Vantage Trouble Shooting

Summary

This document is used to help existing customers about hardware and software issues.

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Document Change History

Date	Section(s)	Description	Author
July 21, 2016	All	Rev A: Initial document	YT / MR
Sep 30, 2017	Chap. 2	Use Vantage project folder to represent the latest SW	YT

1 Hardware issue

Sometimes, the Vantage system becomes unavailable. For instance, if the Matlab crashes during rum time, an error “The hardware can be detected but cannot be initialized” would occur. Usually, the system can be rest by performing a full power cycle or a cold-boot. A power cycle or a cold-boot means power off the system and then power it on.

NOTE: Restarting the PC will NOT fix the issue!! You need to turn off the PC!!

If the issue still exists after a cold-boot, please follow the instructions below:

1.1 Open the Device Manager

First, you need to make sure that the Verasonics Hardware is listed in the device manager. As shown in the Fig 1, a Vantage 256 system should have 8 CGDs. The correct number of ASC and CDG are listed in the corresponding table.

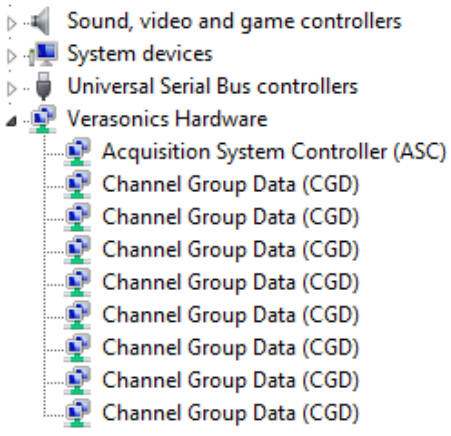
If the Verasonics Hardware is not listed but a “PCI Data Acquisition and Signal Processing Controller“ is listed with a question mark, please follow “Vantage Software Installation Instructions” in the Documentation folder of the installed software directory to install the correct driver. If not, please refer to session 1.2 to check the PCIe connection.

If incorrect CGD number is indicated, please refer to session 1.3 to reprogram hardware. Note: if in the recovery mode, no CGDs will be present but ASC will. Recovery mode could be referred to 1.4.

How to open device manager:

1. Press **Win+R** (Windows key and R key) at the same time. A Run dialog will appear.

2. Type **devmgmt.msc** in the run box and click **OK** button.



System	ASC	CGD
Vantage 64	1	2
Vantage 64LE	1	4
Vantage 128	1	4
Vantage 256	1	8

Figure 1. Verasonics Hardware in the device manager. The Versonics Hardware should be successfully detected and listed in the device manager. If not, a driver or PCIe connection should be inspected.

1.2 PCIe connection inspection

If the Verasonics Hardware is not shown in the device manager, you may have an error about “Hardware not found, ” indicating an incomplete or failed PCIe connection. Please check the PCIe cable connection between the system and computer, check the plug for debris and properly clean if necessary. If everything worked prior to moving the system this is the most likely the cause of the fault.

The indication of successful express link is shown in Fig. 2. Two green lights should be found on the PCIe adapter. The left one (close to the cable side) should be solid, indicating successful express link with the system and the other one should be solid or blinking, indicating successful express link with the host computer. If only one is bright, the PCIe adapter card may be not well seated in the slot. Please take it out and reinstall it. If either one is red, indicating the power fault, please verify nothing is touching the module inside the computer.

If the issue still exists, the PCIe cable, PCIe adapter, I/O Panel and/or Backplane in the system may need replacement. Please contact Verasonics support for more information.

Figure 2. Successful PCI express link indication. Two green lights should be found on the PCIe adapter. The left one (close to the cable side) should be solid, indicating successful express link with the system and the other one should be solid or blinking, indicating successful express link with the host computer.

1.3 Reprogram Verasonics Hardware

If the Verasonics Hardware is shown in the device manager and the PCIe link is successful, but the issue still exists after a cold-boot, usually the error message is equal or similar to: “The hardware can be detected but cannot be initialized or the system SW is unable to communicate with it”. In this case, please reprogram the hardware following the steps below:

1) From a cold-boot (power off state of both the computer and Vantage system)
2) Power On the Vantage system and then Power On the Computer.
3) Open Matlab and navigate to the installed directory
4) In the command window, type "activate" and enter
5) In the command window, type "reprogramHardware" and enter
6) Wait for reprogramHardware to finish (it may take some time)
7) When it has completed, Power off the Computer.
8) Power off the Vantage system at the power switch at the rear of the system.
9) Wait a few seconds
10) Power On the Vantage system
11) Power On the computer
12) Navigate back to the installed directory and activate again.
13) In the command window type, "VVT"
14) If tests PASS, try running a scrip

If reprogramHardware with current software doesn’t fix the issue and newer software version is available, please update to the latest software as we are continuously improving operation and diagnostics.

