



# **HiSPARC Station Problem and Solutions Documentation**

*Release 0.1 alpha*

**HiSPARC team**

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# CONTENTS

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>Frequently asked questions</b>	<b>5</b>
<b>3</b>	<b>Known issues</b>	<b>7</b>
3.1	Software . . . . .	7
3.2	Hardware . . . . .	12



The HiSPARC software can be downloaded here: [HiSPARC Installer](#)

A pdf version of this manual is available here: [HiSPARC maintenance manual](#)

For more information about HiSPARC, see the [HiSPARC Website](#).

For questions or suggestions please contact our project coordinator Surya Bonam ([info@hisparc.nl](mailto:info@hisparc.nl)).



# INTRODUCTION

This documentation describes the steps required to solve problems with an HiSPARC station. It first explains how to recognize different problems and then how to solve them.

The first part, *Frequently asked questions*, might help answer some questions that you have.

The second part, *Known issues*, describes some of the known issues that we have encountered with the HiSPARC software and hardware. It describes how to determine if the problem described is what you are experiencing and then possible solutions.





# FREQUENTLY ASKED QUESTIONS

- **Nothing works! What can I do?**
  - Don't Panic! Try to determine where the problem lies and find the solution in this documentation.
- **Where do I find the list of known possible issues?**
  - Here: *Known issues*
- **The histograms for my station don't look correct, how can I adjust the station settings to fix this?**
  - Read here about *calibrating the detectors*
- **I tried that, I didn't find a similar problem! What do I do now?**
  - Please contact your *cluster coordinator* for further assistance. They may be aware of such problems the corresponding solutions to the problem, and if they are not, they will consult us.



## KNOWN ISSUES

This is a list of known possible issues with HiSPARC stations. For each problem some steps are given which can be followed to determine if that problem is indeed occurring on your station. Possible Nagios Service warnings that might alert you to the problem are noted.

Here are filters to only show problems which cause a certain Nagios warning: Buffer size, CPU Load, Drive Space, EventRate, Labview Usage, Memory Usage, StorageGrowth, StorageSize, TriggerRate, Uptime.

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**Note:** Multiple issues can cause the same Nagios warning.

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Each problem described below has the following fields:

**First Sign** Explaining how you will probably notice the problem.

**Nagios** Nagios warnings that can be triggered.

**Determination** This is a small guide explaining how to make sure that the problem being described is what you are experiencing.

**Solution** How to solve it.

**Effects** The effects of this problem.

### 3.1 Software

This sections concerns itself with issues related to the HiSPARC station-software.

#### 3.1.1 HiSPARC Monitor does not start

##### Missing directory

**First Sign** When the `STARTHiSPARCSoftware` program runs and the other programs (HiSPARC DAQ and Updater) start normally but the HiSPARC Monitor does not appear or closes instantly.

**Nagios** `EventRate`, `StorageGrowth`, `StorageSize`, `TriggerRate`, and possibly `Buffer size`

**Determination**

- Look in `hisparc/persistent/logs/src/` for the latest log file.

- Check if there is a line that contains the text `Error: unable to open database file.`
- Look in the `hisparc/persistent/data/` directory for a `hsmonitor` folder.
- If it does not exist than go to the solution, otherwise this is not the problem.

**Solution** Create the missing `hsmonitor` directory in `hisparc/persistent/data`.

**Effects** The missing directory causes the HiSPARC Monitor to be unable to store events in its SQLite database, preventing it from sending events to the Nikhef datastore. Note that the HiSPARC DAQ should be unaffected. No events should be lost, the DAQ will store events in its MySQL database until the hard disc fills up.

### 3.1.2 Hard Disc Space

#### To many logs

**First Sign** Nagios warning about Disc Space.

**Nagios Drive Space**

**Determination**

- Look in `hisparc/persistent/logs/`.
- Check the size of the `src` directory by right-clicking on it and choosing 'Properties'.
- Check if this is a significant fraction of the total disc space.

**Solution** Remove all logs from the `src` directory except for the current one (present date in `dd-mm-yyyy.log`). Select all (`ctrl + a`) logs in `hisparc/persistent/logs/src`. Deselect the current one (`ctrl + click`). Remove them using `shift + delete` (to bypass the Recycle Bin)

**Effects** If the disc is full the HiSPARC daq can not store events in the database, preventing the station from storing more events.

#### To many updaters

**First Sign** Nagios warning about Disc Space.

**Nagios Drive Space**

**Determination**

- Look in `hisparc/persistent/downloads/`.
- There should be some `adminUpdater_v###.zip` and `userUnpacker_v###.exe` files there.
- By right-clicking them you can see their file size is of the order of 100 MB.
- If there are many they can take up some space.

**Solution** Remove all `userUnpacker` and `adminUpdater` files except the newest ones. Do this by selecting them and pressing `shift + delete` to remove them directly.

**Effects** If the disc is full the HiSPARC daq can not store events in the database, preventing the station from storing more events.

