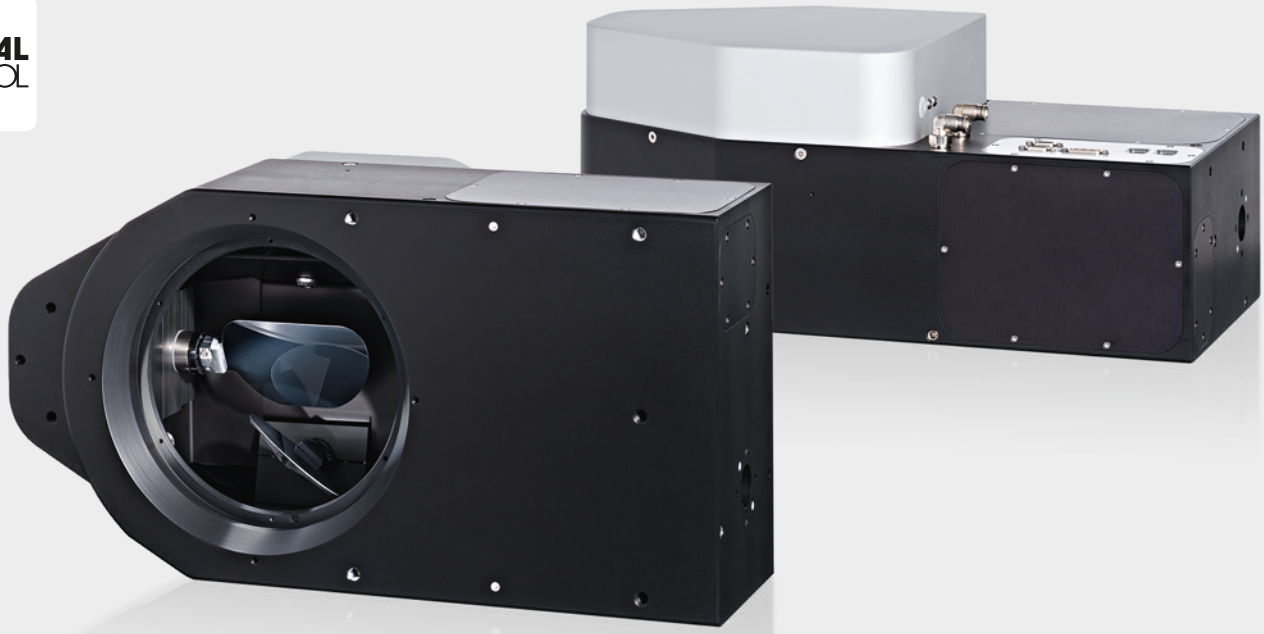
We only show the best.

AXIALSCAN-50 DIGITAL II

PRE-FOCUSING-UNIT

FOR CHALLENGING INDUSTRIAL APPLICATIONS

DIGITAL CONTROL



- For applications at up to 5 kW laser power*
- Control via SL2-100 protocol 20 bit, RL3-100 protocol 20 bit or XY2-100 protocol 16 bit
- Digitally controlled high-speed Z-axis
- Optimized long-term drift performance for the highest process quality
- Optional: Pilot laser function

*at 50% capacity utilization (10,600 nm)

SMALLEST SPOT AT TOP SPEED

YOUR BENEFITS

The 3-axis deflection units of the AXIALSCAN-50 DIGITAL II series with cutting-edge digital control electronics offer not only the smallest spot diameters with large processing areas, but also flexibility, long-term stability and exceptionally low drift values at 20 bit position resolution. Heat development is minimized as a result of the PWM output stages used. Various tuning options are available, enabling application-specific adjustment of control parameters and, in combination with the SC mirrors, produce exceptional deflection speeds and dynamic values.

INTERFACES

The deflection units are available for both the RL3-100 20 bit protocol and XY2-100 16 bit protocol or, alternatively, for the SL2-100 20 bit protocol.

