

# ETT Gustatometer

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*Version 1.0*

*Variable rate, fully programmable 7+1 channel Gustatometer with subject feedback and sub-second data resolution for fMRI and electrophysiological studies of the gustatory system*

We are proudly announcing ETT's latest development - the Gustatometer. It has been specifically designed for gustatory stimulation during fMRI and electrophysiological experiments. The device is computer controlled and comes with a fully featured paradigm designer to perfectly adjust the device behavior to your experimental design needs. All functions can be controlled via the 5 inch color touch-screen display.

Our Gustatometer comes with an easy-to-use user interface, which allows the operator to have full control over all stages of the experiment. Simple steps in our intuitive paradigm designer help you to easily stimulate at specific time points with the exact amounts you specified – consistently reliable.

Paradigms can be triggered manually as well as through any standard TTL pulse (5V,  $\geq 10$ ms) from an external source. During the paradigm the display gives animated feedback about every single stage of the stimulant application and the total progress of the experiment. All information about each run, including all timings and self-diagnostics are stored onto the SD-card in a text file as coma-separated-values, as well as screenshots.

The semi-automatic mode allows easy and fast pre-loading and cleaning of all connectors and tubes before and after the experiments. Standard luer-connectors on all ports allow an easy setup and storage of the tubing and quick switching between custom mouthpieces. The device comes with one standard mouthpiece that easily attaches to most RF-head-coils and has been successfully tested in hundreds of runs already.

The exclusive use of only PTFE and plastics inside the magnet room make the device fully MRI-compatible. Hygienic disposable bags for the stimulants make sure that nothing spills and subject safety is guaranteed at all times.

## Specifications

### In the box

- ETT Gustatometer 1

- Stimulant/tastant –bag holder rack
- 1 set of food safe bags for the stimulants
- 1 food safe tubing set (0.5m, 8 channel) between reservoir bags and peristaltic pumps (incl. all necessary connectors)
- 2 sets of replacement tubing for each peristaltic pump
- Customized mouthpiece/applicator
- 1 PTFE tubing set (8 m, 8 channel) between applicator and device (Incl. all necessary connectors)
- Swallow sensor belt with digital input (optional)
- Subject feedback pad with digital input (optional)
- Power cord
- Coax cable with connectors
- Optical trigger convertor (optional)

## Ports and Details

- Front-panel:
  - o Data I/O for SD-card
  - o Trigger in for paradigm start on external TTL pulse
  - o Trigger out to supply TTL pulse on each paradigm cycle start
- Back-Panel:
  - o Channel 1 to 7 stimulant intake and outlet
  - o Rinse/Flush channel intake and outlet
  - o Air out (low air flow upon request for airflow in applicator/mouthpiece)
  - o AC input
  - o Power voltage adjust switch (110/220 V)

## Configuration

### Weights and Measurements

- 14”(L) x 8”(H) x 12”(D) , 23 lbs / 10.5 kg (device only)

### Color Options

- Blue front-panel with gray body

### Features and Performance

- Easy-to-use paradigm designer, with full flexibility in timing and amounts (1 drop to 10 ml) delivered for each individual channel
- Multiple trigger start control options including industry standard TTL pulse (like MRI RF trigger) or an external trigger source
- Trigger out to supply TTL pulse on each stimulation event can trigger external device

### Memory and Storage

- Up to 2GB SDRAM flash memory cards

## Power

- Input Voltage: 110V/220V
- Power requirements: 100W

## Sound and noise level

- Optional feedback sounds
- Pumps rates less than 15 dB at 1 meter

## Hardware

- Full function user-programmable central control unit with 5" touch-screen display
- 8 independent peristaltic pumps
- Customizable applicator/mouthpiece
- Customizable MRI RF-coil mount for applicator
- 8 channel PTFE tubing set between source and applicator

## Communications

- Trigger out with a TTL pulse (+5V,  $\geq 10\text{ms}$ )
- Trigger in with a TTL pulse (+5V,  $\geq 10\text{ms}$ )
- Optional subject touch response pad
- Optional subject swallow monitoring

## Display

- 5" full color touch-screen display

## Software and support

### ETT original software

- Genuine ETT Gustatometer OS Bata Edition

### Service and warranty information

- 1 year limited warranty with mail-in professional engineer service and support
- 1 year full work hours coverage for technical assistance
- Online and email support available from ETT and the research community users
- Live immediate-ship loaner equipment available for support during experiments