



# Troubleshooting

*Cepheid HBDC Training Centre*



# Troubleshooting Approach

1. In case of an issue, a message will be displayed (often, with an error code)
2. Check if the error affects one particular module
3. Refer to the Operator Manual and look for the error code, and follow the recommended corrective actions
4. If the problem remains, contact your **local service provider** or **Cepheid**

Service	Telephone	Email address
Training Center (Europe)	+33.5.63.82.53.94	training@cepheidhbdc.com
Technical hotline (Europe based)- Instrument errors	+33.5.63.82.53.19	support@cepheideurope.com
Technical hotline ( U.S.A based)- Instrument errors	888-838-3222, Option 2	techsupport@cepheid.com

# Most common situations

- **GeneXpert or module(s) not detected**
- **Failures without error codes**
  - « INVALID » result
  - « NO RESULT »
  - Cartridge stuck in a GeneXpert module
- **Failures with error codes**
  - Temperature errors: codes 1001, 1002, 2014, 4009, 4017...
  - Probe Check failures: codes 5006 or 5007
  - Syringe pressure failure: code 2008
  - Communication loss: codes 2120, 2120, 2122, 2124
  - Signal loss: code 5011

A young child with a medical IV line on their arm is being held by an adult in a hospital setting. The child is looking down and has their hand near their face. The adult is seen from the back, embracing the child. The background is a blurred hospital room.

# Software Messages

# Where to find Software messages?

The screenshot shows the GeneXpert Dx System software interface. The top menu bar includes 'User', 'Data Management', 'Reports', 'Setup', and 'About'. The 'User' field is set to '<None>'. Below the menu bar is a toolbar with icons for 'Create Test', 'Check Status', 'Stop Test', 'View Results', 'Define Assays', 'Define Graphs', and 'Maintenance'. The 'Check Status' icon is highlighted with a red box. Below the toolbar are two main data tables: 'Modules' and 'Tests Since Launch'. The 'Messages' pane at the bottom is highlighted with a red box and has a red arrow pointing to it. The message text is as follows:

Module Name	Assay	Sample ID	Progress	Status	Remaining Test Time
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Sample ID	Mod Name	User	Result	Assay	Status	Error Status	Start Date
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**Messages:**  
Launched GeneXpert® Dx System at 05/04/15 10:56:38  
Version 4.6a  
Modules not detected. Check power switch and computer/GeneXpert cable connections.

# Where to find Software messages?

The screenshot shows the GeneXpert Dx System software interface. The 'View Results' button in the top toolbar is highlighted with an orange box. Below it, the 'Errors' tab in the main window is also highlighted with an orange box. The 'Errors' tab displays a table with two error messages, which are also highlighted with an orange box.

#	Description	Detail	Time
1	Post-run analysis error	Error 5007: [QC-1] probe check failed. Probe check value of 11.9 for reading number 2 was below the minimum of 32.0	01/26/15 11:02:24
2	Post-run analysis error	Error 5007: [QC-2] probe check failed. Probe check value of 6.5 for reading number 2 was below the minimum of 40.0	01/26/15 11:02:24



# Refer to the Operator Manual

Look for the specific Error Code in the **Troubleshooting Section** of the latest Operator Manual

Error code	Error message	Possible causes	Solution
5007	X probe check failed. Probe check value of n for reading number m was below the minimum of p. (x is the analyte name, n, m, and p are values that the software displays. The values can vary.)	One or more of the following might have caused the error: <ul style="list-style-type: none"><li>• An incorrect amount of reagent was inserted into the cartridge.</li><li>• The reagent is bad.</li><li>• Fluid transfer failed.</li><li>• The sample was processed incorrectly in the cartridge.</li></ul>	Check the following: <ul style="list-style-type: none"><li>• Reagents are added to the cartridge correctly.</li><li>• Cartridges were stored correctly.</li></ul> Rerun the test using fresh cartridges. If the error recurs, call Cepheid Technical Support.
5008	X probe check failed. Probe check delta value n between reading number m and reading number p was below the minimum of q. (x is the analyte name, n, m, and p are values that the software displays. The values can vary.)	One or more of the following might have caused the error: <ul style="list-style-type: none"><li>• An incorrect amount of reagent was inserted into the cartridge.</li><li>• The reagent is bad.</li><li>• Fluid transfer failed.</li></ul>	Check the following: <ul style="list-style-type: none"><li>• Reagents are added to the cartridge correctly.</li><li>• Cartridges were stored correctly.</li></ul> Rerun the test using fresh cartridges. If the error recurs, call Cepheid Technical Support.

