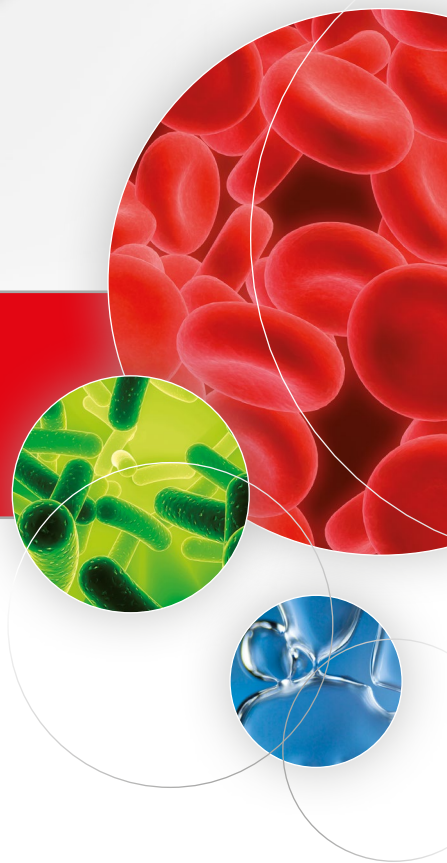




# ScanExpress

customized scanning



## We are pleased

to present to you ScanExpress – our new scanner platform for customised integrated microscope systems.

The modular structure of the ScanExpress is designed to cover highly specialised and automated application areas in medicine, material science and biology, in research and in industry.

Together with you we configure the precise system that you need for your application. The combination of modular insertable standard components enables optimum value for money and short development times.

With the help of our programming interface, you have full access to the system and can integrate the ScanExpress effortlessly into your software environment. In this way, you fully retain your application-oriented know-how.

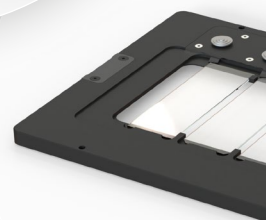
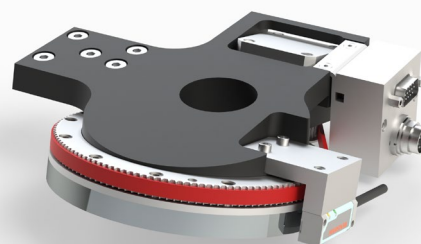
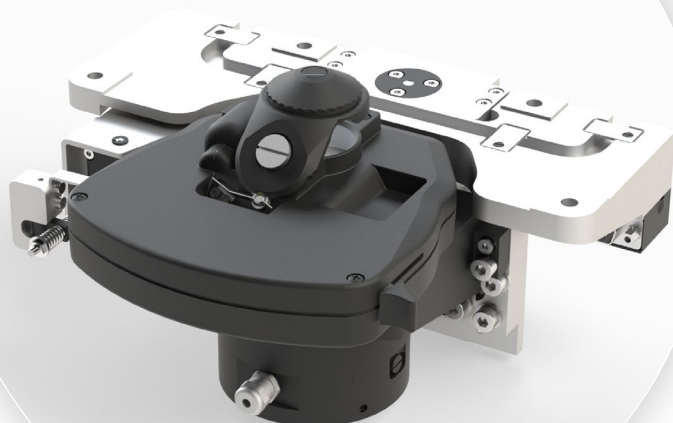
You want to go a step further and increase the degree of automation of your system? ScanExpress is prepared for the seamless linking of a perfected loading system. The storage and automated feed of sample holders are therefore also not an obstacle to your project.

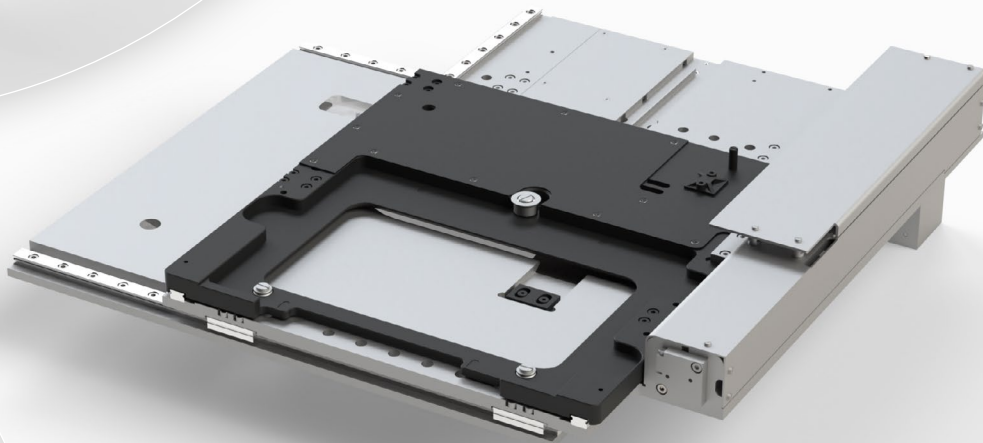
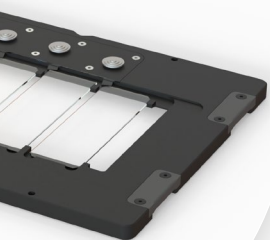
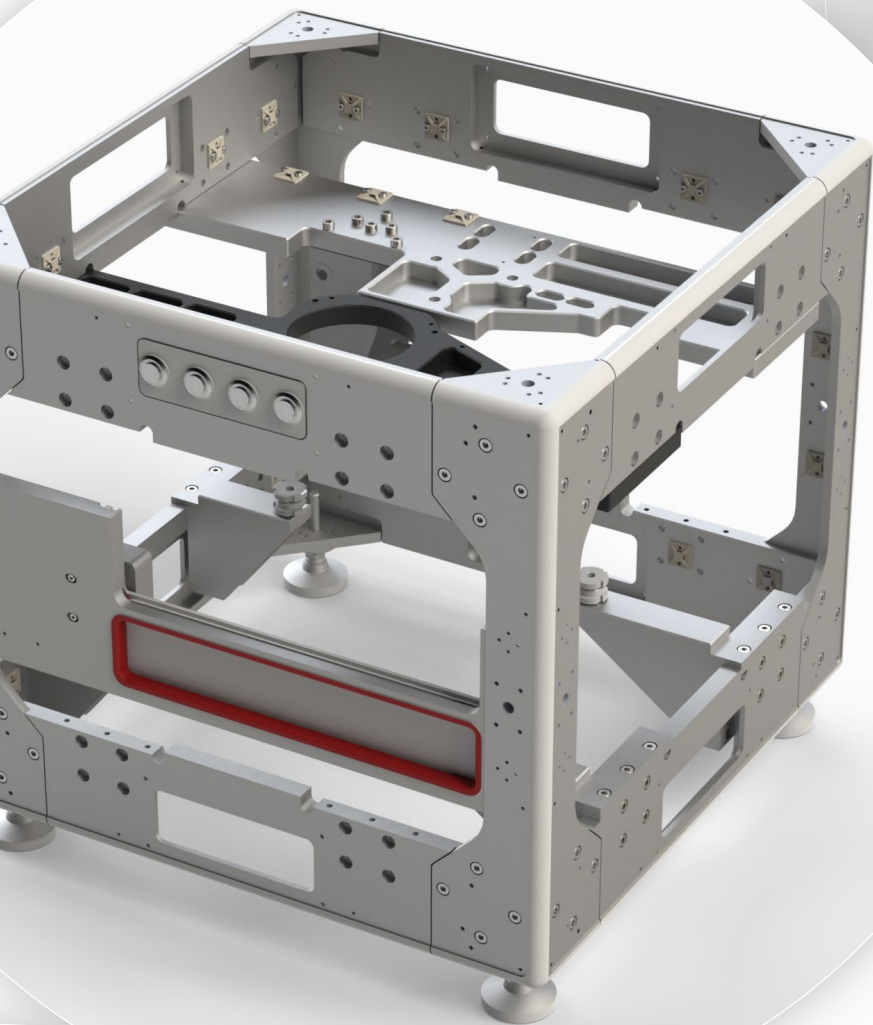
Contact us. We can't wait to find out about your application.

