Operation and Maintenance Manual

SuperTrak™ GEN3

Modular Conveyor

Revision: 8

www.atsautomation.com

Operation and Maintenance Manual

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Modular Conveyor

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CONDITIONS OF ACCEPTABILITY FOR CERTIFICATION

Track Module Assembly & 180 Deg. Sections

a. Models are evaluated as an integrated component and intended to be a scalable interconnected system provided inline protection fuse(s) are installed on the Bus connection and power supply lines. End user/integrator shall recognize ampacity limits of the bus bar interconnect conductors per the National Electrical Code.
b. Models are to be powered by a certified SuperTrak motor power supply Assy / 25270337.
c. Models are evaluated with an optional accessory cable "Control Panel to Section Interconnect" Assy / 25240470 1.2 m, Assy / 125362696 2.0 m or Assy / 25221246 6.5 m (user can adjust the length of the 6.5 m).
d. The equipment is not evaluated for use in hazardous (classified) environments.
e. The equipment is not evaluated for use with flammable liquids or materials.
f. The equipment has been investigated for continuous operation at a maximum operating ambient temperature of 40°C at an altitude up to 2000 m and relative humidity levels from 5-90%, non-condensing.
g. The equipment has been evaluated for indoor use in pollution degree 2 environments.
h. The equipment is to be installed by qualified personal in accordance with local and national installation/wiring requirements.
i. The motor's epoxy resin (potting) is not investigated for flammability (UL94).
j. Emergency stop, disconnect devices for the SuperTrak system are provided via the mains supply to the SuperTrak motor power supply. Integration and validation of system wide emergency stops are the responsibility of the end user/integrator.
k. Functional Safety requirements are the responsibility of the end user/integrator of this component.

SuperTrak Motor Power Supply

a. SuperTrak power supply is evaluated as an integrated component and intended to be a scalable interconnected system provided inline protection fuse(s) are installed on the bus connection and power supply lines. End user/integrator shall recognize ampacity limits of the bus bar interconnect conductors per the National Electrical Code.
b. A suitable cable is to be provided for the plug/socket component (industrial twist lock) for connecting the mains supply.
c. SuperTrak motor power supply is for use only with a SuperTrak track module Assy (1060387 or 1060391) & SuperTrak 180 deg. section Assy 1060638.

d. SuperTrak motor power supply is powered from an ATS SuperTrak conveyor control panel Assy / 25202161 or from other appropriate power source with certified (North American listed) overcurrent protection, 10A UL489 breaker, type CC fuses or Type J fuses.
e. The equipment is not evaluated for use in hazardous (classified) environments.
f. The equipment is not evaluated for use with flammable liquids or materials.
g. The equipment has been investigated for continuous operation at a maximum operating ambient temperature of 40°C at an altitude up to 2000 m and relative humidity levels from 5-90%, non-condensing. All permitted mounting orientations. See *Permitted mounting orientations* on page 241.
h. The equipment has been evaluated for indoor use in pollution degree 2 environments.
i. The equipment is to be installed by qualified personal in accordance with local and national installation/wiring requirements.
j. Emergency Stop, disconnect devices for the SuperTrak system are provided via the mains supply to the SuperTrak motor power supply. Integration and validation of system wide emergency stops are the responsibility of the end user/integrator.
k. Functional Safety requirements are the responsibility of the end user/integrator of this component.

SuperTrak GEN3 Conveyor Control Panel

a. SuperTrak GEN3 conveyor control panel is evaluated as, and is intended only to be used as, an integrated component of the SuperTrak GEN3 conveyor.
b. SuperTrak GEN3 conveyor control panel is evaluated with scalable supply branches to supply 1 – 12 SuperTrak motor power supplies Assy / 25270337.
c. The equipment is not evaluated for use in hazardous (classified) environments.
d. The equipment is not evaluated for use with flammable liquids or materials.
e. The equipment has been investigated for continuous operation at a maximum operating ambient temperature of 40°C at an altitude of up to 2000 m and relative humidity levels from 5-90%, non-condensing.
f. The equipment has been evaluated for indoor use in pollution degree 2 environments.
g. The equipment is to be installed by qualified personal in accordance with local and national installation/wiring requirements. Adequate ground/bond connection is to be provided to the remote connected SuperTrak motor power supplies (<100mohms tested at 10Amps or greater).
h. Emergency stop, disconnect devices for the SuperTrak system are provided within this control panel. Integration and validation of system wide emergency stops are the responsibility of the end user/integrator.
i. Functional safety requirements are the responsibility of the end user/integrator of this component and the integrated system that consists of the ATS SuperTrak conveyor system.