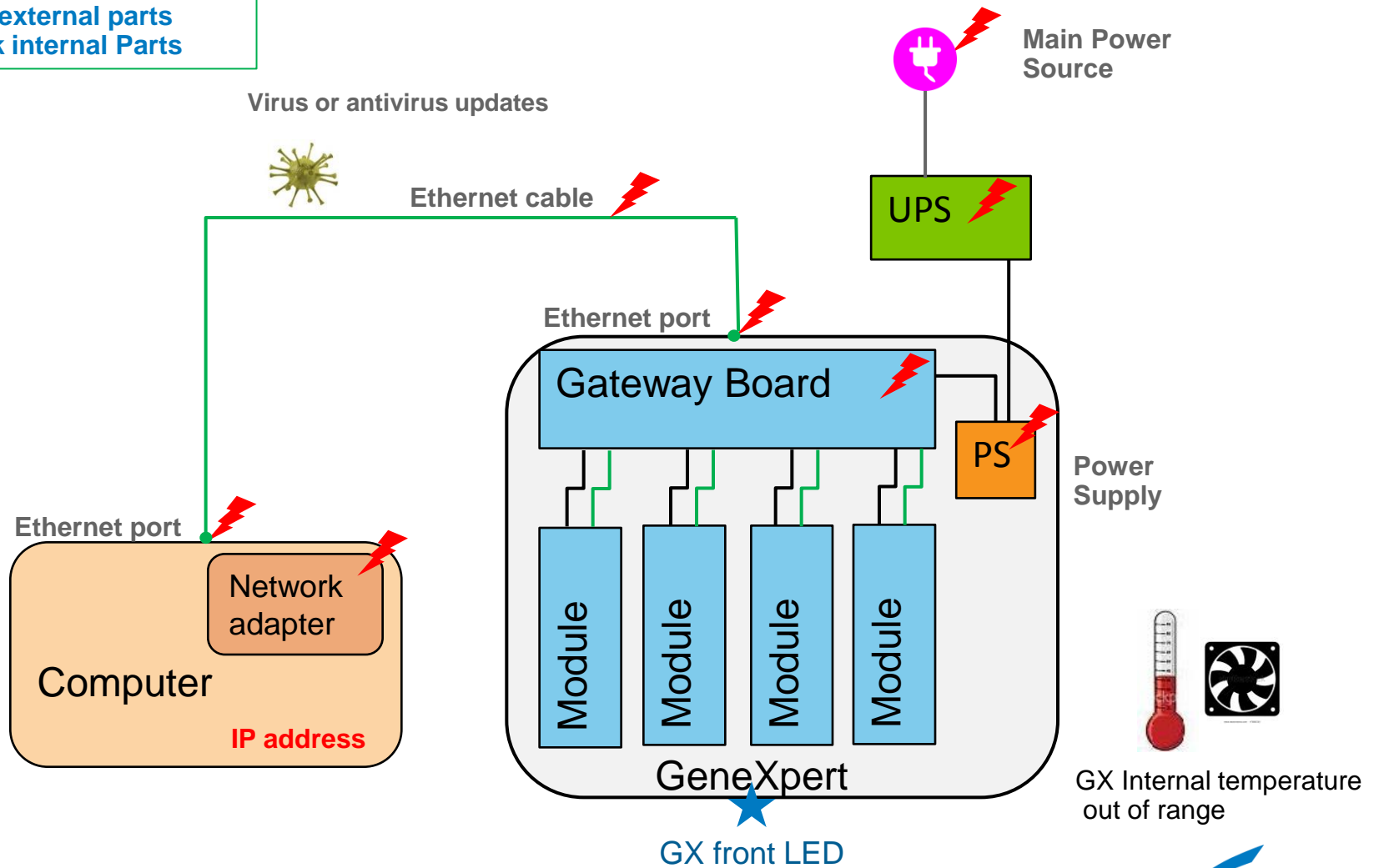
A young child with a medical IV line on their hand is being comforted by an adult. The child is looking down and has their hand near their face. The adult is seen from the back, hugging the child. The background is a soft, out-of-focus blue and green.

