

smart drilling

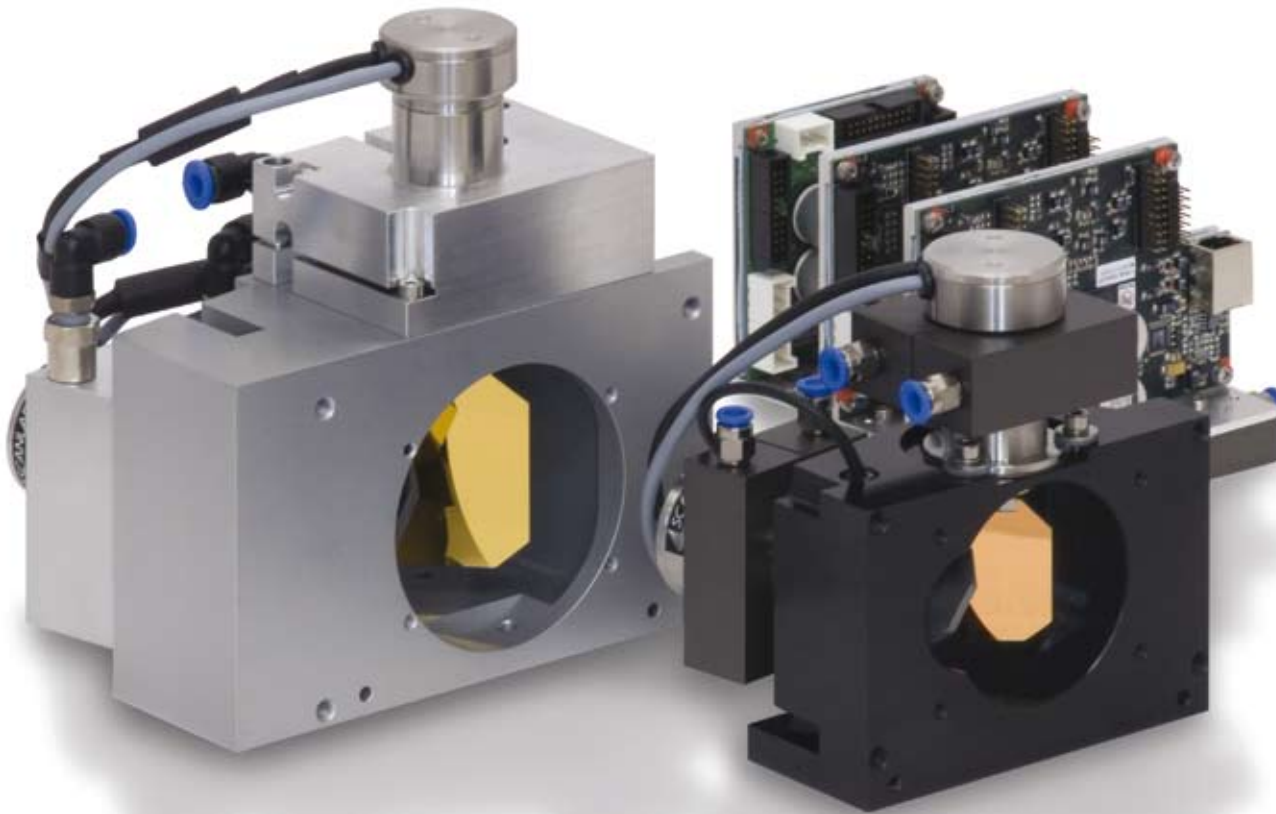
intelliDRILL® 20, intelliDRILL® 30

SCANLAB's intelliDRILL® scan modules are optimized for laser-based material processing applications that require numerous positioning and operation steps (jump and shoot), e.g. drilling printed circuit boards or perforating foils. The modules' low-weight mirrors and digital servo electronics enable beam positioning with maximum speed and precision.

The servo jump algorithms achieve minimum travel times and well-behaved settling performance even over widely varying distances. The intelliDRILL® modules are thus predestined for very high raster frequencies.

Optional water cooling of the products' scanners and electronics ensures reliability even under challenging operational conditions.

intelliDRILL® users benefit from a palette of features enabled by SCANLAB's iDRIVE® technology, including real-time monitoring and remote diagnosis of key operational states, internal monitoring capabilities, simulation-assisted process optimization and utilization of various dynamics tunings.



Typical Applications:

- Drilling circuit boards
- Perforating foils
- Texturing surfaces

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Optics

intelliDRILL® modules for CO₂ lasers are equipped with beryllium deflection mirrors. Other mirror substrates and coatings are available on request.

For beam focusing, a number of standard objectives and customer-specific solutions are available.

Control

Each intelliDRILL® scan module is equipped with two digital servo control boards and a digital interface board. The module can be conveniently controlled via SCANLAB's RTC®4 or RTC®5 PC interface board. Scanner control, scan head diagnosis and all essential

configuration settings are achieved via software commands. intelliDRILL® modules are optionally available with an optical fiber data interface.

Option

intelliDRILL® scan modules can be equipped with an optional reference sensor system for automatic self-calibration in scan systems requiring extremely high long-term positioning stability.