### Your Märzhäuser sales team

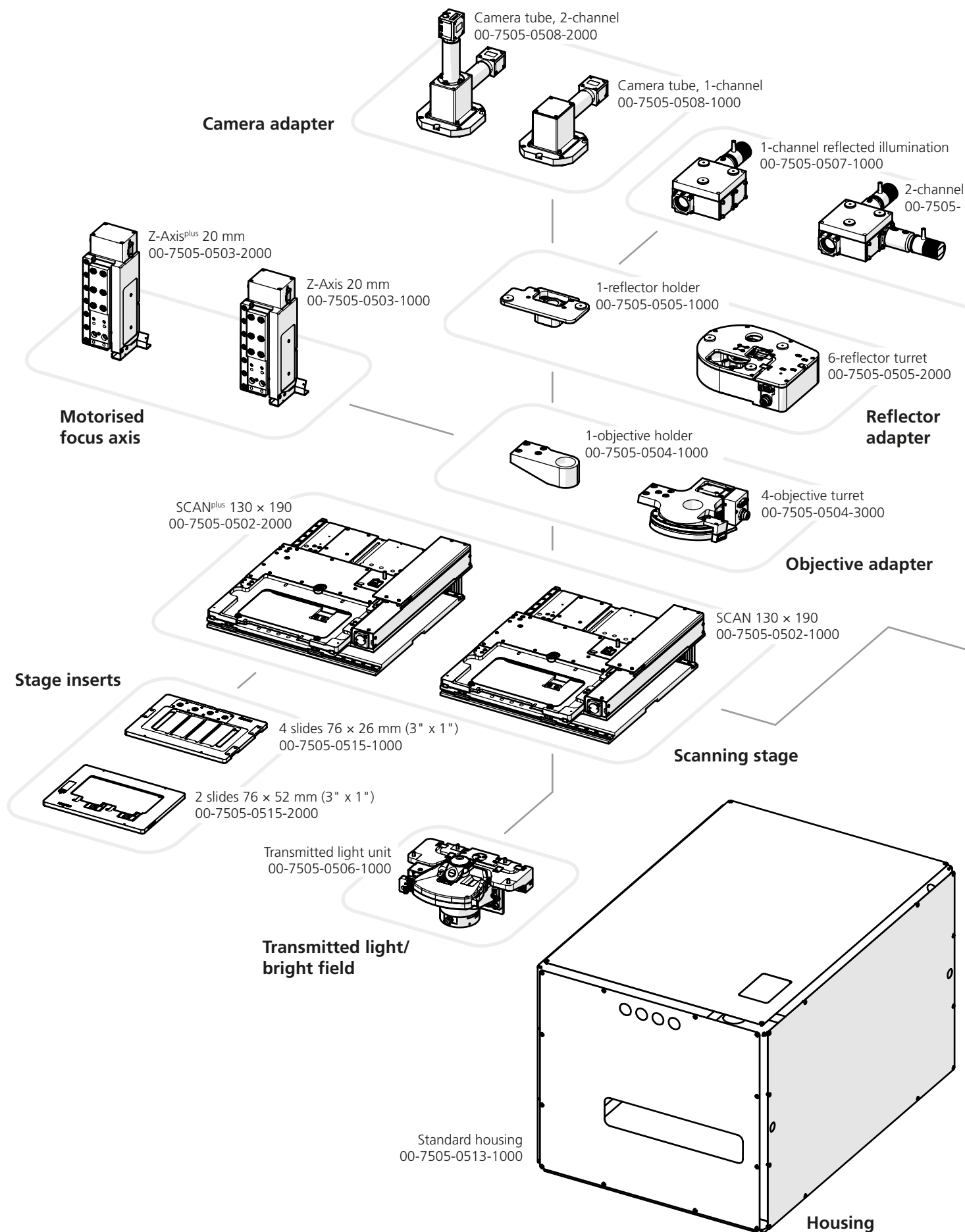
Phone **+49 6441 9116-0**  
E-mail [sales@marzhauser.com](mailto:sales@marzhauser.com)  
Internet [www.marzhauser.com](http://www.marzhauser.com)

System Overview.....	4
Base Unit .....	6
Scanning Stage .....	7
Focus Axis   Transmitted Light/Bright Field .....	8
Reflected Illumination/Fluorescence   Reflectors .....	9
Objective Adapter .....	10
Camera   Liquid Immersion.....	11
Stage Inserts   Housing.....	12
Electronic Unit   Controller .....	13
Loading System   Software .....	14
Technical Data   Approvals   Configurations .....	15