Model Variations:

Certified models SuperTrak GEN3 track module Assy / 1060387 or 1060391 are also represented as 8FZAM1.0A.A000-1 / SuperTrak straight segment. Models are further supplemented by EN standards as models 25220499.

Certified model SuperTrak GEN3 180 deg section Assy / 1060638 is also represented as 8FZAM2.0A.A000-1 / SuperTrak curve segment.

Certified model SuperTrak motor power supply Assy / 25270337 is also represented as 8FZAP0.00.0100-1 / SuperTrak motor power supply. Modes are further supplemented by EN standards as models 25195828, 25270354.

Table of Contents

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Preface

This section provides the following SuperTrak conveyor documentation package information:

Documentation Package

ATS supplies the following documentation and software for the SuperTrak conveyor:

- SuperTrak™ GEN3 Operation and Maintenance Manual
- TrackMaster software (with built-in help)
- Design package, which includes:
    - Electrical drawings
    - Mechanical drawings

Style Conventions

This document uses the following styles to indicate different types of information:

- *Italic text* indicates a document title.
- *Italic text with color* indicates hypertext reference information. For example, a web site link or a link to content within the current document.
- **Bold text** indicates a button or control that requires action during a procedure.
- **Grey Courier text** indicates on-screen messages; for example, a fault or warning message on an HMI screen.
- `Courier text` indicates software code.
- CAPITALIZED TEXT indicates an operational state; for example, ON, OFF, MANUAL mode.
- First Letter Capitalized Text indicates the name of an HMI screen, screen menu, or HMI message.
- Bulleted list indicates items where order is not relevant.
- Numbered list indicates a step-by-step procedure where order is relevant.

Special Notations

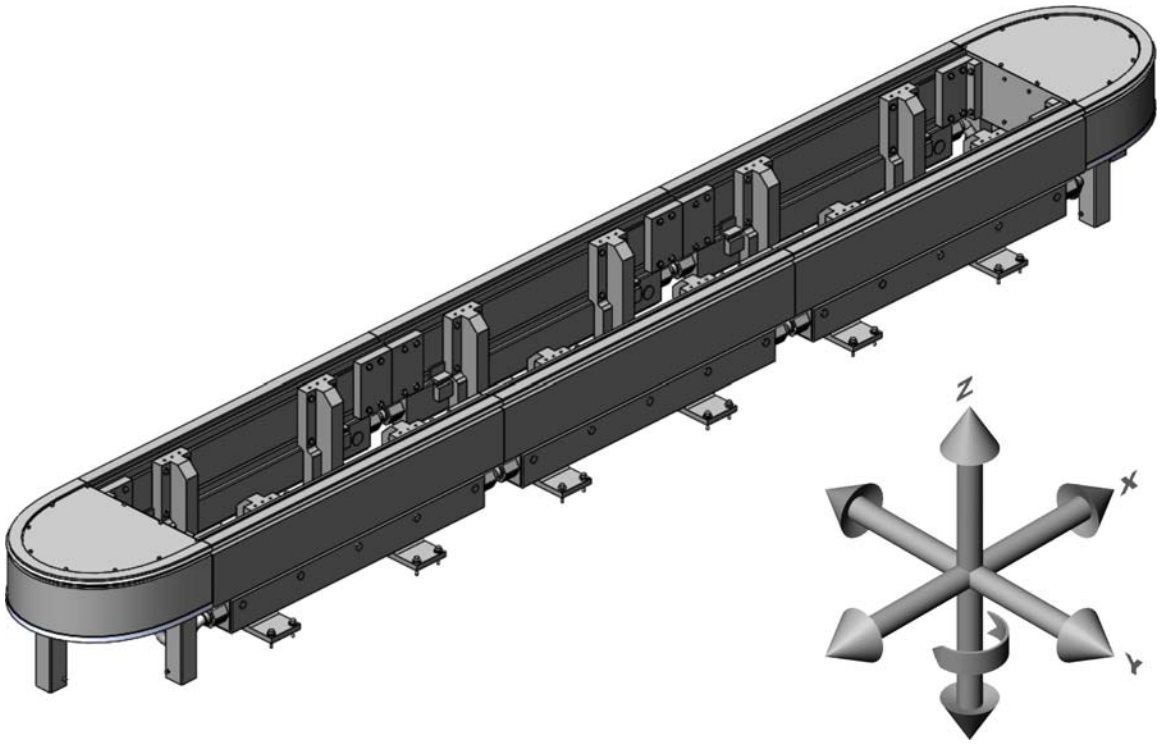
This document uses five (5) levels of notation:

⚠ DANGER	Warns that failure to comply results in death or serious injury.
⚠ WARNING	Warns that failure to comply could result in death or serious injury.
⚠ CAUTION	Warns that failure to comply could result in minor or moderate injury.
NOTICE	Warns that failure to comply may result in property damage.
	Provides additional information, emphasizes a point, or provides a tip.

Frame of Reference

- The SuperTrak conveyor image is for representational purposes only. It may not reflect the system you have installed.
- The direction of travel on each axis (positive or negative) varies based on configuration.

This document describes tooling movement using the following frame of reference:



Referenced Terms

This section defines terms that are used throughout this document.

Term	Description
SuperTrak conveyor	Represents the SuperTrak™ GEN3.
TrackMaster	Represents the TrackMaster™ software.
Power supply	Represents the SuperTrak conveyor power supply.
Control panel	Represents the SuperTrak conveyor control panel.
Pallet	Represents the SuperTrak conveyor pallet.
User	Represents all levels of SuperTrak conveyor users. It includes operators, maintenance personnel, and technicians.
Operator	Represents a user with basic mechanical knowledge.
Maintenance Personnel	Represents a user with knowledge about routine cleaning, and lubrication procedures. They are expected to complete adjustments that are within validated ranges.
Technician	Represents a user that specializes in a discipline such as electrical, mechanical, or programming. They are expected to complete complex SuperTrak conveyor procedures; such as, replacement procedures or adjustments that are outside of validated ranges.

See *Glossary* on page 243 for additional definitions.

Safety Information

This section provides the following important safety information:

Read this information thoroughly and completely before operating, or maintaining the SuperTrak conveyor.

Training

SuperTrak conveyor training packages are available on request. Contact the ATS Technical Services Department for additional information.

General Safety Rules

Everyone:

- Learn how automated equipment works.
- Understand the potential dangers of automated equipment before operating it.
- Energy sources must be shutdown, locked out, and tagged out before preventive maintenance, adjustment, or service.
- Understand and be aware of potential energy sources that exist in the SuperTrak conveyor after lockout and tagout (for example; the strong permanent magnets when pallets are removed from the SuperTrak conveyor).
- Long hair must be tied up and kept away from SuperTrak conveyor devices to prevent entanglement.
- Do not wear loose clothing or dangling jewelry while operating or maintaining the equipment, to prevent entanglement.
- Wear the appropriate personal protective equipment (PPE) for each task.
- Stay away and do not touch any live electrical wires or circuits. Qualified technicians must wear PPE appropriate to the electrical hazard.
- Do not tamper, remove, or make safety controls ineffective.

Operators:

- Do not remove guarding, covers, or shields. Procedures that involve removing guarding, covers or shields must only be performed by a trained, qualified technician.
- Do not operate damaged equipment. Safety and protection features are impaired in damaged equipment. Turn OFF energy sources immediately. Do not use the automated equipment until a trained, qualified technician confirms it is safe to operate.

