

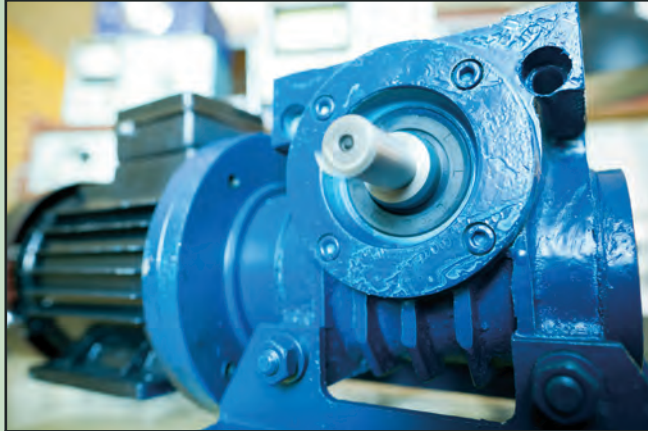


**GET MORE THAN
YOU PAY FOR...**

from  **AUTOMATIONDIRECT**.com

Product Focus: Power Transmission and other Mechanical Components

Power transmission and mechanical products move the world



Power transmission products are the stalwarts of the industrial world, used in mechanical drive-trains to create movement. Always reliable and tough, these devices translate rotational power into more torque or even into linear motion.

These are products that machines and systems depend on every day, but you may not think about because they are not complicated and have always just been “there”. Almost all industrial applications use at least some of these:

- **Worm and helical gearboxes for motors**
- **Linear slides and bearings**
- **Rack and pinion systems**
- **Synchronous drives (timing belts and pulleys)**
- **Shaft couplings**
- **Other mechanical products such as structural T-slotted rail systems**

These products perform for many years of trouble-free operation, and when specified properly, withstand the abuse of harsh environments.

Take a closer look at some of these crucial components that we may take for granted and see how mission-critical they are.



Gearboxes

Worm Gearboxes

Worm gearboxes (worm gear speed reducers) can drive a load at a slower speed than the motor shaft while increasing torque. Worm gearboxes reorient the output shaft at a 90° angle from the motor and are typically available in right hand, left hand, dual shaft, and hollow shaft output options. Worm gearboxes are a commonly used gearbox style because of their simplicity, low maintenance, moderate efficiency, and lower cost.



**Cast Iron
Right-Hand Shaft
Worm Gearbox**



**Cast Iron
Hollow Bore
Worm Gearbox**



**Cast Iron
Left-Hand Shaft
Worm Gearbox**



**Cast Iron
Dual Shaft
Worm Gearbox**

The most popular construction material for worm gearboxes is cast iron. However, some are made from lighter-weight metals such as aluminum, which is suitable for lighter-duty applications.

Helical Bevel Gearboxes

Helical bevel gearboxes offer a very high efficiency rating; since they can provide a greater gear reduction in a smaller footprint, they can support larger motors without being too large for the application. The helical gears provide quiet startup and smooth operation.

Right-angle helical bevel gearboxes change the orientation of the output shaft similarly to a worm gearbox, but allow a much greater gear reduction in a smaller footprint and offer outstanding efficiency.

Inline helical bevel gearboxes have an output shaft in the same orientation as the motor shaft. These gearboxes offer the greatest efficiency with very little losses over all the other standard gearbox options.



**Inline
Helical Bevel
Gearbox**



**Right-Angle
Aluminum
Worm Gearbox**



**Right-Angle
Helical Bevel
Gearbox**

Linear Slides, Actuators, and XYZ Gantries

Linear actuators and sliding components convert rotary motion into linear motion. Driven slides are ready for a connection to a servo or stepper motor and provide high-precision and high-torque linear motion control for accurate positioning applications.

