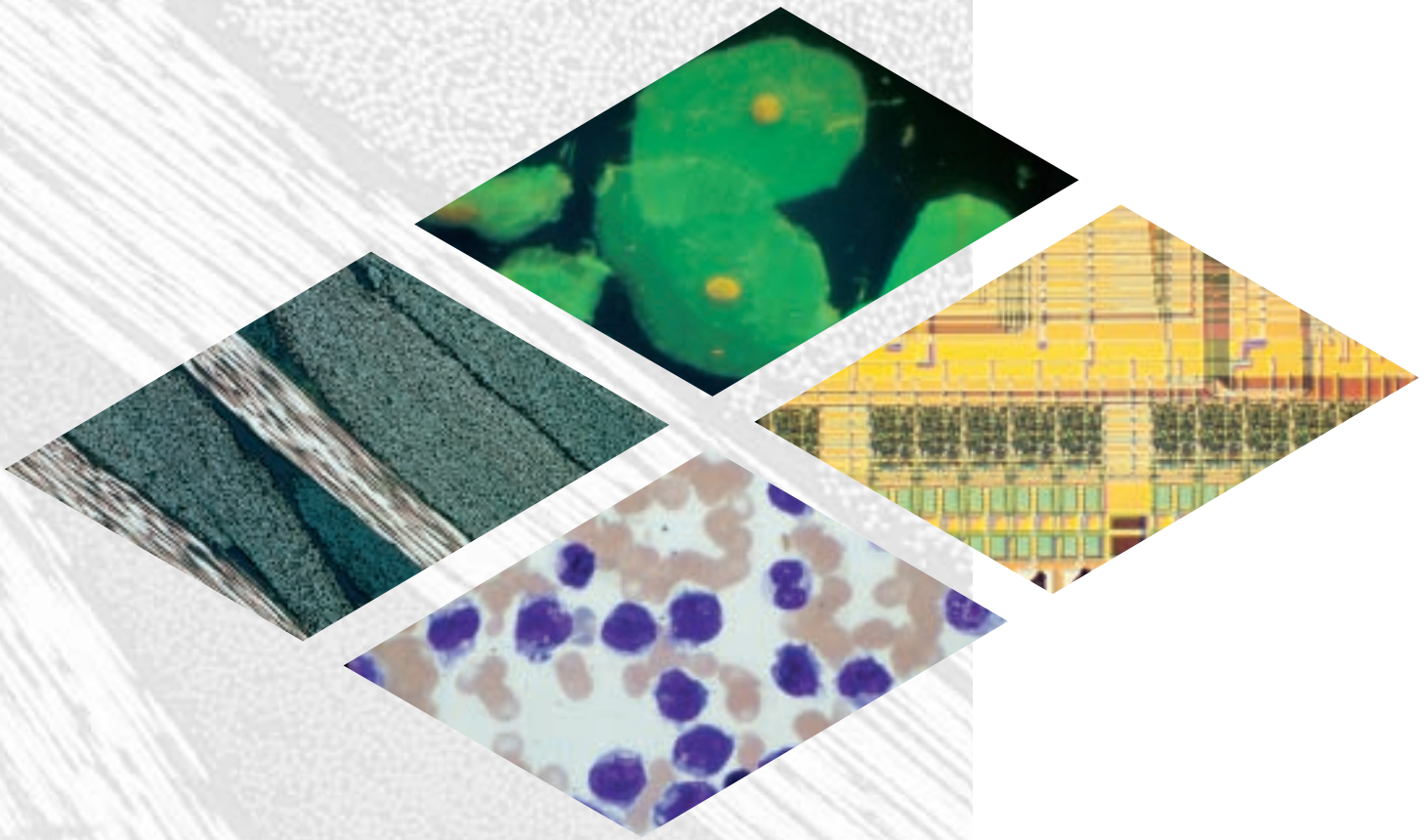
ProScan™ III

PRIOR
Scientific

High Performance Microscope Automation Systems

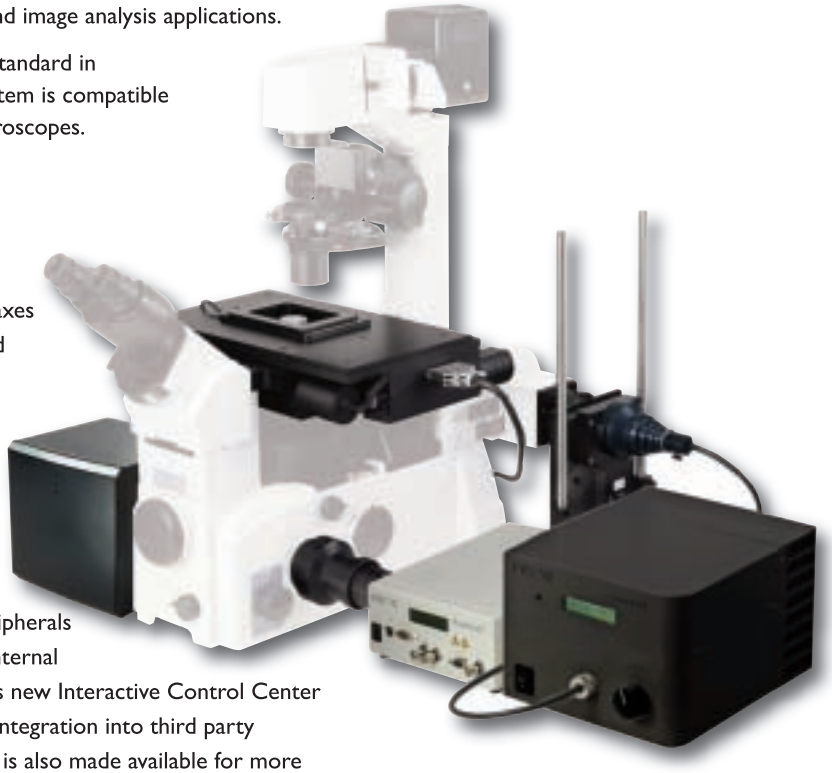


ProScan™III Universal Microscope Automation Controller

System Control

Prior Scientific has designed and manufactured precision optical systems, microscopes and related accessories since 1919. This wealth of experience and commitment to customer service has earned Prior an enviable reputation for unsurpassed customer support. These values, plus our understanding of microscopy, provide a unique foundation for the development of an advanced range of motorized stage systems for microscopy and image analysis applications.

The new ProScan™III system from Prior Scientific sets a new standard in automated microscopy. Modular by design, the ProScan™III system is compatible with a wide range of stages for most upright and inverted microscopes.



Advanced and Powerful Control

The compact and modular design of the ProScan™III system is capable of **controlling up to 16 individual** stepper motor axes including; a motorized stage, focus motor, six filter wheels and six shutters with the speed, accuracy and precision required by today's highly automated and demanding applications. Also with up to 16 individual stepper drives, Prior can customize the ProScan™III to cover any OEM application no matter what the size. Communication to the controller has been improved, as a USB with direct HID connection is now available making the unit both Windows and Mac compatible. Four programmable TTL inputs and outputs allow the unit peripherals or external cameras to be controlled via TTL. The advanced internal software allows for simple control of all accessories via Prior's new Interactive Control Center (ICC) Joystick, RS232 or USB, and a SDK is supplied for easy integration into third party software. Access to acceleration, speed and even drive current is also made available for more advanced users to allow total customization of the unit.

Intelligent Control

Accessories utilize the plug and play features of the ProScan™ system. These have been improved in ProScan™III so that each stage's individual settings are stored on the stage, which complements the patented Intelligent Scanning Technology (IST) and enhances the performance of the ProScan™ range of stages. ProScan™III defies obsolescence by utilizing a user friendly, web downloadable, firmware upgrade.

For the most demanding imaging applications which require high accuracy, speed and repeatability, ProScan™III uniquely provides the option to encode all motor axes.

Advanced Communications

The system includes fast RS232 (115200 baud) and true USB with HID capability communications. The programmable TLL can control the movements of a stage, focus motor, filter wheels and shutters for fast analogue interfacing and camera control.

