

Controllers

- High performance, multi-function and programmable
- Resolution to 0.25 microns
- Control one to four axis
- GP-IB, RS-232 and USB PC interfaces provide computer control and data acquisition
- Labview and ActiveX software drivers



OptoSigma offers a complete line of controllers to configure with SGSP series motorized stages to meet your demanding applications. Controllers are available to control one to four axes and can be linked together to operate additional axes. These controllers are designed to provide precision positioning both by manual operation and by using a personal computer. Control system is easily programmed using ActiveX and Labview and is compatible with Windows HyperTerminal.

The SHOT 204-MS is a closed-loop control system. When used with the SGSP magnescale stages, resolution to 1 micron is achieved. Many of the features make this controller an appropriate control system for measurement and inspection applications.

If you would like help in selecting the most appropriate products for your application please call. Our experienced Applications Engineers are ready to assist you with your most demanding requirements.

SHOT-102

SHOT -102 is a two-axis stage controller designed to deliver high performance in a compact, low-cost package. The controller has two internal drivers and offers both automatic controls using a personal computer and manual operation using a built in joystick.

The controller is complete with built-in manual joystick, a 2-axis digital display, and RS232C and GP-IB ports. The SHOT -102 provides resolution to within 1 micron and utilizes a full and half step drive method.



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 &
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SFS Fine Controllers

The SFS Fine controller is available in one and three-axis versions and in UL and CE products. It is designed to work with the family of Piezo products shown on pages 442-449. The controller will provide high performance in a wide range of applications including many measurement and inspection applications. The controller will operate both open and closed-loop stages. The closed-loop control system delivers resolution to within 2nm. The controller will provide accurate linearity to less than 0.2%.

SFS Fine offers both automatic controls using a personal computer and manual operation using a control pad. The control pad is required for manual operation, memory settings, and programming the system. When the SFS Fine is connected to a personal computer using the RS232C, GP-IB or USB interface, the stage can be accurately moved to the desired position by simple commands sent from the PC.



SHOT-302GS/304GS

The SHOT-302GS 2-axis controller and SHOT-304GS 4-axis controller deliver solid closed loop performance when combined with any of our GS series stepper motor stages with integrated glass scale encoders. They are also backward compatible with any of our open loop stepping motor stages. In addition to the standard CJ-200 control pad that is used with our SHOT-200 series controllers, the SHOT-300 series controllers support two new remote control panels, the JS-300 and JB-400. Standard features also include dedicated TTL I/O ports, a 24VDC trigger output to control external devices, provision for an external emergency stop and dedicated 24VDC output for driving accessories such as electromagnetic brakes.



SHOT-202

SHOT-202 is a two-axis stage controller designed to deliver high performance in a wide range of applications. The SHOT-202 has micro-stepping to provide smooth stepping motor movement. This general-purpose controller has two internal drivers and offers both automatic controls using a personal computer and manual operation using a control pad. The control pad is required for manual operation, memory settings, and programming the system.

When the SHOT-202 is connected to a personal computer using the RS232C, GP-IB or USB interface, the stage can be accurately moved to the desired position by simple commands sent from the PC. It is possible to save internal data by downloads and uploads.

Internal power supply for I/O (Input/Output) signals, trigger output signals, and DC 24V output signals makes it possible to control external input or output devices or to output trigger signals synchronized with external measuring devices.



SHOT-204-MS

SHOT-204-MS is a four-axis stage controller designed to deliver high performance in a wide range of applications. The controller will operate both open and closed loop stages in combination. This closed-loop control system delivers resolution to 1micron. The SHOT-204-MS has micro-stepping to provide smooth stepping motor movement.

SHOT-204-MS offers both automatic controls using a personal computer and manual operation using a control pad. The control pad is required for manual operation, memory settings, and programming the system. When the SHOT-204-MS is connected to a personal computer using the RS232C, GP-IB or USB interface, the stage can be accurately moved to the desired position by simple commands sent from the PC. It is possible to save internal data by downloads and uploads.

Internal power supply for I/O (Input/Output) signals, trigger output signals, and DC 24V output signals makes it possible to control external input or output devices or to output trigger signals synchronized with external measuring devices.



