S3

Savage4 GT/395
Savage4 Pro/397
Savage4 Pro+/397P
Savage4 Xtreme/398

3D GRAPHIC ACCELERATOR

MANUAL

TABLE OF CONTENTS

1. S3 Savage4 (395/397/397P/398) Features

- BUS TYPE: 64bit AGP 2X Side bands 133MHz BUS for 395
  64bit AGP 4X/2X Side bands 266/133MHz BUS for 397/397P/398
  32bit PCI 33MHz BUS for 395/397
- CHIP SET: S3 Savage4 GT 395 / Pro 397 / Pro+ 397P / Xtreme 398
- Memory Size: SP395 Savage4 GT 8MB/16MB/32MB(AGP or PCI)
  SP397 Savage4 Pro 8MB/16MB/32MB(AGP or PCI)
  SP397P Savage4 Pro+ 16MB/32MB(AGP only)
  SP398 Savage4 Xtreme 16MB/32MB(AGP only)

High Performance Accelerator with 2D/3D Video Accelerator

- Floating-point triangle setup engine
- Single cycle 3D architecture
- 8M-triangles/second setup engine
- 128-bit rendering pipeline
- 140M pixels/second trilinear fill rate
- Full AGP 4X/2X, including sideband addressing and execute mode (AGP only)
- Microsoft DX6 texture compression
- High quality DVD video playback

3D Rendering Features

- Single-pass multiple texture
- Full scene anti-aliasing
- 8-bit stencil buffer
- MPEG-2 video texture
- Hardware bump mapping
- Anisotropic filtering
- Single cycle trilinear filtering
- 16 or 24 bit Z-buffering
- Specular lighting and diffuse shading
- Sprite anti-aliasing, reflection mapping, texture morphing, shadows, procedural textures and atmospheric effects

Motion Video Architecture

- High quality up/down scalar
- Planar to packed format conversion
- Motion compensation for full speed DVD playback
- Hardware subpicture blending and highlights
- Multiple video windows for video conferencing
- Contrast, hue, saturation and brightness controls
- Standard Feature Connector for external video stream input
- Independent Color Adjustment

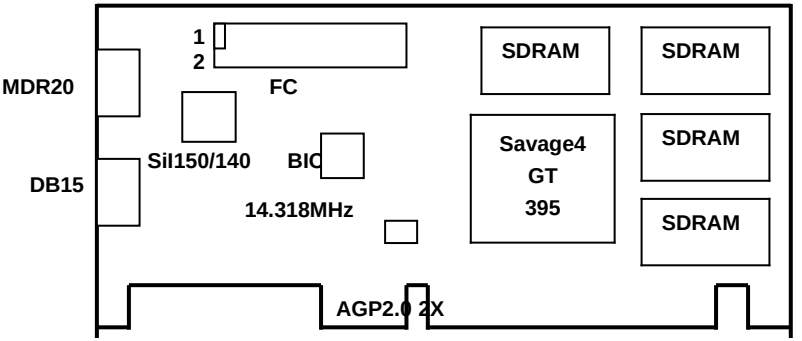
2D Acceleration Features

- Highly optimized 128-bit graphics engine/300MHz RAMDAC, resolutions up to 1920x1440
- Full featured 2D engine for acceleration of BitBLT, Rectangle fill, line draw, polygon fill, panning/scrolling and hardware cursor

S3 Savage4 Accelerator with LCD Panel controller and PanelLink Sil140/Sil150 Digital interface using MDR20 Standard Connector (Optional)