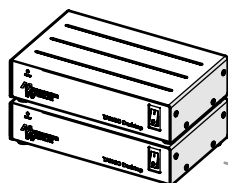




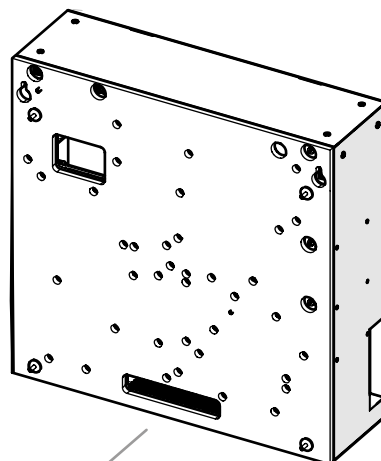
# System Overview



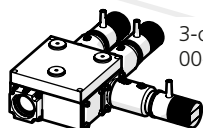
**Controller**



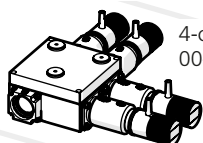
**Electronic unit**



reflected illumination  
0507-2000

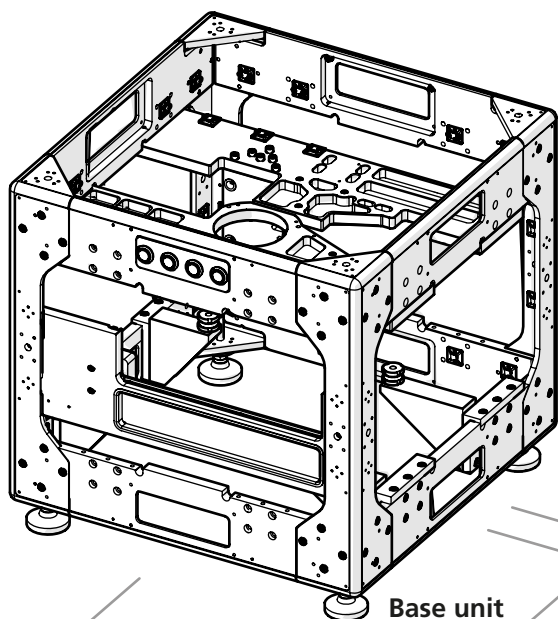


3-channel reflected illumination  
00-7505-0507-3000



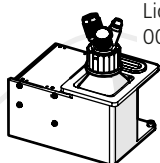
4-channel reflected illumination  
00-7505-0507-4000

**Reflected illumination**

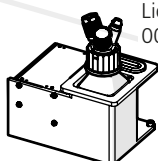


**Base unit**

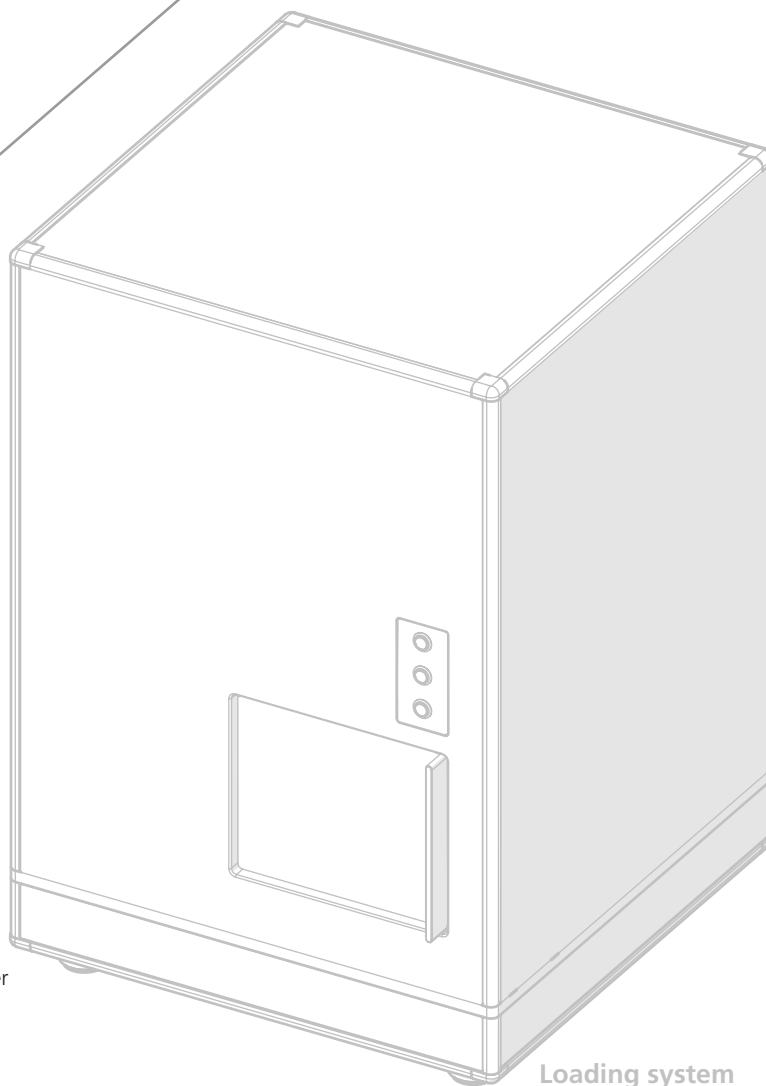
Liquid Dispenser, oil  
00-7505-0509-1000



