

## IVM-1000 & IVM-3000

Single and triple axis *in vivo* manipulators  
Versatile and low-noise



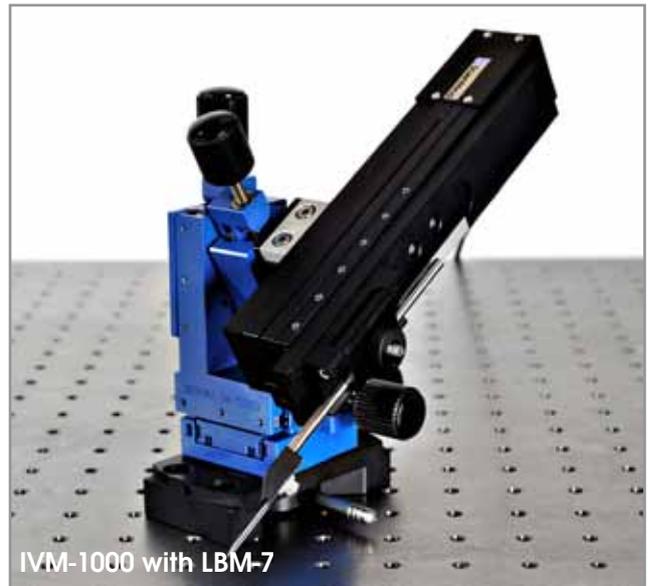
## The IVM and it's possibilities

Scientifica's range of *in vivo* manipulators have been developed in collaboration with world-leading researchers.

Scientifica offer a single axis (IVM-1000) and triple axis (IVM-3000) IVM which are perfectly suited for electrophysiology and microinjection procedures. Both versions are controlled via the PatchPad control device (see page 4 & 5) and a range of available accessories make it suitable for a variety of applications (see page 6).



IVM-1000 Single axis *in vivo* manipulator



IVM-1000 with LBM-7

### Stable and repeatable

Both the IVM 1000, and IVM 3000, are ultra-stable manipulators designed to meet the demands of complex *in vivo* studies.

Solid engineering and high precision motors ensure that once recordings are initiated electrode placement is retained for complete data collection reliability - **with less than one micron of drift in two hours.**

Up to 50 memory positions can be stored on the PatchPad allowing accurate recall and analysis of results. The PatchPad also features "Home in" and "Home out" buttons which allow the user to swiftly return to sites of interest.

### Long travel range

The IVM features motorised travel of 70 mm for ease of setup *in vivo* and in deep tissue slice preparations.

This movement has an impressive 20 nm resolution and two speed modes that can be customised between 1  $\mu\text{m/s}$  and 4 mm/s. This provides convenient approach and accurate placement in all applications.

The motors feature crossed-roller bearings to provide smooth movement across the full range of travel.

### Modular and versatile design

The IVM 1000 and 3000 are both compatible with a range of stereotaxic frames, headstages and probe adaptors, making them the ideal choice for evolving research needs.

The **IVM 1000** can also be used in combination with a manual manipulator - such as Scientifica's LBM-7 - adding motorisation to the crucial approach axis (see above).

The **IVM 3000** is comprised of a separate unit for each axis for completely flexible configuration (see page 5).

### Low-noise electronics - accurate recordings

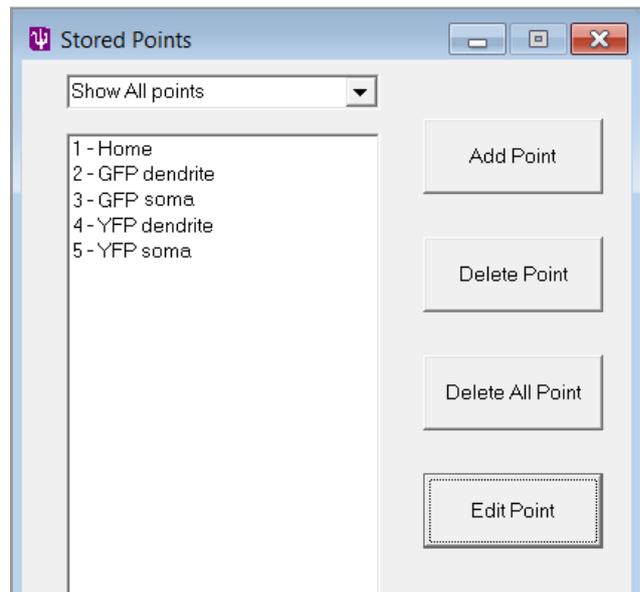
The low-noise motors of the IVM (which utilise linear drive electronics) allow the user to accurately, and without interference, record even weak signals.