**COMMUNICATION ISSUES**  
**GeneXpert not detected**  
**or**  
**Module not detected**



# Whole GeneXpert not detected

First check external parts  
Then, check internal Parts



# Whole GeneXpert not detected

## Troubleshooting Checklist: external parts

### GeneXpert

1. First switch on the GeneXpert then, the computer (restart)
2. Is the front blue LED illuminated? If not, check the power source is functional
3. Ethernet cable : check for visible damage + Reconnect
4. Room temperature (15-30°C)
5. Fan functionality and filter cleanliness

### UPS

1. The status of your UPS (fully charged?)

### Computer

1. Ethernet cable is in the right computer port (as indicated by a white label)
2. Check for visible damage on the ethernet cable+ Reconnect
3. Check the IP address: refer to Operator Manual (Chapter 2.4.1)
4. Scan for computer virus/ check if antivirus is updating (disable it, if required)

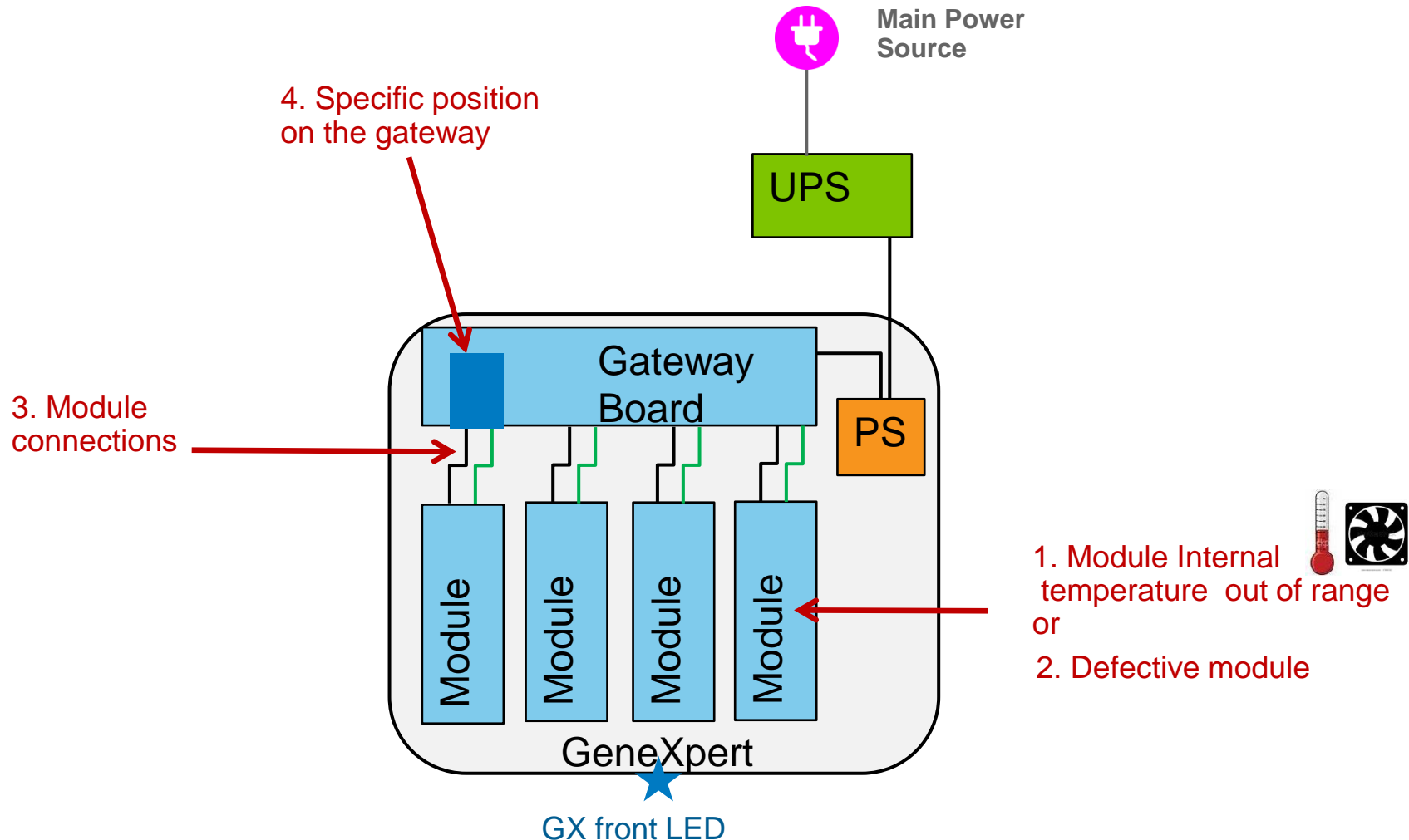
# Whole GeneXpert not detected

## Troubleshooting Checklist: internal parts

Only upon request of Cepheid Technical Support Specialist, you may have to check:

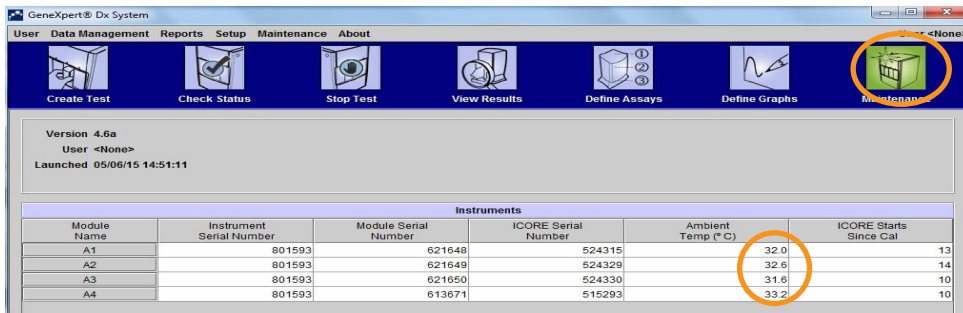
1. GeneXpert power supply
2. GeneXpert gateway board...
3. Ethernet ports (Computer & GX): swap with another GX/computer
4. Network adaptor: wobbling, loose?

# Individual module(s) not detected



# Module(s) not detected: Troubleshooting checklist: External parts

- **Identify the affected module (s): Serial number and position**
- **Check the module(s) internal temperature**
  - Click on the Maintenance icon and check « Ambient Temp » for each module. You may have to report these values when you contact Cepheid Technical Support
  - Check fan functionality\* and filter cleanliness



Instruments						
Module Name	Instrument Serial Number	Module Serial Number	ICORE Serial Number	ICORE Serial Number	Ambient Temp (*C)	ICORE Starts Since Cal
A1	801593	621648	524315		32.0	13
A2	801593	621649	524329		32.6	14
A3	801593	621650	524330		31.8	10
A4	801593	613671	515293		33.2	10



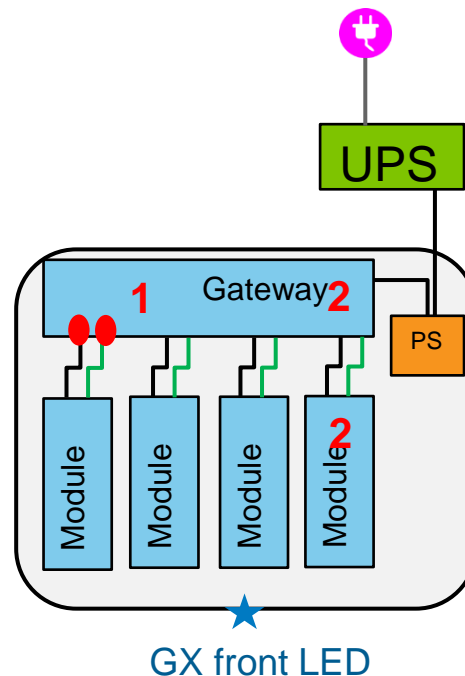
\*Place a wiper on the filter and check if it remains stuck to the back panel

- **Restart the system (GeneXpert and Computer)**
  - If the module is still not detected, please contact Technical Support for guidance

# Module(s) not detected: Troubleshooting checklist: Internal parts

Only upon request of Cepheid Technical Support Specialist, you may have to check:

1. Connection between module and gateway board
2. Gateway failure (specific position) or module failure: Swap module position

