Remote trouble shooting guide for Sun chambers/controllers _{07/29/2013}

IEEE-488 (GPIB) communication issues

1. When troubleshooting GPIB issues, it is recommended you use the utility that came with the GPIB card (such as Measurement & Automation Explorer from National Instruments).
2. Check that the GPIB cables connected to the chamber/controller are secure on both ends and chamber/controller is powered on.
3. Verify that the chamber/controller's GPIB address is set to the address the application is expecting (address between 1 and 30) and that there are no other devices with that same GPIB address on the bus (unique GPIB address). The GPIB address for the EC1x model chambers and the PC1000 is set in SDEF menu. For the PC100, PC100-2, TC02 controllers it is set in the MENU. The address for EC0x model chambers and the TC01 controller are set with dip switches located on the back of the EC0X chamber and on the remote panel of the TC01 controller.
4. Perform software reset on chamber/controller.

    EC1X, EC1xHA, EC1.3W, EC127 chambers and the PC1000:

    STOPE9 <ENTER>

    PC100, PC100-2, TC02 stand-alone controllers:

    STOP-9 <ENTER>

    EC0X chambers, TC01 controller:

    There is no software-reset command. Reset is performed by toggling power OFF/ON.

5. Swap out GPIB cable with known good cable.
6. Verify that GPIB card installed in PC is not at fault by checking that it functions with a known working GPIB device.
7. For EC0X chambers/TC01 controller, swap out remote panel/gray ribbon cable with a known working remote panel/ribbon cable if possible.
8. If problem persists after the above steps have been performed, it's possible motherboard/controller is at fault. Contact Sun for assistance/RMA.

RS232 communication issues

1. Verify the RS232 cable is wired properly.

Most RS232 communication issues arise from an incorrect wiring of the RS232 cable. Store purchased RS232 cables are typically straight through cables - wired to communicate with a modem. Sun controllers require a null-modem wiring configuration as shown below.

DB9 female connector   DB25 male connector
on PC end   on controller end

Pin #3 (TXD) >------------------------> Pin #3 (RXD)

Pin #2 (RXD) <------------------------< Pin #2 (TXD)

Pin #5 (GND) <------------------------> Pin #7 (GND)

RS232 cable wiring diagram for EC1X, EC0X chambers and PC1000, TC02, TC01 stand-alone controllers.

DB9 female connector   DB9 male connector
on PC end   on controller end

Pin #3 (TXD) >------------------------> Pin #2 (RXD)

Pin #2 (RXD) <------------------------< Pin #3 (TXD)

Pin #5 (GND) <------------------------> Pin #5 (GND)

RS232 cable wiring diagram for PC100, PC100-2, TCAL2

When troubleshooting RS232 issues, it is recommended you use a terminal emulator program such as Windows HyperTerminal or TeraTerm (freeware).

Verify that the chamber/controller's RS232 settings are set up properly.

RS232 settings for EC1x, EC1xHA, EC1.3w, EC127 chambers and the PC1000 controller can be set up in SDEF menu. Stand-alone controller models PC100, PC100-2 and TC02 settings can be accessed via the MENU key.

2. Set up terminal emulator with following settings:

COM PORT: Select available port connected to chamber/controller

Baud Rate: Select same baud rate as selected in SDEF or MENU (9600 typical)
DATA BITS: 8
STOP BITS: 2
PARITY: NONE
FLOW CONTROL: NONE

For EC0X chambers and TC01 controllers (no SDEF or MENU):

COM PORT: Select available port connected to chamber/controller
Baud Rate: 9600 for REV F controllers, 2400 for 3-stack REV E and prior
DATA BITS: 8
STOP BITS: 1
PARITY: NONE
FLOW CONTROL: NONE

RS232 ECHO may be set to YES in SDEF or MENU. This setting may be used to echo back characters that are being entered from the keyboard by the user. It is normally only used when communicating with a terminal emulator program or an RS232 dumb-terminal. In an RS232 application such as Sun's RS232 demo, it must be set to NO.

3. Once a properly wired RS232 cable is connected from the PC's RS232 port to the chamber/controller and a terminal emulator is set up as shown above, you should be able to communicate with the chamber/controller.

Example commands to send to an EC1x, EC1.3w, EC1xHA chamber:

CHAM? <ENTER> (returns the chamber channel temperature)
UCHAN? <ENTER> (returns the user channel temperature)

Example commands to send to a PC1000, PC100-2:

C1? <ENTER> (returns channel #1 temperature)
C2? <ENTER>   (returns channel #2 temperature)

Example command to send to a PC100, TC02:

TEMP? <ENTER> (returns probe temperature)

Example command to send to an EC0X, TC01:

T (returns probe temperature)

If you continue to have problems, contact Sun for assistance/RMA.

When writing a custom RS232 application, the following guidelines should be followed:

- Make sure RS232 ECHO is turned off in SDEF/MENU (not necessary for TC01/EC0X chambers) along with the following settings:

COM PORT: Select available port connected to chamber/controller
Baud Rate: Select same baud rate as selected in SDEF or MENU (9600 typical)
DATA BITS: 8
STOP BITS: 2
PARITY: NONE
FLOW CONTROL: NONE

For EC0X chambers and TC01 controllers (no SDEF or MENU):

COM PORT: Select available port connected to chamber/controller
Baud Rate: 9600 for REV F controllers, 2400 for 3-stack REV E and prior
DATA BITS: 8
STOP BITS: 1
PARITY: NONE
FLOW CONTROL: NONE

- A carriage return character (VbCr for Visual Basic) must be sent after each command for all controllers except the TC01 (EC0X chambers).

- A delay time of approximately .5 sec must be sent between sending and receiving a command. (.25 seconds for EC0X, TC01 controllers).

- Must use all caps and NO carriage return when sending commands to an EC0X, TC01 controller.

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