This is crucial for users making sensitive, single channel recordings, improving accuracy and reliability of recordings.

## Benefits of motorisation

*In vivo* electrophysiology studies require vibration-free, and accurate, placement of electrodes or probes. Using a motorised manipulator for these demanding applications improves accuracy and increases productivity.

This is achieved by replacing the need for manual adjustment with remote, interface control and software commands. The system is isolated from user-generated vibration - improving quality and reliability.



### LinLab software with 'creeper function'

Motorisation also offers the chance to capitalise on unique software features within Scientifica's **LinLab** software. Movement speed and step can be set; and automated commands pre-programmed to improve the speed of repetitive tasks. The IVM can be moved at speeds between 1  $\mu\text{m/s}$  and 4 mm/s making it suitable for a range of applications and therefore, improving return-on-investment.

Memory positions can be stored, labelled and recalled, while the position display aids in stereotaxic navigation. These features allow the researcher to quickly recall points of interest once initially found, saving valuable time.

The '**creeper**' function greatly aids the search for signals in quiet regions by allowing the user to pre-programme movement of a defined distance, at a customisable speed. This can be halted with the press of a button.

## IVM-1000

### Single axis *in vivo*, motorised manipulator

The IVM-1000 is designed to enhance the manually adjustable axis on a standard stereotaxic frame, or manual manipulator. Therefore adding accurate, motorised movement in the critical approach, or Z axis, for precise, electrode positioning.



Single axis IVM-1000 on stereotaxic frame with Scientifica SliceScope

#### Accurate and versatile positioning

The single axis IVM is a versatile partner for a range of stereotaxic frames and manual manipulators. Either attaching directly to a stereotaxic frame, or with the addition of a bracket, it can be firmly mounted to other devices providing consistent, smooth travel for *in vivo* and deep tissue experiments.

The IVM-1000 is controlled by a uniquely designed user interface (PatchPad) featuring a single, rotary wheel for fine movement control and continuous drive buttons that make travel over longer distances faster and simpler (for further details see p5).

#### Single-wheeled PatchPad



#### Case Study: Dr Nicholas Lesica UCL, Ear Institute

The Lesica Laboratory at UCL performs extracellular recordings from within auditory brain structures, using the IVM-1000 to carry out single neuron recordings. Dr Lesica describes how the IVM-1000 improved the quality of their recordings:

*"The high resolution step control and low-speed creeper control features proved critical for our recordings; allowing us to significantly improve the stability and signal-to-noise ratio of our recordings. Compared to other micromanipulators I have used, the Scientifica IVM allows us to isolate more cells and to record from each cell for a longer time."*



## IVM-3000

### Triple axis *in vivo*, motorised manipulator

The IVM-3000 provides three orthogonal axes of smooth, motorised movement. The modular design ensures it is extremely adaptable and compatible with a range of mounting frames.

These mounting, stereotaxic frames including Kopf, Stoelting, Narishige, WPI and Leica. Alternatively, it can be mounted directly to the surface of an anti-vibration table.

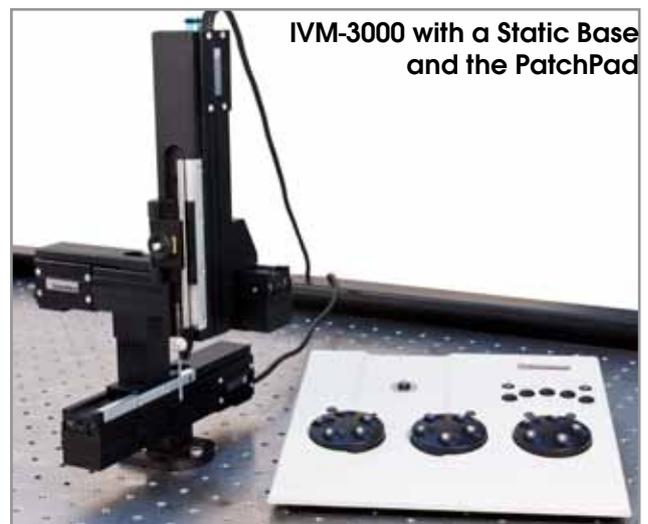


#### Patch Pad -precise control

Precise control of the IVM-1000, and IVM-3000, is provided by a single wheeled, or triple wheeled, variant of the PatchPad. Each control wheel corresponds to an axis of movement. Continuous motion buttons are also available for moving longer distances - useful when approaching, or withdrawing, from the experimental area.

Additionally the PatchPad features a step control button which initiates user programmed movements (defined within LinLab), and an **'emergency stop'** button to override this movement. This is important when a cell has been identified or when sample damage is imminent.

