

MINISCALE

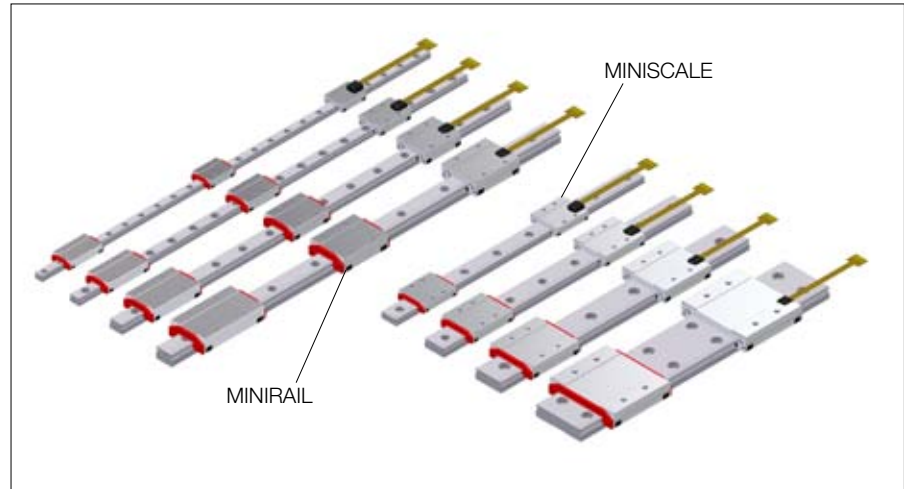
Miniature guideway with integrated measuring system – “all in one“



<ul style="list-style-type: none"> ➤ Product overview 	
Product range	4
Dimensioning	4
<ul style="list-style-type: none"> ➤ The outstanding qualities of MINISCALE 	
Optimal cost-benefit ratio	5
<ul style="list-style-type: none"> ➤ Technical data MINISCALE 	
Specifications of MINISCALE	6
<ul style="list-style-type: none"> ➤ Areas of application 	
Guiding and measuring in the smallest of spaces	7
<ul style="list-style-type: none"> ➤ Handling, installation and lubrication 	
Transport and storage	8
Handling and assembly	8
Lubrication	8
<ul style="list-style-type: none"> ➤ Accessories 	
Software with counter	9
Interface module	9
ESD-protection	9
<ul style="list-style-type: none"> ➤ Further information 	
Ordering information	10
Free downloads of 2D and 3D drawings	11
Mounting instructions	11

