

HiSPARC Station Problem and Solutions Documentation

Release 0.2

HiSPARC team

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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).

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.
- **Where can I find the documentation for a certain part of the software or hardware?**
 - On this page there is an overview of all our documentation pages: [HiSPARC docs](#)

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.

Note: Multiple issues can cause the same Nagios warning.

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 `STARHiSPARCSoftware` 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 for blank lines in the file hisparc/persistent/configuration/HisparcII.ini

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 for the text difference to large in hisparc/persistent/configuration/HisparcII.ini.

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.

400 Bad Request

First Sign Errors in the HiSPARC Monitor: Error Uploader: .. Return code: 400

Nagios StorageSize, TriggerRate

Determination Ensure that all required variables are being uploaded: station_id, password, data and the checksum.

Solution Check that the station number and password are entered correctly in the configuration file: hisparc/persistent/configuration/config.ini.

Effects No data will be uploaded.

Access denied for MySQL buffer

First Sign Error in Nagios: Buffer size: Access denied for user 'buffer'@'localhost'

Nagios Buffer size

Determination Check if the file hisparc/user/diagnosticchecks/checks.py contains only one path to a CONFIG_INI: CONFIG_INI = "../../user/hsmonitor/data/config.ini".

Solution Open the file hisparc/user/diagnosticchecks/checks.py in a text editor like NotePad and add the following line after the line starting with CONFIG_INI = "../../: CONFIG_INI2 = "../../user/hsmonitor/data/config-password.ini". Finally several lines later is the following code: config.read(CONFIG_INI), replace this by: config.read([CONFIG_INI, CONFIG_INI2]). Save the file.

Effects Nagios can not monitor the Buffer size.

3.1.5 GPS

Firmware not loaded

First Sign No GPS appears in DSP Mon

Nagios

Determination This only occurs with HiSPARC III electronics when their firmware is not yet loaded, which is indicated by all LEDs on the unit being on.

Solution Start the HiSPARC DAQ to load the firmware into the HiSPARC electronics.

Effects No GPS recognized by DSP Mon.

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.

Time offset

First Sign No coincidences with nearby stations.

Nagios

Determination Open DSP Mon and check if the timing for the GPS is set to UTC or GPS, it should be GPS.

Solution Set the GPS Timing to use GPS time.

Effects There is a difference of ~16 seconds between GPS en UTC time, resulting in offset timestamps if the wrong setting is chosen.

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

Incoming firewall rules

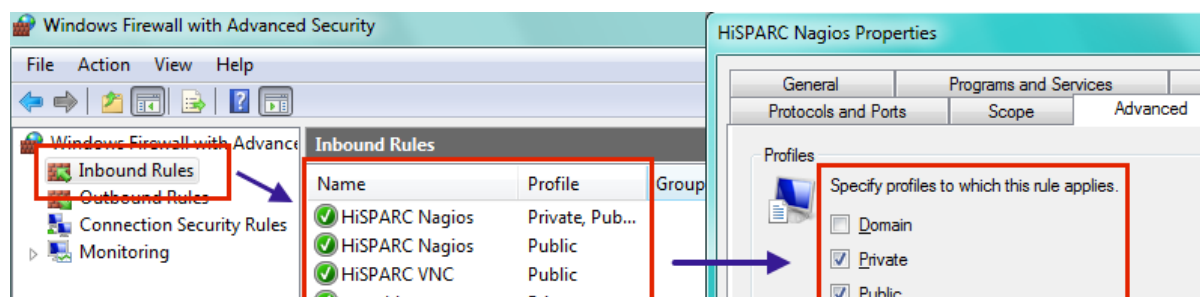
First Sign All active Nagios checks are critical.

Nagios Host, Buffer size, CPU Load, Drive Space, Labview Usage, Memory Usage, Uptime

Determination All of the above Nagios services are critical eventhough the software is running properly.

Solution

- Open the Windows Control Panel, go to Windows Firewall and Choose Advanced settings from the sidebar.
- If required enter an administrator password.
- Go the the Inbound Rules.
- Look for the three rules that start with HiSPARC.
- Open the Properties window for these rules, go the the Advanced tab.
- Enable the rules for both the Private and Public profiles.
- Next look for the rules called File and Printer Sharing (Echo Request - ICMPv4-In).
- Enable those if they are not yet enabled and also ensure they are enabled for both Profiles.



Effects Nagios can not monitor the PC status, VNC may also be blocked.

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, 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

Bad PMT base

First Sign The current for one of the PMTs is very high (above 15 mA).

Nagios

Determination Look in the HiSPARC DAQ at the current used by the PMTs. If this is above 15 mA something is probably wrong.

Solution Try lowering the High Voltage on the PMT, or turning it off for a day. If that does not help it may need to be replaced, contact your cluster coordinator.

Effects The PMT will not function properly.

3.2.2 No Devices Found

Connect to power

First Sign HiSPARC DAQ is 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.