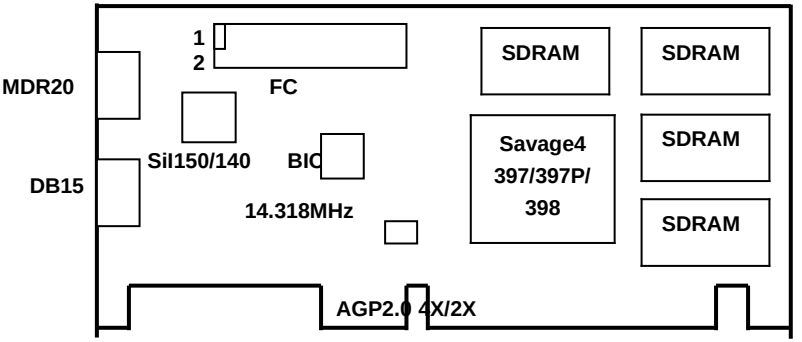
- Flat Panel Desktop Monitor Digital interface support
- Standard MDR20 Digital interface connector support
- Auto-expansion and centering for VGA text and graphics modes
- Support for all resolution up to 1280x1024(SXGA) and EDID 1.2/2.0.
- **All models reserved MDR20 connector and Sil150/140 for optional.**

2. S3 Savage4 Board Outline
2.1 SP395 16MB/32MB on board



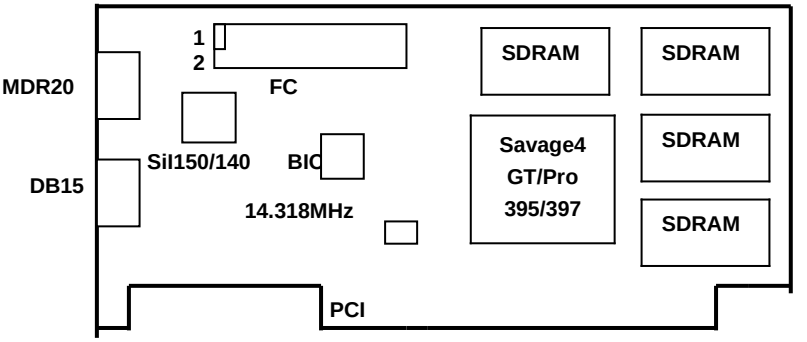
▪ All models reserved MDR20 connector and Sil150/140 for optional.

2.2 SP397/397P/398 16MB/32MB on board



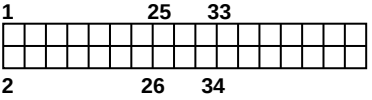
▪ All models reserved MDR20 connector and Sil150/140 for optional.

2.3 SP395PCI/397PCI 8MB/16MB/32MB on board



▪ All models reserved MDR20 connector and Sil150/140 for optional.

2.4 FC Pin Out (26PIN)



PIN [1,3,5,7,9,11,13,15]: D0-D7
PIN [12,14]: VS/HCTL, SCL
PIN [10,8]: HAD0, HS/HAD1
PIN [26]: SDA
PIN [19]: VIPCK
PIN [2,4,6,16,18,20,22,25]: GND
PIN [24]: -VIRQ
PIN [21,23]: NC
PIN [17]: VCK/LCK

PIN [27-34] Reserved

PIN [27,28]: NC
PIN [30,33]: GND
PIN [32]: ODD
PIN [29]: I2CLK
PIN [31]: I2DAT
PIN [34]: EN2

3. Hardware Installation

3.1 Package Contents

1. S3 Savage4 (395/397/397P/398) Accelerator AGP or PCI card.
2. CD title or Software diskettes
3. This manual.

3.2 Installing the Card

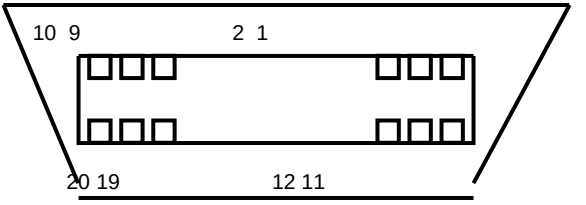
1. Turn off your computer.
2. Remove the cover of the computer per the owner's manual.
3. Install the card in the AGP bus slots.
4. Replace the cover.