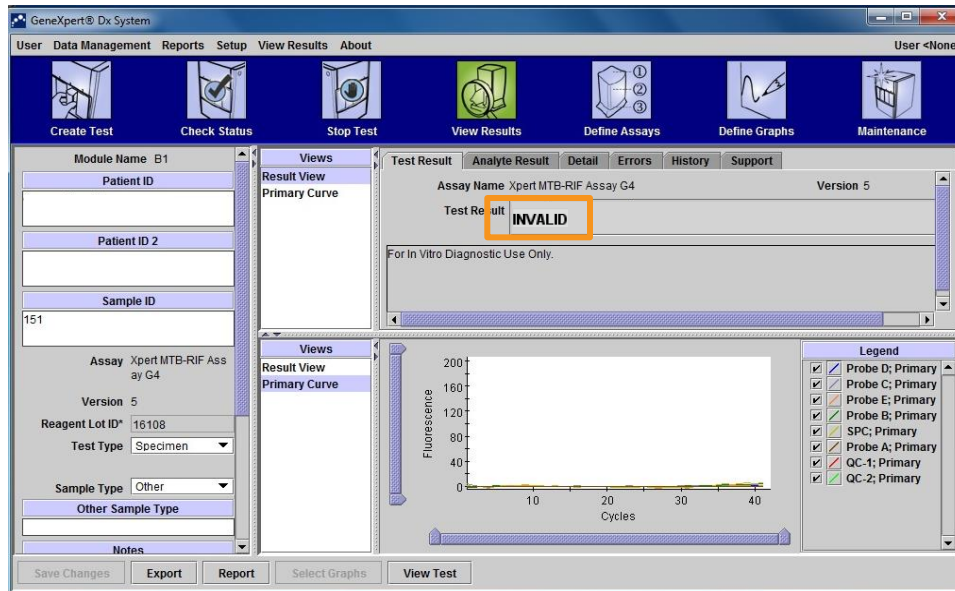




A young child with an IV drip is being held by an adult in a hospital setting. The child has their eyes closed and appears to be resting or sleeping. The adult is seen from the back, wearing a purple wristband. The background is a blurred hospital room.

# Failures without error codes

# INVALID



## INVALID

An Internal Control failed (for a negative result)

SPC/CIC\* or IQS\* or SAC\*

\* (assay dependent)

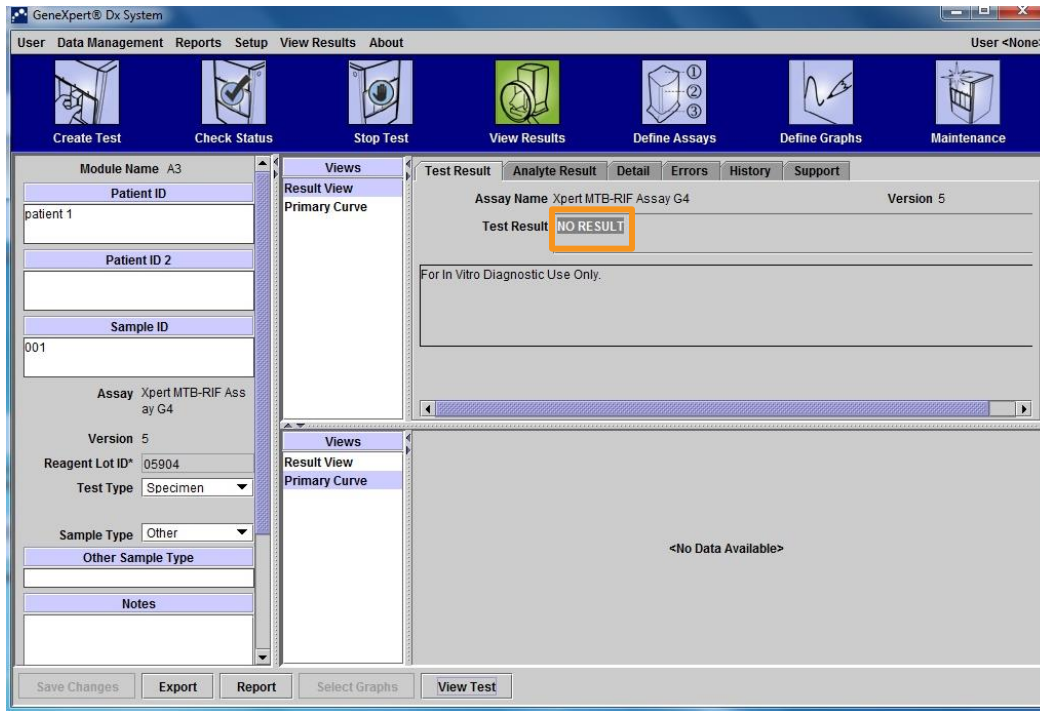
## Origin(s)