Interactive Control Center Joystick

The Prior model PS3J100 Interactive Control Center (ICC) Joystick provides a centralized manual control center for all the ProScan™III accessories. The screen provides positional feedback while the joystick, buttons and digipots control accessories such as; a stage, focus, filter wheels and shutters.

New features in the ICC allow the user to measure distances, label filter wheel positions with dye names (e.g., DAPI, FITC, etc.) and take fine control of the stage for intricate movements. This gives the user instant feedback as to what fluorophore the system is setup for and where the areas of interest are located on the stage. It also allows basic diagnostics of encoders, TTL and internal ProScan™III settings, such as axis movement speed. The PS3J100 can also be configured for OEM users who require specialized menu options.

Modular System

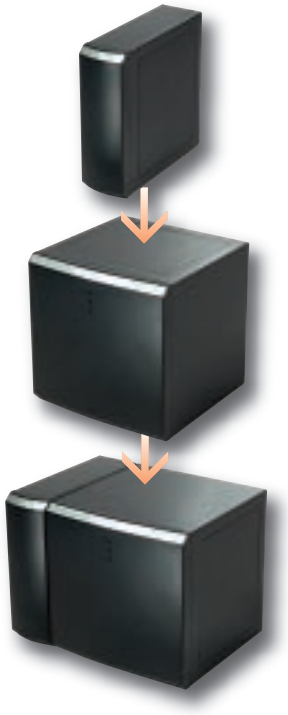
ProScan™III provides a modular approach to minimize the footprint of the controller. The cubic design provides stylish looks with a footprint of only 177x177mm. The base unit is designed to accommodate a three axis system, e.g., a stage and focus. Additional functionality can be added to the unit via modular sections which allow for easy expansion. The ancillary box accommodates any extra functionality required, e.g., three filter wheels and three shutters.

Configured for your Needs

Accessories can be controlled in either the main cube or the ancillary boxes, providing a system which is totally configurable. ProScan™III can be expanded horizontally to accommodate increased functionality, easing the pressure on the limited space in modern labs.

Expand Horizontally

The ProScan™III can expand horizontally to fit under or on shelves or in rack mounted systems.



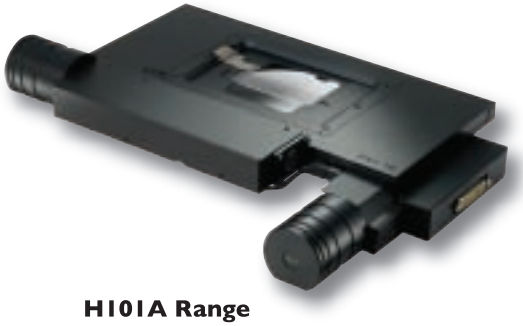
Intelligent Scanning Technology (IST)

GB Patent No. 2411249 : US Patent No. 7330307

Intelligent Scanning Technology (IST) allows each stage to be pre-programmed with a unique set of operating characteristics to that particular stage to ensure optimum performance. Intelligent Scanning Technology allows the ProScan™III controller to periodically interrogate the stage and make any required adjustments to maintain superior orthogonality and metric accuracy.

For full mapping, implemented for larger stages, the frequency of measurements across the stage is increased to significantly improve the metric accuracy of these stages. This is ideal for tiling and image stitching applications.

High Precision Motorized Stages

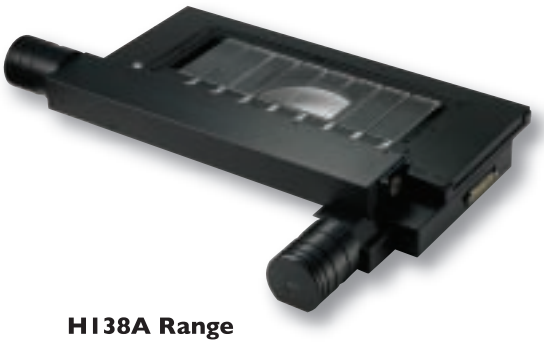


H101A Range

Stage for upright microscopes, providing a travel range suitable for well plates at 114x76mm. Stages can be configured with 2mm ball screws and 200 step motors for high speed applications or 1mm and 400 step motors for high accuracy applications. Both options can be fitted with high precision encoders. H101A stages are pre-programmed with Intelligent Scanning Technology (IST) for improved metric accuracy.