3.3 MDR20 PanelLink Connector Pin out Wiring Diagram (Optional)

HOST

TX1+	1	11	TX2+
TX1-	2	12	TX2-
TX1 SHIELD	3	13	TX2 SHIELD
TXC SHEILD	4	14	TX0 SHIELD
TXC+	5	15	TX0+
TXC-	6	16	TX0-
DDC GND	7	17	NC
DDC +5V DC	8	18	SENS
NC	9	19	DDC / SDA
NC	10	20	DDC / SCL

MDR20



"Face of Receptacle

3.4 Resolutions and colors support:

3.3.1 S3 Savage 4 (395/397/397P/398)

S3 Savage4 AGP bus VGA cards are fully compatible VGA with the addition of Hi-Color and True Color modes depending on the amount of video memory stalled. The amount of memory needed to display various resolutions is shown below.

S3 Savage4

Resolution & Colors	BPP	Refresh Rate (HZ)	8MB	16MB	32MB
640x480-256c	8	60/72/75/85/160	ˇ	ˇ	ˇ
640x480-64Kc	16	60/72/75/85/160	ˇ	ˇ	ˇ
640x480-True	32	60/72/75/85/160	ˇ	ˇ	ˇ
800x600-256c	8	56/60/72/75/85/160	ˇ	ˇ	ˇ
800x600-64Kc	16	56/60/72/75/85/160	ˇ	ˇ	ˇ
800x600-True	32	56/6072/75/85/160	ˇ	ˇ	ˇ
1152x864-256c	8	60/70/75/85/100	ˇ	ˇ	ˇ
1152x864-64Kc	16	60/70/75/85/100	ˇ	ˇ	ˇ
1152x864-True	32	60/70/75/85/100	ˇ	ˇ	ˇ
1024x768-256c	8	60/70/75/85/130	ˇ	ˇ	ˇ
1024x768-64Kc	16	60/70/75/85/130	ˇ	ˇ	ˇ
1024x768-True	32	60/70/75/85/130	ˇ	ˇ	ˇ
1280x1024-256c	8	60/75/85/100	ˇ	ˇ	ˇ
1280x1024-64Kc	16	60/75/85/100	ˇ	ˇ	ˇ
1280x1024-True	32	60/75/85	ˇ	ˇ	ˇ
1600x1200-256c	8	60/75/85	ˇ	ˇ	ˇ
1600x1200-64Kc	16	60/75/85	ˇ	ˇ	ˇ
1600x1200-True	32	60	ˇ	ˇ	ˇ
1920x1440-256c	8	60	ˇ	ˇ	ˇ
1920x1440-64Kc	16	60	ˇ	ˇ	ˇ

((I):interlaced ✓:Support x: Not Support)

4. Smart Installation

For Windows 95 OSR2, Windows 98, WindowsNT4.0 SP3 or newer

4.1 Put the DRIVERS CD in your CD-ROM

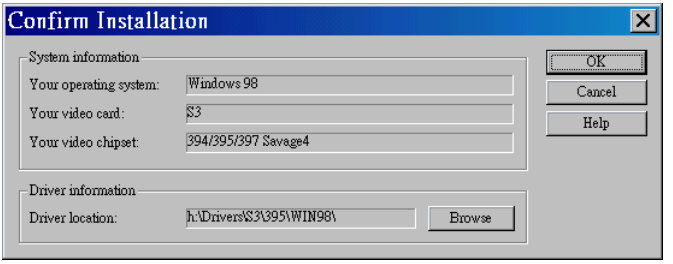
Note: SP395's, SP397's, SP397P's and SP398's drivers are same.

Default directory selection is 395

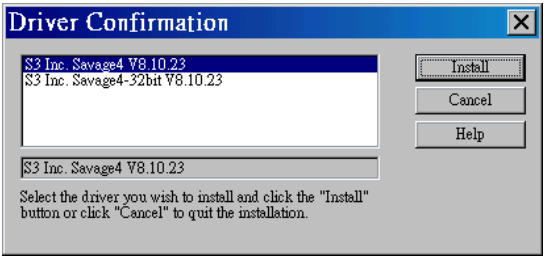
4.2 Click the **Driver installation** button

4.3 If everything fine, screen will show **Confirm Installation** window.

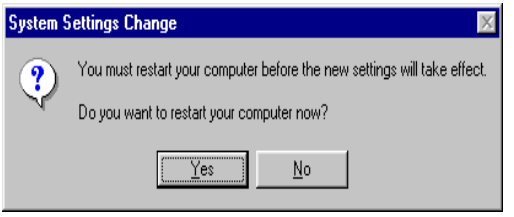
Then Click **OK** or you can use **Browse** to select other location of the drivers.