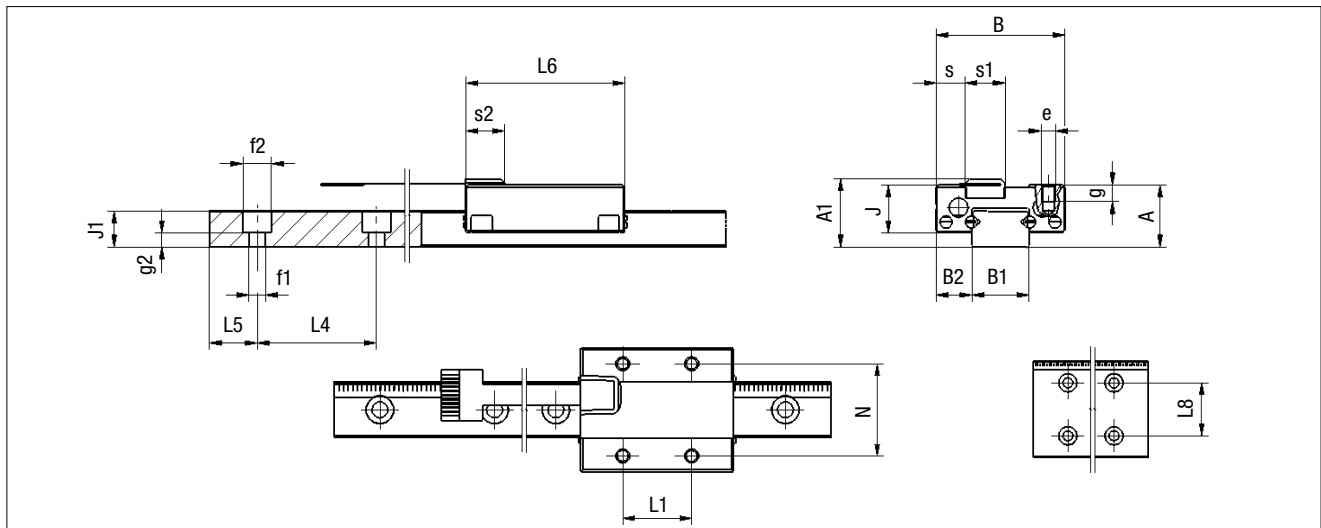


Product range



MINISCALE is based on the proven miniature guideway MINIRAIL. Consequently, the guidance-technical specifications of MINISCALE (see the brochure or visit www.schneeberger.com) also comply with MINIRAIL.

Dimensioning

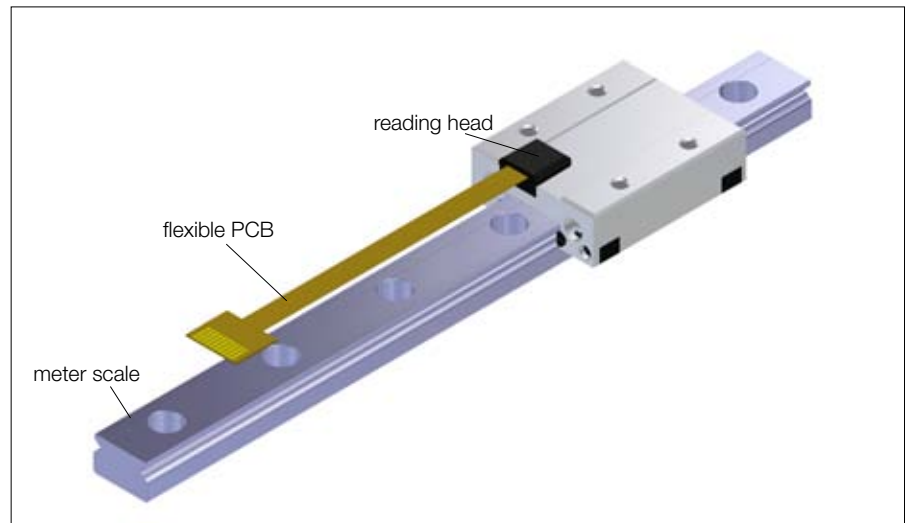


Type	Dimensions in mm																				
	A	A1	B	B1	B2	s	s1	s2	J	J1	L1	L4	L5	L6	L8	N	e	f1	f2	g	g2
Standard sizes																					
MNS 7	8.0	11.5	17.0	7.0	5.0	3.3	8.4	8.2	6.5	4.5	8.0	15.0	5.0	22.1	-	12.0	M2	2.4	4.2	2.5	2.2
MNS 9	10.0	12.5	20.0	9.0	5.5	3.8	8.4	8.2	8.0	5.5	10.0	20.0	7.5	29.0	-	15.0	M3	3.5	6.0	3.0	2.0
MNS 12	13.0	14.5	27.0	12.0	7.5	6.1	8.4	8.2	10.0	7.5	15.0	25.0	10.0	33.4	-	20.0	M3	3.5	6.0	3.5	3.0
MNS 15	16.0	16.0	32.0	15.0	8.5	7.5	8.4	8.2	12.0	9.5	20.0	40.0	15.0	40.7	-	25.0	M3	3.5	6.0	4.0	5.0
Wide sizes																					
MNS 14	9.0	12.0	25.0	14.0	5.5	4.2	8.4	8.2	6.8	5.2	10.0	30.0	10.0	29.6	-	19.0	M3	3.5	6.0	2.8	2.0
MNS 18	12.0	14.0	30.0	18.0	6.0	4.8	8.4	8.2	8.5	7.0	12.0	30.0	10.0	37.0	-	21.0	M3	3.5	6.0	3.0	2.5
MNS 24	14.0	15.5	40.0	24.0	8.0	6.6	8.4	8.2	10.0	8.5	15.0	40.0	15.0	43.4	-	28.0	M3	4.5	8.0	3.5	4.0
MNS 42	16.0	16.0	60.0	42.0	9.0	8.0	8.4	8.2	12.0	9.5	20.0	40.0	15.0	52.7	23.0	45.0	M4	4.5	8.0	4.5	5.0



Optimal cost-benefit ratio

MINISCALE is extremely robust and convinces within any application with its smooth running, precision and reliability.



