

ASC SYSTEM CONTROLLER

DATA SHEET

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DEVELOPMENT
LASER TECHNOLOGY
ENGINEERING PARTNER
RESEARCH AND DEVELOPMENT
TECHNOLOGY CONSULTING
APPLICATION LABORATORY
LASER SCANNING SYSTEMS

DOCUMENTATION

CUSTOMER-SPECIFIC
LASER-SUBSYSTEMS
REMOTE WELDING
MICROMACHINING
OPTICAL DESIGN
MATERIALS SCIENCES
FEASIBILITY STUDIES
SOFTWARE
PRECISION
SCANHEAD
LASER-KNOW-HOW
SOLUTIONS
SYSTEM CONTROLLER



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ASC SYSTEM CONTROLLER

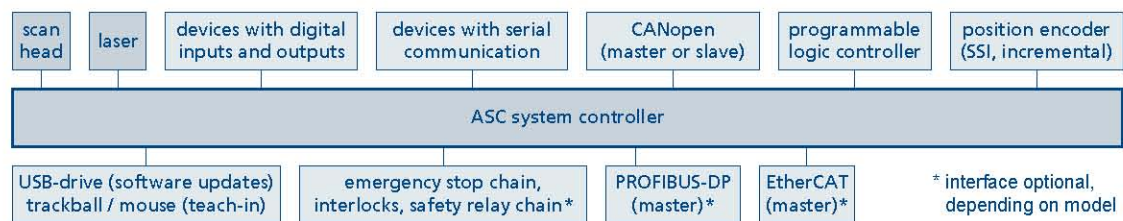
WHAT IS AN ASC SYSTEM CONTROLLER?

An ASC system controller is the central device in a laser system. It controls scan heads, lasers, actuators, other peripherals and reads out sensors. A combination of highly configurable interfaces and processing units responds in real-time to external signals. That way the ASC system controller handles optimized synchronization of all critical devices and signals necessary in modern laser systems.

The ASC system controller has full stand alone functionality. No host is necessary to operate it. However the ASC system controller provides remote diagnosis, management and parametrization via Ethernet TCP/IP.

Use the InScript software as a powerful tool in order to create process sequences and for system management. Alternatively use the ControllerLib, a C/C++ based library and DLL, in order to control many of the ASC system controller's aspects from within your own software applications.

HOW DOES IT BLEND IN?



COMMON MODEL FEATURES

computing core

- high performance microcontroller and DSP subunit for efficient real-time job execution
- fast shared memory for microcontroller and DSP for optimized object data handling
- embedded enhanced Linux operating system with real-time extensions
- data ring buffer with programmable waypoints
- 24 bit position resolution and mathematics for scan control
- local 32 bit bus

scan head control

- 2 scan head interfaces
- 2 transmitting and 2 receiving channels per scan head interface
- fully isolated bidirectional multichannel serial protocol (up to 8 channels)
- position resolution 24 bit per channel
- position feedback, optional position error or velocity feedback
- 2 scan head power supplies

laser control

- 8 isolated, slew rate controlled digital 20 mA laser control ports with individual programmable hardware delay lines with 10 ns time resolution
- 4 channel simultaneous analog modulation with active drift compensation (16 bit resolution plus 1/64 LSB gain and 1/256 LSB offset correction)
- bitmap processing with up to 500 kHz digital modulation and 10 ns resolution
- laser power control depending on speed, position and direction
- all laser control signals including a RS-232/-485 interface on 1 DVI connector
- optional laser-specific adapters

machine interfaces and protocol connectivity

- Ethernet: TCP/IP
- CAN (CANnative, CANopen, CANlib)
- RS-232/-485: terminal and pendant
- USB for flash drive, camera ...
- separately isolated I/O groups for trouble-free connections
- 16 digital inputs, 24 V tolerant, isolated, sample rate up to 100 MHz with event timestamp record and time resolution 10 ns
- 16 digital outputs, output voltage adjustable from 5 to 24 V, isolated, push-pull output stage
- 2 position interfaces for precise processing-on-the-fly with filtered 500 kHz position oversampling for absolute position accuracy towards the reference target, SSI or standard differential signal interface (RS-422), 48 bit counter resolution
- advanced delay management for queuing of up to 64 objects between trigger signal and the currently processed object
- optional adapters to standard industrial connectivity

- safe power distribution (except ASC-1)
 - SAFETY interface to built an emergency stop chain, a safety relay chain and to connect interlocks
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MODEL OVERVIEW

ASC-1

- essential functionality in a slim housing
- controls 1 laser
- controls and powers 2 ARGES scan heads
- learn more on page 5



ASC-2

- standard system controller functionality
- controls 1 laser
- controls and powers 2 ARGES scan heads
- learn more on page 6



ASC-3

- 1 embedded 20 W infrared fiber laser
- controls and powers 2 ARGES scan heads for fiber lasers
- learn more on page 7



ASC-5

- 2 embedded 20 W infrared fiber lasers
- controls and powers 2 ARGES scan heads for fiber lasers
- learn more on page 8



ASC-6

- 1 embedded 150, 300 or 400 W infrared fiber laser
- controls and powers 2 ARGES scan heads for fiber lasers
- learn more on page 9



Find inspiration in some customized OEM subsystems on page 10.



