

Conex™

Compact Photonics Control Solutions



With the increasing complexity of optical setups, the need for remote diagnostics and control of repetitive tasks increases. Scientists and engineers recognize the benefits of PC control of critical alignments, yet are often afraid of the effort, magnitude and cost typically associated with the implementation of a computer controlled solution.

Newport's Conex™ product family addresses these concerns. Conex provides highly functional control solutions that are easy to use, compact, and inexpensive. Available today are the following members of the new Conex family: The CONEX-CC DC servo motor driver, the CONEX-PP Intelligent Stepper motor driver, CONEX-AG piezo motor driver, the CONEX-PSD9 position sensing detector, and the CONEX-IOD I/O module.



Simple USB Connectivity

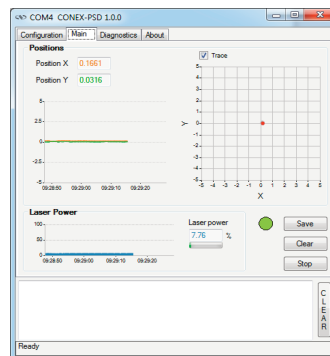
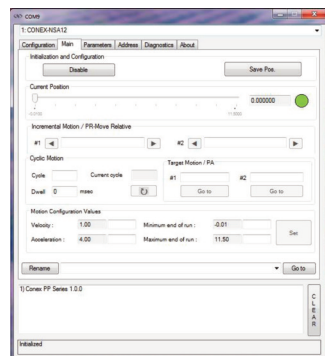
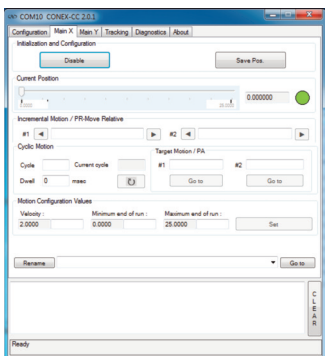
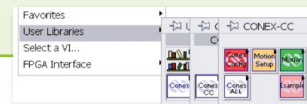
All Conex modules are preconfigured to provide easy, plug-and-play, USB PC control. Multiple units can be connected to a single USB port using standard USB hub technology. Where possible, modules are also powered through the USB port.

The Conex modules are compact with the CONEX-CC modules measuring 3.67" x 2.09" x 0.91" (93x53x23 mm) and the CONEX-PP modules measure 4.33" x 2.06" x 0.98" (110x52.2x25 mm). M3 inserts are provided on three sides for flexibility in mounting. An optional adapter plate holds between three and six Conex modules, which mounts directly on optical tables.

Simple Control Software

Easily controlled from a PC using a downloadable graphical user interface (GUI). For advanced applications, programs can be developed with an ASCII command interface, a set of two letter mnemonic commands.

Note that the GUI's are available in the CONEX-CC, CONEX-PP, CONEX-PSD and CONEX-IOD products only.



CONEX-CC DC-Servo Controller/Driver



The CONEX-CC is a very compact and inexpensive driver for Newport's low power DC servo motor driven devices. For out-of-the box control, the CONEX-CC is preconfigured and delivered with the motion device. Available configurations include TRA, TRB and LTA Series actuators, MFA linear stages, SR50 and PR50 rotation stages and BGS50 goniometers.

The linear amplifier of the CONEX-CC provides the optimum drive solution for low-power motors. Compared to other solutions relying on cheaper PWM amplifiers, the CONEX-CC delivers much smoother motion, with less electrical noise and significantly less motor heating. The motors are powered through a 24 VDC power supply, model CONEX-PS. For added convenience, the power can be shared with up to 5 modules using the optional CONEX-PS-CB power chain cable.

