

# NIKA2 System Recovery

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## Abstract

The present document summarizes the main steps involved in the system recovery of the NIKA2 instrument at the 30m telescope. Procedures to connect, start, check, and reboot the system if necessary are described. Some of the procedures listed below involving reboots of the electronics should be taken with caution and are not recommended for non-experienced observers. In case of doubt, please contact the IRAM staff for assistance.

## 1 Connection to Work Remotely

1. Open the tunnel to nika2-a , to Mac 8, to Mac 12 and to PC31:

- **For Mac:** go in `./Acquisition/appli/` and launch the script **tunnel.command**.
- **For Linux:**  
`ssh -L 2222:nika2-a.iram.es:22 -L 5901:nika2-a.iram.es:5901 -L 5902:nika2-a.iram.es:5902`  
`-L 5908:150.214.224.24:5908 -L 5912:150.214.224.24:5912 -L 5936:mrt-nika1.iram.es:5901`  
`-L 5938:150.214.224.24:5938 t21@mrt-lx2.iram.es`

2. Open a ssh window on nika2:

- `ssh -X -p 2222 -t localhost -l nika2`
- `cd ./NIKA/Processing/NIKA_lib`
- `bash`

3. Open a VNC window on Mac8 and on Mac 12 as well as on the PC31 for the cryostat control:

- **open vnc://localhost:5908** (acquisition Mac : control of the nika2-a machine)
- **open vnc://localhost:5912** (acquisition Mac for the KIDs control: lecture, monitor and trace)

## 2 Start the Acquisition with the NIKA2 Equipment via Mac8

1. Getting the windows ready on the Mac 8:

- Click on the “**ssh nika2**” icon on the desktop, immediately after. This opens a ssh terminal on nika2-a in the *appli* folder.
- Click on the icon “**fenetres\_nika**” on the desktop. This opens 2 VNC windows on nika2-a. If this does not work, try the first instruction of the next point.

2. Start Acquisition Software on nika2-a:

- In the ssh terminal on nika2-a do `./reset_nika.pl`. This resets all the VNCs and applications that could still run.
- In the window **nika2's X desktop (nika2-a:1)** click on the “**LAUNCH ACQUI**” icon. This starts all the applications necessary for the acquisition: elvin, antenna, control and acqui. Then wait for all cards to blink correctly. If one card does not respond or if a card is stuck there is a message. Then go to chapter verification of crates then restart the acquisition (`./reset_nika.pl`).
- If everything is OK go to next point (Section 3)

3. Start-up the reading on nika2-a: in the window **nika2's X desktop (nika2-a:2)**, click on the icon “**LAUNCH LECTURE**”:

- Check that everything is blinking correctly.
- Check that you have **SYNCHRO OK** in green. If it is not in green, click on “**stop**” and “**start**” on the acquisition and then click on “**reload file**” on the Lecture window. Often this does not work and it is necessary to restart the acquisition (`./reset_nika.pl`).

### 3 Resonances Control via Mac12 and Mini-Mac or via nika2's X desktop (nika2-a:1) LECTURE VNC

1. For Mac12 and Mini-Mac:

- If **LECTURE** is not already running, click on the small green animal with big eyes to start it. If there are no messages scrolling in the **LECTURE** panel, click on “**reconnect**”. Check that the messages are scrolling in the window.
- If “**kid\_monitoring**” is not already running, click on the icon representing a red lion to start it. Check that the box at the top left of the window is blinking.

2. For the LECTURE VNC, find the “**kid\_monitoring**” window.

3. To search for resonances (in both cases), go to the window **Recover lost pixel** inside the pink “**kid\_monitoring**” window and:

- Click on “**load freq.**”
- Set the sweep: **50 or 100 points on a cold sky, 250 points if one is open on 300K.**
- Click on “**measure**” and wait until the end of the measurement and the display of the curves.
- Click on “**apply shift**”. The program returns to the main control window.

After this general checks:

- The histogram on the left indicates whether the tuning is of good quality.
- The rising balls indicate the number of usable KIDs.
- The histogram on the right gives an idea of the noise on the measurement.
- Click on “**mise a jour des bons kid**” (update the good KIDs) so that the noise is calculated on the good KIDs.

