TECHNICAL NOTE   TNOI14

Title: G308/G310 Startup Behavior

Product(s): G308, G310

G308/G310 Startup Behavior

When the G3 is first powered up, the on-board power supply monitoring hardware keeps the unit in an inactive state until the 3.3v and 5.0v rails reach their respective operating voltages. During this time, all three keyboard LEDs will be illuminated steadily. 200ms after the power supply has stabilized, the boot loader will execute. If the LEDs remain illuminated for more than a second or so, the unit is stuck in reset, most likely because of too low a power supply voltage.

The boot loader then displays the G3 logo and rapidly flashes the red keyboard LED. If this LED is flashing, the loader is running, even if a problem with the display means that the logo is not shown. The loader then listens on the USB port and the programming serial port, and if nothing is heard, it attempts to run the Crimson firmware. If no firmware is present, the unit will remain in the boot loader. If anything is heard on either port, the unit will likewise remain in the loader, waiting for instructions to either replace or execute the existing firmware.

Since the boot loader enables the USB port, a PC, which is connected to this port, will recognize the G3 as a newly-connected USB device. The device driver installation process will therefore be launched. This may or may not require user intervention, depending on the operating system in question, and whether or not that specific unit has been connected to this PC on a previous occasion. If the installation is aborted by the user, it will not be possible to download firmware via USB until the driver is uninstalled or manually updated. It is also possible that the boot loader will interpret the installation process as an attempt to download new firmware, and will stay in the loader until power is cycled or until a download is completed.

If a firmware download is started on the serial programming port or the USB port, the other port cannot be used for download until the unit is power-cycled, or until the download process has been completed. Similarly, a failed download on one port might deactivate the other port, so always cycle power when switching ports during trouble-shooting.

Once the firmware starts, the unit will beep, and the Crimson banner will be displayed. The USB port will also be reconfigured at this point. This results in the re-installation of the Windows device driver, as the Crimson runtime uses a different device identifier from that used by the boot loader. (In fact, Crimson will use one of two identifiers, depending on whether or not the CF card is mounted on the PC. Mounting or unmounting the card will thus also result in a driver installation if the unit hasn't previously been connected in that mode.) Once again, aborting the installation process will prevent download, this time of configuration data.

Note that if you've aborted the boot loader device driver installation process, and then downloaded the firmware via a serial cable, you may then find yourself then able to download configuration data to Crimson via USB. The next time you attempt to upgrade the unit firmware, though, most likely as a result of downloading a new version from our website, you may find yourself unable to use USB once more. This will be because the main Crimson device driver is operational, while the device driver used by the boot loader is not.

To fix boot loader device driver problems, use the WinSend utility from the Crimson directory to start and then abort a firmware download via a serial cable. Power-cycle the G3, and make sure it remains in the boot loader, thereby allowing you to access the G3 Loader device in the Windows Device Manager. Uninstall the driver manually, and if the driver doesn't re-install on its own, power cycle the G3 once more. This time, let the driver install properly, and then continue as normal. Note that the unit must be in the boot loader for you to be able to get to the G3 Loader device. If you let the unit start Crimson, the driver will not be accessible.

Fixing problems with the main Crimson device driver is easier, because the driver can be deleted from the Device Manager any time the unit is running the Crimson firmware. Thus, allow the unit to start, and then remove and re-install the driver as described above.