Key Features

- Affordable single-axis control for low-power DC servo motor driven devices
- Ultra-compact: 3.67" x 2.09" x 0.91" (93x53x23 mm) only
- Low noise linear amplifier technology
- Advanced Backlash and Hysteresis compensation mode
- Fast USB communication

Specifications

Description	Single-axis motion controller/driver for low-power DC servo motors
Motor output power	24 VDC @ 0.15 A rms, 0.3 A peak, linear amplifier
Control loop	Floating point digital PID loop with velocity and friction feedforward, 2 kHz servo rate
Motion	Point-to-point motion with S-gamma motion profiler allowing acceleration and jerk time control; Backlash and Hysteresis compensation mode
Computer interface	USB2.0, 1.8 m long USB-A to Mini-B cable included
Programming	40+ intuitive, 2 letter ASCII commands
Dedicated inputs	Encoder input for A, B, and I, max. 2 MHz rate, single ended Forward and reverse limit, home switch and index pulse
Status display	Two-color LED
Internal safety feature	Watchdog timer
Input power requirements	24 V, 8 W, female Ø 2.1xØ 5.5x11 mm
Dimensions	3.67"x2.09"x0.91" (93.2x53x23 mm)
Cable length (CONEX-CC to motion device)	9.8 ft (3 m), except CONEX-TRBxxCC: 4.9 ft (1.5 m)

Ordering Information

Stages	Code
CONEX-CC controller with TRA6CC actuator	CONEX-TRA6CC
CONEX-CC controller with TRA12CC actuator	CONEX-TRA12CC
CONEX-CC controller with TRA25CC actuator	CONEX-TRA25CC
CONEX-CC controller with TRB6CC actuator	CONEX-TRB6CC
CONEX-CC controller with TRB12CC actuator	CONEX-TRB12CC
CONEX-CC controller with TRB25CC actuator	CONEX-TRB25CC
CONEX-CC controller with LTA-HL actuator	CONEX-LTA-HL
CONEX-CC controller with LTA-HS actuator	CONEX-LTA-HS
CONEX-CC controller with MFA-CC linear stage	CONEX-MFA-CC
CONEX-CC controller with SR50CC rotation stage	CONEX-SR50CC
CONEX-CC controller with PR50CC rotation stage	CONEX-PR50CC
CONEX-CC controller with BGS50CC goniometer	CONEX-BGS50CC

Accessories

CONEX 24 V power supply	CONEX-PS
CONEX power chain cable, 100 mm length	CONEX-PS-CB ⁽¹⁾
CONEX base plate	CONEX-BP

¹⁾ Required to connect two CONEX-CC to the same CONEX-PS.

CONEX-PP Intelligent Stepper Motor Controller/Driver

The CONEX-PP is a compact, cost-effective motion controller and driver for Newport's Intelligent Stepper Motor stages and actuators. Similar to the FC Series, the iPP technology used in the NSA and NSR series completely eliminates the needs of customer configuration. For out-of-the box control, the CONEX-PP is preconfigured and delivered with the motion device. Users simply connect the USB communication, plug in the power supply and start the included GUI. Up to 4 units can be daisy-chained and controlled from the same GUI. Available configurations include NSA12 and NSA12V6 actuators and NSR Series rotary positioner.

The CONEX-PP controller accessories include the power supply, USB communication cable, and daisy chaining cable. The power supply is a 40 W power supply for all CONEX-PP devices. Cables and power supplies sold separately.



Key Features

- Affordable single-axis control for intelligent stepper motor driven devices
- Ultra-compact: 4.33" x 2.06" x 0.98" (110 x 52.2 x 25 mm)
- Preconfigured for easy plug-and-play
- Advanced Backlash compensation
- Easy connection to iPP graphical user interface via USB or directly via RS-422