- PCR was inhibited due to interfering substances
- Inadequate sample was used
- Improper specimen storage/collection/preparation
- Improper kit storage conditions

## Solution(s)

- Use the correct specimen type
- Check the sample quality (density, viscosity, purity, etc.)
- Follow recommended instructions on sample collection, preparation and storage
- Check Xpert kit storage conditions and shelf life
- Collect a new sample when necessary and retest

# NO RESULT



## NO RESULT

Test could not be completed and insufficient data was collected

## Origin(s)

- Power failure during test
- “Stop Test” function was used.
- Computer freeze or crash during test

## Solution(s)

Ensure there is a consistent power supply

Use “Stop Test” only when it is necessary

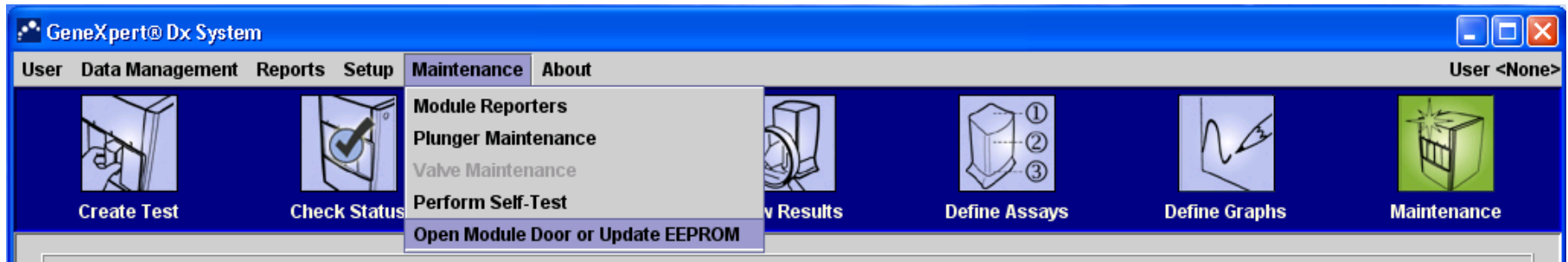
Do not open other applications on the computer while a test is running

# Cartridge stuck inside a GeneXpert module

**Causes:**                   Module mechanical malfunction during the test  
                                  Electrical failure

## **Solutions:**


1. Remove the cartridge using the software



- Select the module. Click “**Open Door**” to open the module door.
- If the door does not open, restart the system and repeat the above steps.

2. Remove the cartridge manually

If the above steps did not resolve this issue, contact Cepheid in order to receive guidance

A young child with an IV drip on their hand is being comforted by an adult. The child is looking down and holding their hand to their face. The adult is seen from the back, embracing the child. The background is a blurred hospital setting.

# Error messages

# Error Messages

The screenshot shows the GeneXpert Dx System software interface. The 'Errors' tab is selected, displaying a table of error messages. The table has columns for '#', 'Description', 'Detail', and 'Time'. Two error messages are listed, both with a description of a probe check failure and a detail of a reading number 2 being below a minimum value. The second error message is highlighted with an orange border.

#	Description	Detail	Time
1	Post-run analysis error	Error 5007: [QC-1] probe check failed. Probe check value of 1.8 for reading number 2 was below the minimum of 27.0	02/18/15 15:21:20
2	Post-run analysis error	Error 5007: [QC-2] probe check failed. Probe check value of 14.1 for reading number 2 was below the minimum of 35.0	02/18/15 15:21:20

## An Error is displayed

- Click on the Error tab to get error code & description

## Origin(s)

- Mainly linked to sample preparation
- Addressed in the next slides

*All other issues should be reported to Cepheid Technical Support*

## Recommended action(s)

It is essential that all operators understand and identify the root causes of errors that may occur in order to avoid high (rising) error rates

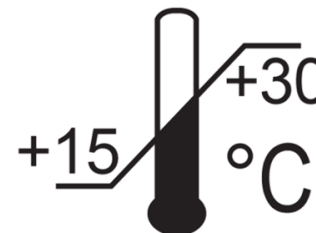


# Temperature issues:

codes 1001, 1002, 2014, 4009, 4010, 4017,

## Causes:

- Ambient temperature is not within acceptable range
- GeneXpert fan failure (broken or filter is dirty)
- Module Heater component is malfunctioning