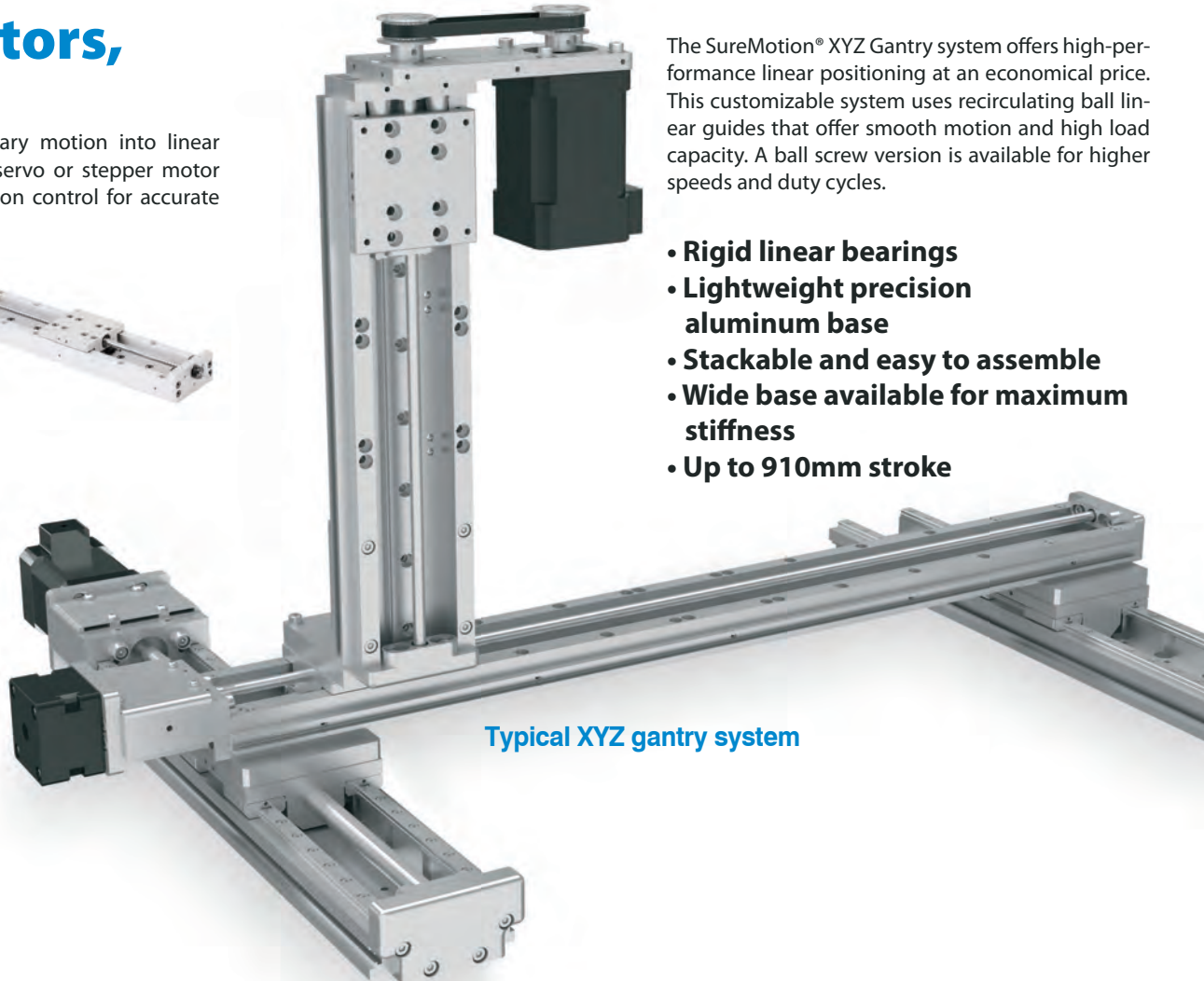
Ball screw driven slide actuators consist of a continuously-supported round rail slide with ball screw actuation, providing very robust precision linear motion; recirculating ball linear guides offer smooth motion and high load capacity.



Lead screw slide actuators offer a very economical solution to linear motion. The base is a single piece design with integrated slide

surfaces, and can be mounted horizontally, vertically, or inverted without loss of load capacity

Undriven slides are used to stabilize an axis and are mounted parallel to an existing driven slide

