RWD | 瑞沃德

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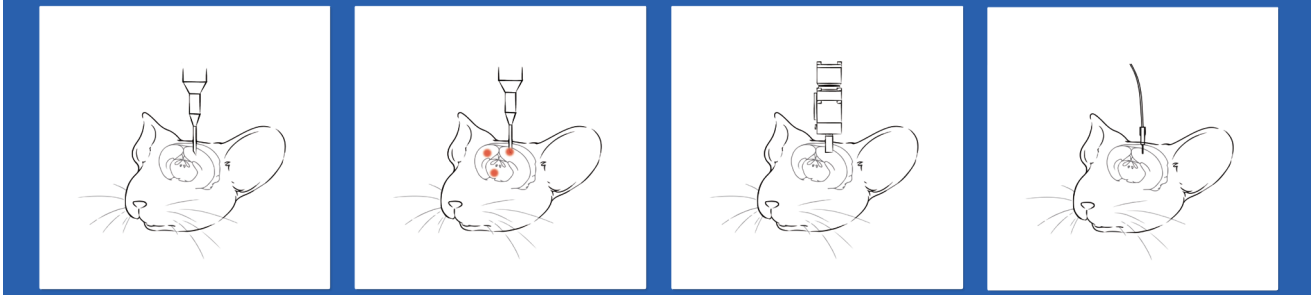
PARTENAIRE DE VOS RECHERCHES

AUTOMATED STEREOTAXIC INSTRUMENT

It's an automated and intelligent stereotaxic instrument with high precision (1 μm). The software has built-in rat and mouse brain atlas and automatic procedures (skull window, tissue removal and automated injection procedure), which can be observing the position of the probe relative to the brain area is convenient and efficient, and the operation is easy to use, greatly reducing the errors and damage caused by manual operation. In addition, it has an anti-collision function to prevent animal damage caused by wrong movement, which is safer.

Application Scenarios



Small Nuclei Injection | Mutil-point Injection | Calcium Imaging | Positioning Implant

Features

1μm Accuracy
Higher precision, suitable for injection of small nuclei.

Software Control
Move at a constant speed to reduce damage.

Built-in Atlas
Know the probe position in real time.

Automated Craniotomy
Optional round or square cranial window

No Leveling Required
Precise positioning without leveling.

Single Point Injection
Control nanoliter syringe pump for automated injection.

Mutil-point Injection
Up to 10 points can be injected.

Tilted Injection
No need to manually calculate displacement after tilting.

Tissue Removal
Tissue removal suitable for calcium imaging experiments.

Optional Dual Manipulators
Bilateral brain regions of the same animal can be located.

Needle Withdrawal Speed
The needle withdrawal speed can reach as low as 1μm/s.

One-click Movement
Move to target point or entry point with one click.

Precise Positioning

High-precision stepping motor

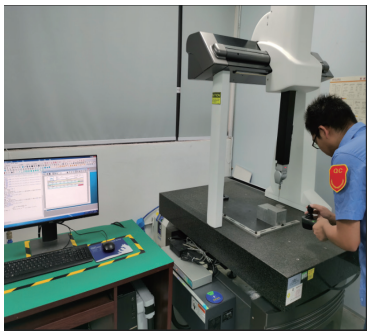
The high-precision stepper motor stably outputs a minimum step angle of 0.04, which is a minimum displacement of 0.33μm, ensuring the accuracy requirement of 1μm. A high-precision projector is used to detect the accuracy of the motor to meet the needs of higher-precision experiments.

Anti-backlash function

Eliminate the gap error caused by the movement of the screw rod and achieve higher positioning accuracy.

Frame calibration

Quickly calibrate three-axis coordinate values, users can calibrate by themselves.



Precision components

Part dimensions are measured using three-dimensional high-precision equipment, with an accuracy of micron level.