**Key Question:** Does this error affect only one module?

## Recommended actions:

- Check room temperature (*must be 15 to 30°C*)
- Check clearance around the system (*must be 10-15 cm on all sides*)
- Check the internal temperature of the modules (*in the Maintenance menu < 39°C*)
- Check the fan functionality (*exhaust at rear of the instrument*)
- Check the filters are clean

# Probe check failed: codes 5006/5007

The screenshot shows the GeneXpert Dx System interface. The 'Test Result' tab is active, displaying a table of errors. The errors are:

#	Description	Detail	Time
1	Post-run analysis error	Error 5007: [QC-1] probe check failed. Probe check value of 1.8 for leading number 1 was below the minimum of 35.0	02/18/15 15:21:20
2	Post-run analysis error	Error 5007: [QC-2] probe check failed. Probe check value of 14.1 for leading number 2 was below the minimum of 35.0	02/18/15 15:21:20

The interface also shows test parameters on the left: Module Name A3, Patient ID, Patient ID 2, Sample ID Xpert M 021815145735, Assay Xpert MTB-RIF Assay G4, Version 5, Reagent Lot ID\* 06001, Test Type Specimen, Sample Type Other, and Other Sample Type venous whole blood.

## Error 5006 or 5007

Probe Check control failed and test was stopped before amplification

## Origin(s)

- Sample density (viscosity)
- Incorrect sample volume
- Improper fluid transfer (bubbles)
- Incorrect storage of cartridges (damaged reagent)
- Insufficient maintenance
- Xpert Check overdue

## Recommended actions

- Make sure the sample is liquid before transferring to the cartridges
- Add correct volume of specimen (per Package insert)
- Avoid transferring bubbles
- Store the cartridges as per Package Inserts instructions (temperature+humidity)
- Perform regular maintenance as advised in HBDC Maintenance Presentation

# Abnormal Pressure detected: codes 2008

The screenshot shows the GeneXpert Dx System software interface. The main window displays a 'Test Result' tab with a table of error messages. The first error message is highlighted with an orange box:

#	Description	Detail	Time
1	Operation terminated	Error 2008: Syringe pressure reading of 120.1 PSI exceeds the protocol limit of 120.0 PSI	1/28/15 20:33:51
2	Error occurred	Error 1010: A high positioning error of 16 count(s) was detected at the end of the run	1/28/15 20:34:01

The interface also shows a sidebar with fields for Patient ID, Sample ID, Assay, Version, Reagent Lot ID, Test Type, and Sample Type. The bottom of the window has buttons for 'Save Changes', 'Export', 'Report', 'Select Graphs', and 'View Test'.

## Error 2008

Pressure reading exceeds the maximum

## Origin(s)

- Cartridge filter is clogged (due to highly viscous sample or debris)
- Pressure sensor failure

## Recommended actions

- Make sure sample does not contain any solid particles
- Make sure the sample is liquid before transferring to the cartridge
- Use a new cartridge and add DEPC treated water (same volume as sample). Load cartridge and note final result. If this problem persists it's likely module related: contact Cepheid

# Module communication loss was detected: codes 212X

The screenshot displays the GeneXpert Dx System interface. On the left, the patient information for 'Smith John' is visible. The main window shows a 'Test Result' tab with a 'Troubleshoot' section containing a table of error events. An orange box highlights the following error entries:

#	Description	Detail	Time
1	Communication Lost	Code 2123: Module A4 lost communication while test was running, attempting recovery	05/04/15 12:23:18
2	Communication Restored	Code 2124: Module A4 communication restored	05/04/15 12:24:35
3	Communication Lost	Code 2123: Module A4 lost communication while test was running, attempting recovery	05/04/15 13:27:22
4	Communication Restored	Code 2124: Module A4 communication restored	05/04/15 13:28:07
5	Operation terminated	Error 2126: Module A4 was reset	05/04/15 13:29:14
6	Communication	Code 2123: Module A4 lost communication while test was running, attempting recovery	05/04/15 13:29:14

Below the error log, a 'Primary Curve' graph shows Fluorescence on the y-axis (0 to 200) and Cycles on the x-axis (1 to 13). The curve shows a flat line at zero fluorescence across all cycles. A legend on the right lists various probes and QC samples, all of which are checked.