Liquid Dispenser, water  
00-7505-0509-2000



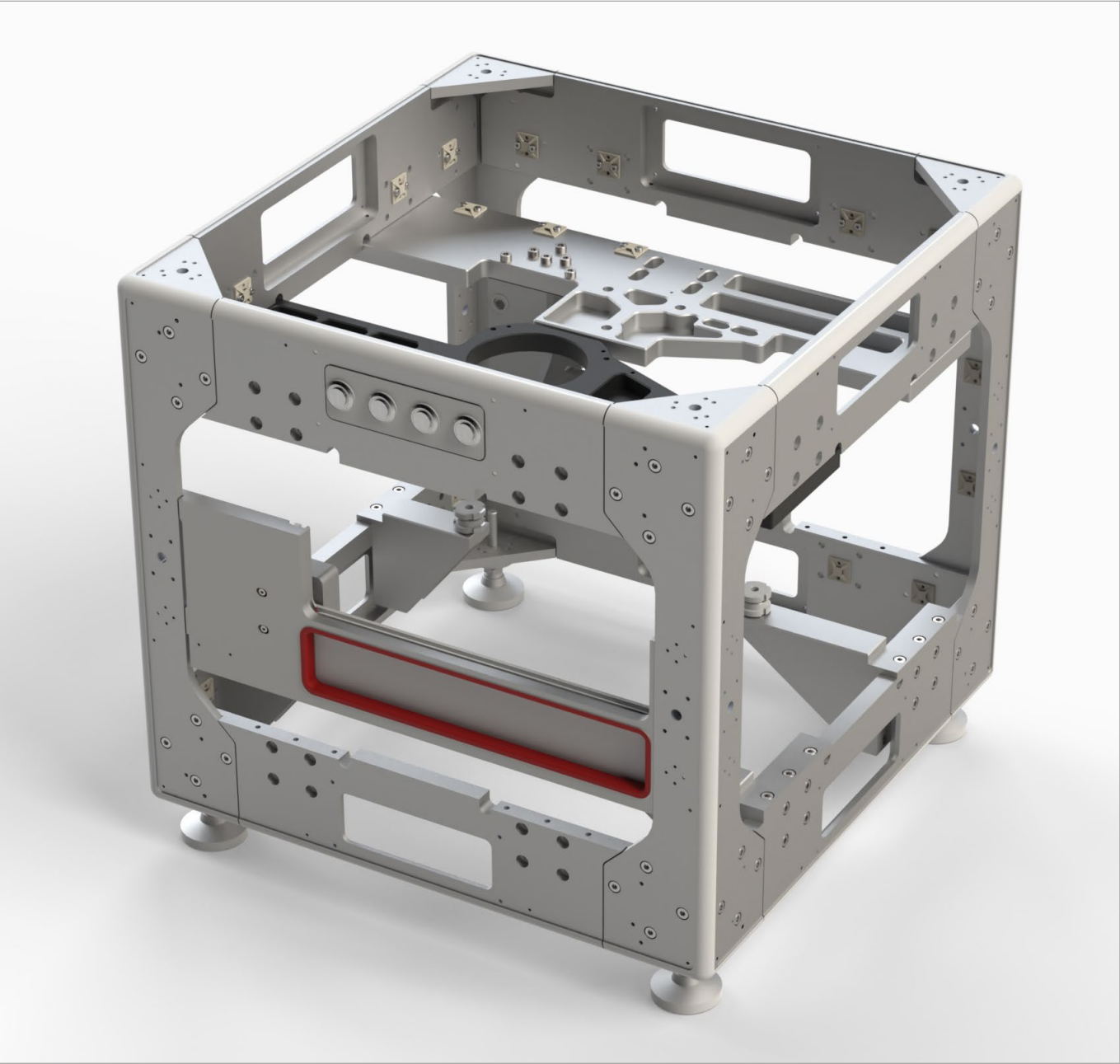
**Liquid immersion**



**Loading system**



# Base Unit



■ A compact scanner needs a cleverly designed stand concept. The **base unit** of the ScanExpress integrates the optics, reflectors and illumination, scanning stage and motorised focus axis as well as optional accessories in the smallest space. Thanks to a stable and torsionally stiff stand body made of aluminium, which is supported by four vibration absorbing feet, the ScanExpress is optimally equipped for isolating your microscopic examinations from external influences.

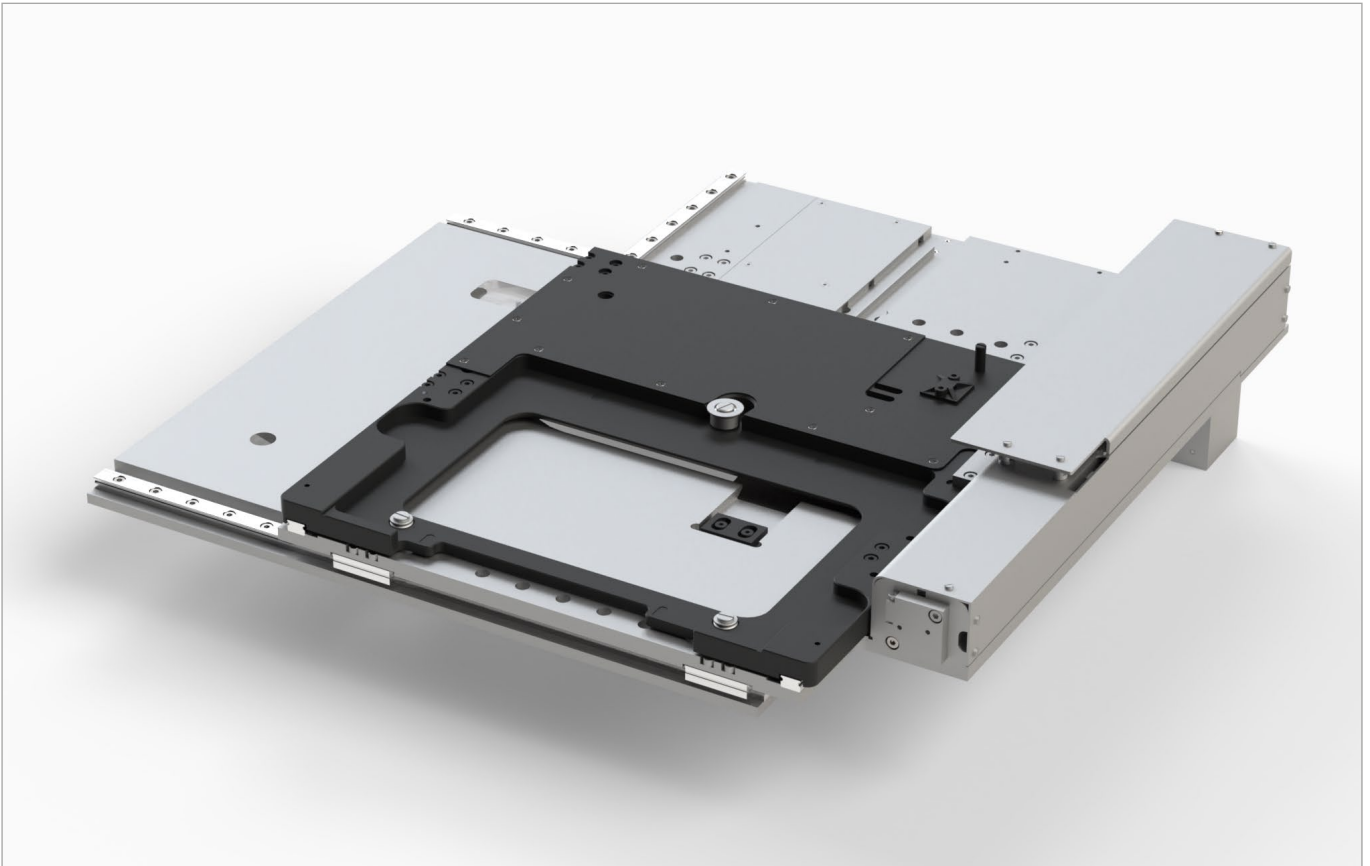
When designing the base unit, it was important to us to enable a high degree of flexibility. The stand body, despite comparatively compact dimensions, therefore provides sufficient space to accommodate different configurations. You decide on the configuration level of your scanner – in full contemplation of your application.

However, flexibility and compact design do not mean that you have to lower your signs when it comes to the optics.

The true to size arrangement of all optical components in the beam path is naturally not a feature in the automated recording of sample material, but rather a basic requirement, which we meet by high-precision compliance with geometric tolerances.

Base unit <sup>1</sup>	
Article no.	00-7505-0501-1800
Design	torsionally stiff, lightweight and form-fitting
Material	aluminium
Operating elements	4 illuminated stainless steel buttons
Sample feed	motorised housing flap

<sup>1</sup> customised version on request



■ A **scanning stage** from our SCAN series, specially developed for the scanner is used for the XY positioning of your samples. Its tried and tested drive concept consisting of precision ball screw and stepper motor ensures maintenance-free operation for many years. We vouch for this with a 2-year guarantee.

Depending on the accuracy requirements, your scanner can also be equipped with the Plus version of our scanning stage. The SCAN<sup>plus</sup> 130 × 80 has an integrated measuring system in both axes that, in interaction with the encoder interface of the TANGO controller, enables closed loop operation<sup>1</sup>.

The automated clamp for stage inserts provides maximum flexibility, as the clamp in the top plate of the scanning stage holds the stage insert – not the sample itself. The ScanExpress is therefore prepared for all kinds of different sample formats. You do not have to define a specific sample format when configuring your system.

Our standard stage insert holds up to 4 off-the-shelf glass slides with dimensions 76 × 26 mm (3" × 1") and therefore ensures a high throughput. Yet no matter whether single slide or company-specific material cut: We offer you the right stage inserts for your sample holder or sample.