Quality

The high quality of SCANLAB's scan solutions is the result of years of experience in the development and manufacture of galvanometer scanners and scan systems. In addition, every intelliDRILL® must first pass the SCANcheck burn-in test before release for shipment to the customer.

Common Specifications

(all angles are in optical degrees)

Dynamic Performance

Repeatability	< 22 µrad
Long-term drift over 8 hours (after warm-up)	< 0.6 mrad

Optical Performance

Typical scan angle	±0.26 rad
Gain error	< 5 mrad
Zero offset	< 5 mrad
Nonlinearity	< 3.5 mrad

Power Requirements

	±15 V DC, max. 6 A each or 30 V DC, max. 6 A
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Interface

	XY2-100 Enhanced, SL2-100 or optical data transfer up to 18 bit ⁽¹⁾
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Weight of Electronics

Digital servo control board	approx. 300 g each
Digital interface board	approx. 150 g

Operating Temperature

	25 °C ± 10 °C
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Cooling Water

Temperature	20 ...25 °C
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Temperature Variation

	constant to ±1K
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⁽¹⁾ only with SL2-100 interface, otherwise 16 bit

Product-Dependent Specifications

	intelliDRILL® 20	intelliDRILL® 30
Aperture	20 mm	30 mm
Beam Displacement	24.53 mm	37.12 mm
Small Vector Response ⁽²⁾		
1 mm pitch	0.6 ms	0.8 ms
10 mm pitch	1.7 ms	2.3 ms
Via Frequency for 1 mm Raster ⁽²⁾	1700 Hz	1250 Hz
Weight without Electronics	approx. 2 kg	approx. 3 kg

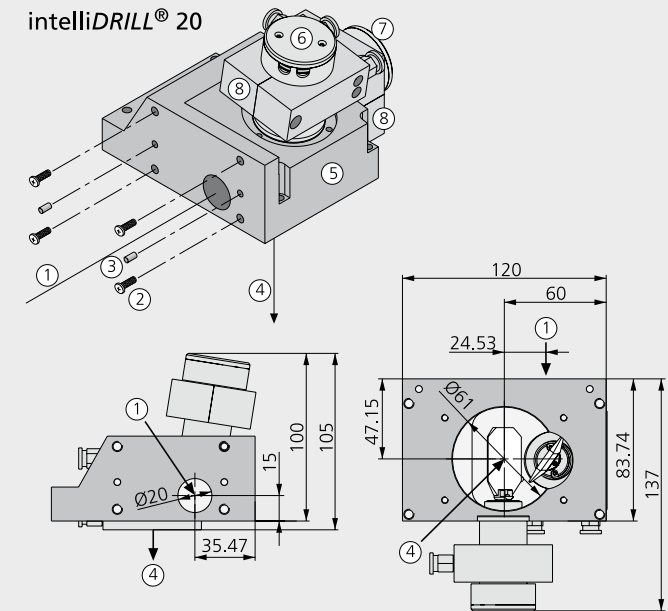
⁽²⁾ Positioning and settling to ±5 µm, with F-Theta objective, f = 100 mm



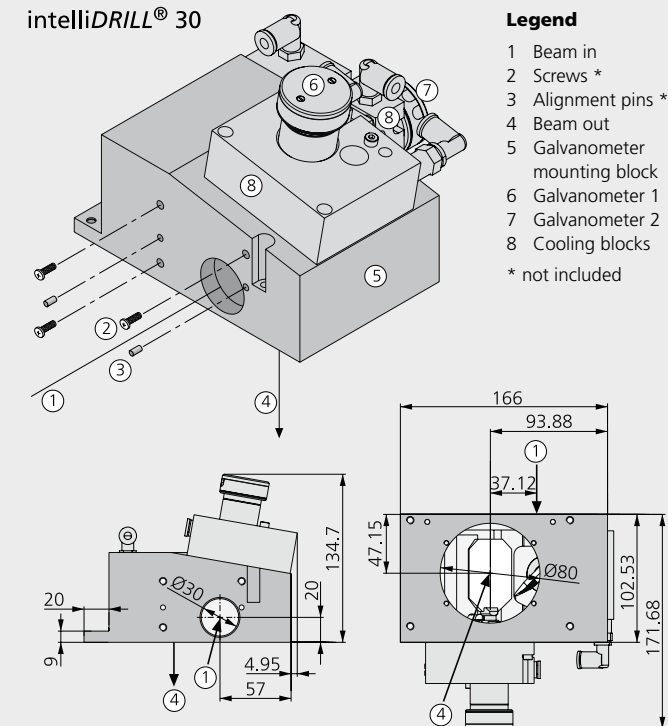
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intelliDRILL® 20



intelliDRILL® 30



Legend

- 1 Beam in
 - 2 Screws *
 - 3 Alignment pins *
 - 4 Beam out
 - 5 Galvanometer mounting block
 - 6 Galvanometer 1
 - 7 Galvanometer 2
 - 8 Cooling blocks
- * not included

All dimensions in mm