Up to 50 memory positions can also be stored and accessed, and two speed settings activated, at the press of a button. These features can be further customised and adapted with the LinLab software.



## Ordering information

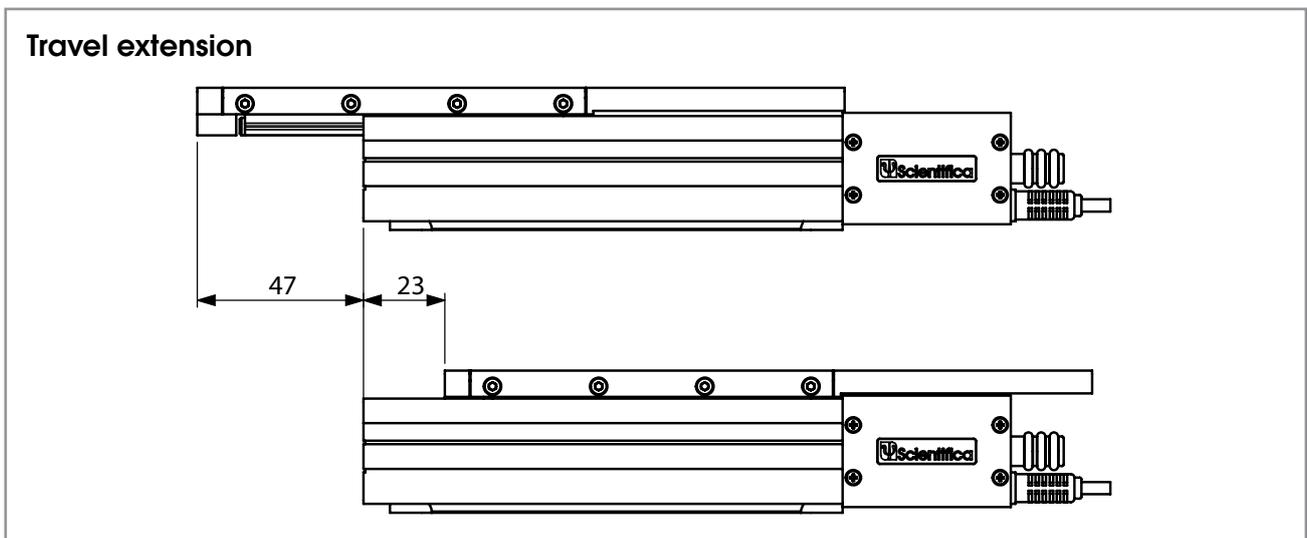
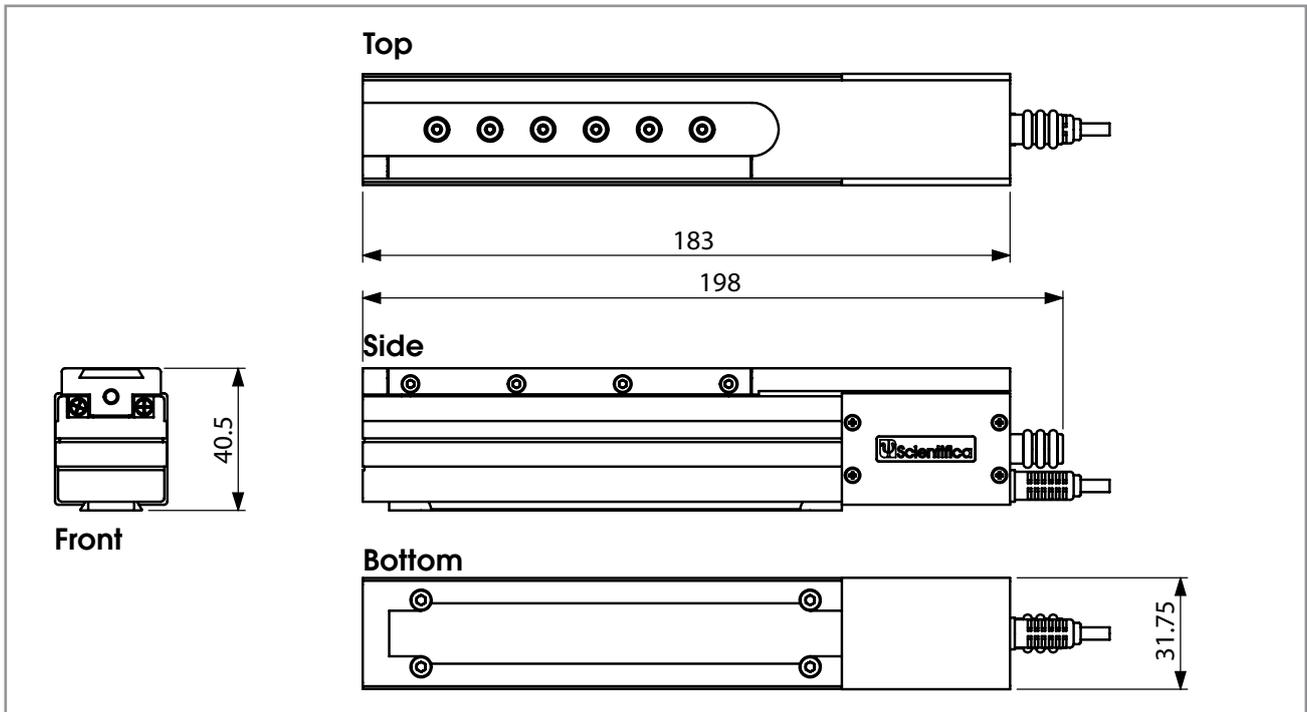
Product	Details
IVM-1000	Single axis <i>in vivo</i> micromanipulator Complete with ultra-low, electrical noise 1U controller and <i>PatchPad-One</i> user interface for one axis control. Includes dovetail slider to attach pre-amplifier headstages or other, user defined tools.
IVM-3000	Three axis <i>in vivo</i> micromanipulator Complete with ultra-low, electrical noise 1U controller and <i>PatchPad</i> user interface for three axis control. Has Dovetail slider to attach pre-amplifier headstages or other, user defined tools.
IVM-3100-00	Three axis <i>in vivo</i> micromanipulator Complete with ultra-low, electrical noise 1U controller and <i>PatchPad Touch</i> user interface for three axis control. Has Dovetail slider to attach pre-amplifier headstages or other, user defined tools.
IVM-5000-00	Single axis <i>in vivo</i> micromanipulator with 3-axis LBM-7 manipulator Complete with ultra-low, electrical noise 1U controller and <i>PatchPad-One</i> user interface for one axis control. Has Dovetail slider to attach pre-amplifier headstages or other, user defined tools. Includes 3-axis version of LBM-7 manual manipulator and appropriate connecting bracket.