Technicians:

- Do not perform service work alone. Only attempt internal service or adjustments in the presence of a person capable of rendering first aid.
- Read the current *SuperTrak™ GEN3 Operation and Maintenance Manual* before troubleshooting or servicing the equipment.
- Guarding, covers, or shields must not be removed, except for emergency or maintenance purposes.
- If guarding is removed, clearly communicate (for example, with signs or barriers) that the guarding is not functional.
- Guarding around moving devices that has been removed, must be replaced.

- Do not install substitute parts or make any product modifications that are not authorized by ATS because this may introduce new hazards.
- Use insulated tools when working with electrical equipment. Make sure qualified electrical technicians wear appropriate PPE when completing live electrical work according to the hazard assessment.
- Remove electrical power before changing fuses, or use approved fuse-pullers.
- Never use jumper wires or fuse substitutes to replace fuses.
- Replace the line fuses with fuses of the same voltage, current rating, and type. Do not use repaired fuses or short-circuited fuse holders.
- Be prepared to handle electrical fires by keeping dry powder or carbon dioxide extinguishers on hand at all times.
- Verify that all fittings and connections are tight once repair work is complete.
- Do not use compressed air to clean SuperTrak conveyor devices. Use clean, lint-free cloths or a vacuum cleaner. Compressed air causes dirt and lubricants to become airborne and contaminate assembly products and tooling.

Personal Protective Equipment

At a minimum, all users are recommended to wear the following personal protective equipment (PPE) when working with or around the SuperTrak conveyor:

- Safety glasses that meet the specific standard requirements the local jurisdiction:
  - North America - ANSI Z87.1
  - Europe - EN 166 F
- Safety shoes that meet the specific standard requirements the local jurisdiction:
  - North America - ASTM F2413
  - Europe - EN ISO 20345 S1

Hazardous Energy

Any energy source that presents a risk of injury to a person working on equipment is considered a hazardous energy source. The SuperTrak conveyor contains the following hazardous energy sources:

- *Electrical* on page 8
- *Mechanical* on page 9
- *Thermal Hazards* on page 10

To prevent accidental or unauthorized start-ups, always lockout and tagout hazardous energy before completing any service or maintenance procedures. Lockout and tagout procedures control hazardous energy supplies, making the SuperTrak conveyor inoperable.

See *Lockout and Tagout* on page 11.

Electrical

⚠WARNING Servicing an electrical panel that is still connected to its power source may cause injury or death. Unless directed otherwise, turn the **main power disconnect switch** to the OFF position. Lock out and tag out the switch before accessing and servicing the electrical panel. Only qualified electrical technicians should perform service on the electrical panel.

See *Lockout and Tagout* on page 11.

The control panel contains high voltages. Electrical hazards may be present from damaged or broken wires, open electrical boxes, or open control panels.

The control panel is designed to be integrated with a main electrical panel, which includes a **main power disconnect** switch. Use the **main power disconnect** switch to turn OFF SuperTrak conveyor power, but maintain UPS power in the control panel. Use the **SuperTrak conveyor power disconnect** switch to isolate the SuperTrak conveyor power and turn the UPS OFF. If an electrical hazard occurs:

1. Stop the SuperTrak conveyor.
2. Turn the **main power disconnect switch** to the OFF position.
3. Turn the **SuperTrak conveyor power disconnect** switch to the OFF position.
4. Allow stored energy of the UPS to discharge until the LED indicator of the UPS is not illuminated.

Do not turn ON power to the SuperTrak conveyor until an electrical technician has corrected the situation.

See *Energy Controls* on page 103.

Mechanical

⚠WARNING

Servicing mechanical components or devices while still connected to energy sources may cause injury. As required for access and service of the mechanical component, open the safety circuit or turn the **main power disconnect switch** to the OFF position and lock out and tag out the **main power disconnect switch**. Only qualified technicians should access mechanical components or devices.

Understand and be aware of stored energy sources (for example; stored electrical energy, or strong magnetic field) that exist in the SuperTrak conveyor after lockout and tagout.

See *Lockout and Tagout* on page 11.