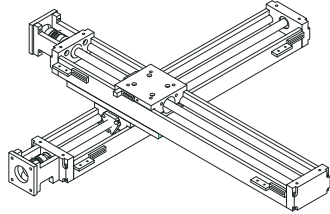


Typical XYZ gantry system

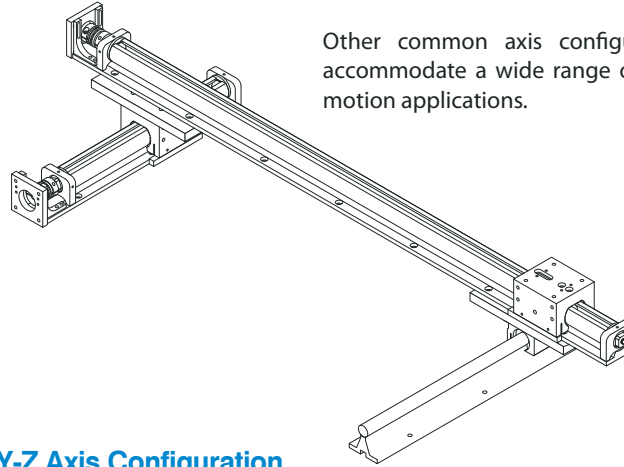
The SureMotion® XYZ Gantry system offers high-performance linear positioning at an economical price. This customizable system uses recirculating ball linear guides that offer smooth motion and high load capacity. A ball screw version is available for higher speeds and duty cycles.

- **Rigid linear bearings**
- **Lightweight precision aluminum base**
- **Stackable and easy to assemble**
- **Wide base available for maximum stiffness**
- **Up to 910mm stroke**

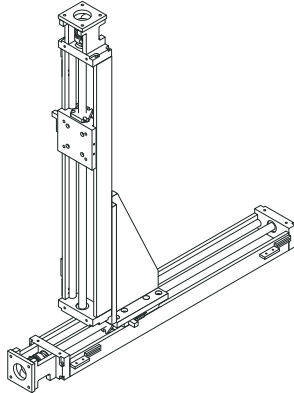
X-Y Axis Configurations



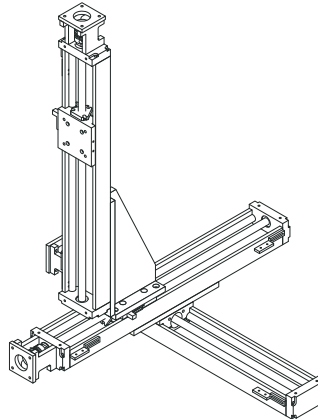
Other common axis configurations accommodate a wide range of linear motion applications.



X-Z Axis Configuration



X-Y-Z Axis Configuration

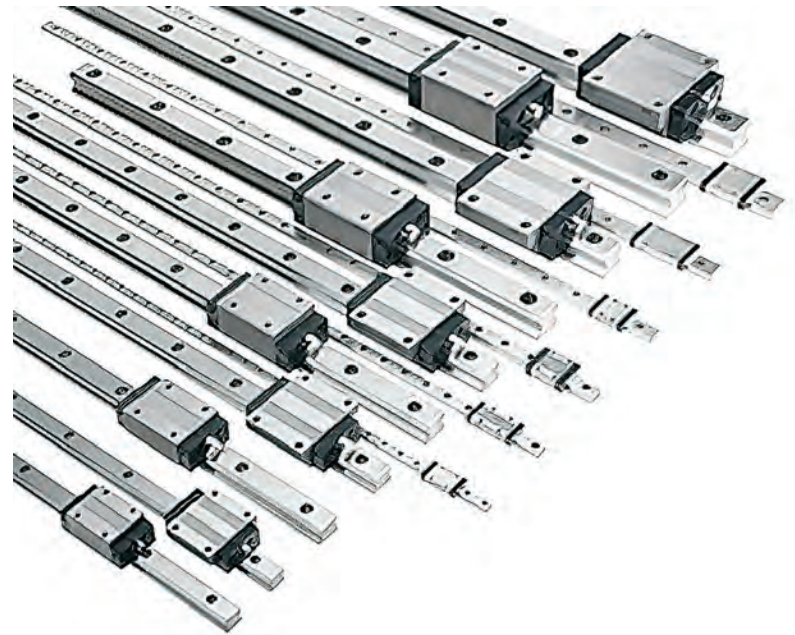


Watch the video:
<https://go2adc.com/lm-vid>



Rack and Pinion Systems

Rack and pinion systems consist of a linear rack with helical teeth mounted to an object that is desired to have linear motion. A pinion mounted to a stationary motor with teeth of a matching pitch meshes with the rack. When the pinion rotates, this translates to linear motion of the rack. Rack and pinion systems are the most cost-effective solution for linear motion travel lengths over 2 meters.



