med associates inc

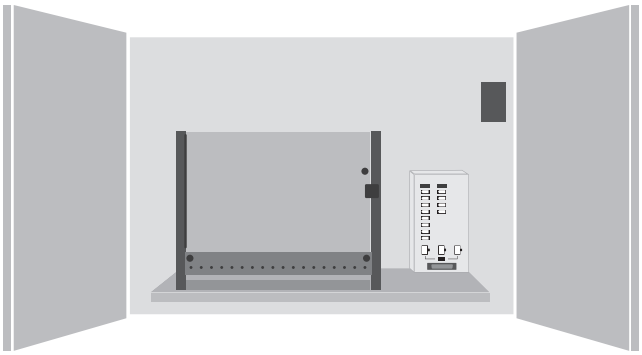
START CONSTRUCTING A SYSTEM

Our system is made to be as modular as possible, adaptable to present and future needs, and integrable with 3rd party products. Because of that, we have many products, often with multiple variations, which can make our catalog feel overwhelming and complicated. Below we've broken down the main components of a system to help you on your way. If you'd like any guidance, we're always a phone call or email away to support you.

STEP 1:
CHOOSE A TEST CHAMBER OR PACKAGE

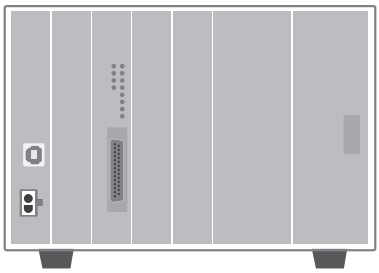
- Operant Conditioning & General Behavior
- Self-administration
- Shuttle Box
- Activity Wheel
- Five & Nine Hole Nose Poke
- Olfactory
- Modular Mazes
- Specialty Mazes *(Barnes, Water, Zero, Elevated Plus)*

...and more!



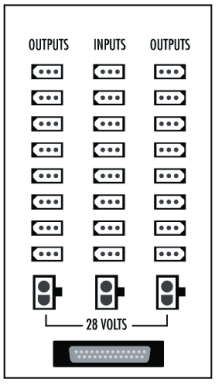
STEP 2:
CHOOSE AN INTERFACE CABINET + CARDS

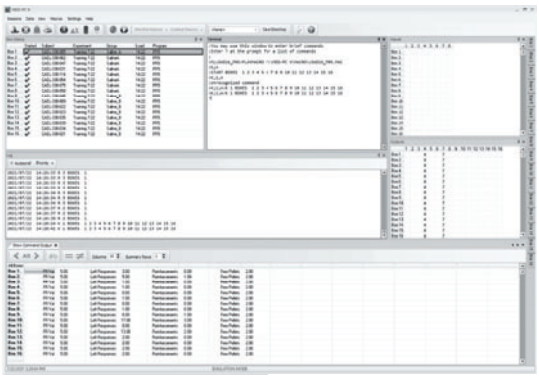
- Standalone Interface (USB)
- Tabletop Interface Cabinet (USB)
- Rack Mount Interface Cabinet (USB)
- SuperPort, SmartCtrl, or OmniCards



STEP 3:
CHOOSE A CONNECTION PANEL

- Passive (for SuperPort) Panels
- SmartCtrl Panels
- Omni Connection Panels





STEP 4:

CHOOSE AN EXPERIMENTAL CONTROL SOFTWARE

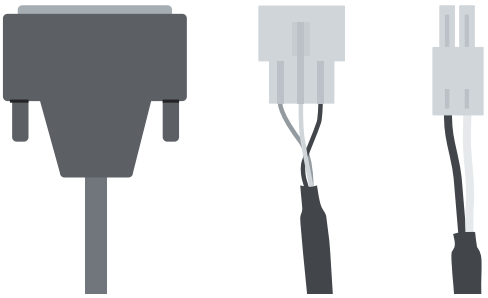
- Med-PC V Behavioral Software Suite
- Schedule Manager

...or other specialized software

STEP 5:

CHOOSE A POWER SUPPLY

- Tabletop Power Supply (built-in)
- Standalone Power Supply
- Rack Mount Power Supply



STEP 6:

CHOOSE YOUR WIRING

- For the wires you need to connect everything together, contact our sales team. We will work with you to get the cables and adapters you need for your setup.

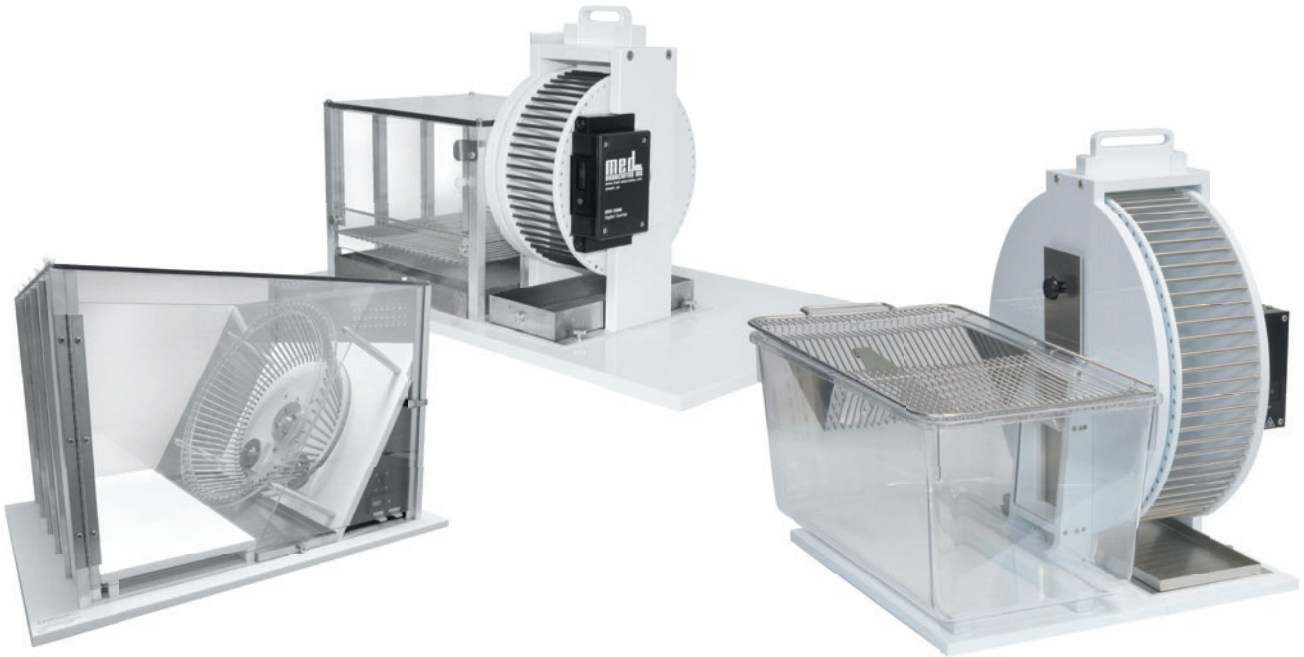
STEP 7:

CHOOSE A COMPUTER

- Your own computer*
  - *As long as it meets the minimum requirements, contact our sales team to confirm*
- Our computer package

...YOUR SYSTEM IS COMPLETE!

SCAN FOR WEBSITE



ACTIVITY WHEELS

HARDWARE

The modular chamber models are fully compatible with all standard response, reward, and stimulus devices. Both rat and mouse models feature a fully integrated manual guillotine door for access to the wheel area.

The home cage model is secured in place alongside the activity wheel for stable transition. For ease of cleaning, the components can be separated, or the animal can be kept in the cage while the wheel is removed

The slanted model's 30° angle provides an even running surface for the animal without interfering with a tether, and is also compatible with our modular accessories.

- Manual stop handle
- Wheels generate four counts per revolution
- Utilize the LCD revolution counter for manual stand-alone operation, or connect to a computer via an input module for automatic data collection using Med-PC

SOFTWARE

Our wheel counter program tracks the number of revolutions of the wheel over a 24-hour period. The counts are saved to a series of bins, one bin per hour.

- Collects and stores data from any activity wheel
- Tracks the total number of revolutions over a user defined time period for analysis
- Session time can be divided into any number of user defined segments (time bins)

SCAN FOR WEBSITE

	DIAMETER (OD)	LENGTH (L)
UNO-PICO-7	1.25 mm	7 mm
UNO-MICRO-8	2.12 mm	8 mm
UNO-MICRO-12	2.12 mm	12 mm

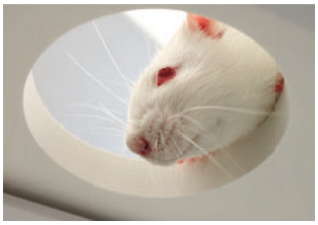
ANIMAL ID

The UNO line of transponders and readers enable facilities large and small to utilize the benefits of RFID microchip identification methods to increase efficiencies and ensure proper animal identification during long term research studies over other methods, such as tattooing and bar-coding.

Available in three sizes, transponders come packaged in a sterile injector needle ready for use. These small passive transponders require no power source and once implanted, remain within the animal for the duration of its life and can be easily detected with a corresponding reader which records the animals information. Once recorded, the information can be downloaded to a PC through a standard USB connection.