H117 Range

Stage for Inverted microscopes, providing a travel range suitable for well plates at 114x76mm. Stages can be configured with 2mm ball screws and 200 step motors for high speed applications or 1mm and 400 step motors for high accuracy applications. Both options can be fitted with high precision encoders. H117 stages are pre-programmed with Intelligent Scanning Technology (IST) for improved metric accuracy.



H138A Range

Stage for upright microscopes, providing an extended X axis travel range suitable for eight slides at 240x76mm. Stages can be configured with 2mm ball screws and 200 step motors for high speed applications and can be fitted with high precision encoders. H138A stages are pre-programmed with Intelligent Scanning Technology (IST) for improved metric accuracy.

Precision Stepper Motors

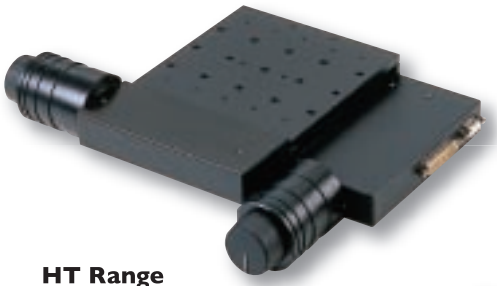
Quiet and precise stepper motors ensure exact positioning of the stage while the use of micro-stepping provides very smooth motion even at low speeds. A range of motors are available to allow both high accuracy and smooth motion at low speed plus high acceleration and speeds of up to 300mm/s.

Cast Aluminium Plate

Prior stages are precision machined from specially cast aluminium plates which are lightweight and provide excellent dimensional stability.

Adjustable Limit Switches

The flexibility to reduce the travel range of the stage to match your application will avoid damaging collisions with the microscope. The limits are internal to the stage to provide a tamper-proof solution and datum point automatically referenced by the ProScan™ firmware.

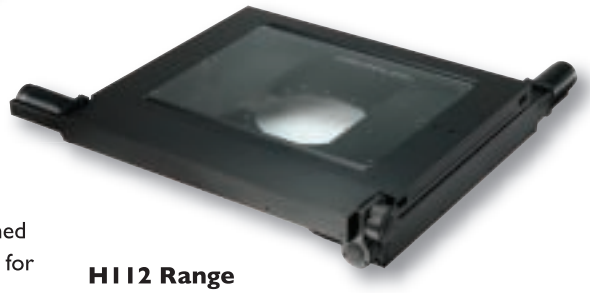


H105 Range

Stage for upright microscopes, providing a large travel range suitable for 6 inch wafers at 154x154mm. Stages can be configured with 2mm or 5mm ball screws for high accuracy and high speed applications. Both options can be fitted with high precision encoders. H105 stages are fully mapped for improved metric accuracy.

HT Range

Stage for upright hardness testing microscopes, providing a range of travel ranges, 50x50mm, 110x110mm and 150x150mm suitable for a wide range of applications. HT stages are pre-programmed with Intelligent Scanning Technology (IST) for improved metric accuracy.

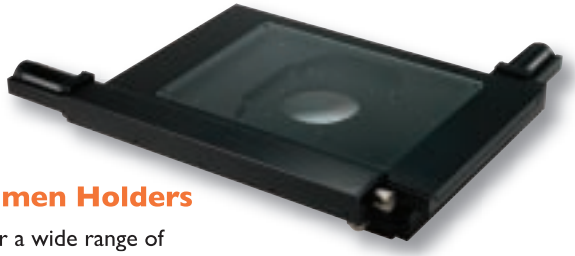


H112 Range

Stage for upright microscopes, providing a large travel range suitable for 12 inch wafers at 300x300mm. Stages can be configured with 2mm or 5mm ball screws for high accuracy and high speed applications. Both options can be fitted with high precision encoders. H112 stages are fully mapped for improved metric accuracy.