Linear Bearings and Rails

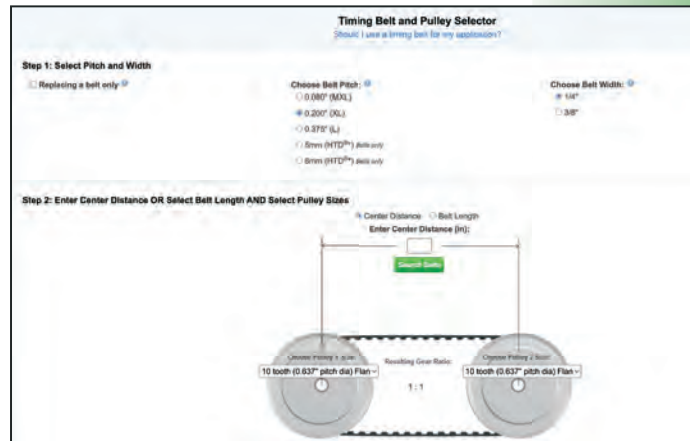
Linear bearing guides and rails are used alone in undriven linear motion applications or in conjunction with driven linear motion applications. These systems consist of a mobile guide that slides along a smooth rail.

These guide/rail systems provide 4-direction equal load sharing in any direction for lower friction and smooth sliding motion. Lower friction means less power is required to move a load, allowing higher speeds and greater efficiency. AutomationDirect's offering of linear bearings and rails are available in various sizes, up to 1000mm.

Synchronous Drive Components

Synchronous belts and pulleys are a popular means of making a final drive connection from the output of a gearbox to a conveyor drive pulley or other rotating machines. Timing belts and pulleys (also known as sprockets) allow adjustment of speed and torque while connecting the mechanically rotating components. Final gearing adjustments can be made by changing pulley circumferences and the belts can act as a mechanical “fuse” protecting more expensive mechanical equipment from breaking and motors from overheating.

Belts are available in a range of circumferences. Drive bushings are also an option that allows the connection of taper-lock style pulleys to connect to shafts that are a different size than the pulley.



Need help sizing and selecting timing belts and pulleys?
Check out the selection tool on the AutomationDirect website.
www.go2adc.com/beltandpulley

Drive Couplings

Drive couplings offer a means of connecting rotating shafts, sometimes from a motor, other times from a driven shaft to another driven shaft. It is nearly impossible to align rotating shafts perfectly; couplings will correct minor misalignments between the two shafts.

Without shaft misalignment correction, mechanical stress can be created, causing breakdowns and costly system repairs. Drive couplings can also be used to connect shafts of different diameters.



Jaw Coupling Hubs and Spiders

Jaw-style drive couplings are popular and cost-effective components for low-inertia applications. Spiders of specific durometers can be chosen for different degrees of shock and vibration reduction.



Oldham Coupling Hubs and Torque Discs

Oldham drive couplings are designed for applications where high axial misalignment exists, acting as a mechanical fuse to prevent damage to other components in over-torque conditions.



Servo Beam Couplings

Servo beam drive couplings are designed for high-speed servo applications, offering the flexibility of bellows couplings plus torsional stiffness, zero backlash, and the strength of disc couplings.



Servo High Gain Couplings

Servo high-gain drive couplings are designed for high-speed servo and stepper applications, offering zero backlash, increased control gain, high durability, and a wide torque range.



Double Loop Couplings

Double loop drive couplings damp shock and vibration, and offer high torsional rigidity. These one-piece integrated couplings are resistant to acids, alkalis, solvents, oils, grease, and ozone. These couplings are ideal for light-duty or medium-speed applications, or where inertia is not a factor.

T-Slotted Structural Rails and Hardware Components

T-slotted rail structures are economical, lightweight, and modular, and have become a popular choice when building a temporary or even a more permanent structure. Typical uses of these components are barcode scanner tunnels above conveyors; label applicator machine stands; and inline weigh scale structures.

Oftentimes these slotted rail structures are used to protect personnel from a dangerous working area of a machine. When a little creativity is applied, these components become even more useful. The material is very easy to work with and is also very forgiving, which lends to its popularity. Assembly and other hardware components make modular construction straightforward, allowing creation of a wide variety of installations.

Components are typically compatible and interchangeable regardless of the brand, as long as the components chosen fit the intended size rail.



T-Slotted aluminum rail structure holding fans above a conveyor



T-slotted rails can be cut to specified lengths with a choice of end angles, making it very versatile in building custom structures, such as this VFD mounting structure.