- Passive transponder device with no internal power supply for minimal size
  - Radio frequency from the reader provides enough power for the transponder to transmit a response
- All transponders have a unique and universal identification number
- Sterile, individually packaged inside an injector

SCAN FOR WEBSITE



BARNES MAZE STANDARD

Without IR sensors, this maze is for use for manual scoring or with third party video tracking software.

- Modular design allows the same base to be used for rats and mice, simply switch maze platforms
- Safe box features:
  - Cage washable black polypropylene
  - Removable steps to facilitate entry and decrease hesitation by the test animal to escape from the aversive environment *(the maze top)*
  - Removable, and can be placed below any hole
- Maze surface features:
  - Constructed from bright white or blue expanded PVC to ensure proper light distribution and reduce glare
  - Material is also easy to clean
  - Standard colors are white or blue, but custom colors are available
  - Custom sizes available

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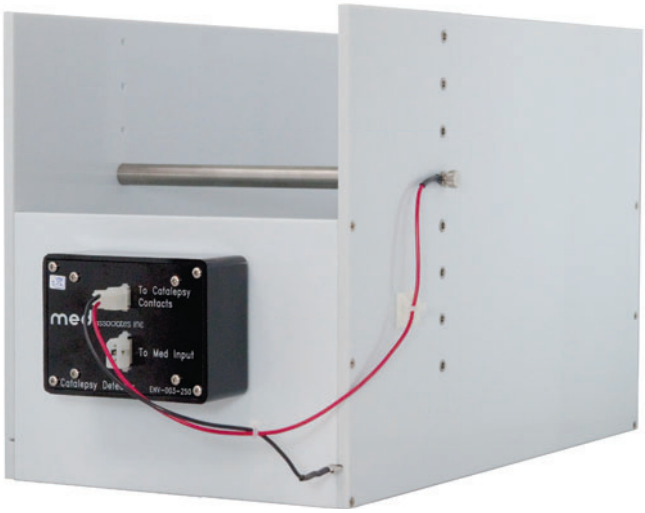

CATALEPSY

Conduct automated catalepsy measurements with rodents...*without a stopwatch!* The system automatically records the amount of time that the rat maintains at least one forelimb holding onto the bar.

- Eliminate the need for hand scoring, this automated system removes ambiguity and user-bias that confound human observer scores of catalepsy
- Simple, straight-forward design minimizes complications
- Data are collected into a table that can be analyzed in a spreadsheet or database application
- Electronic contacts are established using quick-disconnect type fixtures
- Easily add chambers to increase throughput
- Easy to clean and sanitize
  - The electric interface box can be removed so the entire chamber can be sanitized, and is cage washer safe *(tested at 180° F with acid detergent)*
- Includes stainless steel rod sizes
  - 1/2", 3/8", 1/4", and 3/16"
- Rod mount height:
  - Holes every 1", from 1.64" – 8.64" *(4.17 – 21.95 cm)*
- Custom chamber sizes are available

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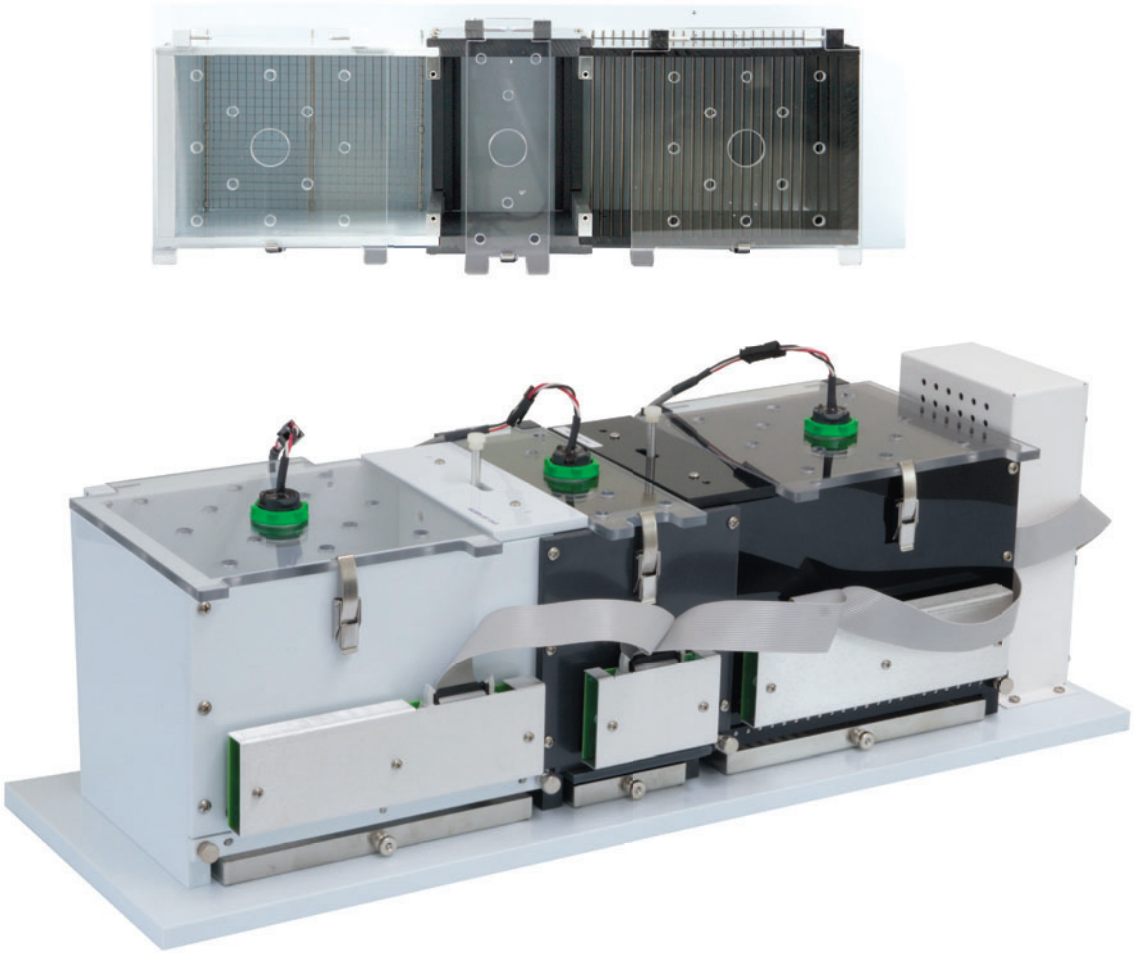

CONDITIONED PLACE PREFERENCE

The standard configuration includes a grid rod style floor in the black compartment and a mesh style floor in the white compartment.

- Automatic or maunal doors
- Animal position tracked by IR photobeams, eliminating issues found with video tracking methods such as varying light levels or obstructed views of the animal
- A maximum of eight (8) chambers can be operated from one interface (not included), and is expandable to sixteen (16) with the addition of another interface cabinet
- Light sources are LED for long lasting and low-heat emitting performance

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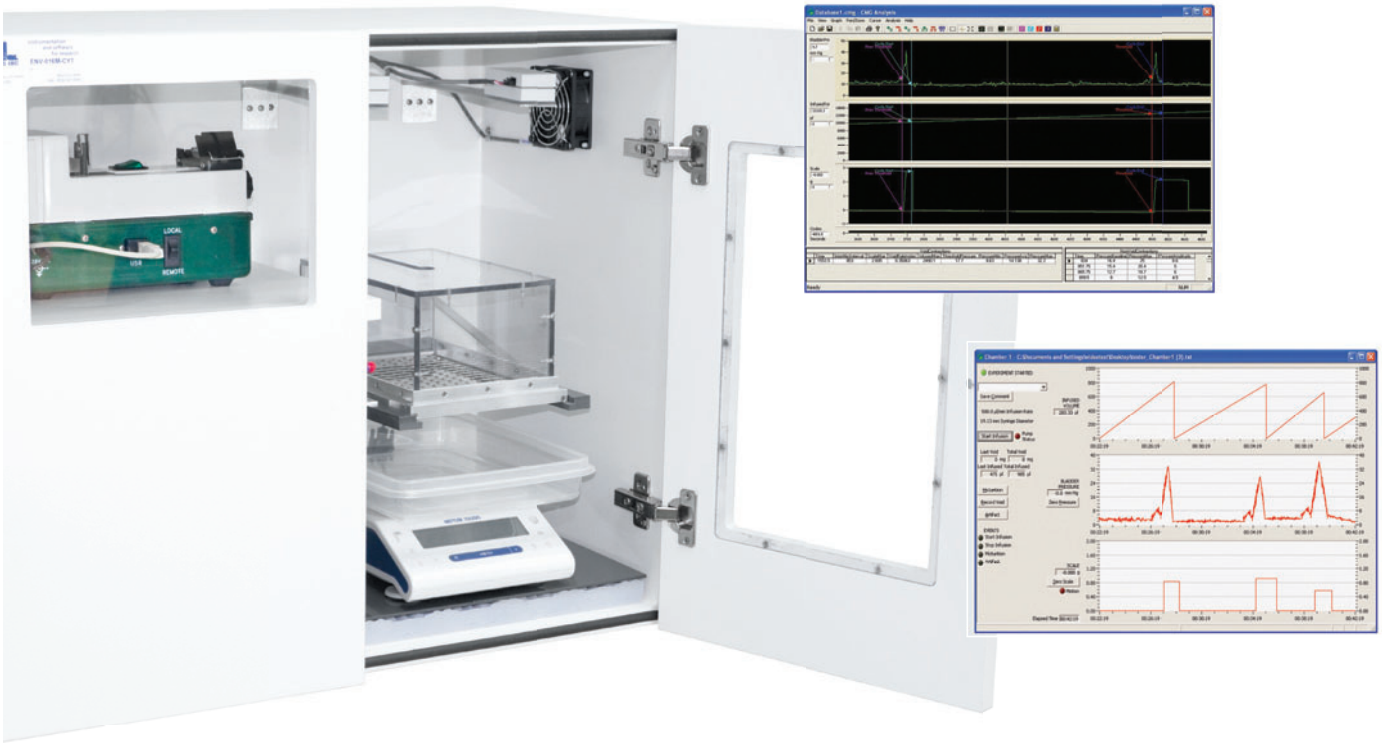

CYSTOMETRY

The small animal cystometry lab station is designed for performing in-vivo measurements of bladder function in mice and rats. It is ideal for physiological assessment of bladder function in "knock-out" and transgenic mice.