Specifications

Description	Single-axis motion controller/driver for stepper motors
Motor output power	24 VDC peak, 2.5 A peak PWM amplifier
Control loop	PI control of motor phase current with programmable idle state; 2 kHz servo rate; Backlash compensation
Motion	Point-to-point motion with S-gamma motion profiler allowing jerk time control
Computer interface	USB +5 V (USB): <0.5A, Windows Compatible
Programming	40+ intuitive, 2 letter ASCII commands; Command set includes software limits, user units, synchronized motion start, stop all...
Communication rate	115,200 baud (serial link over USB)
Internal safety feature	End of range checks, power limit checks, watchdog timer
Input power requirements	+24 V (FC-PS40): <1.67 A
Dimensions	4.33" x 2.06" x 0.98" (110 x 52.2 x 25 mm)
Cable length (CONEX-PP to motion device)	9.8 ft (3 m)

Ordering Information

Stages	Code
CONEX-PP controller with NSA12 actuator	CONEX-NSA12
CONEX-PP controller with vacuum compatible NSA12V6 actuator	CONEX-NSA12V6
CONEX-PP controller with NSR1 rotary positioner	CONEX-NSR1
Accessories	
USB Adapter (cable Length: 1.8 m)	USB-RS422-1.8
CONEX-PP power supply (1.75 m length cable)	FC-PS40
Daisy chain communication cable, 1 m length	FC-CB1 ⁽¹⁾
CONEX base plate	CONEX-BP

¹⁾ Required to connect two CONEX-PP to the same GUI.

Note: Power Supply and cables are sold separately.

CONEX-AG Piezo Motor Controller/Driver

The CONEX-AG is a very compact and inexpensive driver for Newport's piezo motor driven, closed loop devices. This complements the open loop Agilis series of piezo motor stages and mirror mounts.

For out-of-the box control, the CONEX-AG is preconfigured and delivered with the motion device, all with a built-in direct read encoder. Available configurations include the LS25-27P linear stage, the PR100P rotation stage, and M100D mirror mount.

The controller comes with the familiar CONEX GUI, simple and intuitive to use and conveniently accessible via USB, which also supplies power to the controller.

The CONEX-AGP closed-loop algorithm is a simplified version of the typical DC servo loop algorithm, and combined with the rotary encoder, provides high system uni-directional and bi-directional repeatability. For stability in-position, the user can adjust the deadband parameter that stops dithering when the stage is within a set position tolerance.



Key Features

- Closed-loop positioning performance at an affordable price
- Integrated single-axis control for Agilis piezo motor products
- Ultra-compact controller and stage, great for tight spaces
- Repeatable, precision motion
- Fast USB communication

Specifications

Description	Single-axis motion controller/driver for closed loop Agilis piezo motors
Control loop	Digital PI loop at 100 Hz servo rate
Motion	Absolute and relative moves
Computer interface	USB (Windows required, 1.8 m cable included) Programming 25+ intuitive 2 letter ASCII commands
Communication rate	50 Hz Max.
Dedicated inputs	Analog Cosine/Sine signals from encoder.
Status display	Two-color LED
Internal safety feature	Watchdog timer
Power requirement	+5 V, USB, <0.5 A
Dimensions	3.67"x2.09"x0.91" (93.2x53x23 mm)
Cable length	5.9 ft (1.8 m) (included)

Ordering Information

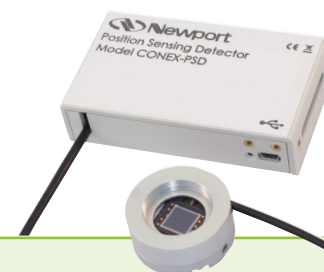
Stages	Code
CONEX-AGP controller with AG-LS25-27P linear stage	CONEX-AG-LS25-27P
CONEX-AGP controller with AG-PR100P rotation stage	CONEX-AG-PR100P
Piezo Motor Mirror Mount, Absolute Positioning, Integrated Controller	CONEX-AG-M100D

CONEX-PSD Series Position Sensing Detectors

The CONEX-PSD position sensing detectors provide accurate XY position information of laser beams and are ideally suited for laser beam stabilization, laser tracking and general beam diagnostics. Unlike quadrant detectors, the improved tetra-lateral effect diode of the CONEX-PSD is highly linear over the full sensor size, and delivers a third signal that is proportional to the beam power.