SCT-602 Control Pad

SCT-602 control pad is a dedicated device for controlling the SHOT-602 when connected using the RS232C interface. The control pad makes it possible to create a program with up to 100 lines for each of four channels (400 lines total). By using the teaching mode of the SCT-602 program steps can be saved. The control pad can control axes coordinates, travel speed, wait time and number of time to run program steps. (see page 487)



SHOT-602 Intelligent Driver/Controller

The SHOT-602 “the intelligent driver” is both a controller and driver in one package. The SHOT-602 provides resolution to within 1 micron and utilizes a full and half step drive method for smooth precise stepping motor movement.

The two-axis intelligent driver provides a low-cost solution for controlling the SGSG20, SGSP26, SGSP60-ZF and TSDM Stages. SHOT-602 is connected to a personal computer or the SCT-602 using the RS232C interface, the stage can be accurately moved to the desired position by simple commands.



PAT-001

The PAT-001 is a compact economic single-axis controller with a built-in motor drive. This single-axis motorized stage controller can be fully automated from your PC. It provides two directional jog motion with the use of a toggle switch located at the front panel for ease of use.

The PAT-001 can control the SGSP translation stages, rotation, ZF, TSDM, Goniometers and the compact stepping motor actuators. The controller can provide two micro-step mode (full step / half step) and driving current can be selected via PC software. The availability of these features provides simple and accurate single axis positioning.



Piezo Stages

Linear Stages

Rotation Stages

ZF Stages

Motorized Optics Holders

Goniometers

GS Closed Loop Stages

Controllers & Drivers

Cables & Accessories

Software

SFS Piezo Actuator Controllers

Number of Axis	Output Voltage (DC)	Logical range	Resolution	Power Requirements	Price	Model	PART NUMBER
1	-10 to 150 .25m V/step	999,999	~1nm open, 5nm closed-loop	108-132 VAC 50/60Hz 20VA	\$ 3,050.00	FINE-01(UL)	510-0111-1
1	-10 to 150 .25m V/step	999,999	~1nm open, 5nm closed-loop	207-253 VAC 50/60Hz 20VA	\$ 3,050.00	FINE-01(CE)	510-0111-2
3	-10 to 150 .25m V/step	999,999	~1nm open, 5nm closed-loop	108-132 VAC 50/60Hz 20VA	\$ 6,200.00	FINE-503(UL)	510-0103-1
3	-10 to 150 .25m V/step	999,999	~1nm open, 5nm closed-loop	207-253 VAC 50/60Hz 20VA	\$ 6,200.00	FINE-503(CE)	510-0103-2

SGSP Stepper Motor Controllers

Number of Axis	Step Increment (pulses/step)	Maximum Pulse rate (pulses/sec)	Minimum pulse rate (pulses/sec)	Power Requirements	Price	Model	PART NUMBER
1	1 - 2	20,000	100	24VDC-2A	\$ 350.00	PAT-001	555-5030
2	2	20,000	1	100-120 VAC 50/60Hz 50VA	\$ 800.00	SHOT-602	555-5020-S
2	1 - 2	20,000	1	100-120 VAC 50/60Hz 50VA	\$ 1,480.00	SHOT-102	555-1102-S
2	1 - 250	500,000	1	100-240 VAC 50/60Hz 160VA	\$ 2,980.00	SHOT-202	555-1202-S
4	1 - 250	500,000	1	100-240 VAC 50/60Hz 300VA	\$ 3,980.00	SHOT-204MS	555-1204-SMS
2	1-250	500,000	1	100-240VAC 50/60Hz 50VA	\$ 4,980.00	SHOT-302GS	555-1302
4	1-250	500,000	1	100-240VAC 50/60Hz 50VA	\$ 5,980.00	SHOT-304GS	555-1304

Drivers

- 250 microsteps/full step
- High current output 0.5-1.6A/phase
- Auto current down to reduce motor heat generation
- Low cost

Compact Micro-driver

The SG-55M compact micro-driver is an inexpensive single axis driver when used with your controller can drive the SGSP Series motorized stages. The SG-55M uses micro stepping to provide fine mechanical resolution. With high power output, the SG-55M can drive long travel, high load capacity stages up to the SGSP 65 Series stages. Auto current down function reduces the amount of heat generated during idle. The SG-5M and SG-5MA are lower cost drivers for applications where very fine micro stepping is not required.



Single axis micro-driver

The SG-5151 micro-driver is an economical single axis driver when used with your controller can drive the SGSP Series motorized stages. The SG-5151 has a built in 110V power supply. The UL certified driver offers high reliability in a compact, light-weight low cost micro-driver.