For standard urological tests and cystometrograms to be performed in conscious, unrestrained mice and rats while measuring bladder capacity, filling pressure, micturition pressure, and voided urine volume.

The experimental animal is chronically instrumented with an intra-bladder catheter, which is routed underneath the skin and exteriorized at the base of the animal's neck.*

A computer-controlled syringe pump infuses saline into the bladder, and an in-line pressure transducer records intra-bladder pressure during the infusion. When bladder capacity is reached, the transducer records pressure during the urination event (micturition). An analytical balance is located beneath the animal cage, which records the weight of urine to provide an index of voided urine volume.

** This technique requires familiarity with small animal survival surgery.*

- Modified cage top for routing catheter
- Cages for both rat and mouse fit in the same SAC without modification
- Ad-lib food cup and a volumetric drinking tube with Lixit valve
- Built-in structures make for easy placement of syringe pump, cage, and scale

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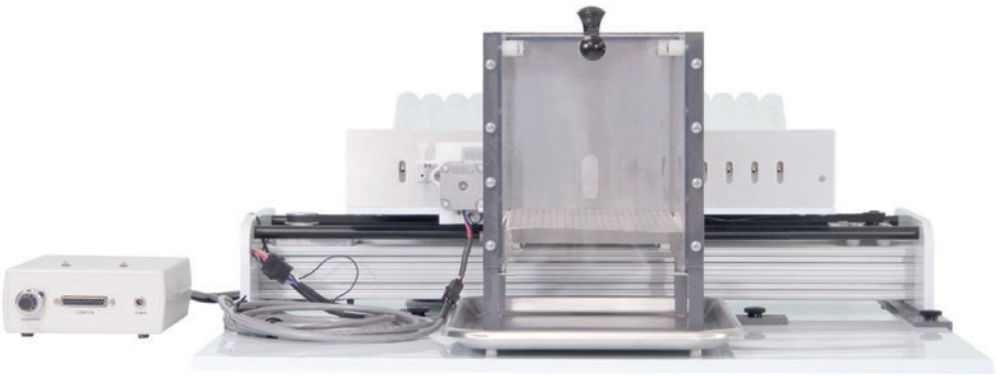

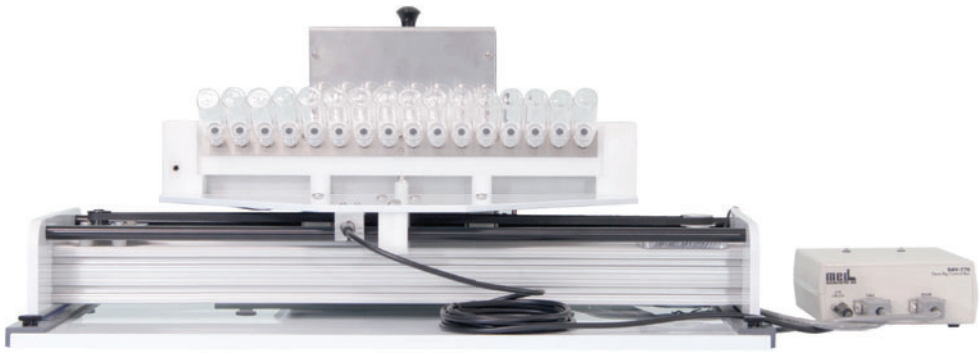

"DAVIS RIG" GUSTOMETER

Founded in 1991, DiLog Instruments pioneered the way in making a reliable and cost-effective apparatus for taste research studies. This device, known as the Davis Rig, has been used in by researchers all over the world.

We have acquired the Davis Rig product line from DiLog Instruments, and are very excited to carry on its legacy at Med Associates.

- Deliver taste samples and measure responses, increasing likelihood that the behavior of the animal is under orosensory control
- Assess taste preference, ingestive behavior, and chemotransduction pathways in a rapid, efficient manner as there is no dead space in stimulus delivery lines, making fluid volumes consistent across trials
- Track licking behavior without passing electrical current through the animal
- Measure both unconditioned and conditioned licking behavior to stimuli
- Train the animal with various stimuli to obtain a reward and/or avoid punishment

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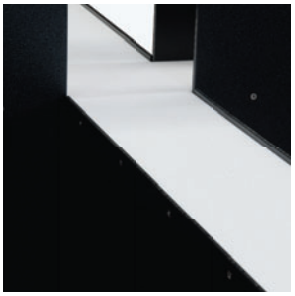

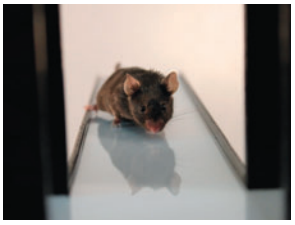

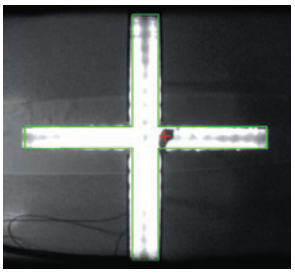

ELEVATED PLUS MAZE

IR PHOTOBEAM OR NIR BACKLIT

The elevated plus-maze (EPM) is a common behavioral test used in the study of fear and anxiety. In the case of mice and rats, freezing behavior and avoidance of brightly lit areas are used as measures to assess anxiety and fear in behavioral tests. The EPM is based on the conflict between the natural tendency of mice and rats to explore a novel environment balanced against the aversive and anxiety producing properties of entering a brightly-lit open area.

- Available with or without IR beams to track movement
- Sturdy base with plastic runways
- Interface and software packages sold separately
- Easily disassembled for storage
- Standard maze has black walls with white plastic runways *(other colors available upon request)*
- Sturdy support stand is held together with quick connect pins for easy disassembly
- IR control box is detachable for simpler cable management
- Runways easily snap on and off for cleaning

SCAN FOR WEBSITE

FEAR CONDITIONING

FOR GENERAL USE OR OPTOGENETICS

Our video fear conditioning systems are designed to be flexible with numerous stimulation and contextual insert options for your experiments. Experiments can be conducted with or without bright visible lighting; instead utilizing near infrared (NIR) imaging without sacrificing video quality.

While bright visible lighting yields uniform illumination, which is effective for achieving high quality & low noise video recording of animal behavior, it also has the potential to adversely affect it. Our near infrared (NIR) imaging system eliminates the need for visible light and its influence on animal behavior.

Our Video Freeze™ software provides a reliable and automated means to monitor the effects of fear conditioning in rodents.

- User-defined:
  - Stimulus intensities and durations
  - Inter-trial intervals
  - Inter-stimulus intervals
  - Session durations
  - Number of trials per session
- Freezing is represented in the data file by:
  - Total time spent motionless during the session
  - Percent of time motionless
  - Number of freezing episodes or occurrences
  - Average index of motion

SCAN FOR WEBSITE

FORCED SWIM

Typically used to conduct the Porsolt forced swim test, a common screening method for assessing antidepressant activity. Rodents are put into the cylindrical container filled with water. By forcing a mouse to swim in this aversive/restrictive space it will actively struggle for a few minutes, but eventually stop moving and become noticeably weary, making only small movements to keep their head above water.

Porsolt (et al) called this state "behavioral despair" and compared it to a human experiencing depressive symptoms. It was noted that anti-depressants appeared to increase the latency to this immobile state, and that the time exhibiting immobile behaviors decreases while active behavior increases.

- LED backlighting increases contrast to silhouette the animal, resulting in a clearer image for the software to analyze the behaviors
- Typical behaviors:
  - Escape/struggle
  - Climb
  - Full/passive dive
  - Immobility/floating
  - Passive dive
  - Swimming

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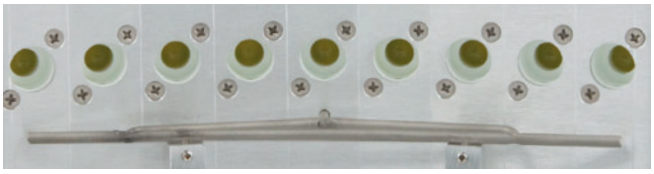

FIVE + NINE HOLE NOSE POKE WALLS

The five or nine choice serial-reaction time task (CSRTT) are behavioral tasks used to assess visuo-spatial attention and motor impulsivity in animals. The difficulty of the task is controlled by the length of time the aperture is illuminated. Between every trial, there is also a short interval wherein the animal must withhold all responses, and any responding during this interval is met with a brief time-out and recorded as a failure of inhibitory control.