Compared to many detectors that are tweaked for high bandwidth, the CONEX-PSD's have been optimized for stability and compatibility with pulsed laser beams. An analog input filters with 319 Hz (Si) and 136 Hz (Ge) cut-off frequencies suppress high frequency noise and undesired signal ringing when used with pulsed lasers. An additional digital low pass filter can be set by software in a frequency range from 0 Hz to 1,000 Hz to further improve signal homogeneity.

The 883-OH adapter allows mounting additional optics in front of the detector for stray light reduction or beam attenuation. The CONEX-PSD's are post mountable with metric and imperial screw interfaces.

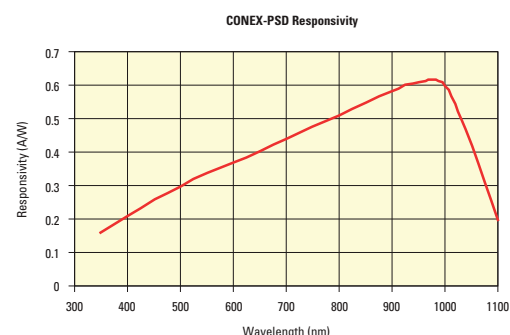
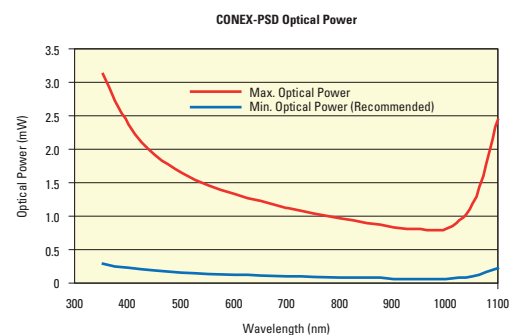


Key Features

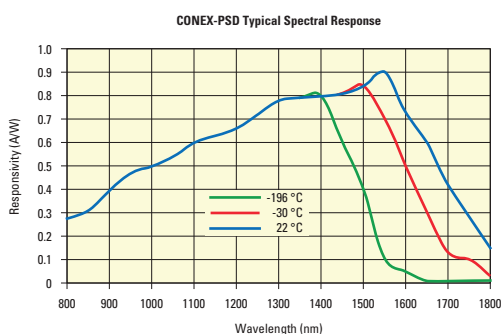
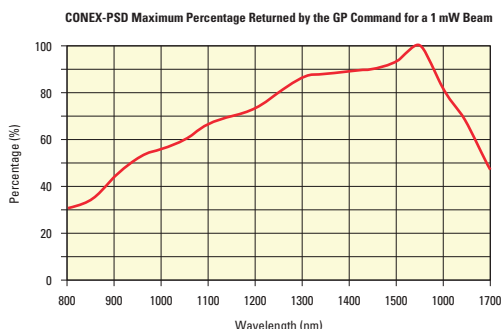
- Measures laser beam position and power
- Sensor Size: 9 x 9 mm (Si), 10 x 10 mm (Ge)
- Wavelength Range: 320–1,100 nm (Si), 800–1700 nm (Ge)
- Analog and adjustable digital filters to reduce noise
- Compatible with pulsed laser sources

