Technical Update

TROUBLESHOOTING

Equipment Type: Phoenix® Dialysis System

Subject: Alarm Lights Flashing without Alarm Message

From: Gary Willis

Purpose: This tech update provides troubleshooting suggestions for a condition that could occur when the yellow Status Lights (sometimes the red) on the IV pole are flashing, but no audible alarm tone is heard and no alarm messages are displayed on the LCD screen. The problem might be observed during Dialysis, ADR processes, or while in the Calibration environment. Incorrect diagnosis of this condition can lead the technician to unnecessarily replace components or to replace the wrong component.

Background: Whenever the yellow or red Status Lights on the IV pole are flashing, the reason for the flashing can usually be determined by checking the status of several values on Status Screen #2. In most cases, this is unnecessary since alarm messages are displayed on the screen, and checking the status screens for details serves only to confirm what you already knew. However, when there are no displayed alarm messages, status screen values can provide useful guidance.

Key status screen values to check are WARNING 1, WARNING 2, and WARNING 3 (yellow Status Lights) or ALARM 1, ALARM 2, and ALARM 3 (red Status Lights). Another useful value is T1T FAIL 1.

Troubleshooting:

Solution #1: The condition is software program related and was inadvertently triggered while in the Calibration environment and is NOT a hardware problem.

During a few of the tests, if a piece of blood tubing is inserted into or removed from the ABD while the test or calibration is in progress, the yellow Status Light will begin to flash slowly and there will be no audible alarm tone. (Sometimes the red Status Light will flash instead of the yellow.) The flashing alarm will latch and cannot be overridden. Exiting to the IDLE screen will stop the flashing, but with a return to the Calibration environment, the flashing will resume. The flashing will continue during any ADR process that is selected. The flashing Status Light does not interfere with any testing or calibrations or ADR processes, but will persist as a nuisance alarm condition until the Phoenix is turned OFF and back ON.
The tests / calibrations that are affected are:
1. PC Pump Test / Calibration
2. D1 Flow Meter Test / Calibration
3. D2 Flow Meter Test / Calibration / Autocalibration
4. P2 Pump Test / Calibration

The circumstances that can cause the alarm are:
1. Inserting tubing into the ABD during the test / cal.
2. Removing tubing from the ABD after the test / cal has been started.

When this alarm occurs, the status screen values for WARNING 2 and WARNING 3 will be affected. When the tubing is mounted in the ABD during one of the test / cals listed above, the WARNING 3 value will change to 0008 (Status Light will start flashing) and if it is removed during the same test, then WARNING 2 will also change to 8000. If the tubing is removed from the ABD after the test / cal has been started, then both values will change at the same time (Status Light will start flashing).

Note: Since the Protective slave board initiates the alarms; it could lead the technician to try replacing this board as a possible remedy. The alarm will be eliminated after replacing the board, but it would have been eliminated anyway, simply by turning the Phoenix OFF and back ON again.

Solution #2: The condition was caused by the NiCad or Lead Acid battery (mounted near the power supply) having lost charge or is unable to hold sufficient charge to pass T1 Test #5.

This condition can be verified in the T1T Fail 1 as a value of 0021 on Status Screen #2 and has already been described in detail in an earlier Tech Update. (For details, refer to Tech Update PH11031t on the Gambro Technical Website – www.usa-gambro.com)

Solution #3: The condition was caused by either a spontaneous software glitch or a software glitch caused by a hardware problem.

1. Software Glitch (spontaneous): During dialysis, if the alarm light issue has been verified to NOT be related to Solution #2 above, then the problem may be caused by a software glitch that can be corrected by performing a Fast Recovery procedure. This procedure will reset the Phoenix CPU, restart the software program, and resume the treatment as quickly as possible. (Refer to the Phoenix Operators Manual, Section 5.A.3 for details.) If this is unsuccessful, then the problem may be hardware related and will need servicing.

2. Software Glitch (hardware problem): The condition was caused by a low supply voltage.

Measure the three 5V supply voltages (5VD, 5VB, 5VP) at their test points as indicated in the Phoenix Service Manual, Power Supply Verifications, Section 8.3.

Note: Measure these voltages with the right side door closed and latched so as not to disturb motherboard J-connectors.

If any of the three 5V supply voltages are 4.95VDC or lower, this can lead to software problems due to hardware communication errors. A poor connection at the J37 connector can cause this problem. Verify the connectivity of the J37 connector on the Phoenix motherboard and the cable that connects it to J7 on the power supply motherboard. Replace the cable if needed. The connection enhancer liquid, Stabilant 22, can be applied to improve the connections at the J37 and Phoenix motherboard.