Less effort for engineering

- › Extra surface preparation, brackets and linear encoder are not required
- › No additional space requirements. Same dimension as standard MINIRAIL
- › Scale has the same coefficient of thermal expansion as MINIRAIL. This minimizes thermal analysis time and controller compensation efforts

Less work for installation and adjustment

- › MINISCALE is a standard product, delivered ready for installation
- › The integrated system provides simple installation
- › Separate adjustment of the measuring system is not required
- › Additional parts and machining are not required

Consistent accuracy

- › Measuring takes place very close to the working process for reduced abbe error
- › Optimal, thermal coupling to the machine base
- › Vibration and shock resistant

High durability

- › MINISCALE is combined with the successful and economical design of MINIRAIL (through hardened, corrosion resistant steel, no screwed end-pieces)
- › Laser etched scale
- › Highly integrated, compact design („all in one“)

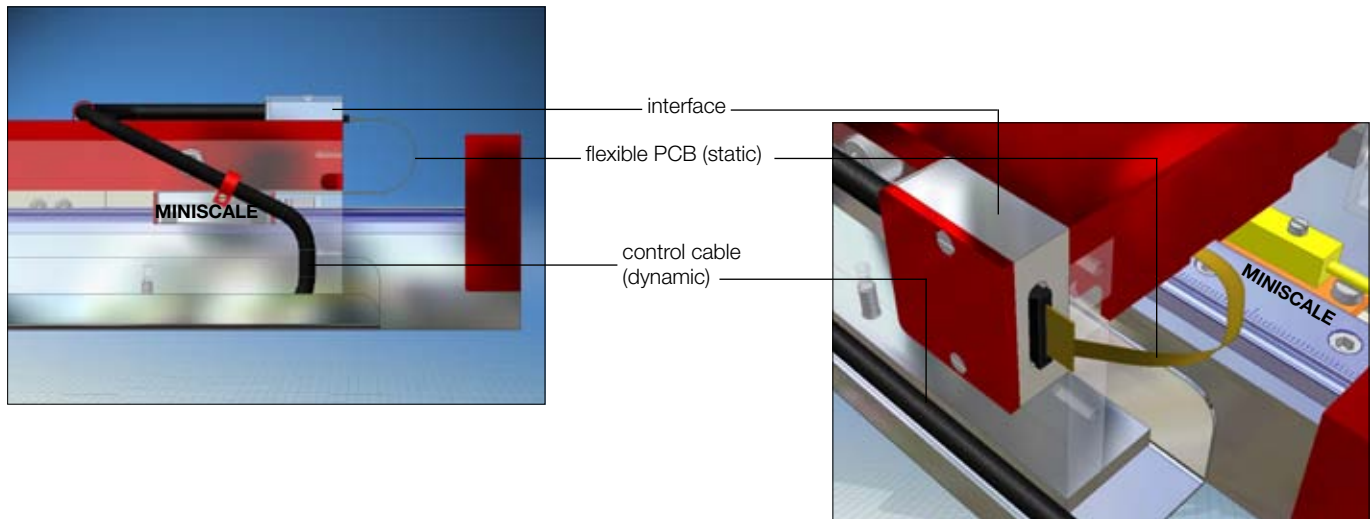


Specifications of MINISCALE

Resolution		1 μm
Accuracy	up to 30 mm	+/- 4 μm (+/- 3 μm upon request)
	up to 300 mm	+/- 10 μm
Repeat accuracy	unidirectional	+/- 1 μm
	bidirectional	+/- 2 μm
Measuring scale	diffraction grating	40 μm
	max. length	1000 mm
Rail	rail width in mm	7, 9, 12, 15 and 14, 18, 24, 42
	quality classification	G1
	preload classification	V1
	length	max. 600 mm
Speed		max. 5 m/s
Acceleration		max. 300 m/s^2 (30 g)
Sensor	lifetime	100'000 h MTTF (mean time to failure)
Electrical connection		5 VDC +/- 5 % @20 mA
Output signal		CMOS/TTL (RS-422 compatible)
Interface		flexible PCB with 10-pin ZIF-connector (1 mm grating pitch). Total length 67 mm, permissible bending radius > 1 mm
RoHS compatible		yes
EMV		corresponding to standard EN 61000-6 (EEC/89/336)
Protection classification		IP 60
Environmental influences	temperature	operating: 0° to 70° C (32° to 158° F) storage: -20° to 100° C (-4° to 212° F)
	humidity	10 % - 90 % (non-condensing)
	magnetism	no influence
	vacuum	not possible
	clean room	clean room classification ISO 5 (acc. to ISO 14644-1)
	elec. charging	ESD-protection required