These tests have been used to study attention-deficit/hyperactivity disorder, and also as a precursor to modern rodent models of gambling and decision making.

- Installs in a modular chamber by removing the two center supports and sliding the ends of the wall into the remaining modular channels.
- A yellow stimulus light is mounted flush with the back wall

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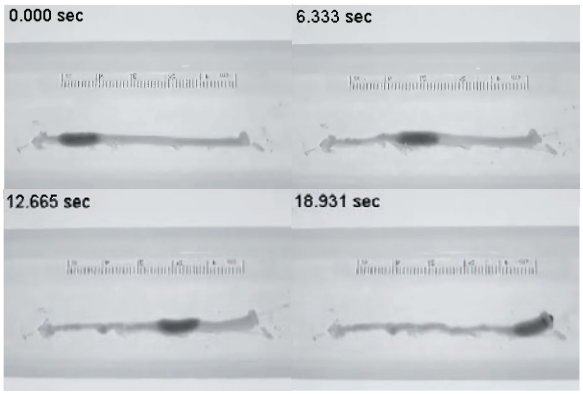

GASTROINTESTINAL MOTILITY MONITOR (GIMM)

GIMM is a powerful and easy-to-use setup for in-vitro measurements of motility patterns (such as the peristaltic reflex) and creating spatio-temporal maps in isolated segments of a laboratory animals' gastrointestinal tract.

GIMM also enables accurate quantification of GI motility patterns in an experimental setting under resting conditions or with the presence of pharmacological test compounds.

It can also be used in the pharmacological evaluation of the effects of receptor agonists and antagonists on propulsive motility, and even patho-physiological conditions such as inflammation or stress.

Compared with traditional methods of monitoring colonic peristalsis, the GIMM system allows for continuous and quantitative evaluation of motility.

EXAMPLE APPLICATIONS

- Monitor fecal pellet propulsion in distal colon
- Examining motility patterns in various gut regions using spatio-temporal mapping

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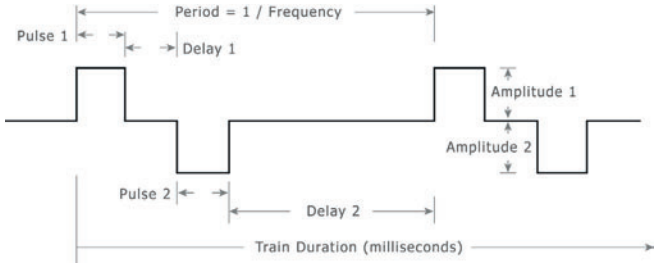

INTRA-CRANIAL SELF-STIMULATION (ICSS)

Since the discovery of the ICSS procedure in the 1950s, studies using this method has greatly expanded our knowledge of the neurobiology of motivation and reward. Laboratory rodents prepared with stimulating electrodes learn to deliver brief electrical pulses into brain structures that are part of the brain reward pathway.

Parameters include:

- Pulse amplitude
- Pulse duration
- Pulse frequency
- Train duration

- Constant current square wave stimulator
- Output may be connected to a conventional or storage oscilloscope or analog to digital converter to validate programmed settings as well as monitor actual subject stimulation
- Designed to interface with Med-PC
- Up to 16 stimulators can be daisy chained to a single interface

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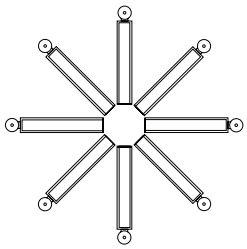

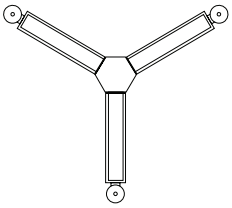

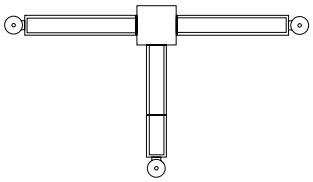

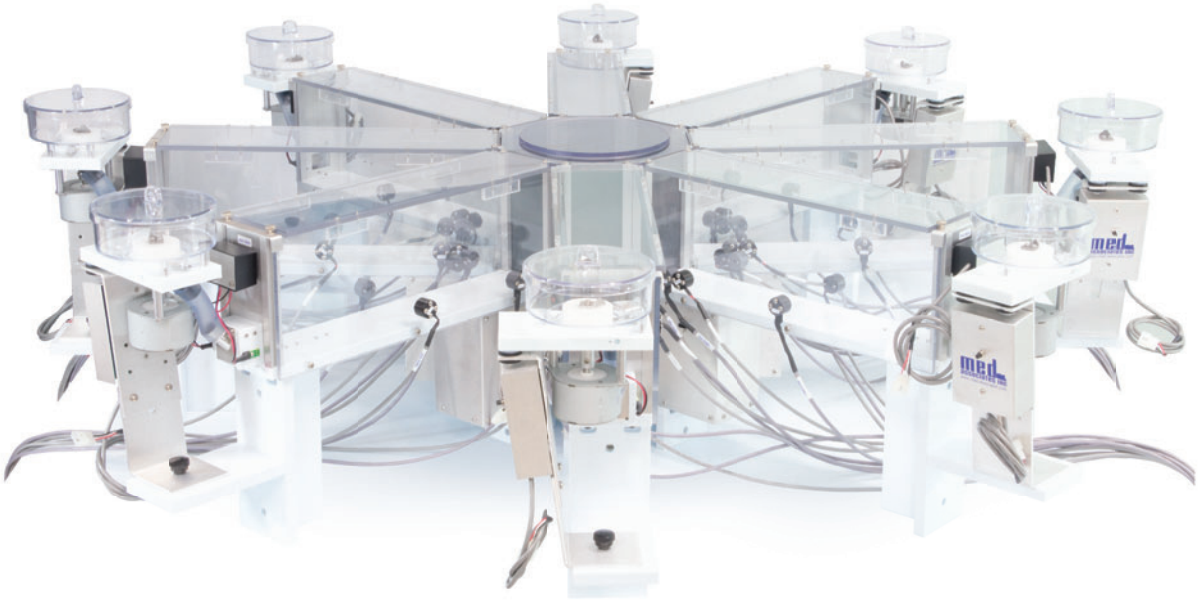

MODULAR MAZE (T/Y/RADIAL) STANDARD, IR BEAM, OR NIR BACKLIT

Our modular mazes make it easier than ever to have the type of maze you need when you need it. Create the desired configuration easily and economically without the need to purchase additional maze systems.

By adding the IR Beam detection components, the software can differentiate between runway exploration and entrances by using dual sensors at the entrance to each runway and one sensor in the center. This results in more accurate position detection and reliable results. A pellet receptacle and head entry detector at the end of each goal runway with pellet dispensers enable automated reinforcement.

Our Near-Infrared (NIR) Backlit Mazes make identifying and tracking test animals easy regardless of coat or maze color, and without worrying about ambient light sources. NIR light is invisible to the animal, eliminating distractions caused by bright visible lighting. Backlighting the maze eliminates variables such as shadows, glare, and reflections common when using overhead lighting systems. The animal's movement can then be captured by a monochrome camera with a NIR filter mounted above the maze to capture an evenly illuminated maze floor silhouetting the animal, and producing a high contrast video image.

- Quiet automatic doors mounted underneath the maze floor eliminate blind spots found in other mazes
- No special equipment is needed, as the runway ends are compatible with our full line of pellet feeders, receptacles, lights, and more
- Optional blue runway inserts for improved contrast in video applications

