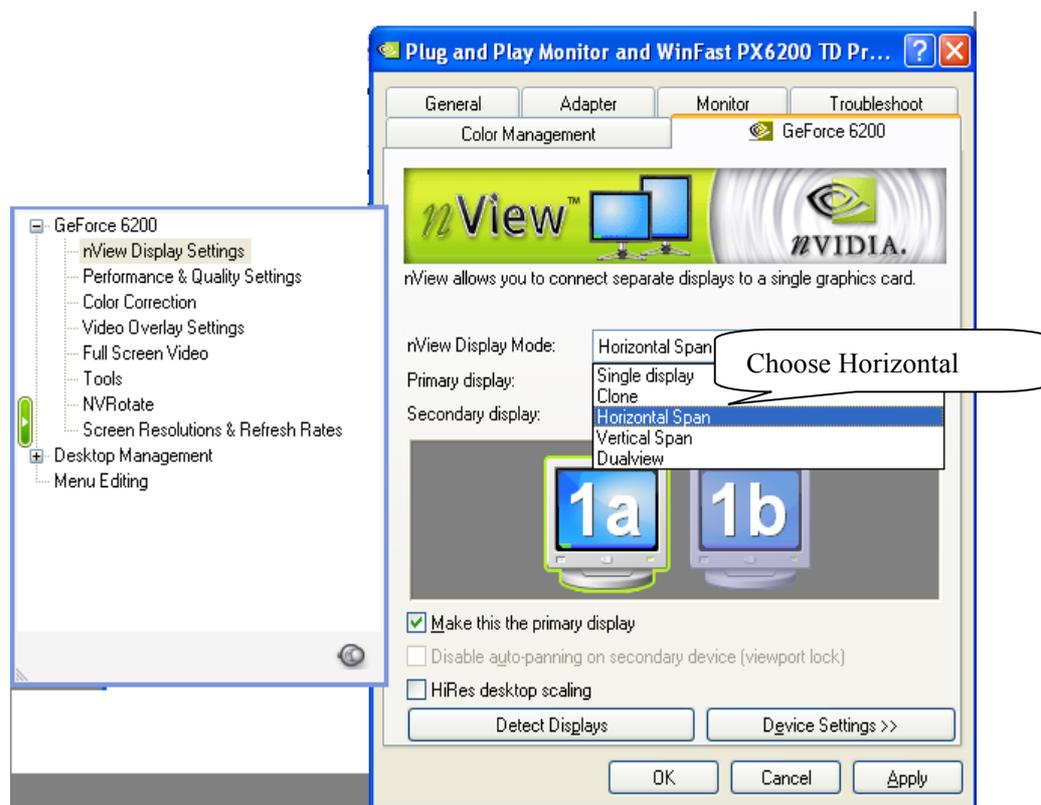


In the “Plug and Play Monitor” window, select “Screen Resolution&Refresh Rats” and then click “Add“, input 2560 and 1024 manually.

Set the resolution to 2560X1024



4. Set display mode to Horizontal Span.



5.6 Slow wave speed or database error message occurs during waveform reviewing

Such symptoms may occur due to too many saved data. To remove these faults, delete part of patient history data, or recover the system according to the instructions in 2.2.