For the following technical information please refer to the MINIRAIL brochure respectively to the download section on our website www.schneeberger.com:

- Running accuracy
- Load rating
- Configuration of the lateral locating sides
- Geometrical and position accuracy as well as the parallelism tolerance of the locating surfaces



Guiding and measuring in the smallest of spaces

MINISCALE is ideal for applications where space is limited and a high precision and process security is required. The unique advantages of MINISCALE come into their own with linear motors.

The most common areas of application for MINISCALE are:

- › Biotechnology
- › Semiconductor Equipment
- › Laboratory Automation
- › Medical Equipment
- › Metrology
- › Micro-automation
- › Surface finishing
- › Optical Industry
- › Robotics, Pick & Place



Source: Objective Imagine

Scanning stage for microscopy



Transport and storage

MINISCALE are high precision components and must therefore be handled with care. To protect against damages it must always be transported in its original packaging. MINISCALE must be stored in a dry area at room temperature.

Handling and installation (see www.schneeberger.com)

The incorrect handling of MINISCALE can lead to damages before use and thus to a premature failure. Therefore only qualified personnel may carry out the assembly.

Caution: Electrostatically sensitive component



To ensure the correct fixing of the MINISCALE onto the supporting assembly the maximum tightening torque values for the fixing screws, given in the table below, must be complied with. Tightening torques for the fixing screws are DIN 912, $\mu 0.125$ (12.9) and DIN 912, $\mu 0.2$ (A270).

	Maximum tightening torque		
	M2	M3	M4
Strength category			
12.9	0.6 Nm	2.1 Nm	5.0 Nm
A2-70	0.3 Nm	1.1 Nm	2.6 Nm

Notes

- When the screws are greased with grease containing MoS_2 the friction coefficient μ can be reduced by as much as half. As the tightening torques required to reach the maximum permissible tightening force depend on the friction coefficient, they must be reduced accordingly. The values can be obtained from the screw manufacturer's information or from the specialist literature. If necessary, carry out tests to determine the actual friction coefficient.
- Refer to the screw manufacturer's information. This is always binding.

Lubrication

MINISCALE are supplied already lubricated. This applies to all carriages and rails defined in the scope of the order (see order details on page 10).

Subsequent lubrication depends upon environmental conditions as well as the nature and type of the load. For subsequent lubrication, we recommend KP_2K or KP_1K grease according to DIN 51825 and experience.

In all cases, the recommendations provided by the lubricant manufacturer must be followed.



Software with counter



This interface makes it possible to obtain a signal evaluation on a PC and is therefore primarily suitable for lab use or for new developments.

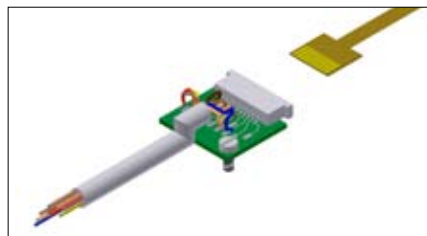
Interface module

Printed circuit board with ZIF plug



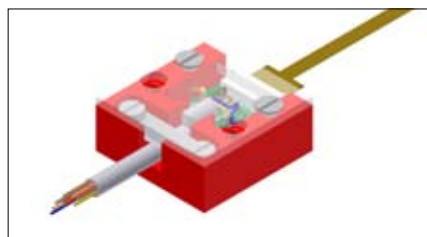
Printed circuit board (17.8 mm x 15.5 mm)

Printed circuit board with ZIF plug and control cable



Printed circuit board (17.8 mm x 15.5 mm), shielded control cable, length 2000 mm, diameter 6.2 mm, bending radius 62 mm

Housing with integrated printed circuit board, ZIF plug and control cable



- Anodized aluminum housing
30 mm x 30 mm x 13 mm
- Shielded control cable, length 2000 mm,
diameter 6.2 mm, bending radius 62 mm