SCAN FOR WEBSITE

```
S5,
  #R1: ADD R; IF R >= 10 [@NextBlock, @ContBlock]
                  @NextBlock: OFF ^LeftLight;
                              ADD B; SHOW 4,Block #,B;
                              SET T = 1 ---> S1
                  @ContBlock: ON ^LeftLight;
                              ADD T; SHOW 5,Trial #,T ---> S2
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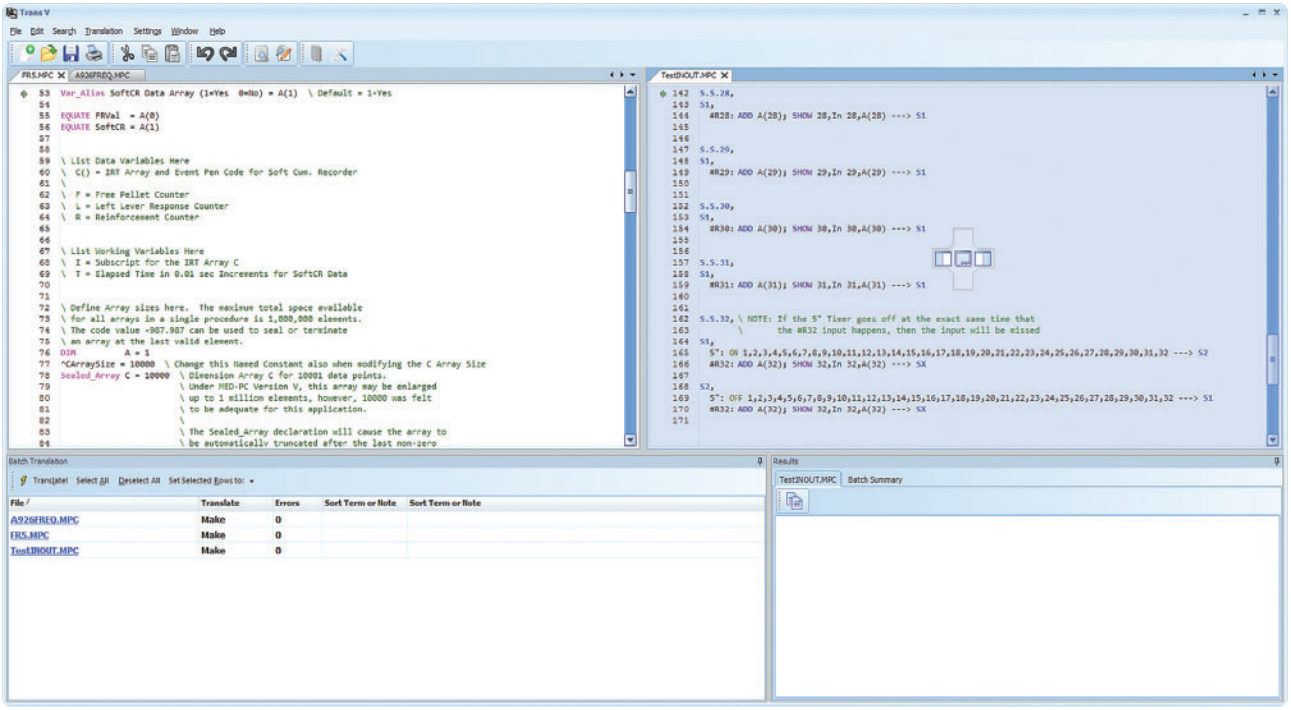

MED-PC BEHAVIORAL CONTROL SOFTWARE SUITE

The simple fact is that MedState Notation (MSN) works. Users determine exactly what is desired for experimental flow and data collection, encoded in simple text commands. Reviewing countless tables is no longer necessary to determine which options apply under given circumstances. MSN uses simple commands whose functions are inherently recognizable and easy to learn (e.g. ON, OFF, SHOW, ADD, IF, SET, etc.).

Placing these commands into logically ordered text gives you total flexibility in the control of chamber components, stimuli, reinforcement mechanisms, data storage, and display. MSN is a state-based programming language with blocks of states called state sets. If it can be drawn as a state diagram or a flow chart, it can be coded in MSN.

To write your own protocol, use the included Trans™ editor and execute it in multiple chambers with Med-PC. Extensive tutorials and syntax documentation to learn MSN programming and concepts are included.

Many standard pre-written procedures are available for purchase to suit many common applications such as: Fixed Ratio Training, Elevated Maze Data Collection, Delayed Match to Position, Five Choice Serial Reaction Time Task, and many more.

In addition, we offer custom coding solutions. Whether simple or complex, just provide us with your specifications and we will develop the program for you so you can focus on getting your experiment up-and-running quickly.

SCAN FOR WEBSITE

OLFACTORY SYSTEMS

DILUTION OLFACTOMETER

Designed to generate precise concentrations of up to eight separate odors and route them into a chamber.

- Conditions incoming air and controls the presentation of either a single scent or a mixture
  - Incoming air is plumbed to a large central chamber that houses the desiccant
  - Then, air is routed to one that contains activated charcoal as a filter
  - Then into distilled water to rehydrate the air
- Ideal for odor discrimination tasks where flow control is critical, such as olfactory coding or any behavioral or neurophysiological study that uses odor as a stimulus
- Airflow to each vertical column saturator is controlled by a sensitive needle valve, and monitored by a calibrated flow meter

OLFACTORY DISTRIBUTORS – TWO OR FIVE CHANNEL

- Uses normally closed valves for odor lines and a normally open valve with fresh air for continuous air flow to the outputs.
- Commonly used with a nose poke wall (sold separately)

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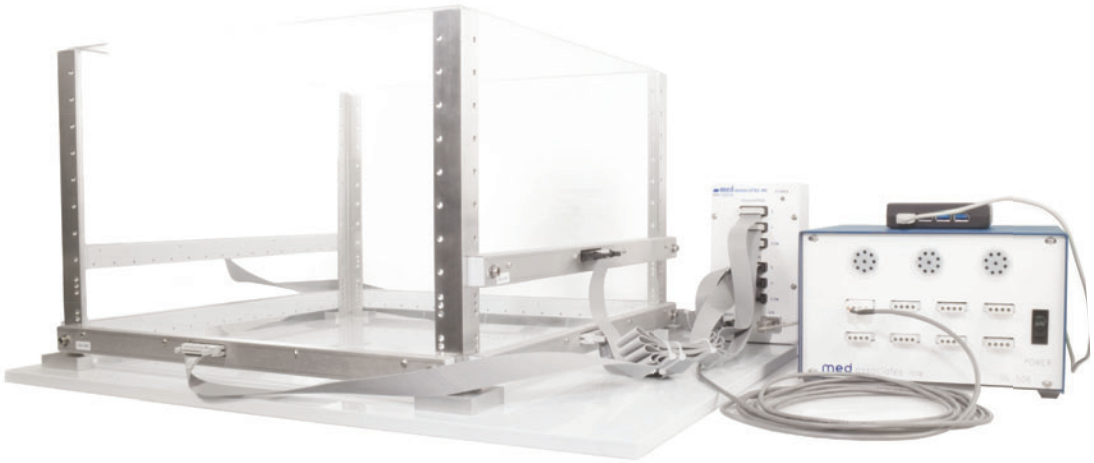


OPEN FIELD ACTIVITY

- Our easy-to-install accessories and components open up the possibility of running different protocols using the same hardware
- Animal movement tracking using three 16-beam IR arrays located on both the X and Y axes for positional tracking and Z axis for rearing detection
- Easily expandable design for accommodating up to 16 chambers from one PC
- USB connection on 48 channel IR controller for connection to PC or USB hub
- Accessories include ventilated covers, two chamber place preferences, dark boxes, hole board inserts, sound attenuating cubicles, and more
- Seamless design is both easy to clean and swap out with spare arenas

Commonly measured in the open field test:

Line crossings – crosses grid lines with all four paws

Center square entries – In center square with all four paws

Center square duration – Time spent in central square

Rearing – Standing on hind legs in the field

Stretch attend postures – Forward elongation of the head and shoulders followed by retraction to the original position

Common behavioral metrics:

- Distance traveled
- Time spent in center of open field
- Freezing
- Rearing

SCAN FOR WEBSITE

OPERANT CONDITIONING & GENERAL BEHAVIOR

Our equipment is as modular and adaptable as possible for your research into the future.

We have assembled packages on the website as examples of common configurations for operant testing. Our sales team can help you create your own setup using any of these designs as your guide to meet virtually any research requirement.

Product categories:

- Audio
- Aversive Stimulation
- Food + Water Delivery
- Infrared Detection
- Lighting
- Modular Chambers + Floors
- Behavioral Test Packages
- Response Devices
- Sound Attenuating Cubicles (SACs)

SCAN FOR WEBSITE

A

B

C

D

E

F

POWER + CONTROL INTERFACE

IT'S ALL ABOUT INPUTS AND OUTPUTS TO/FROM THE COMPUTER. Devices with input lines send response data *to* the computer, while output lines are for signals sent *from* the computer that cause the device to operate.

To send and receive these signals, the computer is connected to a decode card housed in an interface cabinet. In this interface cabinet, there are slots for housing input/output cards, which are wired to connection panels. These panels are paired with a chamber that has devices installed.

28V

Our three interface types:

- OmniCtrl: Interface card and ports on the connection panel can be either inputs or outputs.