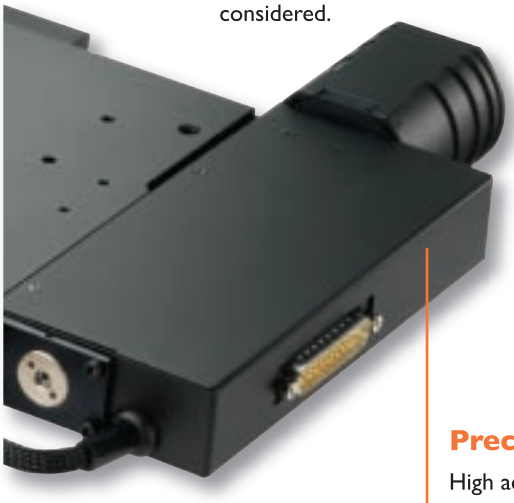
H116 Range

Stage for upright microscopes, providing a large travel range suitable for 8 inch wafers at 255x215mm. Stages can be configured with 2mm or 5mm ball screws for high accuracy and high speed applications. Both options can be fitted with high precision encoders. H116 stages are fully mapped for improved metric accuracy.



Wide Range of Specimen Holders

ProScan™ stages are available for a wide range of applications involving specimens such as slides, micro titre plates, Petri dishes, metallurgical samples and semiconductor wafers. Specimen holders are anodized black to provide excellent wear resistance. Custom designs are always considered.



Precision Ball Screws

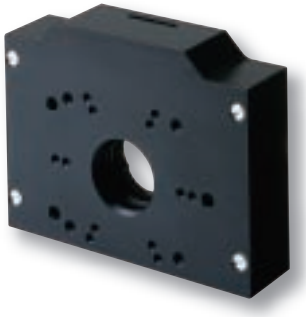
High accuracy ground ball screws provide smooth and maintenance free motion. The pre-loaded re-circulating ball screw nuts ensure zero backlash. The whole ball screw assembly is connected to the motor with an anti-backlash nut. Ball screws of various pitch are available for each stage to optimize the stage for speed and accuracy.

Accessories

Accessories Controlled by ProScan™ III

Filter Wheels

The high speed filter wheel system delivers smooth operation and changes filter positions in as little as 50ms. There are two wheel options available: an 8 position (32mm diameter filter) wheel and a 10 position (25mm diameter filter) wheel. The filter wheels can be installed on most microscopes in the excitation or emission channels.



High Speed Shutters

The filter wheels can be used stand alone or combined with a fast shutter (10ms) to provide total light control. Adaptors are available to connect to most microscopes on the excitation, emission or brightfield locations.

Focus Drives

A range of easy to fit motorized focus mechanisms for accurate control of microscope focusing. Encoded focus and optical limit switches are also supported by ProScan™III. Step sizes as small as two nanometeres give precise and repeatable positioning for the Z-axis. For high speed focus moves for stereo microscopes the focus can be driven up to 60 rev/s.

NanoScanZ Nanopositioning Piezo Z Stage Systems

The NanoScanZ provides ultra fast Piezo Z movement with 100um, 200um, 250um and 500um travel Z ranges. The NanoScanZ provides the ability to take multiple images at highaccuracy (approx. 1nm) at high frame rates (100 Hz), providing the highly accurate fast focus solutions needed for Z-stacking or slicing and image fusion applications. The stages are compatible with Prior automated scanning stages to provide seamless integration. Adapters are available for use with manual stages.

LF210 Laser Automatic Focus System

Prior LF210 provides a laser based auto focus system which can be installed on most microscopes to provide real-time auto focus. Ideally suited for automatic semiconductor wafer inspection applications, the LF210 combines the latest in intelligent microprocessor control and advanced optics to provide the fastest and most reliable laser autofocus available.