### 3.1.3 HiSPARC DAQ Errors

#### Can not connect to buffer

**First Sign** Red LED in HiSPARC DAQ

**Nagios**

**Determination** From the Start menu start odbcad32.exe. Check if the hisparc buffer is there.

**Solution**

**Effects** The HiSPARC DAQ will not be able to store events.

#### Not in DAQ Mode

**First Sign**

**Nagios** TriggerRate

**Determination** Look at the program HiSPARC DAQ, see if the button in the middle shows 'DAQ Mode'.

**Solution** Click the 'DAQ Mode' button in the HiSPARC DAQ.

**Effects** When the HiSPARC DAQ is not in DAQ Mode it will not store triggered events.

### 3.1.4 Error in HiSPARC Monitor

#### Malformed HisparcII.ini

**First Sign** Errors in the HiSPARC Monitor: Uncaught exception in job: need more than 1 value to unpack. Restarting...

**Nagios** TriggerRate

**Determination** Check in the file hisparc/persistent/configuration/HisparcII.ini for blank lines

**Solution** Remove any blank lines from HisparcII.ini

**Effects** Errors in the HiSPARC Monitor and no TriggerRate updates for Nagios.

#### Time difference to large

**First Sign** Errors in the HiSPARC Monitor: Uncaught exception in job: invalid literal for int() with base 10: 'difference too large'. Restarting...

**Nagios** TriggerRate

**Determination** Check in the file hisparc/persistent/configuration/HisparcII.ini for the text 'difference to large'.

**Solution** Check the PC time, make sure that it is set to the current time. Check the GPS settings, make sure that it is working and showing the correct GPS time.

**Effects** Errors in the HiSPARC Monitor and no TriggerRate updates for Nagios.

### 3.1.5 GPS

#### COM Port to high

**First Sign** The GPS date attached to events is very inaccurate, like ~1999 or ~2019.

**Nagios**

**Determination**

- Open Configuration -> System -> Hardware -> Browse Devices -> Com Ports
- If the Com ports number higher than 32 the DSP Mon GPS program can not connect to the GPS

**Solution** Lower the COM Port Number, by direct reassignment, use the com\_port\_reassign utility.

**Effects** No GPS recognized by DSP Mon, this causes data to get dates like 1999 or 2019, making the data unusable.

#### No antenna connected

**First Sign** The GPS get no satellite signals, seen in the Satelites tab of the HiSPARC DAQ.

**Nagios**

**Determination** Open DSP Mon and check the LED status of the Antenna Open. It will be yellow while some of the other LEDs are green. Also all Signal Values (SV) will be 0.

**Solution** Check the GPS cable for kinks or cuts, also check if the antenna is still properly attached. Once fixed the SV should rise and turn green, as well as the Antenna Open status.

**Effects** Makes the GPS unable to determine the correct date. It falls back to some other date like 1999 or 2019, making the data unusable.

### 3.1.6 Uploading

#### Proxy not set

**First Sign** No data is uploaded, the local storage fills with events

**Nagios** StorageSize

**Determination** Run Diagnostics (LocalDiagnosticTool in older versions) to check if a proxy is required.

**Solution** Run Diagnostics (LocalDiagnosticTool in older versions) to check Proxy settings, if it finds proxy settings for the system it can use these to configure them for Python. Press the Write Config.

**Effects**

### 3.1.7 Firewall

#### VPN blocked

**First Sign** All Status indicators on Nagios are CRITICAL

**Nagios** Host, Buffer size, CPU Load, Drive Space, EventRate, Labview Usage, Memory Usage, StorageGrowth, StorageSize, TriggerRate, Uptime

**Determination** Run Diagnostics (LocalDiagnosticTool in older versions) to check the VPN status.

**Solution** Open TCP port 443 in the firewalls

**Effects** Nagios will be unable to check the status of all services. Moreover, the HiSPARC support will be unable to log into the PC remotely to assist in case of problems.

#### Web blocked

**First Sign** No data is uploaded, the local storage fills with events

**Nagios** StorageSize

**Determination** Try opening a website in a browser on the detector PC, preferably [www.nikhef.nl](http://www.nikhef.nl), if this fails then web traffic is blocked. If the browser has no problems, then look at the [Proxy not set](#) issue.

**Solution** Open port 80 in the firewalls

**Effects** The Uploader of the HiSPARC Monitor uses a HTTP POST Request to send data to our datastore, but this will be blocked if port 80 is closed.

#### .exe blocked

**First Sign** An update is available but the software can not download it

**Nagios**

**Determination** Try opening the link to the updater, shown in the HiSPARC Updater, in a webbrowser. If this fails then .exe files are probably blocked by the network.

**Solution** Allow downloading of .exe files through the firewall

**Effects** The Updater will see there is an update and quit the HiSPARC DAQ. However when the update fail it will restart the HiSPARC software, but then see there is an update and try again, it will be stuck in this loop.

## 3.2 Hardware

This sections concerns itself with issues related to the HiSPARC electronics and hardware.

### 3.2.1 Bad signals

#### Bad power supply

**First Sign** HiSPARC DAQ might frequently loose the connection to the HiSPARC electronics or there will be fluctuations (sine) over the signal

**Nagios**

**Determination** Replace the power supply with a new one and see if the problem disappears

**Solution** Replace the power supply

**Effects**

#### Light leak

**First Sign** Many small peaks (short pulses) in the signals in the HiSPARC DAQ, also the number of events will increase during day time (due to sunlight)

**Nagios** `TriggerRate`

**Determination** Cover the detector with a light-tight blanket or foil. Now the extra peaks should disappear.

**Solution** Patch the light-leaking parts with new foil/tape.

**Effects**

### 3.2.2 No Devices Found

#### Connect to power

**First Sign** HiSPARC DAQ s unable to connect to the HiSPARC electronics

**Nagios** `EventRate`, `StorageGrowth`, `StorageSize`, `TriggerRate`

**Determination** Start the HiSPARC DAQ, it will show a message that no device is found. Check if the LEDs on the HiSPARC electronics box are lit.

**Solution** Connect the HiSPARC electronic box via the provided Power supply to a power outlet.

**Effects** No data can be taken.