The SG-55M and SG-5151 offers the user the flexibility in configuring systems to meet a variety of applications. If you would like help in selecting the most appropriate products for your application please call. Our experienced Applications Engineers are ready to assist you.



Drivers

Number of Axis	Driving current range (Amps/phase)	Step increments (controller pulses per physical step)	Maximum pulse rate (pulses/sec)	Interface	Power Requirements	Price	Model	PART NUMBER
1	500,000	1 - 250	0.5 to 1.6	Discrete ¹	24-36VDC-3A	\$ 298.00	SG-55M	519-2050
1	500,000	1 - 250	0.23 to 0.75	Discrete ¹	24-36VDC-1.5A	\$ 298.00	SG-55MA	519-2051
1	50,000	1-2	0.5 to 1.4	Discrete ¹	20-40VDC-3A	\$ 155.00	SG-5M	519-2040
1	50,000	1-2	0.25 to 0.85	Discrete ¹	20-40VDC-1.5A	\$ 155.00	SG-5MA	519-2041
1	500,000	1 - 250	0.5 to 1.6	Discrete ¹	90-125VAC 50/60 Hz 300VA	\$ 510.00	SG-5151	519-2070

Notes:

- ¹Rotate clockwise command pulse input (or pulse signal input in single clock mode);
- Rotate counter clockwise command pulse input (or rotate direction signal input in single clock mode);
- Pulse width 0.5ms or higher
- Pulse interval 0.5ms Minimum
- Rise / fall time 1 μs or lower
- Max pulse rate 500kpps
- Pulse voltage [1]:4 to 8V, [0]: -8 to 0.5V

Accessories

OptoSigma accessories include the plug and play control pad to be used with the SHOT-202 and SHOT-204MS to manually program and control the movement of the SGSP Series motorized stages.



The grease gun and grease tubes are for lubrication of the stages by the user at the appropriate time on site without returning to the factory. When used as recommended this extends the use of the product over a longer lifetime.



After selecting the stage and controller that meets your need, you will then select the required cables to meet your specific application. We offer a complete line of cables of various lengths and will customize to your requirements.



- Piezo Stages
- Linear Stages
- Rotation Stages
- ZF Stages
- Motorized Optics Holders
- Goniometers
- GS Closed Loop Stages
- Controllers & Drivers
- Cables & Accessories
- Software

Control Pads and Lubrication Gun

Description	Price	Model	PART NUMBER
Power adapter for PAT-001	\$ 50.00	PAT-001-POW1	555-5035-S
Control Pad for SHOT-202,204MS,SHOT-302GS,SHOT-304GS	\$ 120.00	CJ-200	555-4020
Joystick controller for SHOT-302GS,SHOT-304GS	\$ 790.00	JS-300	555-4021
Jog Operation box for SHOT-302GS,SHOT-304GS	\$ 820.00	JB-400	555-4022
Control Pad for SHOT-602	\$ 800.00	SCT-602	555-4040-S
Grease Gun	\$ 70.00	GREASE GUN	591-1110
Grease For SGSP20/SGSP26/Rotation Stages	\$ 8.00	AFA GREASE	591-1121
Grease For SGSP33/SGSP46/SGSP55 Stages	\$ 8.00	AFB GREASE	591-1122

