ASC500 Full Version

1008958

Technical Specifications

Size and Dimensions	
chassis	19" rack, 2 rack units, 9 x 45 x 40 cm^3
weight	10 kg
Controller Hardware	
power supply	100/115/230V, 50 .. 60 Hz
power consumption [W]	max. 80
connector	IEC inlet
Output Signals	
frequency range	1 kHz .. 500 kHz
Detection	
measurement bandwidth	50 kHz
Interfaces	
xy scan voltage output	2 x -10 .. +10 , 16 (+16) bit, 5 MHz with programmable tilt correction uni-/bipolar, output limiter, slewrate control
z voltage output	-10 .. +10 V, 18 bit, 200 kS/s uni-/bipolar, output limiter, slewrate control
analog ADC inputs	6 x -10 .. +10 V, 18 bit, 400 kS/s ADC with programmable offset and gain compensation
analog DAC outputs	4 x -10 .. +10 V, 16 bit, 200 kS/s DAC switchable 2nd order low pass 3 kHz / 100 kHz noise: 16 µVrms (10 Hz..100 kHz)
analog modulation inputs	-10 .. 10 V, DC .. 50 kHz for DAC 1, DAC 2, and Z-Out
high frequency section	2 x 16 bit, 50 MS/s ADC with continuous signal amplification, 2 x 16 bit, 50 MS/s DDS-DAC, oscillation excitation, 2 x monitor output of preamplified signal, 2 x SYNC output with fixed 10 V amplitude
general purpose digital interface	8 bit LVTTL trigger input, 8 bit LVTTL trigger output, e.g. pixel-, line-, frame-clock, for optional programmable in / out sync, counter
digital serial interface (RS232)	connection to ANC300 for coarse movement
digital serial interface (NSL)	connection to ANC350 for closed loop coarse movement
host computer interface	USB 2.0 high speed, LAN 100 Mbit
auxiliary power outlet	+/-5 V (0.2 A) and +/-15 V (0.1 A)
Resolution	
frame view display modes	2 frame views, 2 line views, easy generation of additional frames possible
frame view options	oversampling, autosave (png, ASCII, bcrf), line subtraction line view with up to 16 subsequent lines
frame view selection tools	frame alignment, frame centering, zoom function, path mode, grid mode
Scan Generation	
pixel clock [kHz]	312.5
resolution	20 bit (16 bit, 16x oversampling)
features (scan)	slope compensation, switchable uni-/bipola, software rotation and zoom, slew-rate controlled movement
scan speed	1 pm/s .. 2 mm/s
frame rate	max. 20 Hz @ 100 x 100 pixel
Sample Positioning	
sensor type	interferometric (FPS 19” SLIMLINE) or position triggered scanning
closed loop sensor range	5 mm x 5 mm
closed loop scan resolution (steady state, 100 ms sample time)	down to 1 nm (usually limited by noise & vibration levels)
Z Controller	
z feedback	digital P/I, anti wind-up
z resolution	18 bit, up to 34 bit for small control range
input control signal	any internal signal channel
features (z controller)	external modulation input, setpoint modulation, invertable, feedback gain and output polarity, P/I gains in physical units
Phase Locked Loop (PPL)	
features (PLL)	2 P/I controllers with graphical interface
frequency resolution [µHz]	0.14
Q Control	
q feedabck type	electronic, phase controlled
efficiency of Q control	decrease or increase of Q by factor 10 typical
Spectral Performance	
spectroscopy modes	point/line/grid spectroscopy (up to 1024 x 1024 pixel)
spectroscopy type	z-spectroscopy, bias spectroscopy, soft spectroscopy (all GUI parameters), dI/dV with internal Lock-In
averaging	25 µs up to 160 ms per data point
spectroscopy parameters	control loop off, signal limiter
Second Pass Mode	
second pass mode - working principle	2nd pass with height offset or different scan parameter set

second pass mode - parameters	height offset, wait time, slew rate, alternative DAC, alternative setpoint
application for second pass mode	MFM, SGM
Lock-In	
low frequency Lock-In	1 mHz .. 20 kHz
modulation	all DAC channels & any internal signal
high frequency Lock-In	1 kHz .. 500 kHz
integration time	up to 128 periods (low frequency Lock-In), up to 512 periods (high frequency Lock-In)
lock-in usage	AFM cantilever signal, tuning fork signal etc. (high frequency Lock-In), spectroscopy, vibrational analysis, Hall probe etc. (low frequency Lock-In)
Optical Data	
oscilloscope	arbitrary channel vs. time; time base 2.5 µs .. 150 ms, 32000 pixel max. trigger: amp/edge/auto/single
FFTs	for every channel, 0 .. 200 kHz range, 1 .. 128 x averaging, windowing options, scaling: magnitude/power density/power spectrum
Path Mode	
path mode working principle	action executed along user defined path
path mode functionality	user definable, spectroscopies, manual handshake, TTL handshake
Options and Upgrades	
features (transfer function)	ADC/DAC offset adjustment, linear transfer function programming, preamp for each ADC channel (1 .. 64 x gain)
features (crosslink)	two generic P/I loops, input/output for all ADC/DAC channels, map any internal signal to any arbitrary output channel