Button Head Socket Cap Screw



Hammer Screw



Flanged Button Head Socket Cap Screw



Flat Head Socket Cap Screw



Reducer Bushing



Socket Head Cap Screw



Flanged Button Head Socket Cap Torx Head Screw



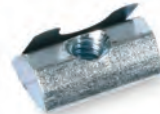
Economy Nut



Hammer Nut



Double-Economy Nut



Roll-in T-slot Nut



T-matic Connector



Milling Connector



Angle Connector



Duo Connector



2D Cube Connector

Other components to help complete a power transmission installation



Stepper Motor Linear Actuators

These linear actuators are stepper motors that incorporate a lead screw as the rotor, which translates motor torque into linear thrust. No maintenance, non-lubricated lead screw nuts ensure long life.



Polymer Bearings

Polymer bearings are cost-effective replacements for traditional bearings in many applications. They typically require no maintenance or lubrication, and can transform dirty, greasy machinery into clean, smoothly operating equipment while reducing costs.



Servo Systems

Servo systems combine a high-performance servo motor with a servo amplifier (drive) to achieve extremely accurate position, velocity, or torque control. High-level automatic tuning offers a variety of modes for improving system performance.



Hard-anodized Aluminum DryLin R Linear Shafts

DryLin R series hard-anodized shafts are the optimal sliding surface for DryLin R linear bearings. Hard-anodized aluminum shafts are available in both round and fully-supported shafting.



Precision Gearboxes for Servo Motors

Precision planetary gearboxes work well for increasing torque output of servo systems while reducing the reflected load inertia for higher response. Styles available include inline, right-angle, and hub styles, offering high stiffness, high efficiency, and very quiet operation. Mounting hardware is included for mating to the appropriate servo motor.



Stepper Systems

Cost-effective stepping systems marry high-performance microstepping drives with high-torque stepper motors to provide simple and accurate control of position and velocity where open-loop control is acceptable and expense is a factor.



Precision Gearboxes for Small NEMA Motors

Planetary gearboxes increase the torque output of small NEMA motors and allow the use of smaller motors in many cases. These gearboxes offer great value for stepper applications with a wide range of ratios.



High-Precision Inline Strain Wave Gearboxes for Servo and Stepper Motors

Strain wave gearboxes for servo and stepper motors offer many advantages over planetary and helical gearboxes, such as much higher gear ratios, higher efficiency, lower heat and noise generation, and zero backlash.

If it's in your cabinet it's online at AutomationDirect.com



Programmable
Controllers

- Productivity[®]Open Arduino-compatible industrial controller
- Productivity1000 micro-modular PLCs
- Productivity2000 micro-modular PLCs
- Productivity3000 modular PLCs
- Do-more[®] BRX, H2 and T1H series PLCs
- CLICK[®] and CLICK PLUS micro brick PLCs
- Numerous I/O expansion modules available including discrete, analog, temperature and high-speed (depending on model)
- DirectLOGIC[®] components still available for maintaining legacy systems

YouTube



Universal
Field I/O

- IO-Link master modules, hubs, and a variety of IO-Link enabled devices
- Distributed I/O with Modbus TCP, EtherNet/IP, Modbus RTU, DeviceNET communication options
- Various combinations of discrete (AC, DC, relay, high-speed) and analog inputs and outputs available

| CPU and I/O Comparison | AutomationDirect Productivity2000 U.S. | Allen-Bradley CompactLogix |
|--|--|-------------------------------|
| Base (if required) | \$103.00 P2-04B | N/A |
| Power Supply | \$100.00 P2-01AC | \$542.00 1769-P4A |
| CPU | \$347.00 P2-550 | \$3,370.00 1769-L33ER |
| 16 AC Inputs | \$143.00 P2-16NA | \$343.00 1769-IA16 |
| 16 24VDC Inputs | \$94.00 P2-16NE3 | \$289.00 1769-IO16 |
| 8 Relay Outputs | \$68.00 P2-08TRS | \$354.00 1769-OW8I |
| 8 Analog Input Channels (mA) | \$282.00 P2-08AD-1 | \$943.00 1769-IF8 |
| ASCII Comm Module | \$0.00 Built in to CPU | \$851.00 1769-ASCII |
| Modbus RTU Comm Module | \$0.00 Built in to CPU | \$940.00 1769-SM2 |
| Total Hardware Cost w/USB, Ethernet and Serial | \$1,137.00 | \$7,632.00 |
| Programming Software | FREE PS-PGMSW | \$935.00 9924-RLD200ENE |

All prices are U.S. published estimated retail prices. AutomationDirect prices as of 08/03/2022.
Allen-Bradley hardware prices taken from www.werner-electric.com 11/5/2020.
Allen-Bradley software price taken from www.werner-electric.com 11/5/2020.