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Cables

Description	Length (m)	Price	Model	PART NUMBER
FINE Piezo drive cable	3	\$ 128.00	FINE-CA-3	510-0531
FINE Piezo sensor feedback cable	3	\$ 193.00	DS1-CA-3	510-0536
MINI type cable	1	\$ 71.00	MINI-CA-1	561-1021
MINI type cable	2	\$ 71.00	MINI-CA-2	561-1022
MINI type cable	3	\$ 76.00	MINI-CA-3	561-1023
MINI type cable	4	\$ 87.00	MINI-CA-4	561-1024
MINI type cable	5	\$ 96.00	MINI-CA-5	561-1025
MINI type unterminated for use with drivers	1	\$ 65.00	MINI-CA-SG-1	561-1101
MINI type unterminated for use with drivers	2	\$ 65.00	MINI-CA-SG-2	561-1102
MINI type unterminated for use with drivers	3	\$ 71.00	MINI-CA-SG-3	561-1103
DMINIS type cable	2	\$ 71.00	DMINIS-CA-2	561-2042-S
DMINIS type cable	3	\$ 76.00	DMINIS-CA-3	561-2043-S
DMINIS type cable	4	\$ 87.00	DMINIS-CA-4	561-2044-S
DMINIS type cable	5	\$ 98.00	DMINIS-CA-5	561-2045-S
DMINIS type cable	10	\$ 185.00	DMINIS-CA-10	561-2050-S
DMINIS type cable	15	\$ 265.00	DMINIS-CA-15	561-2055-S
DBCS type cable	2	\$ 80.00	DBCS-15-2	561-2202-S
DBCS type cable	3	\$ 104.00	DBCS-15-3	561-2203-S
DBCS type cable	4	\$ 128.00	DBCS-15-4	561-2204-S
DBCS type cable	5	\$ 148.00	DBCS-15-5	561-2205-S
DHR type cable for SGSP(GS) and KST(GS) stages	3	\$ 120.00	DHR-CA-3	561-3203
GSE type encoder cable for SGSP(GS) and KST(GS) stages	3	\$ 120.00	GSE-CA-3	561-3103
Encoder electronics and cable for SHOT-204SMS	1	\$ 349.00	CH-SIGMA-1	561-2101
Encoder electronics and cable for SHOT-204SMS	3	\$ 360.00	CH-SIGMA-3	561-2103
I/O connector and shell for SHOT-202, SHOT-204MS	-	\$ 28.00	10150/10350	561-2830
RS232C interface cable	1.8	\$ 55.00	RS232C/STR-1.8	561-2531
RS232C interface cable	3	\$ 65.00	RS232C/STR-3	561-2533
RS232C interface cable	4.5	\$ 75.00	RS232C/STR-4.5	561-2535
USB to Serial adapter	0.1	\$ 30.00	US232R-10	561-2751
GPIB interface cable	1	\$ 87.00	GP-IB-1	561-2601
GPIB interface cable	3	\$ 98.00	GP-IB-3	561-2603
USB interface cable	1	\$ 14.00	USB-1	561-2701
USB interface cable	2	\$ 16.00	USB-2	561-2702
Remote cable for JS-300 and JB-400	2.5	\$ 90.00	MDR14-CA-2.5	561-3302

XY Brackets for SGSP stages (included in SGSP (XY) stages)

Description	Size	Price	Model	PART NUMBER
XY-Bracket for SGSP20 stages	40 x 70 x 7	\$ 56.00	SGXY-20	541-2200
XY-Bracket for SGSP26 stages	50 x 70 x 6	\$ 56.00	SGXY-26	541-2260
XY-Bracket for SGSP33-50 and SGSP33-100 stages	80 x 120 x 16	\$ 80.00	SGXY-33-50	541-2335
XY-Bracket for SGSP33-200 stages	80 x 220 x 16	\$ 104.00	SGXY-33-200	541-2339
XY-Bracket for SGSP46 stages	120 x 224 x 19	\$ 140.00	SGXY-46	541-2460

Z Brackets for SGSP stages (included in SGSP (Z) stages)

Description	Size	Price	Model	PART NUMBER
Z-Axis Bracket for SGSP20-20 stages	60 x 60 x 85	\$ 112.00	SGZ-20(A)	541-3200-S
Z-Axis Bracket for SGSP20-35 and SGSP20-85 stages	60 x 60 x 193	\$ 208.00	SGZ-20(B)	541-3200-L
Z-Axis Bracket for SGSP26-50, SGSP26-100 and SGSP26-150 stages	80 x 80 x 243	\$ 264.00	SGZ-26(A)	541-3260-S
Z-Axis Bracket for SGSP26-200 stages	80 x 80 x 333	\$ 324.00	SGZ-26(B)	541-3260-L
Z-Axis Bracket for SGSP33 stages	80 x 80 x 330	\$ 400.00	SGZ-33	541-3330
Z-Axis Bracket for SGSP46 stages	120 x 120 x 560	\$ 576.00	SGZ-46	541-3460

