



Holographie Adaptative et Systèmes

HOA20K UI

User Manual — software version 1.7.1

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HOASYS SAS — www.hoasys.fr

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1 Introduction

HOA20K UI is the desktop control application for the HOASYS **HOA20K** high-voltage amplifier / signal generator. The application talks to the device over its USB serial port and provides:

- setting of the output **voltage** (0–28 V RMS, 0.01 V resolution) and **frequency** (0–20 000 Hz);
- automatic **amplitude sweeps** (voltage ramp up/down) and **frequency sweeps**, repeating with a programmable period;
- live device telemetry: temperature, battery level, output state;
- DC offset **calibration** of the output;
- a command **terminal** for direct access to the device protocol;
- a prominent **EMERGENCY STOP** that disables the output immediately.

HOA20K UI runs on Linux, Windows 10 or later, and macOS. The user interface is identical on the three platforms.

2 Installation

2.1 Windows

Run the installer HOA20K_UI-<version>-setup.exe and follow the wizard. It installs the application, creates a Start Menu entry and an optional desktop icon, and registers an uninstaller.

Alternatively, the portable HOA20K_UI-<version>-win64.zip needs no installation: unzip it anywhere and run HOA20K_UI.exe.

The device uses a standard FTDI USB-serial interface; Windows installs the driver automatically (a COM port appears in the Device Manager when the device is plugged in).

2.2 macOS

Open HOA20K_UI-<version>.dmg and drag **HOA20K_UI** to the **Applications** shortcut. The application is not notarized: on first launch, right-click the app and choose *Open*. No driver installation is needed; the device appears as cu.usbserial-....

2.3 Linux

On Arch Linux, install the package (`sudo pacman -U hoa20k-ui-<version>-1-x86_64.pkg.tar.zst`). On any other distribution, use the AppImage: make it executable (`chmod +x HOA20K_UI-<version>-x86_64.AppImage`) and run it.

Your user must be allowed to open serial ports — on most distributions, add yourself to the dialout (Debian/Ubuntu) or uucp (Arch) group and log in again.

3 Quick start

1. Connect the HOA20K to the computer with the USB cable and switch it on.
2. Start HOA20K UI and select the device's port in the **Connection** list (ttyUSB0, COM3, cu.usbserial-..., depending on the platform), then press **CONNECT**.
3. The status LED turns **green** and the **output is enabled** automatically. Telemetry (temperature, battery) starts updating once per second.
4. Set the output with the **Voltage** and **Frequency** controls, or start a sweep from the **Sinusoidal Sweep** tab.
5. Switch the output off and on again with the **OUTPUT OFF / OUTPUT ON** button; press **EMERGENCY STOP** at any time to disable the output.

4 User interface

4.1 Connection

The topmost section selects the serial port and establishes the connection. The round status LED shows the link state:

LED	Meaning
red	not connected
orange	connected, output off
green	connected, output on

Connecting enables the device output. The application verifies the link by querying the device before declaring it connected; if the device does not answer, the log console shows the reason.

The **OUTPUT ON / OUTPUT OFF** button next to **CONNECT** switches the output without disconnecting. The button shows the action it will perform: it reads **OUTPUT OFF** while the output is on (LED green) and **OUTPUT ON** while it is off (LED orange). With the output off the device delivers 0 V; the set voltage and frequency are kept and are restored when the output is switched on again. The button is greyed out while the application is not connected.

4.2 Sinusoidal tab

The screenshot shows the 'Sinusoidal' tab of the application interface. At the top, the 'Connection' section includes a 'Port:' dropdown set to 'ttyS0', a 'CONNECT' button, and an 'OUTPUT ON' button with a red circular status indicator. Below this, the 'Sinusoidal' and 'Sinusoidal Sweep' tabs are visible, with 'Sinusoidal' being the active tab. The 'Voltage Control' section features a 'Voltage (V):' input field set to '0.00 V' with a slider below it. The 'Frequency Control' section has a 'Frequency (Hz):' input field set to '0 Hz' with a slider below it. The 'Terminal' section contains a large text area for commands and a label 'command, e.g. V=12.25 or F=120.12 - Enter to send'. Below the terminal is the 'Device Status' section, which includes a 'Battery:' field showing '--', a 'DC cal:' field set to '-1751 mV' with a 'Set' button and an 'Unlock' checkbox. At the bottom, there is a prominent red 'EMERGENCY STOP' button and a large empty white rectangular area.

Figure 1: Sinusoidal tab

The **Sinusoidal** and **Sinusoidal Sweep** tabs are exclusive: the visible tab selects which controls are shown, and a running sweep keeps running if you switch tabs.

4.2.1 Voltage Control

Sets the output amplitude, from 0 to 28 V RMS with 0.01 V resolution, with the slider or the spinbox. The 28 V limit is enforced by the application on every path that can set a voltage, including the terminal.