## Errors 212X

Loss of communication between module(s) and software, while test is running

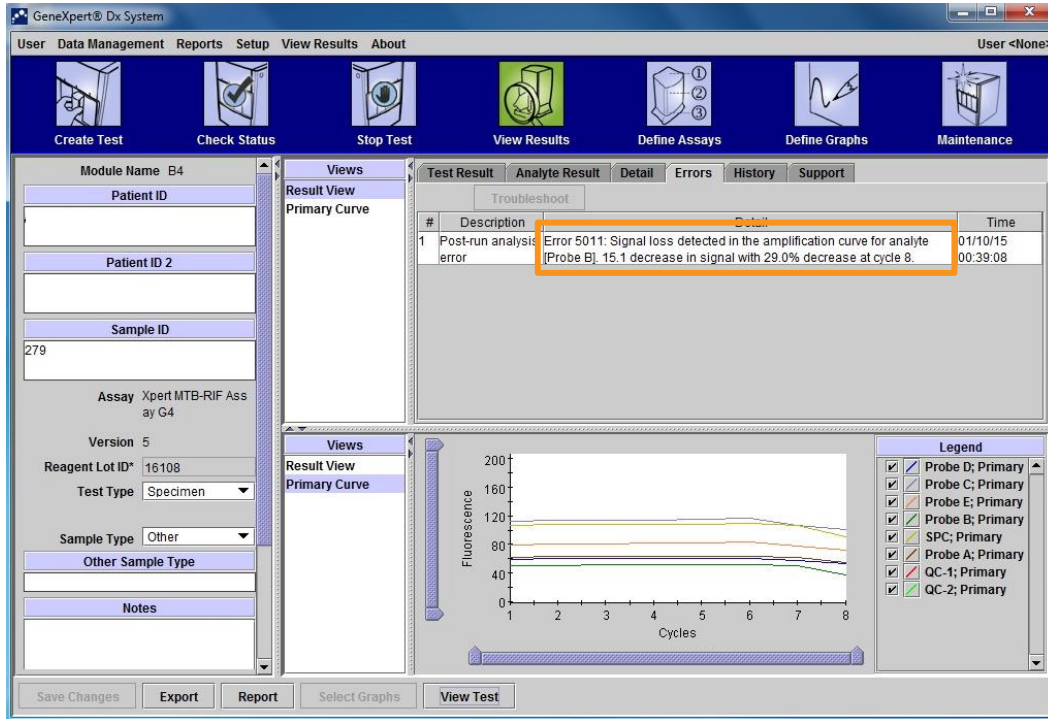
## Origin(s)

- Power supply issue (Mains or UPS)
- Faulty PC-GX Ethernet connections
- Faulty connections between gateway board and modules
- Room temperature above or below expected range

## Recommended actions

- Check mains supply and use appropriate UPS with surge protector
- Unplug and replug Ethernet cable between computer and instrument, restart the system
- Check the module internal temperature in the Maintenance menu
- Unplug and replug the communication cables inside GX, upon Technical Support request

# Signal loss detected in the amplification curve: code 5011



## Error 5011

Signal loss detected in the amplification curve

## Origin

Loss of PCR tube pressure because the cartridge tube is not airtight, or cartridge valve is not working correctly

## Recommended actions

- Avoid transferring bubbles to the cartridge
- Use a new cartridge. If the error persists, this can be module related. Contact Cepheid Support

# Training and assistance

Should you need some training please contact us or your local service provider if available in your country

Service	Telephone	Email address
Training Center (Europe)	+33.5.63.82.53.94	training@cepheidhdbc.com
Technical hotline (Europe based)- Instrument errors	+33.5.63.82.53.19	support@cepheideurope.com
Technical hotline ( U.S.A based)- Instrument errors	888-838-3222, Option 2	techsupport@cepheid.com

*For more information please visit*

<http://www.cepheidcares.com/tb/index.php>



# Technical information of your Genexpert

Information of your GeneXpert	
Person in charge (name)	
Phone number	
Serial number of your GeneXpert (on the back panel)	
E-mail address	
Address City Country	
Computer Service Express Service Tag Number	
Installation date of the system	..... / ..... / .....
Windows Password (Should never be changed)	cphd
UPS (manufacturer, model)	
UPS Battery (V and AH)	



Thank You.

Visit us at  
[www.cepheidcares.com](http://www.cepheidcares.com)