⚠CAUTION

- The magnetic field generated by the pallets can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the pallet and the implant location. The permanent magnets in the pallets have a strong magnetic field. When the pallets are installed on the SuperTrak conveyor, the magnetic field around the pallet is low. When a pallet is removed from the SuperTrak conveyor, the permanent magnets are exposed and the magnetic field is very strong.
- Always install a keeper plate on the pallet magnet when a pallet is removed from the SuperTrak conveyor to reduce the magnetic field to a safe level.
- The magnetic field of the SuperTrak conveyor may induce magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment and magnetic data carriers can also be affected by magnetic fields.

The SuperTrak conveyor has mechanical hazards from moving tooling components or devices. Crushing, pinching, and impact injuries can result from devices actuated by potential or kinetic energy in the form of rotational, linear force, or gravity.

The magnetic field generated by the pallets can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the pallet and the implant location. The permanent magnets in the pallets have a strong magnetic field. When the pallets are installed on the SuperTrak conveyor, the magnetic field around the pallet is low. When a pallet is removed from the SuperTrak conveyor, the permanent magnets are exposed and the magnetic field is very strong.

The magnetic field of the SuperTrak conveyor may induce magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment and magnetic data carriers can also be affected by magnetic fields.

In the event of a mechanical hazard, turn the **main power disconnect switch** to the OFF position. Do not turn ON power to the SuperTrak conveyor until a qualified technician has corrected the situation.

Thermal Hazards

⚠WARNING

Allow adequate time for hot surfaces to cool before commencing work. Wear the appropriate PPE when working on or near the thermal hazard.

Use a non-contact thermometer to verify the temperature.

NOTICE

The lifespan of some SuperTrak components may be compromised when temperature-related TrackMaster configuration parameters are adjusted from the default value.

For optimum lifespan of SuperTrak conveyor component, do not increase the default value of the electronics temperature configuration parameter, and use caution when increasing the coil temperature configuration parameter:

- Coil Temperature Limit (°C); default=60, hard limit=90.
- Electronics Temperature Limit (°C); default=60, hard limit=70.

The SuperTrak conveyor may include thermal hazards if temperature-related TrackMaster configuration parameters are adjusted from the default value.

Thermal hazards include any excessively hot or cold point of contact. Thermal hazards can cause contact injuries to exposed skin, or create a fire hazard. Use shielding to avoid contact burns. Dissipate thermal to make sure the point of contact is at a moderate temperature before working near it.

See *Access the TrackMaster Built-in Help* on page 126 to access the TrackMaster built-in help for more information about configuration parameters.

Lockout and Tagout

DANGER Understand and be aware of stored energy sources (for example; uninterrupted power supply (UPS) energy, or magnetism) that exist in the SuperTrak conveyor after lockout and tagout.

See *Hazardous Energy* on page 8.

This lockout and tagout information is provided for reference only. Follow the lockout and tagout procedures listed below or use an applicable lockout tagout procedure that complies with local requirements.

Lockout and tagout neutralizes all sources of SuperTrak conveyor energy, making it inoperable and preventing accidental or unauthorized energizing of the SuperTrak conveyor. Follow an approved lockout and tagout procedure before maintenance or service, or where unexpected SuperTrak conveyor startup or the release of stored energy may cause injury.

Lock Prerequisites

An acceptable lock should:

- Be provided by an employer. Ensure standardization (size, shape and color) and purchase from a reputable manufacturer.
- Be able to withstand heat, cold, and humidity.
- Be strong enough that it cannot be removed with heavy force.
- Not be a combination lock.
- Have only one (1) key and are not able to be opened using any other key.

Tag Prerequisites

A tag must never be used as a substitute for a lock. A tag is a visual warning that does not provide physical protection.

A good tag should:

- Have a clear warning.
- Be easy to read (that is; legible and understandable).
- Have the identification mark of the person who applied it.
- Be secure enough to prevent accidental removal, and durable enough to withstand extreme temperatures, fumes, and caustic chemicals.
- Be secured with something similar to a nylon cable tie that is self-locking, can be attached by hand, can resist release with less than 23 kgs (50 lbs) of pressure, and cannot be reused.