	SCAN 130 × 80	SCAN <sup>plus</sup> 130 × 80
Article no.	00-7505-0502-1000	00-7505-0502-2000
Scan area	130 × 80 mm	130 × 80 mm
Travel speed	max. 100 mm/s	max. 100 mm/s
Repeatability <sup>2</sup>	< 5 µm (bidirectional)	< 1 µm (bidirectional)
Accuracy <sup>2</sup>	±3 µm	±1 µm
Resolution	0.01 µm	0.01 µm
Orthogonality	< 10 arcsec	< 10 arcsec
Ball screw pitch	2 mm	2 mm
Motor type	2-phase stepper motor	2-phase stepper motor
Drive system	ball screw (2 mm)	ball screw (2 mm)
Measuring system	–	optical
Limit switches	light barriers, optical (middle reference)	light barriers, optical (middle reference)

<sup>1</sup> positioning in closed loop control

<sup>2</sup> measured according to VDI/DGQ 3441

# Focus Axis | Transmitted Light/Bright Field



■ With the help of our **motorised focus axis**, we achieve motorised objective focussing: It is not the scanning stage that is moved but the far lighter optics. Your system therefore benefits from fast focus phases and low impact on the mechanics.

The Z positioning follows the same principle as the X and Y positioning. The maintenance-free combination of precision ball screw and stepper motor is also used here, ensuring optimally focussed samples. As with our scanning stage, a Plus version of our motorised focus axis is also available, enabling even more precise closed loop operation<sup>1</sup>.

The focus axis and objective adapter can also be configured independently of each other, as our focus axis can hold a 1-objective holder or an optional 6-objective turret.

	Z-axis 20 mm	Z-axis <sup>plus</sup> 20 mm
Article no.	00-7505-0503-1000	00-7505-0503-2000
Travel	20 mm	20 mm
Repeatability <sup>2</sup>	±1 µm (bidirectional)	≤ 1 µm (bidirectional)
Resolution	0.01 µm	0.01 µm
Motor type	2-phase stepper motor	2-phase stepper motor
Drive system	ball screw (1 mm)	ball screw (1 mm)
Limit switches	hall sensors	hall sensors
Measuring system	–	optical
Load capacity	10 kg	10 kg

<sup>1</sup> positioning in closed loop control

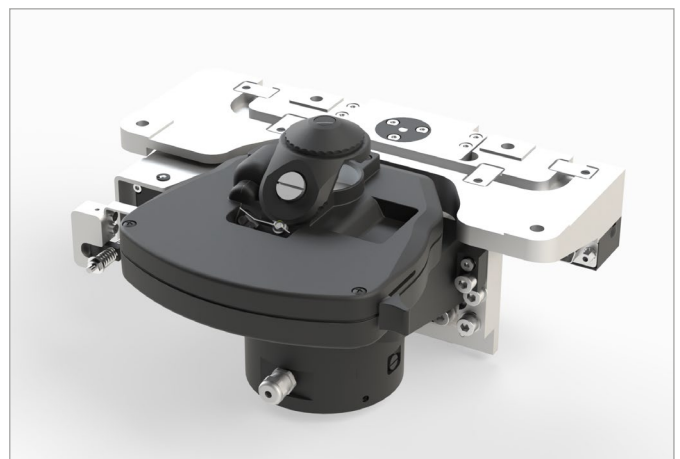
<sup>2</sup> measured according to VDI/DGQ 3441

■ The **transmitted light unit** of the ScanExpress can be centred on the optical axis of the ScanExpress and is based on the principle of critical illumination. It consists of our tried and tested LED 100 illumination unit and an achromatic-aplanatic ZEISS bright field condenser with Z lowering and motorised switchable front lens.

The transmitted light unit is suitable for the use of objectives with magnification between 1 and 100 and a maximum aperture of 0.9.

See for yourself what the advantages of the LED 100 are:

- manual and programmable brightness change
- flash function (no warm-up time, no afterglow)
- low photo bleaching of the samples due to flexibly programmable light pulses
- constant, brightness-independent colour temperature
- no interference in the camera's video signal due to constant brightness
- no infrared component, no IR cut filter necessary
- contrasty and sharp images
- LED module easily replaceable
- optional filter holder with diffuser
- long service life, no maintenance necessary
- mercury and halogen-free



## Standard transmitted light unit<sup>4</sup>

Article no.	00-7505-0506-1000
LED	LED 100
Condenser	condenser with switchable front lens <sup>5</sup> , motorised
Z lowering	10 mm, motorised
Aperture diaphragm	motorised setting not available

<sup>4</sup> customised version on request

<sup>5</sup> manufacturer: ZEISS, Article no.: 424225-9060-000



# Reflected Illumination/Fluorescence | Reflectors



■ The **reflected illumination unit** of the ScanExpress can be equipped with up to 4 LED light sources. The modules are produced by Thorlabs, one of the leading manufacturers of illumination systems and optical components for microscopy.

The ScanExpress can be equipped with virtually all typical industry wavelengths – the selection is entirely dependent on your application. Thus, in addition to white light, UV and infrared light can also be used, for example. With the help of our TANGO controller, the intensities of the individual LEDs can always be controlled independently of each other. The fibre coupling for an external light source is currently in development.

Contact us, we will be pleased to check your configuration wishes for feasibility.

	1-channel solution	2-channel solution	3-channel solution	4-channel solution
Article no.	00-7505-0507-1000	00-7505-0507-2000	00-7505-0507-3000	00-7505-0507-4000
Number of light sources	1	2	3	4