Verticality and parallelism detection

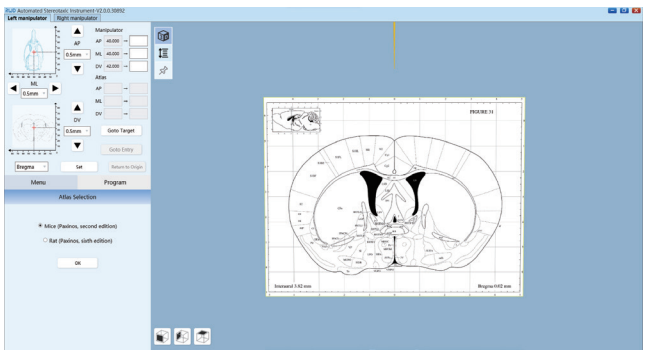
Each instrument is carefully debugged, and a dial indicator is used to detect the verticality and parallelism of the three axes to ensure the accuracy of the instrument.

Constant Speed

The AP or ML axis has 5 adjustable speeds, the DV axis has 9 adjustable speeds, and the lowest speed in the DV direction can reach 1μm/s.

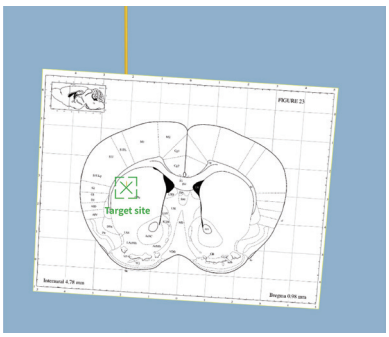
- Reduce jitter at a uniform speed to ensure precise positioning.
- Reduce mechanical damage.
- Prevent massive bleeding from affecting surgery.

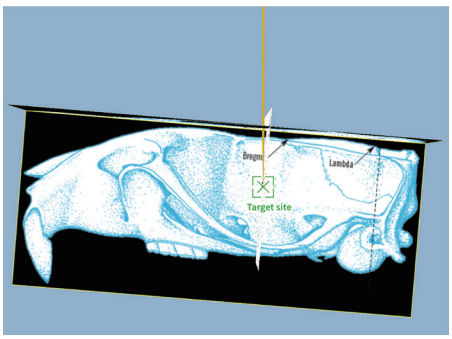
Built-in Atlas



The software integrates the rat and mouse brain atlas, which can display the movement trajectory and position of the probe in real time and keep track of the experimental progress.

No Leveling Required





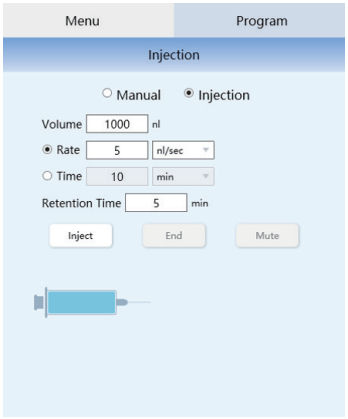
Atlas Calibration

By determining four points to determine the skull tilt angle, accurate positioning can be achieved without leveling through angle calculation. (Bregma, Lambda, 2mm left and right of the sagittal suture) At the same time, the brain atlas can be scaled according to the actual skull size, making the positioning more accurate.

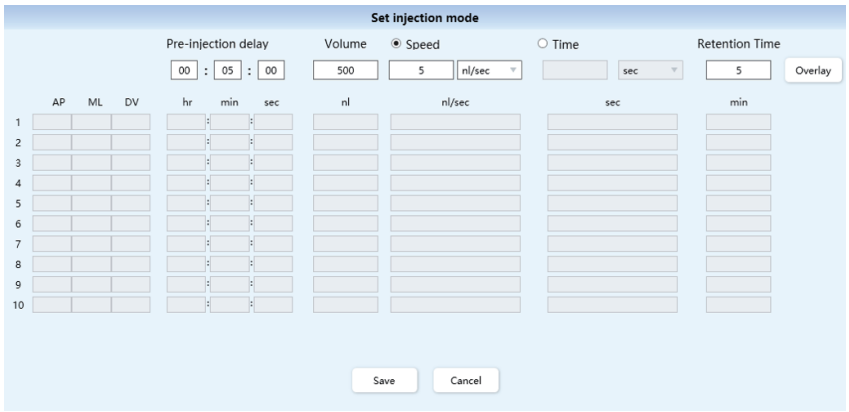
Automated Injection

The software directly controls the nanoliter syringe pump for single-point, multi-point and tilted injection. Tilted injection also does not require manual calculation of the three-axis displacement after tilting.