4.2.2 Frequency Control

Sets the output frequency, from 0 to 20 000 Hz in whole hertz, with the slider or the spinbox.

4.2.3 Terminal

A three-line terminal for sending protocol commands directly, e.g. $V=12.25$, $F=1200$ or $CAL?$ (see section 5). Type the command and press *Enter*; the command and the device's reply appear in the pane.

- input is converted to uppercase automatically ($v=12.25$ works);
- $V=$ values are clamped to 0–28 V and keep two decimals;
- $F=$ values are truncated to whole hertz;
- the UI controls follow the values typed here;
- the terminal is disabled while a sweep is running.

4.3 Sinusoidal Sweep tab

The screenshot shows the 'Sinusoidal Sweep' tab selected. At the top, the 'Connection' section shows 'Port: ttyS0' with 'CONNECT' and 'OUTPUT ON' buttons. Below this, the 'Sinusoidal Sweep' section contains two sub-sections: 'Amplitude sweep' and 'Frequency sweep'. The 'Amplitude sweep' section has 'Vmin: 0.00 V' and 'Vmax: 10.00 V' spinboxes, a 'Tp: 10.0 s' spinbox, a 'Start amplitude sweep' button, and a description 'V: Vmin -> Vmax -> Vmin, period Tp'. The 'Frequency sweep' section has 'Fmin: 100.0 Hz' and 'Fmax: 1000.0 Hz' spinboxes, a 'Tp: 10.0 s' spinbox, a 'Start frequency sweep' button, and a description 'F: Fmin -> Fmax -> Fmin, period Tp'. Below these is the 'Device Status' section, which shows 'Battery: --' and 'DC cal: -1751 mV' with a 'Set' button and an 'Unlock' checkbox. At the bottom is a large red 'EMERGENCY STOP' button.

Figure 2: Sinusoidal Sweep tab

Both sweeps repeat a linear **triangle profile** ($min \rightarrow max \rightarrow min$) with period **Tp** (2 s to 3600 s). While a sweep runs, the manual voltage/frequency controls and the terminal are disabled; the other sweep cannot be started at the same time. The sweep's own **Stop** button, or the EMERGENCY STOP, ends it.

4.3.1 Amplitude sweep

Sweeps the output voltage between **Vmin** and **Vmax**. Steps are kept at 50 mV or less, so the ramp stays smooth regardless of the period.

4.3.2 Frequency sweep

Sweeps the output frequency between **Fmin** and **Fmax**, in steps of 10 Hz or less; the voltage is not modified.

Note. The sweep modes stream many settings per second to the device. They must only be used with device firmware that does not save each setting to permanent memory (firmware supplied by HOASYS for this purpose) – contact HOASYS if unsure.

4.4 Device Status

- **Temp** – internal temperature of the device, in °C.
- **Battery** – battery voltage shown as a colored gauge: 4.00 V or more reads as *charged*; the bar turns orange below half charge and red when nearly empty.
- **DC cal** – DC offset compensation of the output, in millivolts (± 5000 mV). Verify with a multimeter that the DC voltage at the output is almost zero; if it is not, adjust the compensation value to minimize it (measure the DC component and set its opposite to null it). The controls are behind a safety lock: tick **Unlock**, set the value, press **Set**. The value is applied immediately and **saved permanently in the device**, so this is meant for occasional calibration only, not for repeated adjustments. On connection the application reads back the compensation stored in the device.

4.5 Emergency stop and log console

The red **EMERGENCY STOP** button disables the output immediately and stops any running sweep. The log console at the bottom of the window records every command sent, the device replies, and connection events; check it first when something behaves unexpectedly.

5 Serial protocol reference

The device communicates at **115200 baud, 8N1**, no flow control. Commands are ASCII lines terminated by CR LF. These commands can be typed in the terminal:

Command	Effect
ON / OFF	enable / disable the output
V=<v>	set voltage, volts (2 decimals)
F=<f>	set frequency, hertz
V=?	read voltage
F=?	read frequency
B=?	read battery voltage
T=?	read temperature
CAL=<mv>	set DC compensation, millivolts (signed, saved in the device)
CAL?	read DC compensation

6 Troubleshooting

The port does not appear in the list. Check the USB cable and that the device is powered. On Linux, verify you belong to the serial group (`dialout/uucp`). The list is read when the application starts: restart it after plugging the device.

CONNECT fails. Another program may hold the port open (close serial monitors, other instances of HOA20K UI). Verify you selected the right port.

The device stops answering. Power-cycle the device completely (switch it off, disconnect USB, reconnect). If the application was mid-operation, restart it as well.

macOS blocks the first launch. The application is not notarized: right-click **HOA20K_UI** in Applications and choose *Open* the first time.

Which version am I running? The version is shown in the window title, e.g. *HOA20K UI v1.7*.

7 Support

For questions and support:

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