ESD-protection

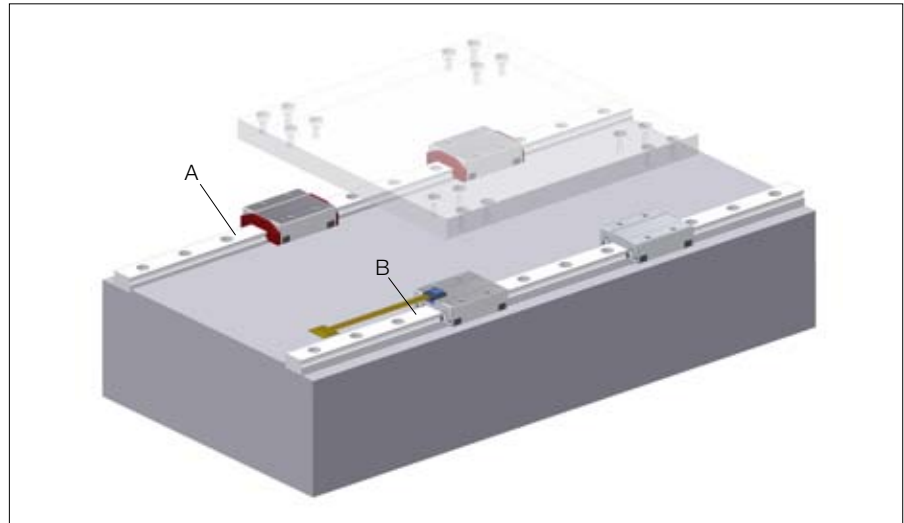
ESD wrist-strap set





Ordering information

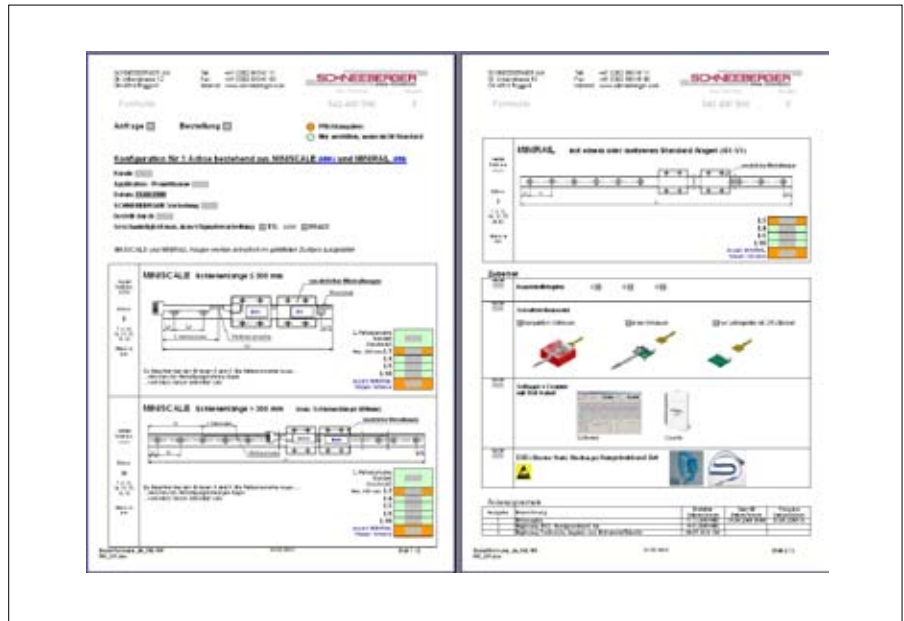
Your order should include all components of the axis.



Example:

- A) 1 MINIRAIL rail with 2 MINIRAIL carriages
- B) 1 MINISCALE rail with 1 MINISCALE carriage and 1 MINIRAIL carriage

Use the form in the downloads section of the website to define the configuration (www.schneeberger.com).





Free downloads of 2D and 3D drawings

In order to facilitate your design work, you will find 2D drawings and 3D models in all common formats available on the Cadenas part server. You can access the download area and all further product information from our website www.schneeberger.com.



Mounting instructions

The installation of the MINISCALE guideways is described in detail in the separate mounting instructions and can be downloaded from www.schneeberger.com.



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