- SmartCtrl: Interface card and ports on the connection panel has both inputs and outputs on it.
- SuperPort: The interface card has only inputs or outputs, used with a passive connection panel

TTL

In addition to our own interface types, we also make it possible to use 3rd party TTL interfaces and 3rd party equipment (see drawings on the following page).

IMAGES

A) 28V DC to TTL Adapter

B) TTL to 28V DC Adapter

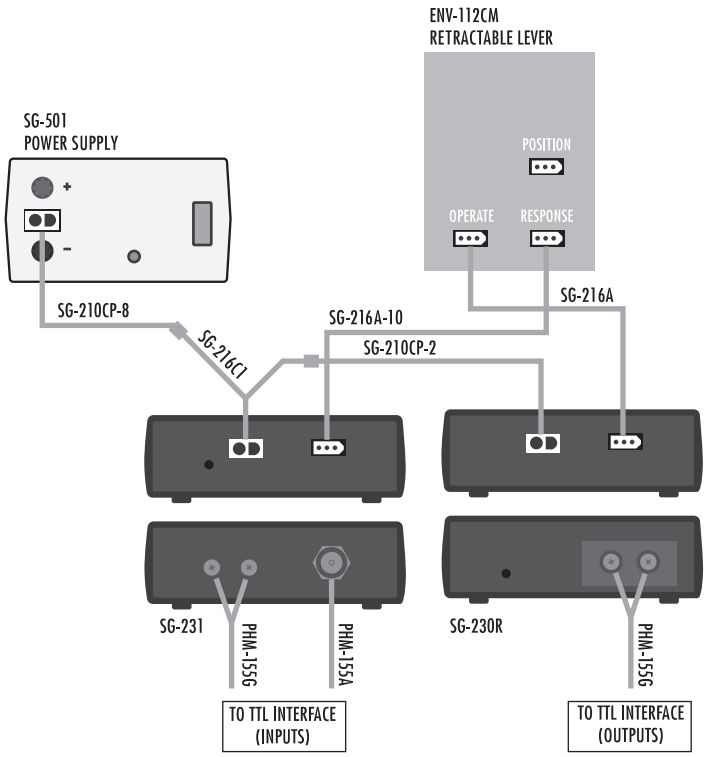
C) TTL Passive Connection Panel (16 out)

D) OmniSound Connection Panel

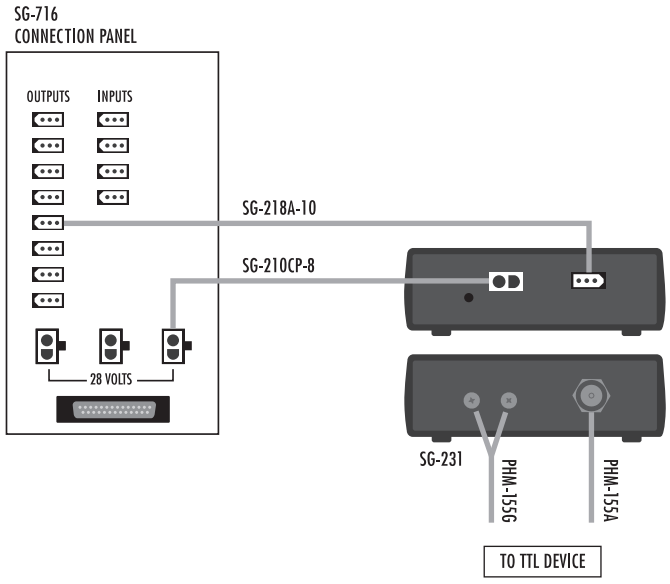
E) OmniCard

F) Smart Cabinet with USB Decode Card and SmartCtrl Card

A



B



28V DC TO TTL ADAPTER EXAMPLE SETUPS

A) For sending TTL inputs to a third party device such as an optogenetics laser for electro physiology data acquisition.

B) For controlling our devices with a third party TTL interface.

SCAN FOR WEBSITE

ROTA-ROD

- Fall areas are enclosed, preventing fallen animals from escaping
- Each lane has an infrared photobeam fall detection beam for independent animal measurement
- Redesigned textured rod allows animals to have better traction on it while rotating, without being able to grip onto it
- Noise production has been reduced from our previous model by 30% (from 64 to 48 dB @ 40 RPM) *NOTE: The noise produced remains constant up to the top speed of 100 RPM.*
- Easy-to-clean design with a removable waste pan
- Each lane has a digital timer for a clear readout of the test time

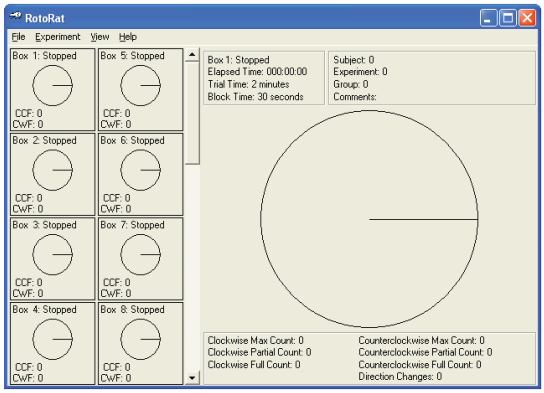
Manual Control:

- 5 constant speed profiles
- 5 accelerating profiles

USB Control:

- User-defined protocols utilize speeds from -100 to +100 RPM
- Change from any speed to another in 1 second
- Ramp, step, interval, accelerating, and decelerating profiles possible
- Use either a desktop or laptop PC
- Operate up to four Rota-Rods simultaneously on a single computer

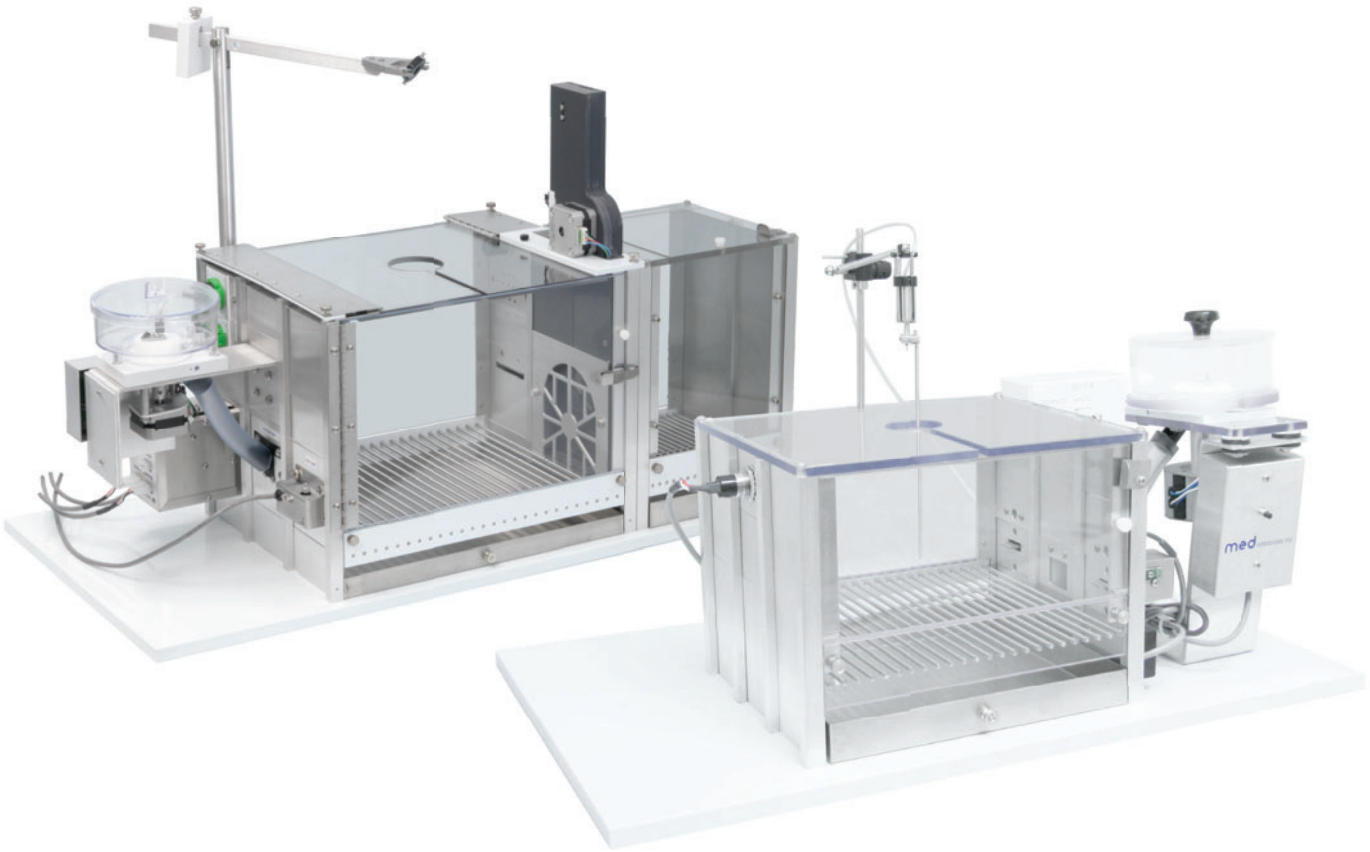
SCAN FOR WEBSITE



ROTORAT

- Stainless steel leash extends from the optical encoder to an animal jacket
  - Detects both clockwise and counterclockwise rotations
  - Reports movements with a sensitivity of 5.625 degrees or 64 increments for one full rotation of 360 degrees
  - Enables measurement of ipsillateral and contralateral rotations following unilateral ablation or microinjection
- We carry a full range of jacket sizes to accommodate animals from 100 to 500 grams
- Built for years of trouble free use, constructed of sturdy materials including a solid polypropylene base and stainless steel leash and bowl
- System is expandable to 16 or 24 units
- Provides a graphical representation of the animals position at all times

SCAN FOR WEBSITE



SELF ADMINISTRATION ORAL, INTRAVENOUS, SOCIAL

Oral + Intravenous

A typical self-administration setup includes a syringe pump, a modular chamber with a drug infusion "modified" top to allow the tether system to enter the chamber, and a sound attenuating cubicle (SAC) to isolate the animal from environmental disturbances.

The packages on our website are just a few of the more common configurations that we have assembled over the years. Customize your own using any of these designs as your guide to meet virtually any research requirement by adding components like pellet dispensers, audio generators, or aversive stimulators.

Social

Originally created for Marco Venniro and Yavin Shaham* as a custom build, the social self-administration chamber for is now a standard product.

This chamber was crafted to run an operant model in which the subject engages in lever pressing, rewarded with either social interaction, or a drug infusion. This model is intended for studying the role of operant social reward in addiction, as well as addiction vulnerability.

- A chamber with a modified top for the resident (drug user) is conjoined with a smaller chamber that houses their drug naïve social partner.
- The automatic door linking the two has a custom-designed grate to prevent them from being able to touch, but can still see, smell, and hear each other

**Venniro, M., Shaham, Y. An operant social self-administration and choice model in rats. Nat Protoc 15, 1542–1559 (2020).*

SCAN FOR WEBSITE

SHUTTLE BOX

The shuttle box task has been used to study conditioning in non-human animals for over seventy years. Shuttle box tests of avoidance and escape from aversive stimulus are used in contemporary research because these behavioral assays are efficient and standardized methods for testing learning and memory processes through active or passive avoidance tests.

- Stimulus light and Sonalert tone generator on each side
- Grid floor is equipped with our patented quick disconnect harness for aversive stimulation delivery to either side of the chamber floor and makes for easier clean-up
- Up to sixteen (16) chambers can be controlled with one computer, either a desktop or laptop
- Shuttle box chamber is the same for both rats and mice
  - Convert by changing out the grid floor and adjusting the height of photobeam sensors
- Four independent infrared photobeams on each side of the chamber for accurate measurement of activity
  - More reliable and higher resolution than a tilting floor, pressure plate, or single photobeam solution
- MDF sound attenuating cubicle limits distractions during testing

SCAN FOR WEBSITE

STARTLE REFLEX