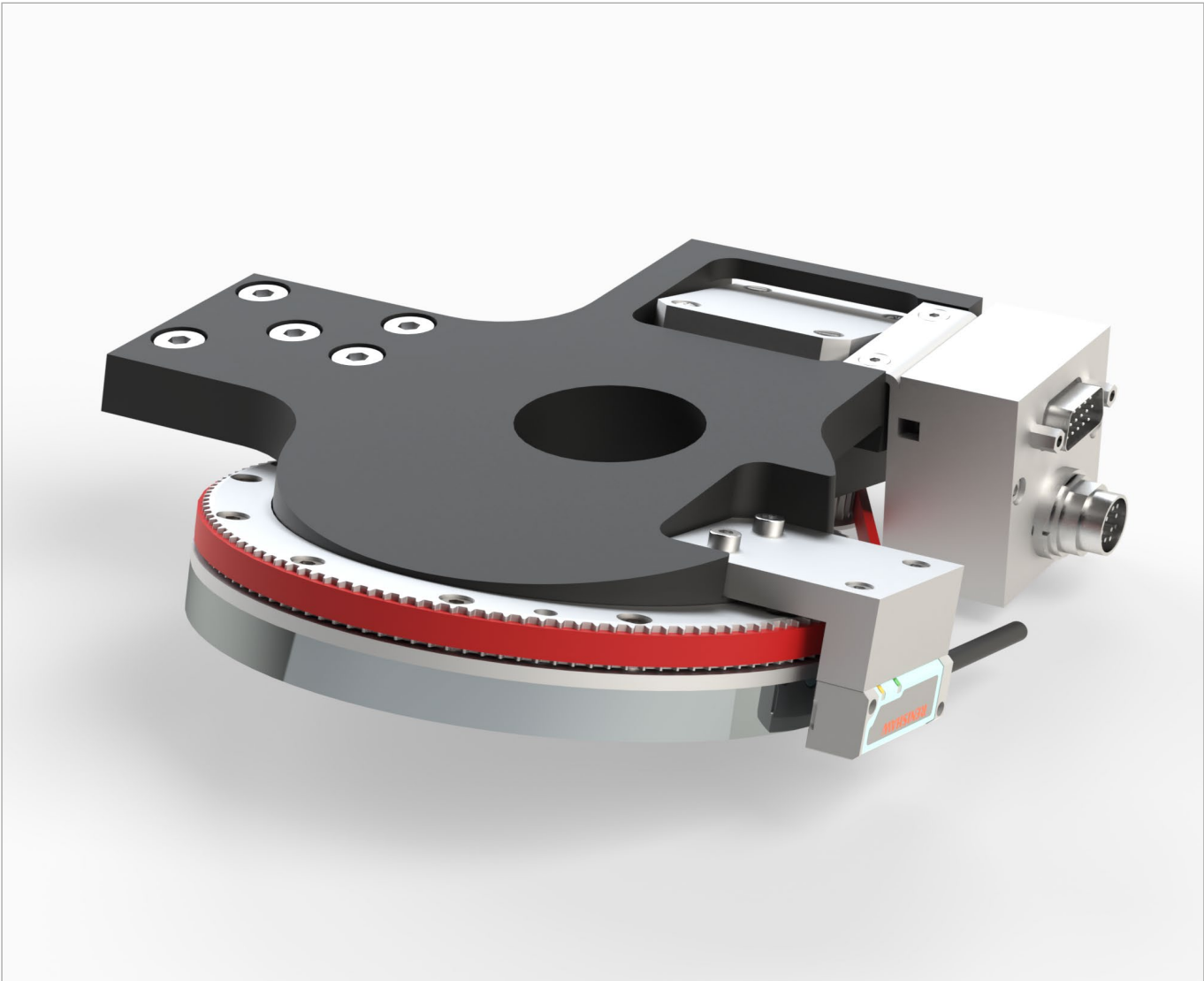


■ Suitable for our reflected illumination, we offer you 2 different adapters for your **reflector modules**: If a single reflector only is required, a 1-reflector holder is used. If your application requires the use of multiple reflector modules, a latch-free and low-wear 6-reflector turret is available.

The reflector turret enables up to 6 reflector modules of the ZEISS brand to be fitted and is equipped with a magnetic-resistive measuring system, which ensures accurate positioning of the reflectors. The switching time to the nearest reflector module is 300 ms maximum.

	1-reflector holder	6-reflector turret
Article no.	00-7505-0505-1000	00-7505-0505-2000
Adapter	1 reflector module	up to 6 reflector modules <sup>1</sup>
Reflector format	ZEISS	ZEISS
Change duration	–	≤ 300 ms
Motor type	–	2-phase stepper motor
Drive system	–	toothed belt
Measuring system	–	magneto-resistive

<sup>1</sup> max. 5 reflector modules, if the ScanExpress is to be used in both reflected and in transmitted light mode



■ By developing specially designed systems along the beam path, we realise an optical system in which all components are optimally aligned with each other. The same naturally also applies to your objectives in the **objective holder/turret**.

Which objectives are used in turn depends entirely on your needs. Our objective adapters are prepared for the mounting of ZEISS objectives as a standard.

Similar to our reflector adapters, you can also choose between a static and a dynamic version for the objective adapters of the ScanExpress.

The 1-objective holder is intended to hold a single objective. If other objectives are to be used, a 4-objective turret is available, which positions up to 4 objectives, measuring system-supported in a closed loop control <sup>1</sup>. The switching time to the nearest objective is 300 ms maximum.

Due to the use of a measuring system, unlike similar products, we can ensure higher accuracies as well as latch-free and virtually wear-free positioning of your objectives, which is reflected in a longer service life of the objective turret.

	1-objective holder	4-objective turret
Article no.	00-7505-0504-1000	00-7505-0504-3000
Number of objectives	1	up to 4
Connection	M27 × 0.75 (ZEISS)	M27 × 0.75 (ZEISS)
Change duration	–	≤ 300 ms
Motor type	–	2-phase stepper motor
Drive system	–	toothed belt
Measuring system	–	optical

<sup>1</sup> closed loop mode



■ Opt for a **camera** that suits your application. Or even for two. Depending on the requirement, the ScanExpress can be equipped with a 1-channel or a 2-channel camera tube. If two cameras are used, the light intensity is divided between both cameras with the help of a beam splitter, completely in line with your requirements.

Our camera tubes have C-mount adaptations as a standard. This industrial standard provides access to a large range of compatible camera models. If you use cameras with CS-mount or other adaptations, we will also be pleased to offer you a customised integration solution.

	Camera tube, 1-channel <sup>1</sup>	Camera tube, 2-channel <sup>1</sup>
Article no.	00-7505-0508-1000	00-7505-0508-2000
Adapter	C-Mount	C-Mount

<sup>1</sup> customised version on request



■ You would like to further increase the resolution of your images? Not a problem, as the ScanExpress can be extended to include a module for **liquid immersion**.

With our tried and tested Liquid Dispenser, a programmable applicator is available for precise liquid application with careful use of material, in which you do not have to worry about introducing particles and interfering fluorescence.

The liquid is supplied via highly chemical-resistant PTFE capillaries. You are free to choose the immersion medium, because we offer two variants of the Liquid Dispenser. Either high-viscosity or low-viscosity immersion media can be used, depending on the requirement.

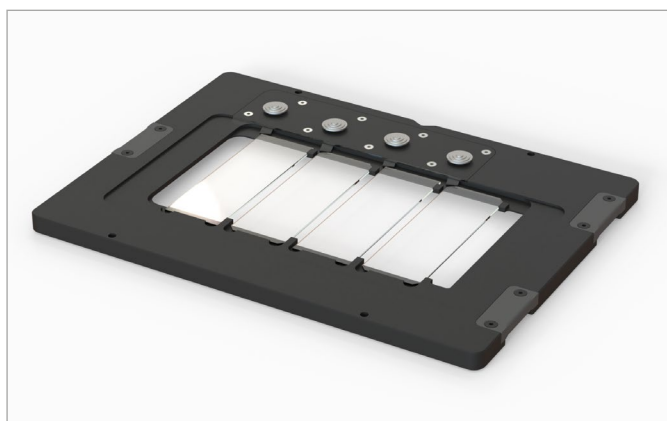
Your immersion medium is kept in a standard glass laboratory flask with a capacity of 100 ml, which is in turn kept in a recess in the top of the ScanExpress. This makes refilling easy.