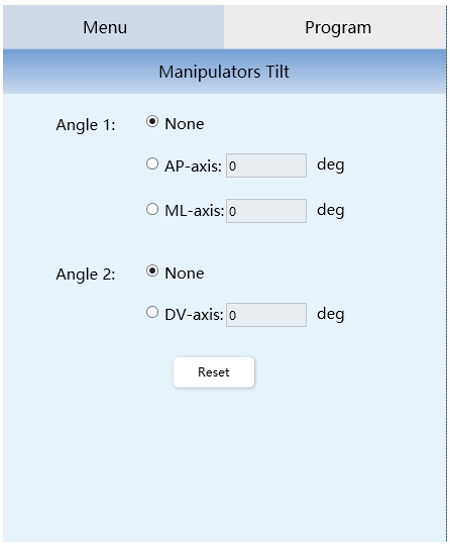
- The injection precision is high, the injection volume is 0.6-5000nL, and the injection rate is 0.02-200nL/s.
- The needle withdrawal speed can be customized, with a minimum of 1μm/s. Slowly withdrawing the needle can prevent drugs or viruses from spilling into the needle tract.
- Multi-point injection procedure can achieve up to 10 injection sites.
- Needle retention time setting can realize automated needle retention and extraction.
- Real-time display of injection progress.

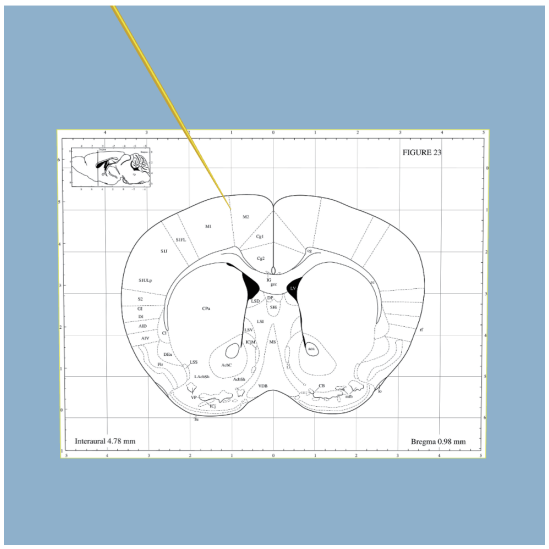


Single-point Injection



Mutil-point Injection



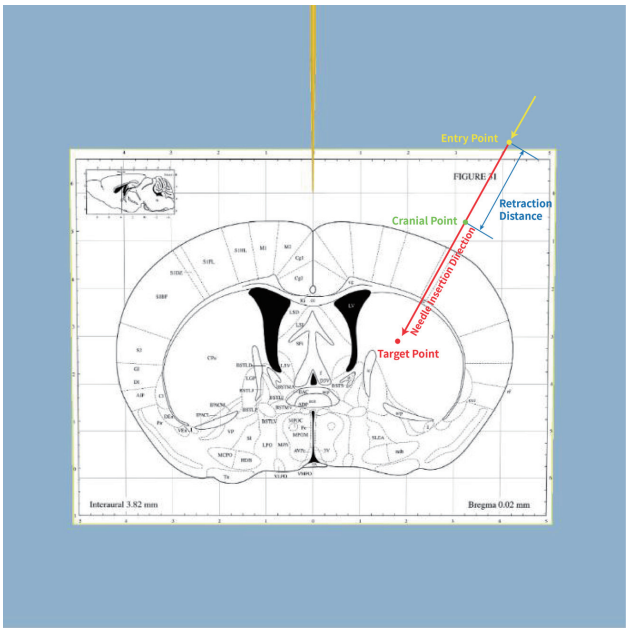


Tilted Injection

The Manipulator Tilted function is combined with the single-point or multi-point injection function to achieve single-point or multi-point injection in a tilted state.