Optical table/breadboard adapters for SGSP stages

Description	Size	Price	Model	PART NUMBER
Adapter plate for SGSP20/26 to 1/4-20 x 1 inch (2 req'd)	125 x 28 x 4.7	\$ 14.50	—	541-4050
Adapter plate for SGSP20/26 to M6 x 25mm (2 req'd)	125 x 28 x 4.7	\$ 14.50	—	541-4055
Adapter plate for SGSP20-20 universal (1 req'd)	120 x 80 x 9	\$ 60.00	SG20-US	541-4051
Adapter plate for SGSP20-35/85 universal (1 req'd)	120 x 140 x 9	\$ 95.00	SG20-UL	541-4052
Adapter plate for SGSP26-50/100/150 universal (1 req'd)	152.4 x 180 x 9	\$ 115.00	SG26-US	541-4053
Adapter plate for SGSP26-200 universal (1 req'd)	152.4 x 260 x 9	\$ 165.00	SG26-UL	541-4054
Adapter plate for SGSP33 universal (1 req'd)	152.4 x 220 x 11	\$ 140.00	SG33-U	541-4060
Adapter plate for SGSP46 universal (1 req'd)	152.4 x 340 x 11	\$ 160.00	SG46-US	541-4070

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Optics holders for SGSP-60YAW (513-6010)

Description	Optic Size	Price	Model	PART NUMBER
waveplate/polarizer	Ø1" x 6mm thick	\$ 78.00	SGSP-60WHD-25.4t6	541-6011
waveplate/polarizer	Ø30mm x 6mm thick	\$ 78.00	SGSP-60-WHD	541-6012
circular ND mount	20mm center hole by 3mm thick	\$ 190.00	SGSP-60-ND-01	541-6013
glan-thompson mount	Ø19mm x 25mm long	\$ 78.00	SGSP-60-GHD	541-6014

Objective adapters for SFS-OBL-1 objective lens focus actuator

Description	Price	Model	PART NUMBER
Male adapter to Olympus Microscope body	\$ 160.00	OBL-ADP-M20.32A	510-0222
Male adapter to Nikon Microscope (CFI60) body	\$ 160.00	OBL-ADP-M25.0A	510-0223
Male adapter to Mitutoyo style microscope body	\$ 160.00	OBL-ADP-M26.0A	510-0224
Female adapter to Olympus objective	\$ 53.00	OBL-ADP-M20.32B	510-0225
Female adapter to Nikon CFI60 objective	\$ 53.00	OBL-ADP-M25.0B	510-0226
Female adapter to Mitutoyo standard objective	\$ 53.00	OBL-ADP-M26.0B	510-0227

All stages are measured using calibrated equipment in our ISO certified factory. The stages are inspected to insure that they meet the all specifications in the catalog including; dimensions, angles, straightness, perpendicularity, flatness, pitch, yaw and roll.

The actual measured data for positioning accuracy, positioning repeatability accuracy, backlash and straightness measurements can be provided for an additional charge. Please contact us for additional information about the availability and cost of your required measurements.



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 **OptoSigma®**

Software for Positioning & Measurement



- SGEMCS(E) is a motion control application software program which supports our automatic positioning devices.
- Program features manual operations, time-series measurement, center presetting, and other useful measurement functions.
- Utilizes Excel instruction files, both the stage control and the measurement device control can be executed simultaneously.
- Facilitates easy data editing by saving controlling/ measurement results in Excel formats.
- Communication parameters and other conditions can be saved in SGS files, which allows you to repeat the same process without difficulty.
- Operating System: Microsoft Windows

Product Name	PART NUMBER	Price
SGEMCSE	591-0002	\$ 495.00

Terminal Software



- SGTERM(E) utilizes commands sending/ receiving through Microsoft Excel
- Continuous process or step-by-step process can be selected.
- SGTERM(E) facilitates easy data analysis by saving measurement results in Excel formats.
- Communication parameters and other conditions can be saved in SGS files, which allows you to repeat the same process without difficulty.
- Operating System: Microsoft Windows

Product Name	PART NUMBER	Price
SGTERME	591-0006	\$ 295.00

Terminal Software



- SGACTX(E) is an ActiveX control, software, which enables automatic positioning and measurement utilizing Microsoft Excel macros and Visual Basic
- A 360 page user manual is enclosed in the package. The manual covers the necessary fundamentals of Excel macros and Visual Basic programming.
- Program customization and development is made easy with SGACTX(E) and is time saving and user friendly.
- Operating System: Microsoft Windows



Product Name	PART NUMBER	Price
SGACTXE	591-0010	\$ 85.00
SGSFSXE	591-0012	\$ 85.00
SGPATXE	591-0014	\$ 85.00

Contact us for other software options.

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