TYPICAL APPLICATIONS

Ideal for 3D processing and applications in the textiles, paper, leather, plastic web, automotive and packaging industries, where small spot sizes, precision and speed are essential.

TUNING

The AXIALSCAN-50 DIGITAL II can be equipped with a range of tuning options (VC, LS and M). Default tunings are configurable.

INNOVATION AND QUALITY

Innovation and maintaining high product quality standards are our priorities at RAYLASE. All our products are developed, built and tested in our own laboratories and production facilities. Through our world-wide support network we can offer best maintenance and rapid service for our customers.

AXIALSCAN-50 DIGITAL II

GENERAL SPECIFICATIONS

Power supply	**Voltage**	+ 48 V
	Current	6 A, RMS, max. 8 A
	Ripple/ Noise	Max. 200 mVpp, @ 20 MHz bandwidth
Ambient temperature		+15°C to +35°C
Storage temperature		-10°C to +60°C
Humidity		≤ 80 % non-condensing
IP Code		54
Interface signals	**Digital**	RL3-100 Protokoll 20 Bit, XY2-100 Protokoll 16 Bit or SL2-100 Protokoll 20 Bit

Typical deflection [rad]	± 0.393
Resolution XY2-100-E 16-Bit [µrad]	12
Resolution SL2-100 20-Bit [µrad]	0.76
Resolution RL3-100 20-Bit [µrad]	0.76
Repeatability (RMS) [µrad]	< 2
Position noise (RMS) [µrad]	< 3.2
Max. Gaindrift [µrad/K] [1]	15
Max. Offsetdrift [µrad/K] [1]	10
Long-term drift 8 h without water temperature control [µrad] [1]	< 60
Long-term drift 8 h with water temperature control [µrad] [1, 2]	< 40
Tracking error of LT [ms]	1.5
Speed of moving lens [mm/s]	880

[1] Angles optical. Drift per axis, after 30 min warm-up, at constant ambient temperature and process stress.
[2] After 30 min warm-up, under varying process loads, with water temperature control set for ≥ 2 l/min and 22°C water temperature.

DYNAMIC DATA DEFLECTION UNIT

Tuning	**VC**	**LS**	**M**
Processing speed [rad/s] [1]	30	50	10
Positioning speed [rad/s] [1]	30	50	10
Tracking error deflection unit [ms] [2]	0.58	0.83	0.38
Step response time at 1% of full scale [ms] [3]	1.5	1.9	1.4

[1] See "Calculation speed in field".
[2] Calculation of acceleration time approx. 2.2 × tracking error.
[3] Setting to 1/5,000 of full scale.

APERTURE DEPENDENT SPEZIFICATIONS - MECHANICAL DATA

Weight	approx. 28 kg
Max. input aperture	20 mm
Beam displacement	60 mm
Dimension (L x W x H)	550 mm x 280 mm x 230 mm
Field sizes:	
Nd:YAG	300 mm x 300 mm to 1,200 mm x 1,200 mm
CO_2	300 mm x 300 mm to 1,000 mm x 1,000 mm

Calculation speed in field
1 rad/s @ ± 0.393 rad deflection (45°) ≙ 0.12 m/s for 100 mm working field size.
Example: AXIALSCAN-50 DIGITAL II, Tuning VC, Working field size 500 mm x 500 mm ≙ field factor = 5),
Positioning speed 30.0 rad/s: => 30.0 x 0.12 m/s x 5 = 18.0 m/s.
Note: Lower speeds may be produced by the linear translator module, depending on which control card is used, the laser job, field size and optical configuration.

