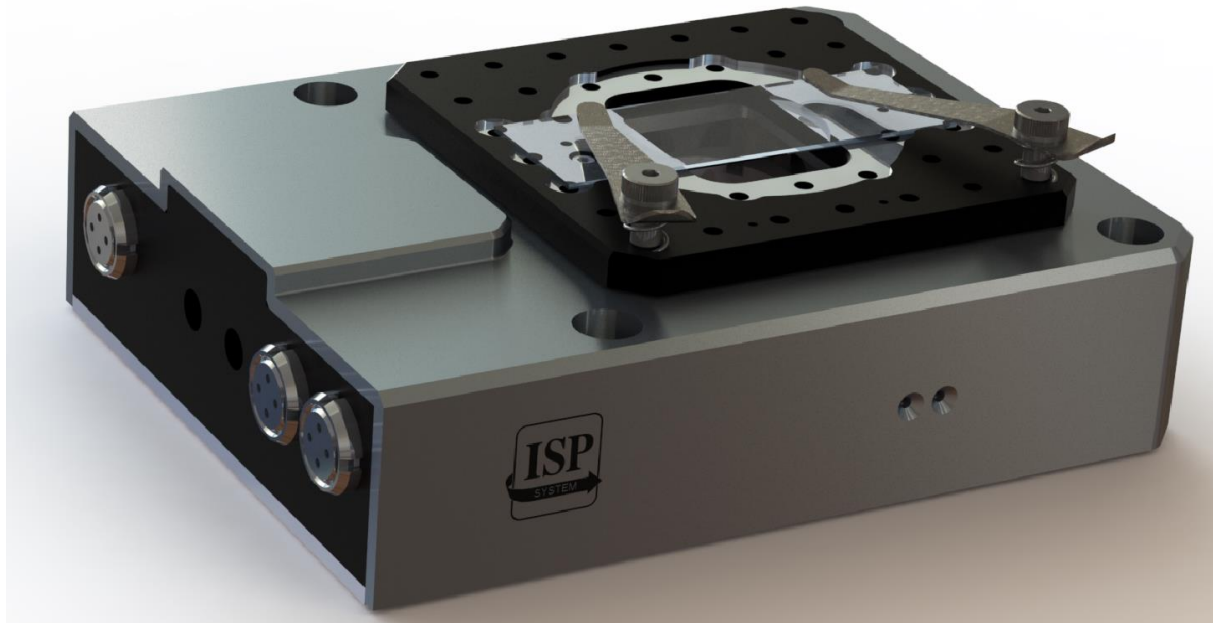


Update : 12/19/2022



*Image is for illustrative purposes only*

### 1 - On-the-fly scanning – Nano-positioning

- Sub-nanometer positioning resolution
- Absolute position closed-loop control
- Travel range of up to 10 mm
- Excellent closed-loop speed control on the whole stroke (speed variation <10%)
- X-Y movement through combination of two stages
- Patented guiding system for optimized straightness in 3 directions
- Dedicated electronics hardware and software available
- Triggered for synchronisation with customer application
- Vacuum and Ultra High Vacuum versions available
- Free aperture through the stage
- Remote motor → no electromagnetic perturbation near the sample to be studied

The **NLS + series** is a product range based on a reliable technology providing nanometric resolution motion in horizontal direction. These stages were created to address the new needs in nanotechnology (e.g. Scanning Electron Microscope, laser lithography, atomic force microscopy, wafers manufacturing, spectroscopy ...).

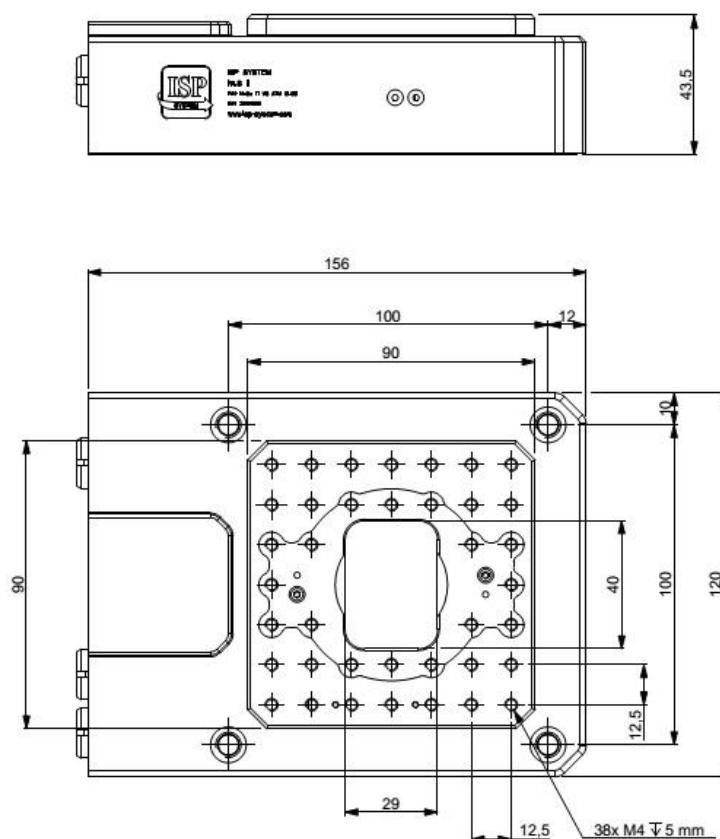
They are particularly adapted to on-the-fly scanning applications.