HMI/Operator
Interface

- C-more[®] operator interface HMI touch panels in various sizes up to 15 inches with wide screen options available
- C-more headless HMI - same functionality as C-more touch panels without display size restrictions
- C-more Micro text and touch panels - 3, 4, and 6-inch models available starting at only \$101
- C-more and C-more Micro HMI design software free to download
- ViewMarq[®] LED message displays
- ATLAS[®] industrial monitors



AC and DC Drives

- DURAPULSE® variable frequency AC drives up to 300hp, featuring GS10, GS20, GS20X, and GS4 series
- WEG CFW100, CFW300 and CFW500 AC drives up to 60hp, depending on series
- WEG CFW500 drives up to 20hp, IronHorse® AC drives up to 30hp and DURAPulse GS20X drives up to 10hp available in a NEMA 4X enclosure
- IronHorse DC drives up to 3hp
- Drive accessories
- Soft starters up to 480A



What our current customers think:
www.automationdirect.com/reviews



Software

- Free PLC programming software (download)
- Free process control and measurement software (download)
- Free motion control software (download)
- Free HMI programming software (download)
- Free AC drive configuration and programming (built-in PLC) software (download)



Motors and Motor Controls

- IronHorse general purpose AC motors up to 300 hp
- Stainless steel and white epoxy washdown AC motors
- Stainless steel AC motors
- IronHorse Farm Duty up to 10 hp
- IronHorse three-phase ODP motors up to 50 hp
- Marathon inverter duty AC motors up to 100 hp
- Marathon permanent magnet AC motors up to 10 hp
- Marathon single-phase AC motors up to 5 hp
- DC motors up to 2 hp
- Motor controls and contactors up to 300 hp



Process

- Temperature and process controllers
- Digital and process panel meters
- PID, Batch PID, and Loop Control
- Temperature sensors and transmitters
- Pressure sensors and gauges
- Level sensors and controllers
- Flow sensors and transmitters
- Signal conditioners
- Pipeline valves
- Solenoid /media separated process pipeline valves
- Current to pneumatic (I/P) transducers
- Timer relays, counters and tachometers
- Trumeter graphical panel meters
- Cloud data logger with I/O
- Hour meters and counters



Safety

- Reer MOSAIC safety controllers
- IDEM® and Dold® safety relays
- Speed/Standstill safety relay modules
- Safety laser scanners
- Magnetic safety switches
- Magnetic coded safety switches
- RFID coded safety switches
- Light curtains from Contrinex, Reer and Datalogic
- Two-Hand controls
- Trapped key interlocks
- Safety mats and edges
- Safety bumpers
- Intrinsically safe isolators
- Hazardous location devices

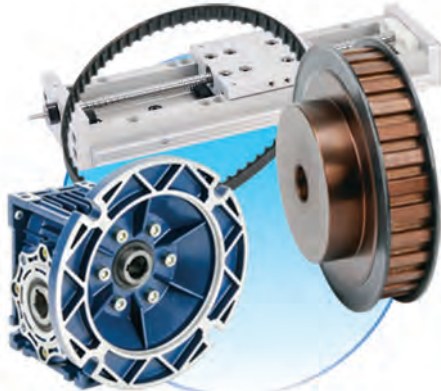


Structural Frames/Rails

SureFrame cut-to-length aluminum T-slotted rails make constructing a frame or machine easy and quick.

NO CUT CHARGES

- Complete assortment of hardware and accessories to complete your slotted rail project
- You specify length and cut angles for each piece
- No cut fees
- Free 2-day delivery on all orders over \$49



Power Transmission

- Worm gearboxes
- Helical gearboxes
- Precision gearboxes
- Shaft mount gearboxes
- Timing belts and pulleys
- Couplings and bushings
- Shafting and shaft supports
- igus polymer bearings
- GAM rack and pinions
- Linear bearings and rail



Relays & Timers

- Electro-mechanical relays
- Intrinsically safe relays
- Phase monitoring relays
- Alternating relays
- Optocoupler relays
- Pump seal failure relays
- Solid state relays
- Relay sockets and accessories
- Timer relays
- Counters
- Tachometers
- Motor control relays
- Force-guided relays



Tools

- Southwire multimeters and testers
- Southwire nutdrivers
- Sensor testers
- Wera screwdrivers and torque tools
- Wera wrenches, ratchets and sockets
- Southwire and AutomationDirect pliers and stripping tools
- SapiSelco cable tie tools
- RUKO hole cutting tools
- RUKO grinders and burrs
- SapiSelco® wire ties
- Z+F Wire Crimping Tools
- AutomationDirect interchangeable die crimping tool, self-adjusting crimper and rotatable die crimpers