1.4 ERROR about ASC, ACI, or CGD

If it an error occurs during or after reprogram hardware, please follow the instruction below:

- **ASC Error**

If any error message about ASC is displayed, please reprogram hardware in "Recovery mode"

1) While the system is on, toggle the system to the recovery mode (Fig. 3)
2) Power off the computer and the system (Important!)
3) Power on the system and then the computer. The system should be in the recovery mode. Please look though the fan and you should be able to see green or amber "RECOVERY MODE" scrolling on a display around the top center of the back plane.
4) Open Matlab and navigate to installed directory (ex. Vantage-4.0.0), activate it
5) reprogramHardware
6) During the process of reprogramHardware, you will be asked to toggle the system back to the normal mode (Green LED). Save any error message
7) Power off and Power on the PC
8) Run VVT in the normal mode

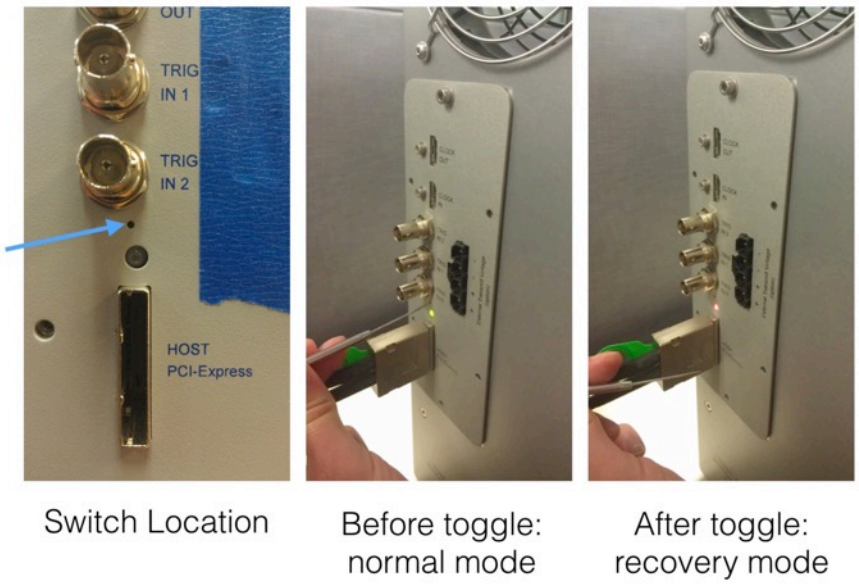


Figure 3. How to toggle the system to the recovery mode. The LED is green in the normal operation, and is red in the recovery mode.

- **ACI or CGD Error**

If the hardware is detected but receive ACI or CGD error while doing verification test, please look through the fan and check whether the green LED is blinking for all boards. Figure 4 shows the green LED of the first board. Please check the LED of all boards. If any green LED is off, check the red LED about the halfway down the backplane of the same board. If it's red, please email support for board replacement.

Usually reprogramHardware should have fixed issues regarding ACI or CGD. If the red LED is not on and the issue continues, please refer to session 1.6 and send Verasonics all reports.

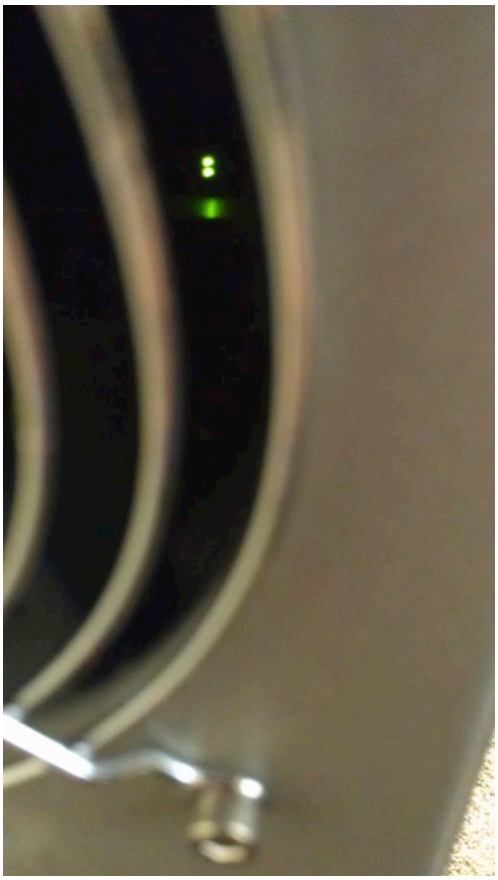


Figure 4. Successful express link for the CGD of the board 1. If any green LED is not on, check the red LED about the halfway down the backplane of the same board. If it's red, please email support for replacement.

1.5 ID of transducer specified by script doesn't match ID of transducer at connector 1

Please make sure that the transducer is tightly connected to the connector. Sometimes re-plug the transducer or restart the computer would work as well. If the issue exists, please plug different probes and type "SHstatus" in the command window for each probe. If all of them don't work, please send us the log file.