Specifications

	CONEX-PSD9	CONEX-PSD10GE
Wavelength range	320–1,100 nm	800–1700 nm
Sensor size	9x9 mm	10x10 mm
Peak responsivity	0.6 A/W @ 960 nm	0.9 A/W @ 1550 nm
Maximum photocurrent	500 μ A (0.5 mA)	1000 μ A (1 mA)
Recommended spot size	BSx = 9 mm – Δ X and BSY = 9 mm – Δ Y	BSx = 10 mm – Δ X and BSY = 10 mm – Δ Y
Minimum spot size	>0.2 mm	
A/D resolution	12 Bit	
Position sensitivity	0.5 μ m at maximum power and with 20 Hz digital filter.	
Recommended power range	10–80% of max. power, see graph for details	
Computer interface	USB2.0, 1.8 m long USB-A to Mini-B cable included	
Programming	20+ intuitive, 2 letter ASCII commands	
Filters	Analog input filter, 319 Hz cut-off frequency, fixed Digital low-pass filter, 0–1,000 Hz, set by software	Analog input filter, 136 Hz cut-off frequency, fixed Digital low-pass filter, 0–1,000 Hz, set by software
Status display	Two-color LED	
Input power requirements	Powered through USB interface	
Sensor dimensions	ϕ 1.50" (38.1 mm), Height: .70" (17.7 mm)	ϕ 1.50" (38.1 mm) Height: .90" (22.9 mm)
Controller dimensions	3.67"x2.09"x0.91" (93.2x53x23 mm)	
Cable length (detector to electronic)	1.6 ft (0.5 m)	



CONEX-PSD Series Position Sensing Detectors

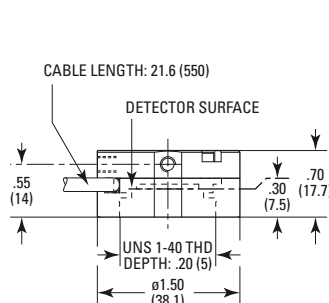


Ordering Information

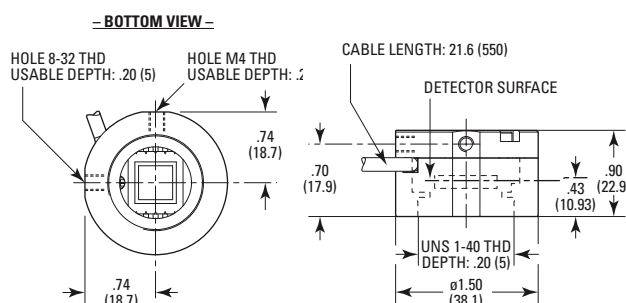
Detectors	Code
9-mm Optical Beam Position Detector (Si)	CONEX-PSD9
10-mm Optical Beam Position Detector (Ge)	CONEX-PSD10

Accessories	
1" filter holder for CONEX-PSD9	883-OH

CONEX-PSD9



CONEX-PSD10GE



CONEX-IOD I/O Module

The CONEX-IOD is a highly versatile I/O module that can interface with many third party devices. It comes with multiple general-purpose input and output functions, including digital input and output lines, and 12-bit analog input and outputs.

Specifications

Digital inputs	4 channel, +5 V pull-up
Digital outputs	4 channel, open drain
Analog inputs	2 channel, ± 1 V, ± 10 V, 1 V or 10 V, programmable 12-bit resolution, 50 Hz analog bandwidth
Analog outputs	2 channel, ± 10 V or 10 V programmable 12-Bit resolution
Connectors	Screw terminals
Computer Interface	USB2.0, 1.8 m long USB-A to Mini-B cable included
Programming	2 letter ASCII commands
Input power requirements	Powered through USB interface
Dimensions	3.67" x 2.09" x 0.91" (93.2 x 53 x 23 mm)



Ordering Information

Module	Code
CONEX general purpose I/O module	CONEX-IOD

Conex™ Compact Photonics Control Solutions

Conex™ Products

Conex Actuators



▲ CONEX-TRBxxCC

▲ CONEX-TRAxxCC



▲ CONEX-LTA-HL & CONEX-LTA-HS



▲ CONEX-NSA12



▲ CONEX-NSA12V6

Conex Linear Stages



▲ CONEX-AG-LS25-27P



▲ CONEX-MFACC

Conex Rotation Stages



▲ CONEX-AG-PR100P

▲ CONEX-SR50CC & CONEX-PR50CC



▲ CONEX-NSR1

▲ CONEX-BGS50CC

Conex™ Products

Conex Mirror Mount



▲ CONEX-AG-M100D

Other Conex Products



▲ CONEX-PSD



▲ CONEX-IOD