TYPE DEPENDENT SPECIFICATIONS - TUNING

Tuning	**Description**
Vector-Tuning (VC)	Optimized tuning for a wide range of applications with emphasis on processing speed
Linescan (LS)	Optimized tuning for long lines at very high speeds
Microstructuring Tuning (M)	Optimized tuning for high precision beam deflection with sharp corners and minimized tracking error

SPECIFICATIONS FOR DEFLECTION UNITS – LASER: YAG (λ = 1.064 NM) AND FIBER LASER (λ = 1,060 – 1,090 NM)

Deflection Unit: AS-II-50 [Y] **V2** SC-[W230]-MT-RX/S3 and AS-II-50 [1,060 – 1,090+AL] **V2** SC-[W230]-MT-RX/S3

Field size [mm x mm]	300 x 300	400 x 400	500 x 500	600 x 600	700 x 700
Distance D [mm] [1]	16	28	35	40	43
Working distance [mm] [2]	280	403	527	651	775
Spot diameter 1/e² [µm] [3]	19	25	30	36	42
Focus range [mm]	70	160	300	500	700
Max. laser power cw [W]	5,000				

Field size [mm x mm]	800 x 800	900 x 900	1,000 x 1,000	1,100 x 1,100	1,200 x 1,200
Distance D [mm] [1]	46	48	50	51	52
Working distance [mm] [2]	898	1,022	1,146	1,270	1,394
Spot diameter 1/e² [µm] [3]	47	53	59	64	70
Focus range [mm]	800	900	1,000	1,100	1,200
Max. laser power cw [W]	5,000				

[1] Rear side of the linear translator up to the inner side of the housing. Length may vary depending on laser divergence and lens tolerances.
[2] From the bottom edge of deflection unit to the processing field. [3] Input beam quality: $M^2 = 1.0$.

SPECIFICATIONS FOR DEFLECTION UNITS – LASER: CO_2 (λ = 9,300/10,600 NM)

Deflection Unit: AS-II-50 [9.300/C] SC-[W230]-MT-RX/S3

Field size [mm x mm]	300 x 300	400 x 400	500 x 500	600 x 600	800 x 800	1.000 x 1.000
Distance D [mm] 9,300 nm [1]	29	36	40	43	47	49
Distance D [mm] 10,600 nm [1]	28	35	40	43	47	49
Working distance [mm] [2]	280	403	527	651	898	1,146
Spot diameter 1/e² [µm] 9,300 nm [3]	165	210	256	302	394	487
Spot diameter 1/e² [µm] 10,600 nm [3]	188	240	292	345	450	556
Focus range [mm]	210	400	500	600	800	1,000
Max. laser power cw [W]	2,500 [4]					

[1] Rear side of the linear translator up to the inner side of the housing. Length may vary depending on laser divergence and lens tolerances.
[2] From the bottom edge of deflection unit to the processing field. [3] Input beam quality: $M^2 = 1.0$. [4] For laser power > 2000 W air flush is recommended

AXIALSCAN-50 DIGITAL II

PRE-FOCUSING-UNIT

FOR CHALLENGING INDUSTRIAL APPLICATIONS

AIR FLUSHING

Specifications	
Compressed air [1]	Clean air free of water and oil

Flow rate	Pressure drop
50 – 100 l/min	1.0 bar – 1.5 bar

[1] ISO 8573-1:2010 [1:0(0.05):0(0.005)]

WATER TEMPERATURE CONTROL

Specifications	
Water [1]	Clean tap water with additives
Temperature	22°C – 28°C
Max. water pressure	< 3 bar

Flow rate	Pressure drop
4 l/min	1.6 bar
6 l/min	2.4 bar

[1] **Caution:** When using cooling water including deionised water, suitable additives must be used to prevent the growth of algae and protect the aluminium parts against corrosion.

Additive recommendations (Please consult your additive supplier for dosage information):
Standard industrial applications: Products of company NALCO, e.g. CCL105 (Premix) or TRAC105A_B (Additive)
Food & beverage, packaging applications: Polypropylene glycol of company Dow Chemical, e.g. DOWCAL N

SPECIFICATIONS FOR OPTICS

Laser	Nd:YAG	CO_2
Wavelength [nm]	1,064	10,600 / 9,300
Coating	AR Coating	AR Coating / Low Absorption Coating

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