ASC-1

- essential system controller functionality in a slim housing
- controls 1 laser
- controls and powers 2 ARGES scan heads

additional interfaces	
SAFETY	no
PROFIBUS	optional (excludes EtherCAT)
EtherCAT	optional (excludes PROFIBUS)
mechanics	
housing, height, depth	19 inch rack, 1 U, 350 mm
weight	5 kg
operational supplements	
input voltage	100–120, 200–240 V, 50/60 Hz
typ. power consumption	100 W (1 scan head connected)
environment	
operating temperature	10–40 °C
storage temperature	0–50 °C
humidity	10–80 %, non-condensing



ASC-2

- standard system controller functionality
- controls 1 laser
- controls and powers 2 ARGES scan heads

additional interfaces	
SAFETY	optional
PROFIBUS	optional
EtherCAT	optional
mechanics	
housing, height, depth	19 inch rack, 2 U, 500 mm
weight	10 kg
operational supplements	
input voltage	90–240 V, 50/60 Hz
typ. power consumption	140 W (1 scan head connected)
environment	
operating temperature	10–40 °C
storage temperature	0–50 °C
humidity	10–80 %, non-condensing



ASC-3

- 1 embedded 20 W infrared fiber laser
- controls and powers 2 ARGES scan heads for fiber lasers

additional interfaces	
SAFETY	yes
PROFIBUS	optional
EtherCAT	optional
1 embedded fiber laser	
wavelength	1060–1070 nm
average output power	20, 30 or 50 W
pulse repetition frequency	2–200 kHz
mechanics	
housing, height, depth	19 inch rack, 3 U, 550 mm
weight	20 kg
operational supplements	
input voltage	90–240 V, 50/60 Hz
typ. power consumption	420 W (1 scan head connected)
environment	
operating temperature	10–40 °C
storage temperature	0–50 °C
humidity	10–80 %, non-condensing



ASC-5

- 2 embedded 20 W infrared fiber lasers
- controls and powers 2 ARGES scan heads for fiber lasers

additional interfaces	
SAFETY	yes
PROFIBUS	optional
EtherCAT	optional
2 embedded fiber lasers	
wavelength	1060–1070 nm
average output power	2 × 20 W
pulse repetition frequency	80 kHz
mechanics	
housing, height, depth	19 inch rack, 5 U, 600 mm
weight	35 kg
operational supplements	
input voltage	90–240 V, 50/60 Hz
typ. power consumption	750 W (2 scan heads connected)
environment	
operating temperature	10–40 °C
storage temperature	0–50 °C
humidity	10–80 %, non-condensing



ASC-6

- 1 embedded 150, 300 or 400 W infrared fiber laser
- controls and powers 2 ARGES scan heads for fiber lasers

additional interfaces	
SAFETY	yes
PROFIBUS	optional
EtherCAT	optional
1 embedded fiber laser	
wavelength	1060–1070 nm
average output power	150, 300 or 400 W
pulse repetition frequency	continuous wave
mechanics	
housing, height, depth	19 inch rack, 6 U, 550 mm
weight	47 kg
operational supplements	
input voltage	90–240 V, 50/60 Hz
typ. power consumption	2800 W (2 scan heads connected)
environment	
operating temperature	10–40 °C
storage temperature	0–50 °C
humidity	10–80 %, non-condensing

FIND INSPIRATION IN SOME CUSTOMIZED OEM SUBSYSTEMS

Besides the component business, we offer complete OEM subsystems for integration into laser processing equipment. A subsystem can consist of a laser, scan head, system controller, InScript software, and laser beam guidance and shaping.

Our customers can be sure to receive a subsystem with best combined components from one source. Thus the maximum achievable reliability of process and production for the customer can be reached.

ASC-2L



ASC-2L

- like ASC-2, see also page 6, but with 1 embedded fiber laser, wavelength 1060–1070 nm, average output power 20 W, pulse repetition frequency 1 MHz
- combined with 1 ARGES scan head for fiber lasers
typical application: ID-card marking

ASC-3



ASC-3

- ASC-3, see also page 7
- combined with 1 ARGES scan head for fiber lasers
typical applications: fine welding, fine cutting, ablation, micro hardening, structuring or modification of technological features of functional surfaces in general
- combined with 1 Fiber RHINO 16 scan head
typical applications: emitter wrap through solar cells, grey scale dithering card marking, micro surface structuring

ASC-3 WOMBAT



ASC-3 with WOMBAT scan head

- like ASC-3, see also page 7, but with embedded laser control and power unit
- like ELEPHANT scan head, but with embedded laser head: laser data see below
typical applications: thin film photovoltaic, micro structuring, laser trimming, intra-glass or glass surface marking, engraving, ID and security labeling

wavelength	349 nm	355 nm	532 nm
pulse energy	60 μ J or 120 μ J	–	–
output power	–	0.3 W	1 W
pulse width (FWHM)	< 5 ns	< 10 ns at 50 kHz	< 20 ns
repetition rate	single shot–5 kHz	20–150 kHz	20 –150 kHz
spatial mode	$M^2 < 1.3$; TEM ₀₀	$M^2 < 1.3$; TEM ₀₀	$M^2 < 1.3$; TEM ₀₀

ASC-4



ASC-4 with ANTEATER scan head

- 19 inch rack, height 4 U, depth 550 mm
 - controls 6 ARGES scan heads
 - controls 6 lasers and 6-times more peripheral devices than a standard ASC
 - additional interfaces: SAFETY, EtherCAT optional
 - for example combined with up to 6 ANTEATER scan heads
- typical application: marking with overlapping scan fields, micro structuring/drilling/welding, high-speed marking



ASC-12 with special scan head

ASC-12

- 19 inch rack, height 12 U
 - 4 embedded fiber lasers, wavelength 1060–1070 nm, average output power 20 W, pulse repetition frequency 80 kHz
 - additional interfaces: SAFETY
 - controls and powers 1 special scan head for 4 fiber lasers
- application: optimized for high speed perforating (multi-beam trepanning)

For purpose of brevity, some product descriptions in this sheet remain at platform level and may not be referred to as detailed data sheets of the product. ARGES reserves the right to amend, omit or add products, product-lines, and / or features without notice.