There is no need to manually calculate the three-axis displacement distance after tilting, and the target position can be reached with one click.

Tilted Trajectory



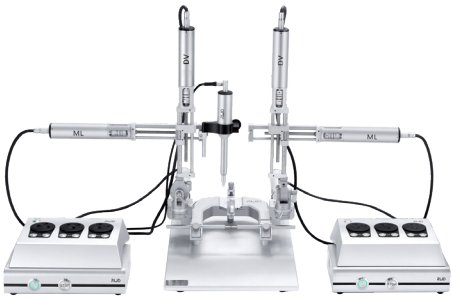
Manipulator Tilted Function

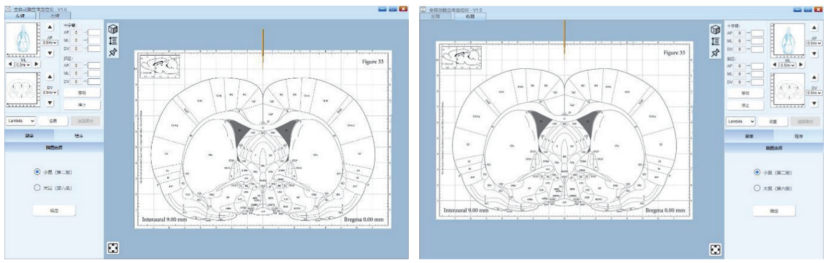
Traditional positioning methods require manual calculation of the three-axis displacement distance after tilting when performing experiments such as tilt injection or implantation, which is time-consuming and labor-intensive.

The Automated Stereotaxic Instrument includes a tilted trajectory function, eliminating the need to manually calculate the displacement distance after tilting. It can be used for experiments such as tilted craniotomy, tilted injection and tilted implantation.

++Optional Dual Manipulators

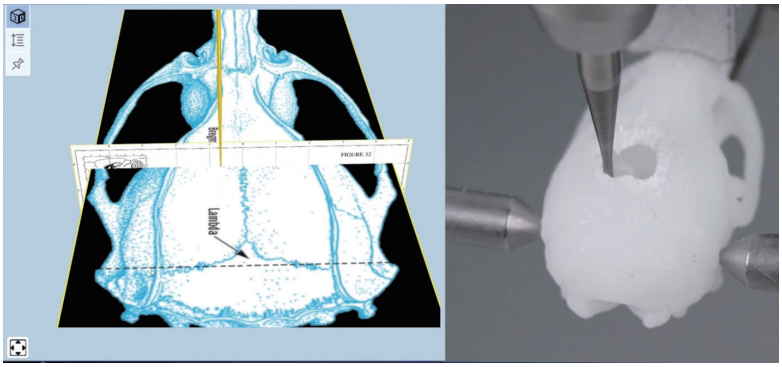
It can realize experiments such as injection and implantation of bilateral brain areas of the same animal, which is more efficient.