	Liquid dispenser for high-viscosity immersion media	Liquid dispenser for low-viscosity immersion media
Article no.	00-7505-0509-1000	00-7505-0509-2000
Immersion medium	e.g. oil	e.g. water
Delivery principle	pressure delivery	pressure delivery
Dosage <sup>2</sup>	controlled	controlled
Liquid quantity/flow	programmable	programmable
Liquid store <sup>3</sup>	100 ml	100 ml

<sup>2</sup> by drop counter

<sup>3</sup> container is replaceable

# Stage Inserts | Housing



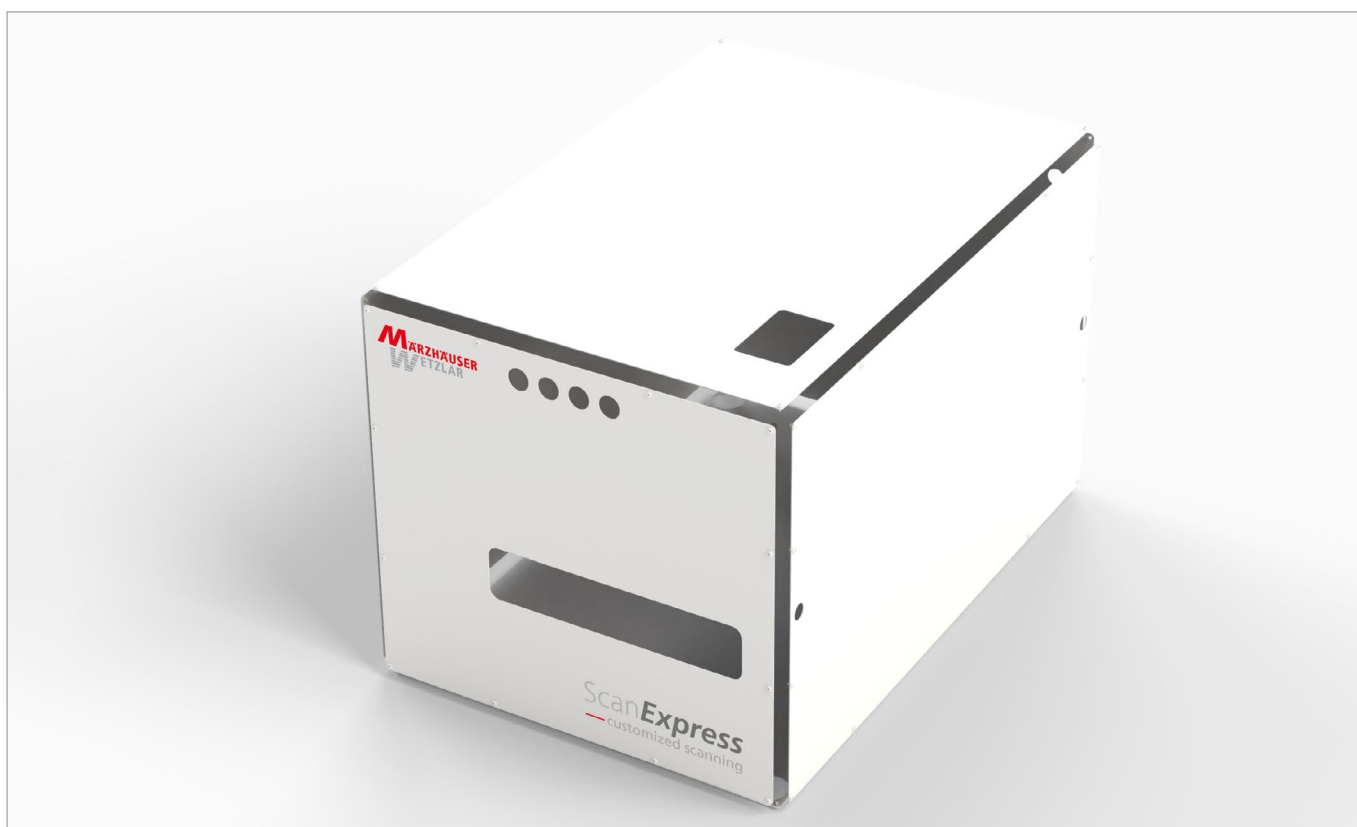
■ We equip the ScanExpress with stable and high-quality **stage inserts** for your valuable samples. The samples can be easily inserted in the stage inserts and securely fixed with the help of our tried and tested clamp concepts, so that nothing goes wrong on the way into the ScanExpress.

A scan area of 130 x 80 mm is available for examining your samples. With the help of our standard stage insert, automated examining of up to 4 glass slides with dimensions 76 x 26 mm (3" x 1") is enabled with only one loading operation.

On request, we develop other transmitted and reflected light stage inserts for you, for microtitre plates, Petri dishes, filters or your individual material samples.

	Stage inserts for 4 slides <sup>1</sup>	Stage inserts for 2 slides <sup>1</sup>
Article no.	00-7505-0515-1000	00-7505-0515-2000
Sample holder	slide 76 x 26 mm (3" x 1")	slide 76 x 52 mm (3" x 2")
Dimensions	205 x 150 x 8 mm	205 x 150 x 8 mm

<sup>1</sup> customised version on request



■ In the standard version, our **housing** protects the examination in the ScanExpress effectively from brightness, dust and other external interferences. Fluorescence applications are therefore no problem at all for the ScanExpress. Powder-coated aluminium sheets provide sufficient stability, the appearance is functional.

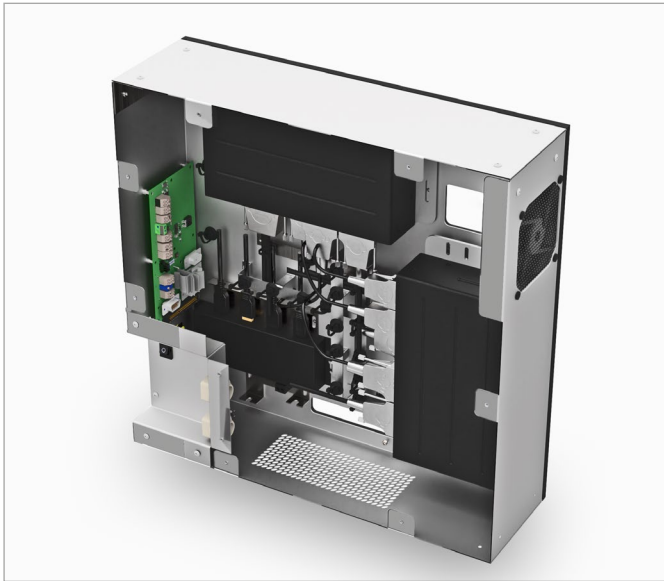
However, this does not have to remain the case. On request, we work with you and professional industrial designers to produce your own product housing design, which no longer only differs from other ScanExpress versions by vir-

tue of branding alone. There are virtually no limits to your creativity.<sup>2</sup>

	Standard housing <sup>3</sup>
Article no.	00-7505-0512-1000
Material	aluminium sheet
Surface	powder coated
Colour	white

<sup>2</sup> depending on quantity/year

<sup>3</sup> customised version on request



■ The ScanExpress contains motorised and electronic components, which must be addressed centrally, in a coordinated way and with  $\mu$  precision. The control centre for this is located in the **electronic unit**, which is accommodated in the rear area of the ScanExpress.

