

## 3Dxx Series Displays FAQ

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Updated October 30, 2019

**Q: How do I make the Linux read-only file system writeable?**

A: Enter the following command on the serial command terminal of the 3Dxx display:

```
mount -o remount,rw /
```

This can be automated so that the file system comes up writeable on startup. First, put the above command in a script file:

```
echo "mount -o remount,rw /" > /home/writeablefs  
chmod 755 /home/writeablefs
```

Then create a link to launch the script on startup:

```
ln -s /home/writeablefs /etc/rc.d/S03writeablefs
```

Conversely, the file system can be made read-only with the following command:

```
mount -o remount,ro /
```

**Q: What CAN bus bit rates are supported by the display?**

A: The following CAN data rates have been tested:

- 125 Kbps
- 250 Kbps (default)
- 500 Kbps
- 1000 Kbps

**Q: I want to connect to my display via ethernet. How does it obtain an IP address?**

A: By default, a 3Dxx display with ethernet capability is configured to obtain an IP address using DHCP. It is possible to assign a static IP address instead, which requires a simple text file modification on the unit. See the "Ethernet Configuration" section in the *Grayhill 3Dxx Display Products Developers Manual* for details.

**Q: How can I display a splash screen?**

A: An image file in ".raw" format can be displayed by writing it directly to the frame buffer of the display. The splash image can be displayed using a script file, which can be run early in the startup process.

Example:

Script file contents (script file called *show\_splash.sh*):

```
# write splash image to both frame buffers  
cat splash.raw > /dev/fb0  
cat splash.raw > /dev/fb1  
# turn on the backlight  
b1 100
```

Create a link for launching script file on startup:

```
ln -s /home/show_splash.sh /etc/rc.d/S08showsplash
```

**Q: How do I set up my application to automatically run on startup?**

A: A launch script and link to run the script can be created for running an application on startup. See section "Configuring an Application to Run at Bootup" in the *Grayhill 3Dxx Display Products Developers Manual* for details.

**Q: How can I update files on the display using a USB flash drive?**

A: The 3Dxx displays contain a built-in application for installing files from a USB flash drive. See section "Updating Files on the Device Using *app\_update*" in the *Grayhill 3Dxx Display Products Developers Manual* for details.

**Q: Can both VUI Builder and Qt be installed on the same display?**

A: Yes; however, they cannot both be running at the same time.

**Q: Why is my video image unstable?**

A: An unstable or unsynchronized video image is commonly caused by a poor ground connection. The display and camera should be connected to the same ground. If using a Grayhill development board, try connecting the video input connector to the metal shell of one of the DB9 CAN connectors.

**Q: The screen is set to 100% brightness but does not appear to be as bright as expected. Is there a problem with my display?**

A: A reduction in brightness can be observed if Qt is being used for application development. This is due to the default frame buffer configuration of Qt.

The 3D displays use 2 frame buffers ("fb0" and "fb1"). By default, the displays are set for a 50% alpha blending between the 2 frame buffers. If you use only fb0 (and with fb1 blanked), blending does not come into play. If you use fb1 without adjusting alpha, it will mix with fb0 (which is likely cleared, i.e. all black). The Grayhill Qt installation configures Qt to use fb1. Thus, the 50% blending between fb0 and fb1 would cause the screen to be dimmer.

In order to maximize screen brightness, the alpha blend setting can be modified by a Qt application. How to do this is shown in the *Grayhill 3Dxx Display Products Developers Manual*.

**Q: How do I blank (hide) or un-blank (show) the screen (frame buffer)?**

A: This is done by blanking/un-blanking the frame buffers on the display.

To blank the screen, on the display command terminal enter:

```
echo 1 > /sys/class/graphics/fb0/blank
echo 1 > /sys/class/graphics/fb1/blank
```

To un-blank the screen, on the display command terminal enter:

```
echo 0 > /sys/class/graphics/fb0/blank
echo 0 > /sys/class/graphics/fb1/blank
```

N.B. For displays running the Linux 4.x kernel, there is a utility called 'fb' that can be used for this.

To blank frame buffer 1 (for example), enter:

```
fb 1 off
```

To un-blank frame buffer 1 (for example), enter:

```
fb 1 on
```

**Q: I have a touch screen unit, but the touch areas are not responding. What could be wrong?**

A: The touch screen may not be properly calibrated. Try re-calibrating the touch screen.

**Q: How do I calibrate the touch screen?**

A: On the display command terminal, enter:

```
mount -o remount,rw /  
echo 1 > /sys/class/graphics/fb1/blank  
echo 100 > /sys/class/backlight/pwm-backlight.0/brightness  
ts_calibrate
```

**Q: Can I run a touch screen test manually?**

A: Yes! On the display command terminal, enter:

```
ts_test
```

**Q: How can I tell if my display is a touch screen model?**

A: On the display command terminal, enter:

```
ghprintenv PARTNUM
```

Interpret the resulting part number as follows:

```
3DxxXX-x00 = base display (non-touch)  
3DxxVX-x00 = video capable non-touch display  
3DxxVT-x00 = touch display
```

**Q: How do I manually adjust the backlight brightness?**

A: On the display command terminal, enter:

```
echo lvl > /sys/class/backlight/pwm-backlight.0/brightness
```

where *lvl* is the brightness level in percent (0-100).

For example, to set at full brightness, enter:

```
echo 100 > /sys/class/backlight/pwm-backlight.0/brightness
```

Or, if the display contains the utility "bl", enter:

```
/home/bl 100
```

**Q: How can I tell if my application is running?**

A: To see a list of currently running applications, enter the following command on the display command terminal:

```
ps -A
```

Look for your application in the list.

**Q: My application is running, but I don't see anything on the screen.**

A: Make sure the backlight is on and the frame buffers are enabled.

**Q: How do I enable/suppress boot messages?**

A: To suppress boot messages, add "quiet" to the 'bootargs' environment variable.

On the display command terminal, enter:

```
ghsetenv bootargs console=ttymxc0,115200 lpj=7905280 rootfstype=ext4  
root=/dev/mmcblk0p1 ro rootwait board-ghi_imx6.pn=3D70VT-100 quiet
```

To enable boot messages, remove "quiet" from the 'bootargs' environment variable.

On the display command terminal, enter:

```
ghsetenv bootargs console=ttymxc0,115200 lpj=7905280 rootfstype=ext4  
root=/dev/mmcblk0p1 ro rootwait board-ghi_imx6.pn=3D70VT-100
```

**Q: How do I manually copy a file to the display over ethernet?**

A: Secure Copy (scp) can be used to transfer files over ethernet. On the display command terminal, enter:

```
scp <file> root@<IP>:./<path>
```

See section "Copying Files From Ethernet" in the *Grayhill 3Dxx Display Products Developers Manual* for details.

**Q: My display was re-started and now I cannot transfer files over ethernet. What happened?**

A: If using DHCP to obtain an IP address, make sure the IP address did not change. It is possible the DHCP server may have assigned the IP address the display was using last time to another device.

To see the IP address of the display, on the command terminal enter:

```
ifconfig eth0
```

**Q: How do I capture a screen image?**

A: The display contains a utility called "fbgrab", which captures a frame buffer image and saves it as a file. Specify the desired frame buffer and filename.

For example, to capture frame buffer 1, enter:

```
fbgrab -d /dev/fb1 screen.png
```

To capture screen video from frame buffer 1, enter:

```
fbgrab <file>.png
```