4.4 Now appears the **Driver Confirmation** window
Click the **Install** button to start drivers' installation.



4.5 When finished the installation, system will prompt you to restart your computer.
Please Click **Yes.**



5. Manually install Windows 95 & Windows 98 drivers

5.1 Installation and Setup

5.1.1 Windows95

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 95 drivers.

- Insert the DISC (CD Title Driver).
- Select **Control Panel** from **My Computer** group.
- Select the **Display** icon
- Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option form the pop-out menu.
- Click the **Settings** tab.
- Click the **change** Display Type button.
- Click the **Have Disk** button.
- Change directories and Select **savage4.inf**
  Disc (CD Title) is **E:\drivers\S3\395\WIN95 Note: "E:"→**CD Drive **"395"→**VGA model name
- Select AGP driver form the list and click the **OK** button. If a message stating that one or more driver files is older than the files on the system respond **YES** to overwrite the files.
- Click the Close button and Apply button, and restart your computer.

5.1.2 Windows98

The Windows setup program installs and modifies all of the necessary files. Follow these steps to install the Windows 98 drivers.

- Insert the DISC (CD Title Driver).
- Select **Control Panel** from **My Computer** group.
- Select the **Display** icon
- Double-click on the **Display** icon in the Setting -> **Control Panel** folder. You can also click the right mouse button anywhere on the desktop and select the Properties option form the pop-out menu.
- Click the **Settings** tab.
- Then show **[Unknown Device.] Properties** tab
  Select **Adapter**
- Then show **Standard PCI Graphics….** tab
  Select **Change**
- Then show **Update Device ….** tab
  Select **Next**
- Then show **Update Device ….** tab
  Select **Search for a better……**
  Then select **Next.**
- Then show **Update Device ….** tab
  If the **Specify a location** is wrong
  Please select **Brows**
- Then show **Browse for Folder** tab
  Select **E:\drivers\S3\395\win98**
  Disc (CD Title) is **E:\drivers\S3\395\WIN95 Note: "E:"→**CD Drive **"395"→**VGA model name

Then select **OK**

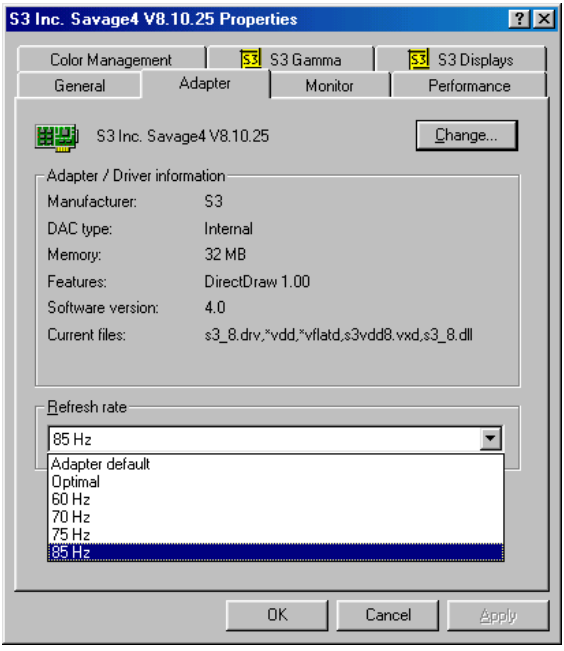
- Then show **Update Device Driver Wizard** tab
  Select **CD-ROM driver**
  Click the **Specify a locator,** if right
  Then select **Next**
- Then show **Update Device Driver Wizard** tab
  Select **Next**
- Then show **Update Device Driver Wizard** tab
  Select **Finish**
- Then show **System Settings Change** tab
  Select **OK**

5.2 How to Change Color Depth and Resolution

1. Make sure that you have installed windows95/98 Driver.
2. Click on the **Start** box in the lower left corner and proceed to **Control Panel**.
3. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and select the **Setting table**
4. Click on the pull-down arrow from the **Color** palette area to select color depth or adjust the sliding bar to either **Less** or **More** from the **Desktop area**
5. Select **OK** to restart **WINDOWS95** and new color depth or the new resolution takes effect.