The electronic unit is set up with modular equipment and is configured by us in relation to the equipment of the ScanExpress. We also take into account your individual interface requirements, so that you can integrate the ScanExpress precisely in the infrastructure of your customers.

The electronic unit is located in a separate stainless steel housing to minimise the unwanted input of heat and vibrations into the system. Comprehensive isolation is ensured extensively with the help of an insulation layer between the electronic and scanning unit. An active, yet almost silent industrial fan cools the electronic components.

## Electronic unit<sup>1</sup>

Article no.	00-7505-0514-1000
Controller type	TANGO 4 Desktop 2HE
Number of controllers	2
Assignment controller 1	scanning stage (XY), motorised focus axis (Z), 6-reflector turret
Assignment controller 2	lifting unit for transmitted light illumination, motorised hinged lens, motorised housing flap, objective turret
Equipment	USB hub, power distributor, hardware On/Off switch
Interfaces <sup>2</sup>	1× USB 2.0, 1× camera connection cable
Power supply	24 V / 160 watt (ext. power adapter)
Cooling	active fan
Housing	stainless steel housing, isolated

<sup>1</sup> example full spec. configuration

<sup>2</sup> customised interfaces on request



■ In the maximum configuration level of the ScanExpress, 2 **controllers** type TANGO 4 Desktop 2HE from our latest controller generation form the core components of the electronic unit.

The modular structure of the TANGO Desktop, however, enables needs-based configuration, which is always adjusted to the equipment of the ScanExpress.

With a full spec. ScanExpress, up to seven stepper motors can be addressed by the integrated TANGO controllers. Digital and analog inputs and outputs enable, for ex-

ample, independent activation of the different LED light sources as well as addressing the Liquid Dispenser. The 3 function buttons on the front of the device are also freely programmable so that you can adjust the operation of the ScanExpress optimally to the processes of your application.

## TANGO 4 Desktop 2HE

Article no.	00-4076-0000-3014
Number of axes	4
Step resolution	4,096 microsteps/full step, 819,200 microsteps/rev.
Encoder interface	closed loop operation of up to 4 axes
Phase current per axis	1.25 A
Operating voltage	24 V
Cooling	convection, no fan necessary





■ If you want to extend your ScanExpress for a high sample throughput, we offer you a tailor-made **loading system** that attaches seamlessly onto the ScanExpress. With more than 10 years' development experience in loading systems for automatic provisioning and feed of sample holders, we can offer you a suitable and above all reliable addition for your application.

ScanExpress and the loading system are connected by us mechanically, electronically and via the software so that

you acquire an overall system that offers maximum process reliability with high capacity.

Integrated measuring systems monitor the positions, not only in the ScanExpress, but also in the loading system.

Contact us: Depending on your sample holder format and capacity requirements, we offer you a loading system that suits your application.

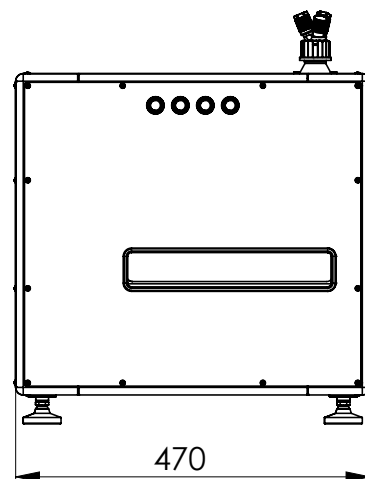
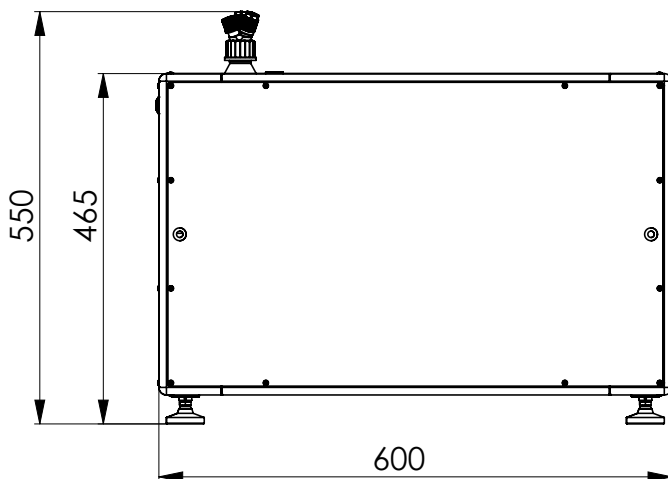
■ With our **programming interface** (API) you have full access to the two TANGO controllers of the ScanExpress. In this way, you integrate the ScanExpress effortlessly into your software environment – just like you are used to with our TANGO product family and our positioning systems.



■ Our programming interface is also listed with **µManager**<sup>1</sup>, the open-source software for the control and automation of microscope hardware. This enables you to perform extensive function tests in your new system, quickly and cost-effectively.



<sup>1</sup> [micro-manager.org](http://micro-manager.org)



■ The 60 cm length of the ScanExpress is less than the standard table depth, so that the ScanExpress easily finds space in the laboratories of your customers. The straight contours fit space-savingly in any workplace.

Depending on the equipment, the ScanExpress weighs approx. 50 kg and is delivered to you securely on a pallet.

■ Apart from the integration in your software, we deliver a complete ready to use microscope system to you with the ScanExpress. This is why our ScanExpress is also issued a **CE marking** according to the Machinery Directive specifications.



You therefore no longer have to worry about EMC conformity and mechanical hazards. This also applies to con-

■ Have we caught your interest? Then we look forward to getting to know your application and your questions. On request, we create an individual **proposed configuration** for your ScanExpress, based on your specifications.

If you are interested in components that have not been presented or come from other manufacturers than those named, we will be pleased to check what can be done. Depending on the quantity of your customised ScanExpress that is expected, we can also respond flexibly to your wishes regarding customer-specific special requirements for components and housing designs.

## Technical Data

Weight	approx. 50 kg
Dimensions	600 × 470 × 465 mm

formity with the regulations in the United Kingdom, as the ScanExpress also has UKCA marking as a standard feature.

As the power is supplied via a multi-certified standard 24 V power adapter of the renowned manufacturer MeanWell, your system is also well prepared for worldwide sale.

You are planning certification on international markets? We clarify the necessary preconditions for your successful product launch in good time during the course of the project.

## We look forward to receiving your enquiry!

Phone **+49 6441 9116-0**  
E-mail **[sales@marzhauser.com](mailto:sales@marzhauser.com)**  
Internet **[www.marzhauser.com](http://www.marzhauser.com)**

Märzhäuser Wetzlar GmbH & Co. KG  
In der Murch 15 · 35579 Wetzlar (Germany)  
Tel. + 49 64419116-0 · Fax + 49 64419116-40  
info@marzhauser.com · www.marzhauser.com

Issue: 02.05.2023