Servo Systems

| | SureServo2 AutomationDirect Price/Part Number | VS. | Allen-Bradley Price/Part Number |
|--|---|------------|--|
| Digital Servo Drive | \$372.00 SV2A-2040  | | \$1,418.00  2098-DSD-005 |
| 100W Servo Motor with connectorized Leads | \$280.00 SV2L-201N  | | \$712.00  TLV-A130T-HK62AA |
| Breakout Board Kit for CN1 Control Interface | \$122.00 SV2-CN1-R1B0 + SV2-CN1-CBL30  | | \$347.00  2090-USBK-D4401 |
| 3m Encoder Feedback Cable | \$59.00 SV2C-E122-03NN  | | \$107.00  2090-CFBM6DF-CBAA03 |
| 3m Motor Power Cable | \$39.50 SV2C-PA18-03NN  | | \$121.00  2090-CPBM6DF-16AA03 |
| Configuration Software | FREE SV2-PRO*  | | \$98.90  2098-UWCPRG |

*SureServo2 Pro configuration software is a FREE download or also available on USB drive for \$20.00

Complete 1-axis 100W System \$872.50 \$2,803.90

All prices are U.S. list prices. AutomationDirect prices as of 08/03/2022.
The Allen-Bradley 100W system consists of part numbers shown in table above with prices from
www.westernelectric.com, www.todaycomponents.com 3/15/2020.



Motion Control

- ProductivityMotion controller
- SureServo² drives and motors, up to 15kW
- LS-Electric[®] servo drives and motors up to 1kW
- Stepper and servo gearboxes
- SureStep[®] drives and NEMA motors
- Stepper motor linear actuators
- Leadshine[®] stepper drives
- Linear slides
- Koyo[®] encoders
- CUI Devices[®] Kit Encoders
- XYZ Gantries



Identification

- Imagers capable of reading 1D/2D/DPM images
- All handheld scanners are industrial grade and can read all common barcodes such as Code 128 and QR codes
- Convert code into human readable characters and transmit over communications network



Sensors

- Proximity sensors
- Photoelectric sensors
- Limit switches
- Precision limit switches
- NEMA limit switches
- Laser sensors
- Color and contrast sensors
- Area sensors
- Encoders
- Current and voltage sensors
- Pressure sensors and gauges
- Temperature sensors, switches, transmitters and thermometers
- Liquid level sensors
- Flow sensors
- Ultrasonic sensors
- Fork sensors
- Linear position sensors



Pushbuttons, Switches and Lights

- KILLARK® hazardous location control stations
- IDEM emergency stops
- Fuji®, Schmersal and Eaton metal/
plastic 22 and 30mm pilot devices
- IP69K-rated selector switches, pilot devices
and pushbuttons from Captron and Schmersal
- WERMA audible devices and visual signals
- WERMA and Patlite stacklights
- IP69K-rated Patlite stacklights
- Patlite signal towers and LED lighting
- Foot switches



Communications

- Industrial managed and unmanaged Ethernet switches
- StrideLinux VPN routers and cloud services for secure remote access
- Pocket Portal IIoT remote I/O
- MQTT gateways
- Modbus gateways
- Network adapters/ converters
- Ethernet cables
- Power over Ethernet (PoE) switches



Pneumatics

- Tubing, hose and fittings in a wide variety of configurations
- Air cylinders and position switches
- Solenoid valves
- Rodless air cylinders
- Modular solenoid valves (Ethernet or hardwired)
- Air preparation and air relief valves
- Pushbutton valves
- Total Air Prep (TAP) all-in-one units
- Rotary actuators and grippers
- Pressure switches, transmitters, and transducers
- Pneumatic pushbuttons and limit switches
- Electro-pneumatic systems
- Vacuum products; suction cups, ejectors, spring plungers



Power Products

- Acme Electric®, Hammond and Jefferson Electric® transformers
- Rhino® DC power supplies and converters
- WAGO power supplies
- Mersen surge protectors
- Roxburgh and Eaton line filters and surge protectors
- Roxburgh power outlets
- ACME Electric encapsulated transformers
- Edison® power distribution blocks
- Bryant® electrical plugs, connectors and receptacles, and other wiring devices
- AcuAMP® AC current transformers
- Socomec multifunction power meters
- Trumeter graphical panel meters
- Surge protection devices