1.6 Problem still exists?

If the problem doesn't get solved, please email support@verasonics.com with the report of:

- Version X (please have a letter after Version, NOT Version only)
- SystemInfo
- VVT (in HardwareTest/VTestData folder) Without transducers attached.
- reprogramHardware X (please have a letter after reprogramHardware, a prompt about showing the report will be displayed at the end of the process)
- Hwdiag (Execute it in cmd, NOT Matlab)
- Hwdiag microregistersdump (Execute it in cmd, NOT Matlab)

Note: All commands should be executed under the installed directory (ex. Vantage-4.0.0), not the root directory

2 Software issue

Note: The term "**Vantage project folder**" is used throughout the Vantage Trouble Shooting documentation to refer to the main directory containing an installation of the Vantage software, with a default name such as "Vantage-x.x.x-DateString". Here, x.x.x means the software version, like 4.0.0. DateString shows the year, date, and time of the software build, like 1810181030".

2.1 Incorrect main directory

The user may encounter the following error messages:

"Error!! VerasonicsVerificationTest must be executed from Matlab Simulator directory"

"Your current directory is not set to the root of a Vantage produce software directory"

"hwConfigCheck: Exiting due to hwdiag error as displayed above."

"Cannot create 'xxxxx.mat' because 'MatFiles' does not exist.

Usually it is caused by the incorrect directory and software installation. Please confirm:

1) The software is installed following the instructions in the release note

2) The software must be activated by an "activate" commend before typing other commands.

3) Please keep Vantage project folder as the current working directory and select "add to path" while you run a script not shown in the Matlab search path.

Since software 2.11, the way of software operation has been changed significantly. We have received many requests about having its own software in different login account, and the tedious installation procedure. Therefore, with 2.11, you will be able to have your own software folder and change to another folder easily without interrupting other's work.

You can still have all your Setup scripts in a different directory. Just open your Setup scripts using "my computer" and the Matlab Editor should pop out. Run the script and select "Add to Path" instead of "Change Folder". This way, you will still be able to keep all your experimental script somewhere else and use different software.

If you update the Matlab, please re-install the software.

2.2 The Matlab crashes randomly, even before VSX loads a .mat file

Most likely, it is caused by the conflict between Verasonics software and Matlab toolboxes, like MATLAB Compiler toolbox, or functions in your Matlab environment. In the crash dump report, please check whether the Matlab Complier Routine (mcr::runtime) is executing, so something may get executed while starting Matlab.

Please take a look at your startup.m function. If possible, rename it to have a clean start up then do the following steps without hardware connected:

1) Open Matlab, without loading user startup.m function
2) Change current folder to Vantage project folder
3) Type activate
4) Make sure that only Vantage project folder and default Matlab Toolboxes are in the path.
5) Run VSX and load any .mat file

If it still fails, please try to install the Matlab with ONLY signal_toolbox. Other toolboxes are not required. Vantage project folder should be working properly in a clean installation.

2.3 License problem?

If the system is not operable because of a missing, or an incorrect license file, please go through Vantage User Manual, session 10, Software Licensing. Attach the *systemInfo.txt* file to an email message. In the email message, describe the situation briefly and send the email to licensing-request@verasonics.com.

2.4 Warning about timeToNextAcq too short

The 'timeToNextAcq' value is the time in microseconds from the start of the transmit period in the event that it is specified to the next start of transmit period. The minimum time for a transmit/receive acquisition is around 10usec (the actual minimum is 128 A/D samples or 10usec, whichever is greater), so if you set the 'timeToNextAcq' value smaller than something in this range, the timing can't be met and an error is produced.

Usually, the missed ‘timeToNextAcq’ warnings are due to changing the high voltage. The amount of time missed is consistent with the time the HV supply takes to slew to a new level. If the high voltage change occurs while the hardware sequencer is paused (which is likely the case at the ‘sync’ point) it may take a transmit event to initiate the change in high voltage.

In addition, a DMA can only launch when the previous DMA has completed; if the previous DMA is still in progress, the hardware sequencer will pause until it completes.

2.5 Warnings or errors about different limits while using profile 5

During the operation of profile 5, extended burst option, some warning or error messages related to the hardware limit may appear, like:

1) Transmit flux limit
2) Peak transmit output current limit
3) Gate driver supply current limit
4) Gate driver device estimated temperature rise
5) TX FET temperature rise
6) Push Capacitor Peak current
7) Estimated average HV transmit supply

Please refer to computeTWWaveform.m and TXEventCheck.m which find all active transmit events in the event sequence as defined by the user's setup script, estimates the operating state currents, dissipation levels, etc. and compares them to the limits that have been defined to ensure safe, reliable operation of the system.

Basically, lower the transmit frequency, reduce active elements by changing TX.Apod setting, reduce the duty cycle, or transmit pulse length would be possible options to avoid reaching the limits.

2.6 Still get errors?

Please note, the free support is 8 hours per system per SLA per year, so please use EventAnalysisTool to find possible script errors before asking for support. Please refer to the Application Note – EventAnalysisTool for more information. If you can't identify where the bug is, please email your script and systemInfo to support@verasonics.com.