Left Right

Automated Craniotomy

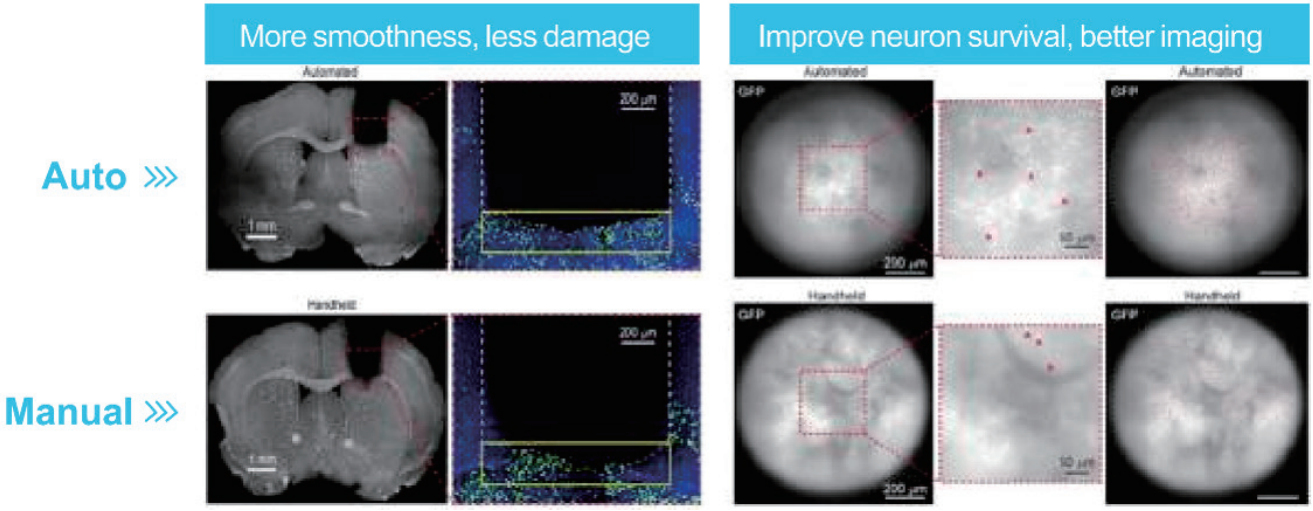


Skull Windows Function

You can choose a round or square window, which is suitable for brain imaging scenarios, such as miniscope calcium imaging experiments, two-photon imaging or other brain imaging experiments before craniotomy.

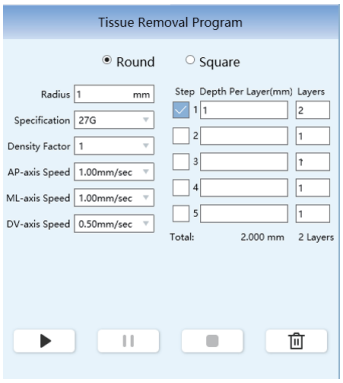
Tissue Removal

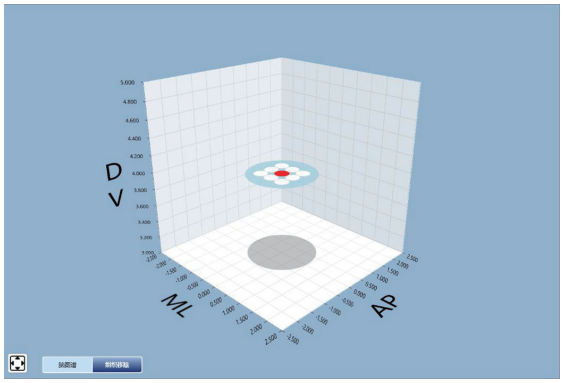
Equipped with a tissue removal kit, it is used to remove tissue before implanting the GRIN Lens. It is suitable for miniscope calcium imaging experiments. Compared with manual tissue aspiration, fully automated aspiration ensures flat wound end surfaces, less additional neuronal damage, and better imaging as compared to manual tissue removal.

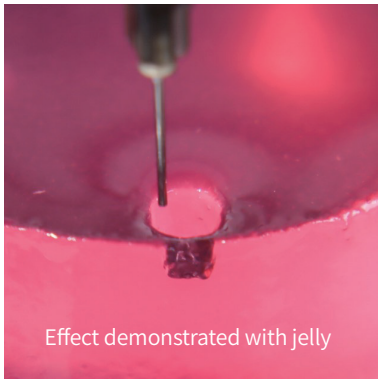


3D View

- The software can set the depth and speed of lens implantation, one-click implantation.
- The 3D view can display the current absorption position, number of layers, etc. in real time, allowing for a more intuitive view of the experimental process.