4. Click “**Auto.tune**” so that the Elvin commands can trigger the tuning. The system is ready: **YOU CAN START THE SCANS**

## 4 Check-list for Running Processes

On Mac 8:

1. On the **nika2's X desktop (nika2-a:1)** blue window (**Acqui**):
  - All the LEDs blink correctly. If a LED does not blink, then restart (“**stop**” and “**start**”).
  - All the needles are facing upwards (and orange).
  - the intermediate files are well recorded (**blinking**).
2. On the **nika2's X desktop (nika2-a:2)** green window (**Lecture**):
  - The acquisitions appear regularly in the table on the right.
  - **The sync indicator is green and does not blink.**
  - The file name is displayed correctly and flashes (blinks)
3. On the monitoring Mac:
  - On the pink window (histograms):
    - The text at the top left, next to Auto\_tune, blinks.
    - The histogram of the kid must be rather sharp
    - The balls must be fairly high (number of good kids)
  - On the PC31 by vnc or on the PC38:
    - The temperature of the mixing box (MC) is  $\sim 150$  mK.
    - The level of the cryostat. Check that it is stable.
    - Check that the **duoPOMP**, the **COMP**, and the **HP400** turbo are on.

## 5 Verification of Amc Card Crates

- Go to the Mac 8 in the ssh window on nika2-a. Normally you are in the *appli* folder. If not do: `cd ./NIKA/Processing/NIKA.lib/Acquisition/appli/`
- Send the command `./control.py nika`. It indicates the state of the 3 Crates as well as of all 20 boards. Verify that the 20 boards are present.

After this, different cases may arise:

- The 3 Crates are not presents: it is necessary to **restart everything (power cycle them)**. Go to  $\rightarrow$  1.
  - The 3 Crates are present but there are some missing boards in the list: reboot the Crate in which boards are missing. Go to  $\rightarrow$  2)
  - The 20 boards are present but some are marked **KO instead of OK**: restart the doubtful boards. Go to  $\rightarrow$  3.
  - Everything seems OK but the acquisition refuses to start a precise board: **restart the board indicated by the acquisition**. Go to  $\rightarrow$  3.
1. Complete restart of the Crates (power cycle):
    - Connect with firefox or safari from the Mac 8 or Mac 12 on the PSE538 switch: IP-address: **192.168.1.58**, user: **admin**, pass: **admin**

- Each Crate is powered separately by the **220V P1 (for Array 1), 220V P2 (for Array 2), and 220V P3 (for Array 3)** power supplies.
  - Click off 220V Px and wait 20 seconds.
  - Click on 220V Px and wait 40 seconds. **WARNING: only touch the P1, P2, or P3 power supplies, nothing else.**
  - Check with `./control.py nika` that the Crates are present. If they are, restart `./reset_nika.pl`.
2. Rebooting a Crate: if there are missing boards in the Crate (there must be  $8(A1) + 4(A2) + 8(A3)$ ): `./control.py 192.168.1.xxx crateColdReboot`, where xxx is the IP-Address of the Crate: array1 = 150, array2 = 160, array3 = 170. Wait some seconds then check with `./control.py nika`.
  3. Restart an individual board:
    - To restart a board, you must know the IP-Address of the crate and the slot number of the board. Everything is indicated after a `./control.py nika`.
    - Nonetheless, it could happen that on the `./control.py nika` command output, all boards are shown with OK status but on the Acqui or kid\_monitoring windows, a board shows a problem (e.g. blinking in different colors or arrow not vertical on the Acqui display, or board level drop in the kid\_monitoring display). In this case, to reboot the board it is necessary to identify its IP-Address to find its slot number and Crate IP in the `./control.py nika` output. For this, check the corresponding RunXX.ini file to relate the NICKEL Board name, to the corresponding IP-Address shown by the `./control.py nika` command.
    - To restart a board, stop it and then restart it with the following commands: `./control.py 192.168.1.xxx deactivate n`, where xxx is the IP-Address of the Crate: array1 = 150, array2 = 160, array3 = 170, and where n is the number of the slot (read the slot number with the command `control.py nika`). Wait some seconds and then: `./control.py 192.168.1.xxx activate n`. Wait some seconds then check with `./control.py nika`.

## 6 Log Information in Case of a System Crash

In case of a system crash, it is important to properly record the information of the errors showed by the system so it can be further investigated. Therefore, if a crash happens, please record the following information:

- Time of the crash.
- Kind of problem: board crash?, crate crash?, synchro lost?, etc.
- Error message if available: check in the nika2-a:1 VNC the blue output window of **ACQUI**.

And please inform P. García, M. Calvo, O. Bourrion, A. Ritacco, or S. Sánchez about the problem.