The x-y motion is obtained through a combination of two NLS stages

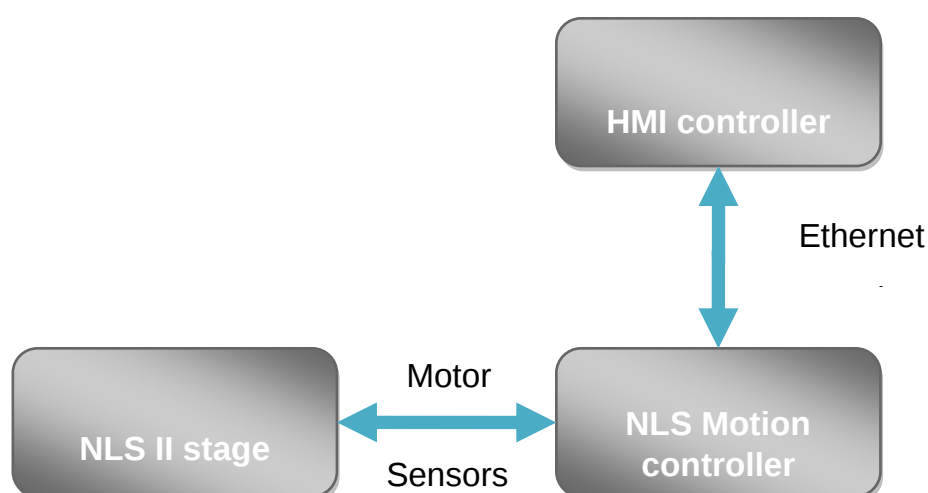
## 2 - Main characteristics

| TECHNOLOGY                                                    | AVAILABILITIES                                                                                                |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| Motor                                                         | remote Voice-coil <b>(VC)</b>                                                                                 |
| Pressure compliance                                           | Atmospheric <b>(ATM)</b> , Low Vacuum <b>(LV)</b> , High Vacuum <b>(HV)</b> or Ultra High Vacuum <b>(UHV)</b> |
| Motion controller                                             | Closed Loop <b>(CL)</b>                                                                                       |
| Displacement sensors                                          | Optical <b>(O)</b> or Capacitive <b>(C)</b>                                                                   |
| Travel                                                        | Up to 10 mm                                                                                                   |
| Static resolution                                             | <b>0.2nm</b> at 2Hz                                                                                           |
| Sensor dynamic resolution                                     | <b>10nm dynamic</b> resolution at 1KHz                                                                        |
| Static accuracy                                               | <b>+/-10nm</b>                                                                                                |
| Near straightness in the three directions<br>(angular/linear) | <b>1μrad/ ±30 nm (10 mm travel)</b>                                                                           |
| Pay load                                                      | 250 g                                                                                                         |
| Scanning mode                                                 | On-the-fly scan                                                                                               |
| Maximum speed                                                 | 10 mm/s                                                                                                       |
| Speed variation over 10mm stroke                              | <b>&lt;10%</b> of nominal speed                                                                               |
| Working direction                                             | Horizontally                                                                                                  |
| Temperatures                                                  | Working temperature 0 to 30°C; Baking 150°C                                                                   |
| Size                                                          | 156x120x43.5mm                                                                                                |
| Weight                                                        | 1.3kg                                                                                                         |
| Body materials                                                | Stainless steel or Aluminium                                                                                  |

*\*Please notice that further data and measurements are available on request.*



### 3 - NLS II x series Motion controller architecture



**NLS controllers** are Windows®-based interfaces providing powerful diagnostic, development, and analysis tools (simple automation tasks, observe the system behavior, system optimization...) on a user-friendly platform. Jog-mode allows the user to program motion profiles and to call them manually or in operating.

NLS controller has a host-mode operation allowing you to send commands with your PC via Ethernet for immediate execution. Jog-mode is completed by fly-scan and step-by-step modes available to triggered motion and acquisition on the same clock. Synchronous data transfer can be initialized by the user and acquisitions can be triggered on a master input clock.

Motion profiles are designed and developed to optimize actuator displacement and obtain the best behavior.

| NLS MOTION CONTROLLER        |                                       |
|------------------------------|---------------------------------------|
| <b>Platform</b>              | NLS software                          |
| <b>Languages supported</b>   | C, C++, LabVIEW (VIs supplied), ...   |
| <b>Operating system</b>      | Windows 7                             |
| <b>Operating profiles</b>    | Manual, jog, flyscan and step-by-step |
| <b>Data acquisition</b>      | Synchronous                           |
| <b>Acquisition triggered</b> | Yes                                   |

| CONTROLLER TECHNICAL DATA                         | SPECIFICATIONS                                                                                             |
|---------------------------------------------------|------------------------------------------------------------------------------------------------------------|
| Power supply                                      | 100-240VAC/50-60Hz 4.5A                                                                                    |
| Resolution                                        | 24-bit                                                                                                     |
| Motion profiles                                   | Position and speed                                                                                         |
| Speed profile                                     | Trapezoidal                                                                                                |
| Communication                                     | Ethernet                                                                                                   |
| Motor supply                                      | ±12VDC/1A                                                                                                  |
| Position sensor                                   | Sin/Cos                                                                                                    |
| Homing sensor                                     | Photomicrosensor (accuracy ±1µm)                                                                           |
| Trigger input                                     | 0-5V TTL (max freq. 1kHz)                                                                                  |
| Working temperature                               | 0 to 50°C                                                                                                  |
| Storage temperature                               | -20°C to +70°C                                                                                             |
| Cooling                                           | Forced convection                                                                                          |
| Dimensions                                        | 4U depth 260mm                                                                                             |
| Weight                                            | 8 Kg                                                                                                       |
| Maximum cable length between stage and controller | 2m (P <sub>atm</sub> ), 3m (vacuum)<br>If longer cables necessary, to be discussed acc. to the application |

*Please notice that further data and measurements are available on request.*