## Accessories

The table below details some of the accessories available for mounting the IVM-1000 and IVM-3000, along with brackets for attaching to other devices and securing headstages.

Mounting Options for IVM-1000	Accessory required	Part number
Scientifica LBM-7 manipulator	IVM - LBM-7 adjustable mount (replaces approach axis of the LBM-7, and allows rotation and locking of IVM)	IVM-510-00
	IVM - LBM-7 Fixed Mount (mounts onto approach axis of the LBM-7)	IVM-505-00
Kopf, Stoelting or RWD stereotaxic manual manipulator	Right angled mount Extended right-angled mount (allows attachment on one of four mounting positions)	IVM-520-00 IVM-550-00
Rod clamp	IVM Rod mount adaptor (attaches IVM on 8 mm diameter rod)	IVM-570-00
Mounting options for IVM-3000	Accessory required	Part number
Bread Board Platform	IVM Static Base with circumferential mounting slots	IVM-590-00
Kopf stereotaxic frame	Kopf Bracket	IVM-575-00
Stoelting or RWD stereotaxic frame	Stoelting bracket (attachment to side of frame)	IVM-545-00
Rod clamp	IVM Rod mount adaptor (attaches IVM on to 8 mm diameter rod)	IVM-570-00
For attaching to the IVM	Accessory required	Part number
Axon headstages	Axon Dovetail adapter plate	IVM-560-00
HEKA headstages	Dovetail strip for Heka headstage	HEK-Dovetail
Capillary glass 1-2 mm in diameter	IVM Extended probe holder (a compact bracket to hold electrodes close to the plane of movement)	IVM-530-00
	Swivel probe holder (as above, with ability to rotate and lock probe angle)	IVM-540-00
Electrode holding rods (inc Scientifica EHB-500)	Dovetail probe holder (rods up to 10 mm)	PH-1000

## Schematics



## Warranty

Scientifica's success is founded on supplying superior support and application of our significant manufacturing experience. We would therefore really value the opportunity to understand your applications better and to offer no obligation advice on equipment, configurations and compatibility.

All Scientifica instruments are sold with a two-year warranty giving you complete peace of mind. This covers all defects in manufacturing and materials. In this unlikely event, Scientifica will remedy either by repair or replacement.

Our team of customer support engineers is dedicated to providing you with the very best advice and support, should you experience any difficulties with our products. With all products we offer a complete installation support service.

# Scientifica

Revision 1.0

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