AOSense, Inc.
40919 Encyclopedia Cir
Fremont, CA 94538
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AOSense Laser Controller Spec Brief (2021/12/13)

ILC Specifications		AOS-ILC-P-XXX	AOS-ILC-P-XXX-B
Laser type	Compliance voltage	4 V (Red/IR)	7.5 V (Blue)
	Current polarity	-P: Positive (Cathode ground) -N: Contact us	
LD Current Source	Range	-100: 100 mA -200: 200 mA -XXX: Contact us	-100: 100 mA -200: 200 mA
	Resolution	-100 10 μA -200 10 μA	-100 10 μA -200 10 μA
	Current noise	60 pA/√Hz 100 pA/√Hz	110 pA/√Hz 200 pA/√Hz
	Mod port coefficient	1 mA/V	1 mA/V
	Mod port input range	+/- 3.8 V (Zener diode limited)	
	Mod port BW, delay	DC-10 MHz, ~12 ns delay	
	RF mod coefficient		
	RF mod BW, delay	~80 kHz - 40 MHz (cable dependent)	
PZT Control	Range	120 V	
	Resolution	10 mV	
	Voltage noise	< 500 nV/√Hz	
	Mod port coefficient	V_{PZT}= -12.5 V_{MOD}	
	Mod port input range	+/-3.8 V (Zener diode limited)	
	Mod port BW	DC-1 kHz (see transfer function)	
	Monitor port coefficient	-1/11 V_{PZT}	
	PZT/Current FFWD	Yes, variable gain and sign	
Temperature Control	TEC range	MCU interlocks at 10 and 45deg. Note: Don't go below dew point	
	TEC current range	800mA with wall wart, 1.2A with external power supply	
	Temperature resolution	1 mK	
Digital Control	User interface	Window GUI or virtual serial port	
	Control connector	USB	
	Memory (SN, safety limits, operation)	NVRAM, in controller	
Power and Size	Power supply	+5 V DC	
	Power consumption	6 W typical (10 W start)	
	Dimensions (L x W x H)	Compact: 13.72 cm x 7.37 cm x 2.97 cm [5.4"x2.9"x1.17"]	

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SILC Servo Specifications		AOS-SILC-P-200
Input configuration	AC Loop	PDH lock setup with built in mixer
	DC Loop	Mixer bypass to allow use in PLL, other locks
Primary Loop	Loop input	Mixer or amplified PD
	Loop output	LD current range control, PZT loop input
	Transfer function	PI^2D
	Loop gain control	G= 0.7 to 150
	Integrators	Fast I2 & Slow PI corner controls with gain clamps
	PI corners	0.5-100 kHz
	Fast I2 corners	0.01-6 MHz
	Integrator gain clamps	1, 50, inf.
	Differentiator	PD corner control with gain clamp
	Differentiator corners	0.2-10 MHz
	Differentiator gain clamp	1-10
	Loop BW and delay	10 MHz, ~20 ns delay
	Loop output range	+/- 4 V
	Output range/gain control	Coarse and fine 0.037-1
PZT Loop	Loop input	Primary loop output
	Loop output	PZT range control
	Transfer function	PI
	Loop gain control	G= 0.001-1
	PI corners	0.03-20 kHz
	Gain clamp	1, 62.5, inf.
	Loop output max range	+/-4 V
	Output range/gain control	Coarse 0.1-1
	Sign control	Yes
LoopType	PI^2D	Primary loop to LD current, PZT loop held in reset
	PI^2D+ PZT	Dual actuator loop with current + PZT: Useful for fast locks with large DC gain and range. Useful for PZT only lock with full transfer function (LD mod off)
	PZT+P	Proportional gain in primary loop: useful for simple PZT locks with or without P feedback to LD current
	PI^2D+TEC	PI^2D lock with slow temperature servo for DC stability
	Custom parameters	Development mode

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SILC Servo Specifications		AOS-SILC-P-200
Lock Modes	Scan	Laser sweep
	Off	Idle, no sweep, integrators held in reset
	Lock	Engage lock
Lock Acquisition	Automated lock	Starts automated scan and lock when lock mode
	Automated lock with relock	Attempts to relock if lock fails
	Manual lock	User controlled lock engage
Laser scans	Actuators	LD current or PZT
	Amplitude	10-100%
	Sign change	Yes
Output Monitor	Error signal (after primary gain stage)	100 Ohm, BW adjustable 0.01-20 MHz
	Photodiode monitor	100 Ohm, BW adjustable 0.01-20 MHz
	Select scope output	Ramp trigger, output mon, lock acquisition setup
DDS Synthesizer	Frequency	0.2-30 MHz
	Loop notch filters	20, 40 MHz
	RF out (Min/Max) to EOM	-30 dBm/+15 dBm
	Ref (Min/Max) to mixer	-30 dBm/+7 dBm
	Ref phase	0-360°
	Aux out (Min/Max)	-30 dB/+7 dBm
	Ref phase	0-360°
Lock automation	Lock acquisition method	User thresholds with peak counting
	Dual actuator lock	Staggered PZT gain increase after lock acquired
	Lock monitors	Integrators, PD signal thresholds, interrupt
Power and Size	Power supply (Min/Max)	+5.1/5.6 V DC
	Power consumption	7.5 W Typical (12.5 W Start)
	Dimensions (LxWxH)	Compact: 5.4"x2.9"x1.17"