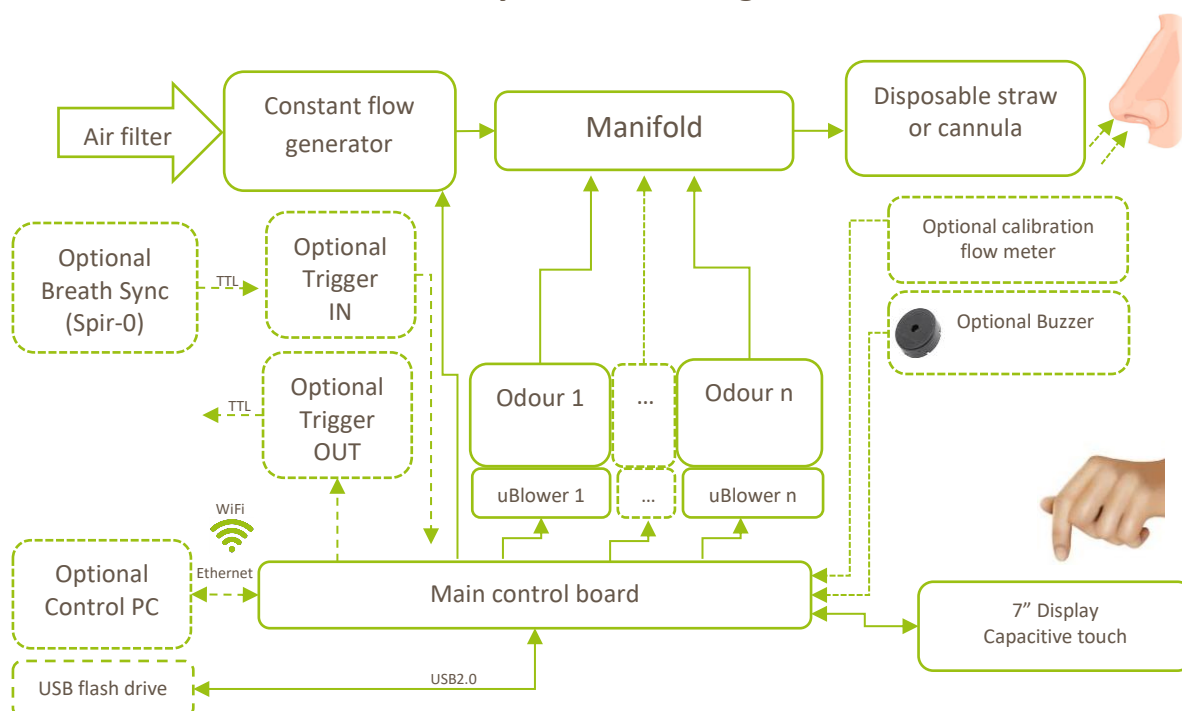


Sniff-nano



Recent and constant problems generated by the SARS-CoV-2 virus are demanding newer and cheaper options for evaluating olfactory performance and recognising loss of smell (anosmia). From the experience gained with *Sniff-0*, a laboratory instrument for olfactory experiments, we have developed *Sniff-nano*, a very compact olfactometer for medical olfactory purposes. This configurable unit can operate as a standalone device to allow the implementation of olfactory experimental protocols, including those that require interaction with the test subject (e.g. via touch screen or audible outputs) for an automated and loggable process. Precise and calibrated quantities of odours and constant flow carried by a straw or a nasal cannula, avoids any spread of breath droplets in the environment.

System block diagram



The device's basic configuration consists of a constant flow generator that can be regulated to obtain a direct nostril flow ranging from 0.5 to 2 l/minute. This air flow feeds into an odour mixing chamber into which controlled odour channels can be injected with a flowrate ranging from 0.3 to 0.5 l/minute and a very precise control of timing: digitally controlled dispensing enables short odour pulses as well as ramping the odour up or down. With two independent flow-controlled channels, a double sync odour delivery or mixing is possible, enhancing combined flow rate up to 1.0 l/minute.

Standard configurations of *Sniff-nano* start from 2 odour channels and can be expanded to 16 odours, with each channel having its own replaceable / refillable odour jar. The programmable control unit synchronizes the dispensing of odours, the use of the constant flow, the sound buzzer, and the capacitive display outputs. All operations can be customized to meet specific experimental or diagnostic protocol needs, and all device activities and data can be logged by the unit using a progressive trial number.

An optional flow meter unit can be attached to the output to check flowrate stability across the product's lifespan, run an autocalibration routine, or define new constant flow/odour combinations for new protocols. Once programmed using Python code, any protocol can run in a standalone mode to ensure maximum use flexibility. An Ethernet or WiFi peer-to-peer connection allows *Sniff-nano* to be controlled and monitored through a dedicated network connection, and the integrated USB 2.0 host port can be used to upgrade the SW or save data to a USB Flash Drive.

Main features



Safe: low pressure dispensing avoids odour and breath droplets spreading in the environment. Use of disposable straws or cannulas avoid any direct contact between user and device.



Fast and cheap: each odour refill can last for a large number of trials, depending on odour, dilutant used, flow rate and dispensing duration. Once exhausted, just unscrew and refill or replace the odour jar with a new one.



Digital device: automated protocols with session logging are possible, allowing the use of multiple or remote stations. Automated tests can be collected as anonymous statistics for each station. Each device contains a fully programmable GNU/Linux embedded controller as Pygame application.



No external compressed air source needed: the system self-generates the basic airflow needed for running the experiments.



Very precise time-controlled odour dispensing which can be synchronized with subject feedback through the interactive touch display and sound buzzer output.



WiFi peer-to-peer connection to collect statistics, monitor the application and perform system upgrades. An internal **ethernet** port is available for wired point-to-point connections.



USB host interface to connect USB flash drives for saving of logs or for software upgrades.



Small, portable and robust, packaged in a conveniently appealing and standalone format.

SPECIFICATIONS Sniff-nano	
OS support	GNU/Linux embedded
Software compatibility	Python, Pygame
Communication	WiFi or internal ethernet
Constant flow range	From 0.5 to 2 l/min
Odour flow range	From 0.3 to 0.6 l/min (0.6 to 1.2 l/min when using paired channels)
Screen	7" 800x480 capacitive touch
Power	12V 30W max (EN60601-1 compliant medical grade power supply included)
Dimensions (Max)	450 x 280 x 240mm
Weight	4.5-6.0 kg (depending on configurations)

RELETED PRODUCTS	
Olfactometer	Sniff-0
Breathing cycle monitor	Spir-0

OPTIONS / ADD-ONS	
	<ul style="list-style-type: none"> • Development of custom experimental protocols • Development of custom graphical interfaces • RS232 port • Pluggable flow sensor, range 0-10 l/m accuracy 2%, 14 bit resolution