5.3 How to Change Refresh Rate

1. Make sure that you have installed windows95/98 Driver. Click on the **Start** box in the lower left corner and proceed to Setting, **Control Panel**
2. Inside the **Control panel** group , click on **Display** icon to open the **Display Properties** folder and select the **S3 Refresh table**
3. Click on the **Change Configuration** to change refresh rate
4. Select **OK** and new refresh rate takes effect



- Refresh Rate default is Optimal.
- If you change Refresh Rate from Optimal to another , you must be to restart Windows System.
- **Be sure your monitor can support DDC functions(or it is Plug & Play monitor), otherwise you can not select refresh rate.**

6. Windows NT 4.0

The following steps describe how to install Windows NT4.0 display drivers

1. Select **Control Panel** from the **Main** group.
2. Select the **Display** icon.
3. Select C**hange Display Type**.
4. Select Change from the **Adapter Type** area.
5. Select **Other**.
6. Place the Disc (CD Title) into Driver. Click **OK**.
7. Select I**nstall** and click "**YES**" when the Installing Driver dialog box appears.
8. When the Windows NT **Setup** dialog box appears select CDROM, and click "**Continue**".

A message appears stating that drivers were successfully installed. Click **OK**. Another message appears stating that the driver could not be restarted dynamically. Restart **Windows NT** to run the new driver. Click **OK.**

7. Windows 2000
First time install drivers under windows2000

1. When system boot up, system will prompt find new device. Suppose the device is VGA, now system will find the default drivers for you.
2. If you want to install our drivers along with the SP395/SP397/SP398 pack. Please put the drivers CD in your CDROM drive. If now shows SmartInstall window, please click **EXIT** button to quit.
3. Drivers for windows2000 are located at \2000drv\s3\savage4\win2000 or \drivers\ s3\395\win2000
4. If the drivers is very new may not certified by Microsoft, if so, system will prompt you the drivers do not have “digital signature”, still you can force to install.
5. Follow on screen instructions will finish the installation.

The following steps describe how to update Windows2000 display drivers
1. Place the Disc (CD Title) into CDROM Drive. If now shows SmartInstall window, please click **EXIT** button to quit
2. Right click mouse button on Desktop Area, now shows a sub menu window. Please select **Properties**.
3. Now come up **Display Properties** window, please select **Settings** on the top.
4. Select **Advanced**
5. Select **Adapter**.
6. Select **Change**
7. Now comes up a update drivers wizard window. Please follow the on screen instruction.
8. Please specify the drivers location at your CDROM letter: \2000drv\s3\savage4\ win2000 or \drivers\s3\395\win2000 or the directory where you put your drivers
9. Select I**nstall** and click “**YES**” when the Installing Driver dialog box appears. If the drivers is very new may not certified by Microsoft, if so, system will prompt you the drivers do not have “digital signature”, still you can force to install.

A message appears stating that drivers were successfully installed. Click **OK**. Another message appears stating that the driver could not be restarted dynamically. Restart Windows2000 to run the new driver. Click **OK.**

FCC Statement

This device complies with part 15 of the FCC Rules. Operation is subject to the following two condition.(1).this device may not cause harmful interference. (2).this device must accept any interference received, including interference that may cause undesired operation

Warning:
Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, used and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference in to radiate communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different form that to which the receiver in connected.
- Consult the dealer or an experienced radio/TV technician for help.

Notice:
(1) An Unshielded-type power cord is required in order to meet FCC emission limits and also to prevent interference to the nearby radio and television reception. It is essential that only the supplied power cord by used.
(2) Use only shielded cables to connect I/O devices to this equipment.3
(3) Changes or modifications not expressly approved by the party responsible for compliance could void the use's authority to operate the equipment.

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