The startle paradigm is used to study fear and anxiety. Although the underlying circuits and systems controlling fear and anxiety are complex, the startle paradigm itself is relatively simple: a form of Pavlovian conditioning where a central state of fear is inferred from an animal's behavioral response. This is done by measuring the amplitude of a simple brainstem reflex (acoustic startle reflex) in the presence of a cue (conditioned stimulus) previously paired with a mild foot shock (unconditioned stimulus).

The cages are positioned on a sensitive load-cell device that transduces movement in the cage into an electrical signal that is amplified and quantified in arbitrary startle units.

- Set up programs for:
  - Prepulse inhibition of startle (PPI)
  - Fear-potentiated startle (FPS)
- Run up to eight test stations from a single computer
- Flexible stimulus presentation – auditory, visual, aversive stimulation, or any auxiliary device controllable by 28 V DC
  - Four outputs to control a startle stimulus light and/or aversive stimulus (such as air puff)
- Designed to require minimal cabling between the connection panel, programmable audio generator, and audio amplifier
- Designed to be economical & easy to expand, as each chamber has its own audio amplifier
- Data collected during the experiment is collected by the included Startle Reflex, PPI, and FPS software
- Sound level calibration from the animal's position in the holder

SCAN FOR WEBSITE

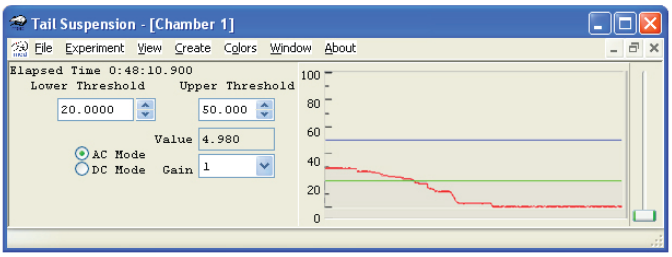
SYRINGE PUMP

The next generation of our time-tested PHM-100 series syringe pump has significant improvements, including a complete redesign of the enclosure, anti-siphoning hardware, and a purge/flush feature.

- Can be operated standalone, or activated and de-activated by a Med-PC® 28 volt output (3-pin micro-fit molex)
- A built-in limit switch disconnects power when the plunger reaches the end of the syringe
- Stainless steel and aluminum construction

NOTE: A calibration sheet is included with every pump, which supplies a formula for calculating flow rate using any syringe.

SCAN FOR WEBSITE



TAIL SUSPENSION

First reported in Psychopharmacology *(1985(85): 367 - 370)*, the tail suspension test continues to be used for a range of antidepressant compounds including SSRI's, benzodiazepines, typical and atypical antipsychotics, etc.

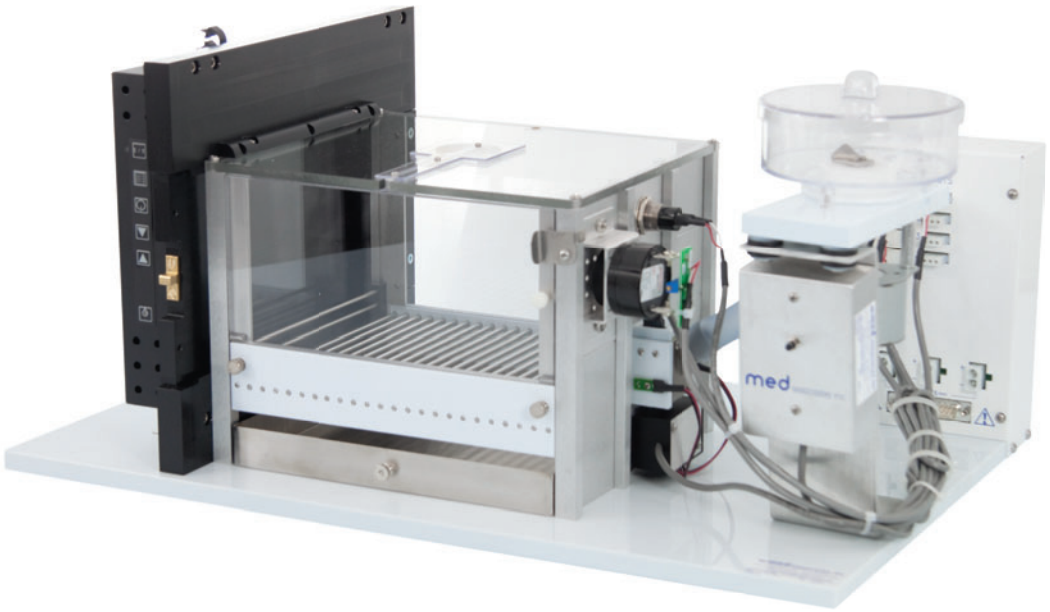
The primary dependent measure is the time to relative immobility; therefore, the duration and vigor of activity is inferred to be an index of escape persistence.

To measure this activity, a precision linear load cell interfaces with the tail suspension software (SOF-821) which records the load cell output as both quantitative and graphic data.

- System can support up to seven add-on test stations (eight total)
- Packages include both a hook style catch and a suspension paddle for a choice of suspension method that works best for your experiment

SCAN FOR WEBSITE

COMING SOON



TOUCHSCREEN SYSTEM - MEDTOUCH™

The K-Limbic system began as the Kestrel Control System, (used by SmithKline Beecham) and developed in association with Med Associates' partner, Conclusive Solutions, in 1993. Five years later the software was renamed "K-Limbic" and made commercially available. 'K-Limbic' (SOF-740) was designed in collaboration with several international pharmaceutical companies, and has developed into an incredibly versatile, flexible and powerful tool for performing behavioural experiments.

This advanced touch screen technology provides you with a full library of standard tests as well as the ability to easily design custom protocols to suit your research needs. The software also includes a fully integrated auto-analysis utility to create formatted data reports quickly and easily.

- Effortless data collection & analysis for experimental data
- Image Support for simultaneous presentation of up to 16 pre-loaded images (JPEG), movies, or AVI files on one screen
- No programming required, easy to use flowchart style graphical interface to design and control behavioral experiments
- Uses any existing Med Associates interface for experimental control and data collection
- Database utility stores experimental details unique to individual subjects
- Includes automated statistical analysis for standard applications including:
  - Delayed match to sample
  - Paired associates learning
  - Spatial discrimination
  - Spacial search
  - Trial-unique delayed nonmatching-to-location (TUNL)
  - Visual discrimination
  - ...and more!

SCAN FOR WEBSITE

TRIADIC WHEEL TURN

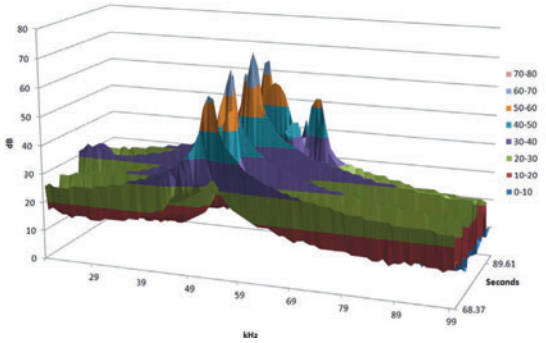
This triadic design has been used to study the impact of stress controllability on a variety of behavioral as well as physiological indices *(Current Protocols in Neuroscience, Feb 2001, Supplement 14)*.

- Extending out the back of each chamber is a tail holder with curved aversive stimulation electrodes, and a soft velcro strap to hold the tail in place
- Chambers can be easily removed for cleaning

Designed to run three animals at the same time. Subjects in the "escape" condition learn to turn the response wheel to terminate the aversive stimulus for themselves and a "yoked" partner. The "control" subject is not stimulated.

- Escape *(controllable aversive stimulation)*
- Yoked *(uncontrollable aversive stimulation)*
- Yoked Control *(no aversive stimulation)*