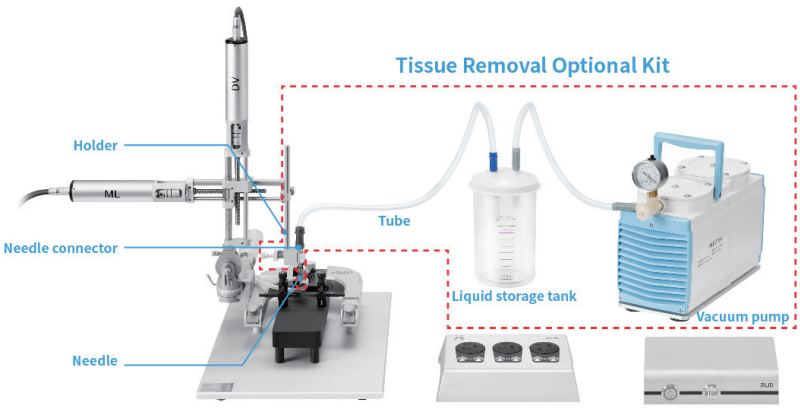






Tissue Removal Optional Kit

Negative pressure suction tissue, the suction pressure is adjustable from 0-0.095MPa, including vacuum pump, liquid storage tank, pipeline, needle, needle connector and holder, etc.



Configuration List

Category	Model	Product Description	Remark
Stereotaxic host (without accessories)	71001-S	Automated Stereotaxic Instrument, SGL.M, Automatic Injection	Left manipulator and nanoliter injection pump included, without laptop, adaptor, ear bars, holder and mask.
	71000-S	Automated Stereotaxic Instrument, SGL.M	Left manipulator, without laptop, adaptor, ear bars, holder and mask.
	71001-D	Automated Stereotaxic Instrument, Dual.M, Automatic Injection	Two manipulators and nanoliter injection pump included, without laptop, adaptor, ear bars, holder and mask.
	71000-D	Automated Stereotaxic Instrument, Dual.M	Two manipulators, without laptop, adaptor, ear bars, holder and mask.
Required accessories (optional)*	71000-LT	Laptop for Automated Stereotaxic Instrument (software included)	i3-1215U/8G/256G/WIN10/Set display/14".
	68055	Mouse Adaptor	68601, 68663-S, 68663, 68665 masks can be selected.
	68030	Mouse/Neonatal Rat Adaptor, 18°and 45°Ear Bars Incl.	68601, 68663-S, 68663, 68665 masks can be selected.
	68057	Anesthesia Adaptor for 20-30g Mouse, Tube, Angle-adjustible	No additional mask is required.
	68021	Rat Adaptor	68602, 68666, 68667 masks can be selected.
	68053	Rat Anesthesia Adaptor for rats less than 300g, Tube, Angle-adjustible	No additional mask is required.
	68301	Rat 18° Ear Bars	
	68306	Mouse 60° Ear Bars	
	68201	Standard Probe Holder-Corner	Clamping range: 0.3-1.5mm.
Other accessoriesand related products (optional))	71000-I	Injection Module for Automated Stereotaxic Instrument	Contains nanoliter injection pump + connecting wire + 3.5-inch glass capillary + 7-inch glass capillary + universal fixing accessories +68207V-attachment + filling needle + sealing material + hexagonal wrench.
	TRA-220	Tissue Removal Optional Kit (220V)	Optional when using tissue removal procedure, including needle connector, holder (68202), vacuum pump-GM-0.5 II -220V-50HZ, liquid storage tank, connecting tube, needle.
	TRA-110	Tissue Removal Optional Kit (110V)	Optional when using tissue removal procedure, including needle connector, holder (68202), vacuum pump-GM-0.5 II -110V-50HZ, liquid storage tank, connecting tube, needle.
	78001	Microdrill	For craniotomy.
	78040	Drill Bits HM1005 0.5mm, Round Tip, pkg of 5*	It is used together with a microdrill, usually for mice.
	78042	Drill Bits HM1005 0.8mm, Round Tip, pkg of 5*	It is used together with a microdrill, usually for rats.
	68605	Microdrill holder	Used to hold 78001 microdrill.
	GC-3.5	3.5-inch (8.89cm) glass capillary	Inner diameter 0.53mm, outer diameter 1.14mm.
	GC-7	7-inch (17.78cm) glass capillary	Inner diameter 0.53mm, outer diameter 1.14mm.

*Indicates that other specifications can be selected, which can be viewed from the product catalog of RWD.

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