Water (Potable) Components

- Regulators
- Solenoid valves
- Hand valves
- Check valves
- Push-to-connect water fittings
- Tubing
- Hose
- Hose clamps



Circuit Protection

- Eaton UL 489 miniature circuit breakers
- Fuji UL 489 molded case circuit breakers
- Eaton UL1077 supplementary protectors
- Edison fuses, fuse holders and fuse blocks
- Socomec, Gladiator and Bryant disconnect switches
- Bryant UL 508 manual motor controllers
- Socomec manual transfer switches
- Wago electronic circuit breakers



Terminal Blocks and Wiring

- Electrical hook-up wire / building wire
- Konnect-It® and DINnectors® terminal block systems
- Edison power distribution blocks
- Bryant power wiring devices
- Wire duct and tubing
- Cable entry systems for enclosures
- Wire end connectors, cable glands, sanitary cable glands, connectors and fittings
- ZIPport® connectors
- Multi-wire connectors
- Sensor cables
- DYMO XTL label makers and labels
- General- and special-purpose cable ties



All of our cable is available cut to your specified length so you can eliminate waste and purchase only what you need - **plus it's cut for free and shipped FAST!!**

Dozens of cables available including:

- Flexible Portable Cord (indoor and outdoor)
- Power Cables
- Motor Supply Cables
- Tray-rated Cables
- Control and Signal Cable
- Instrumentation Cables
- VFD and Servo Cables
- Data Communications Cables
- Thermocouple and RTD cables
- Food and Beverage FDA approved cables

Minimum lengths of 10ft unless otherwise indicated

Also available...

Bulk Electrical Hook-up/Building Wire













AutomationDirect has a large selection of quality electrical wire in pre-spoled lengths that meets all NFPA and NEC requirements at great prices.

- MTW Machine Tool Wire
- TFFN Fixture Wire
- THHN General Purpose Building Wire



- Over 7,100 NEMA rated enclosures from Saginaw, Hammond, Wiegmann, Integra, Quadritalia and AttaBox
- Many types of metallic and non-metallic enclosures
- Modular enclosures
- Data communication racks
- Sanitary enclosures
- Heating, cooling and climate control
- Lighting
- Wide selection of enclosure accessories

Enclosures

| Enclosures | AutomationDirect Wiegmann Price/Part Number | US. | Hoffman Price/Part Number | |
|--|---|---|-----------------------------------|---|
| NEMA 1 wall mount 24 x 24 x 08" | \$296.00 N1C242408LP |  | \$354.01 A-24N248LP |  |
| NEMA 12 wall mount 20 x 16 x 08" | \$376.00 N12201608 |  | \$491.96 A-201608LP |  |
| NEMA 12 free-standing mount 60 x 60 x 12" | \$2,547.00 N12606012 |  | \$2,849.47 A-606012LP |  |
| NEMA 4 wall mount 20 x 20 x 06" | \$514.00 N4202006 |  | \$622.59 A-20H20ALP |  |
| NEMA 4X wall mount 20 x 20 x 06" | \$914.00 SSN4202006 |  | \$1,518.12 A-20H2006SLP |  |
| NEMA 4/12 wall mount 36 x 24 x 08" | \$447.00 N412362408C |  | \$621.03 C-SD36248 |  |

*All prices are U.S. published prices. AutomationDirect prices as of 04/06/2022. Hoffman prices are taken from: www.alliedelec.com 11/5/2020. Prices may vary by dealer. Many other part numbers are available from all vendors.

AutomationDirect.com
Product Engineering and Development



AutomationDirect.com HQ campus and warehouses

AutomationDirect
3505 Hutchinson Rd
Cumming GA 30040

Our campus is located about 45 minutes north of Atlanta, GA, USA. [We're all here](#)
- our sales and technical support teams, purchasing, accounting, and of course our multiple huge warehouses and speedy logistics team.

- Honest up-front pricing (no gimmicks)
- Quick delivery - order today, it ships fast!
- Top technical support as rated consistently by our customers
- FREE shipping on orders over \$49



AutomationDirect.com has been a leader in providing affordable, quality industrial control products to the U.S. and Canada for more than two and a half decades.

As a privately-held efficiently run company, we take pride in serving our customers the way they want to be served - honestly and fairly. We do everything we can to accomplish this day in and day out.



 **AUTOMATIONDIRECT**.com
www.AutomationDirect.com 800-633-0405