SCAN FOR WEBSITE



ULTRASONIC VOCALIZATION (USV) DETECTION

Empirical evidence suggests that ultrasonic vocalization (USV) can be used as a measure of motivational and emotional state *(Knutson et al. 2002)*.

For instance, rodent pups emit distress USVs as a consequence of maternal severance or hypothermia *(Blumberg & Alberts, 1990; Hofer & Shair, 1993; Sokoloff & Blumberg, 2005)* and maternal responsiveness is proportional to the number of calls mouse pups emit *(D'Amato et al. 2005)*. Brudzynski & Pniak *(2002)* observed that mature laboratory rats emit USVs in anticipation of social contact. Furthermore, USVs are produced as a result of painful stimulation during fear conditioning *(Antoniadis & McDonald, 1999; Lee et al, 2001)* and as a result of morphine or ethanol withdrawal *(Vivian & Miczek, 1991; Moy et al. 2000, respectively)*.

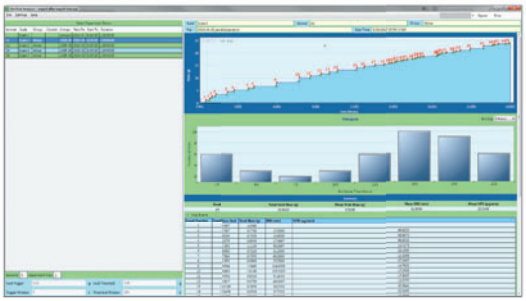
Although the empirical evidence is somewhat inconclusive, one theory of motivation states that rat USVs can be divided between two different kHz bandwidths. Vocalizations ranging between 50-70 kHz represent positive affective states, but those in the 22 kHz range are characteristic of negative affective states *(Knutson et al. 2002)*.

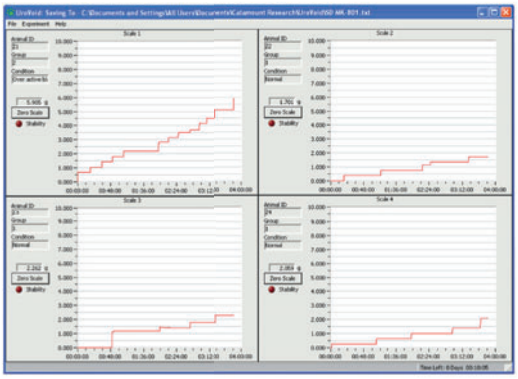
Whether or not this theory continues to garner empirical support, the evidence is clear that USVs are good indicators of underlying motivational state.

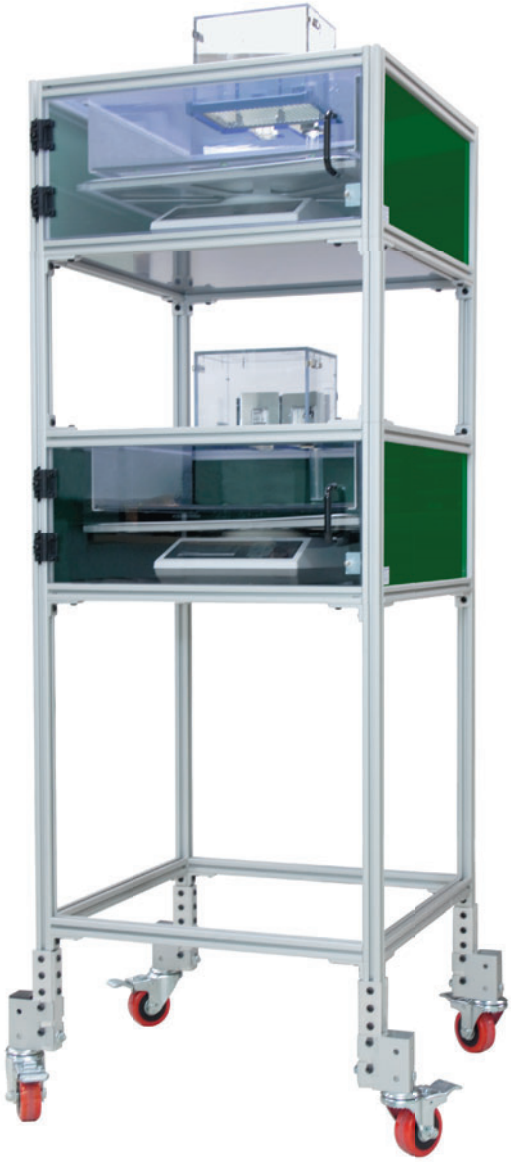
Therefore, our USV system is designed for behavioral applications, and is an affordable solution for accurately measuring both the amplitude and frequency of these ultrasonic vocalizations emitted by laboratory rodents.

- Designed to measure motivational behavior in paradigms such as:
  - Drug addiction
  - Mother-pup separation
  - Isolation stress
  - Social interactions
  - Sexual encounters
  - ...and more

SCAN FOR WEBSITE







UROVOID

Non-invasive urinary voiding frequency quantification for conscious rats and mice.

- Separates feces from urine as it drops, measuring the voided urine time and volume
- Access to food and water is provided, while also preventing food and water from contaminating measurements
- Monitor up to twelve (12) cages simultaneously
- Collect data for up to forty (40) days
- A complete UroVoid system consists of the following:
  - Interface package/software
  - Up to twelve (12) cage packages

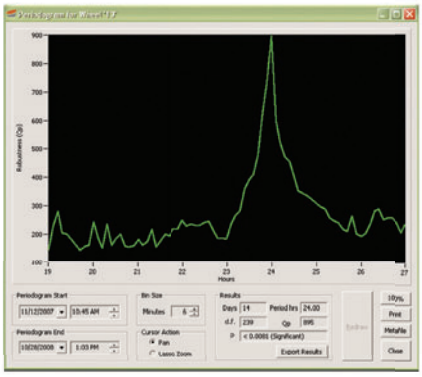
SCAN FOR WEBSITE



WATER MAZE STANDARD

- Three basic strategies to escape the maze:
  - Praxic = remembering the movements needed to get to the platform
  - Taxic = uses visual cues to reach their destination
  - Spatial = using distal cues as points of reference to locate themselves
- "False bottom" insert for stowing away the heater, and provides a smooth surface for placement of platforms or other accessories anywhere on the maze floor
- Constructed of chemical resistant polyethylene material

SCAN FOR WEBSITE



WIRELESS RUNNING WHEELS

The current trend of housing mouse colonies in individually ventilated cages (IVCs) has allowed for dramatic increases in housing density, improved environmental control, and better biosecurity. However, the low profile configuration of many mouse IVCs has made it more difficult to add enrichment devices, such as a running wheel.

Our wireless low-profile mouse running wheel (ENV-047) represents a state-of-the-art device that enables quantitative measurements of mouse running levels in most standard IVCs. We use the popular Fast Trac™ running wheel surface from BioServ® along with our proprietary wireless transmitter to get running data from the home cage to a computer without any wires or cables.

- Monitor wheel running activity without running wires.
- Each hub monitors up to 40 wheels, with four hubs per computer

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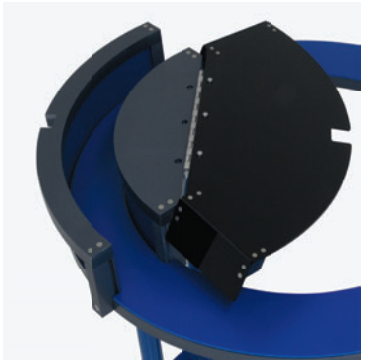

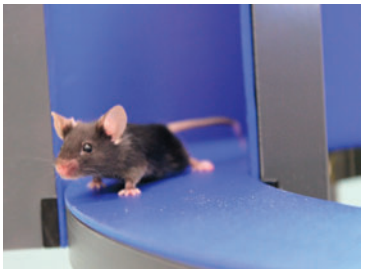

ZERO MAZE STANDARD OR NIR BACKLIT

- NIR lighting is invisible to the animal, which eliminates distractions caused by bright overhead visible lighting such as shadows, glare, and reflections
- Evenly illuminated maze floor silhouettes the animal creating an easy to track, high contrast video image
- Track animals of various coat colors without worrying about ambient light or maze color
  - *NOTE: Requires monochrome video camera equipped with an NIR filter, sold separately*
- Closed runways feature hinged covers to prevent the animal climbing out of the maze

ACTIVITY WHEELS
HOME CAGE, MODULAR CHAMBER

ANIMAL ID

CATALEPSY

CONDITIONED PLACE PREFERENCE
"CPP"

CYSTOMETRY

"DAVIS RIG" GUSTOMETER

FORCED SWIM

FEAR CONDITIONING
STANDARD, CONTEXTUAL, OPTOGENETIC

FIVE + NINE CHOICE NOSE POKE

GASTRO-INTESTINAL MOTILITY MONITOR
"GIMM"

INTRA-CRANIAL SELF STIMULATION
"ICSS"

MODULAR MAZES
T, Y, RADIAL

OLFACTORY

OPEN FIELD ACTIVITY

OPERANT CONDITIONING & GENERAL BEHAVIOR

POWER + CONTROL INTERFACE

ROTA-ROD

ROTOMETRY

SELF-ADMIN
ORAL, INTRAVENOUS, SOCIAL

SHUTTLE BOX

STARTLE REFLEX

SYRINGE PUMPS

SPECIALIZED MAZES
BARNES, ZERO, ELEVATED PLUS

TAIL SUSPENSION

TRIADIC WHEEL TURN

ULTRASONIC VOCALIZATION (USV)

UROVOID

WIRELESS RUNNING WHEELS
LOW PROFILE + VERTICAL

CUSTOM

If you don't see what you're looking for, we also make custom hardware and software. Contact our sales team with your ideas!

CAREERS