ProScan™ III System Product Partners

Lumen 200 Fluorescence Illumination System

This cost effective solution provides a powerful 200W collimated illumination beam which is adaptable to most microscopes. The specially designed bulb lasts a staggering 2000 hours before a simple procedure allows for the replacement of the bulb.

The DC bulb is specially cooled by the unit to provide a controlled environment producing a very stable output, not only over the average time of experiments but over the lifetime of the bulb. The unit can be positioned away from the microscope as the flexible liquid light guide connects the Lumen 200 to the microscope. This protects the microscope from any heat or vibration.

Five position manual attenuation is provided for control of the light output. The Lumen 200 can be combined with existing filter wheels and shutters to provide a complete automated fluorescence solution.

Lumen 200 Options

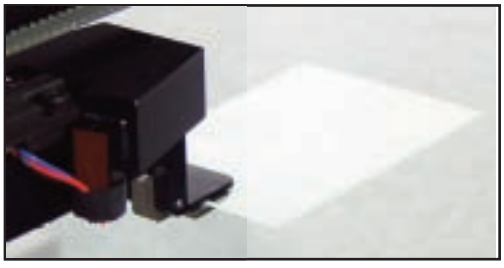
A range of heat filters are available for the Lumen 200 and Lumen 200Pro which protect the liquid light guide from damaging wavelengths emitted by the Lumen bulb. The standard unit has a filter designed to suit general microscopy needs. Two more options are available; the L210 extends the output wavelength into the red for CY5.5 and CY7 dyes and the L220 extends the output wavelength range to enhance Fura dye use in the UV and CY7 in the IR.

Lumen 200Pro Fluorescence Illumination System

The Lumen 200Pro system combines the intense fluorescence light source of the Lumen 200 with Prior's high speed motorized six position filter wheel and light attenuator to create a fully automated solution. In addition to being more cost effective than purchasing individual components the remote location of the Lumen 200Pro ensures minimized vibration and thermal drift which equates to faster imaging.

PL-200 Automated Slide Loading and Scanning System

Prior's PL-200 Slideloader is compatible with the ProScan™III system and most major upright microscopes, providing the ability to reliably load up to 200 - 1"x3" slides or 100 - 2"x3" sllde automatically onto the ProScan™ range of stages. The system has a multitude of sensors to ensure the slides progress is tracked throughout the handling process. This ensures precious slides are delivered safely to the stage, time after time. The PL-200 is supported in most major image software packages and is supplied with a free software integration kit for OEM customers.



Specifications

Power	Universal Mains Input 110/240 VAC 50-60Hz
Computer Interface	USB (HID or Virtual COM) RS232C
COM Port Communications Protocol	8 bit word, 1 stop bit, no parity, no handshake, baudrate options of, 9600, 19200, 38400 and 115400.
Controller Dimensions	Cube: Width, Height and Depth 177mm (ancillary box add 59mm)
Controller Weight	3kg (1kg for ancillary box)
Stage Speed	Up to 300mm/s
Step Size	From 0.01um for XY, 0.002um for Z
Repeatability (Focus/Stages)	Typically <1um
Linear Scales	0.1um or 0.05um options available
Ball Screws	Zero Backlash, ground recirculation ballscrews, 1mm, 2mm, 4mm or 5mm options available.
Limit Switches	Adjustable in X and Y Optical and mechanical available in Z

Branded, Special and OEM Systems

Made to Measure from Prototype to Manufacture

At Prior Scientific we control the design and manufacturing process for all of our automated microscope products. This way, we can be sure of offering the most flexible service.

This approach along with our commitment to customer service means that Prior Scientific is uniquely placed to provide complete systems to match your exact specifications. From branded products to entirely unique solutions Prior has the tools to provide for your needs.

Our design engineering department employs the latest in computer aided 3D modelling along with many years experience in the design and manufacture of scientific instruments. It is here that quality and reliability are designed into our products. Advanced CNC machines and computer aided manufacturing systems are used to produce high quality components. In assembly, experienced instrument makers build complete stage and controller assemblies with care and attention to detail.

It is this blend of skills, experience and flexibility that have established Prior as one of the world's leading manufacturers of automated microscopy products and OEM systems.

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