Lockout and Tagout Locations

The control panel is designed to be integrated with a main electrical panel that includes a main power disconnect switch.

To lock out SuperTrak conveyor hazardous energy, complete one (1) of the following:

- Lockout and tagout the **main power disconnect** switch when the SuperTrak conveyor power must be OFF, but the SuperTrak conveyor UPS power can be ON.
- Lockout and tagout the **main power disconnect** switch and the **SuperTrak conveyor power disconnect** switch when SuperTrak conveyor power and UPS power must be OFF.

See *SuperTrak Conveyor Power Disconnect Switch* on page 103, *SuperTrak Conveyor Power ON Behavior* on page 123, and *SuperTrak Conveyor Power OFF Behavior* on page 124.

Label Descriptions

Labels are applied throughout the SuperTrak conveyor to warn users of possible or certain hazards. Read this section carefully and comply with the required actions, warnings, or prohibitions.

Identification Label

An electrical nameplate is located on the door of the control panel. It specifies the SuperTrak conveyor power requirements and provides the electrical drawing reference number (25202161).

Maintain correct SuperTrak conveyor power requirements. If power levels fall below or rise above the requirements specified on the identification label, the SuperTrak conveyor will not work properly and damage may occur.

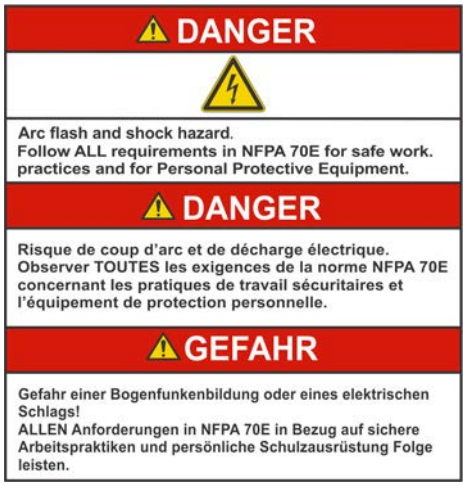
Marking Labels

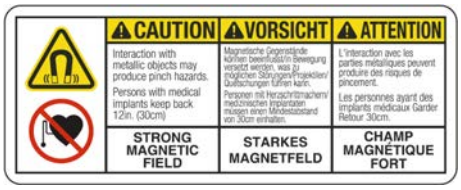
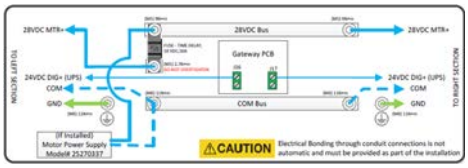
Label	Label Name	Description
	Ground	This label is affixed next to grounded connections. The grounding conductor is the current path that enables protective devices, such as circuit breakers and fuses to operate when a fault occurs.

Mandatory Action Labels

Label	Label Name	Description
	Read and Understand the Manual	Users should read the Operation and Maintenance Manual before operating the SuperTrak conveyor. Technicians should read and understand the Operation and Maintenance Manual before conducting any work or service in the referenced area. Personal injury may occur if the label warning is not observed. Label number: 6017X-ISO.
	Mandatory Lockout and Tagout	Personal injury may occur if the label warning is not observed. See *Lockout and Tagout* on page 11. Label number: 6013X-ISO.

Other Labels

Label	Label Name	Description
	Danger - Arc Flash and Shock	This label warns users of arc flash and shock hazard. Follow ALL requirements in NFPA 70E for safe work practices and for Personal Protective Equipment. Label number: C459-53.
	Warning - UPS Voltage Present	This label warns users that UPS voltage is present when power is OFF. Contact may cause electric shock or burn. Turn OFF and lock out UPS output power before servicing. Label number: C459-54.

Label	Label Name	Description
	Warning - Hazardous Voltage	This label warns users of electrical energy. Only qualified electrical technicians should complete work in these areas. Disconnect power before opening the electrical cabinet working within. Close the electrical cabinet before turning the power ON. Label number: C459-49.
	Caution - Strong Magnetic Field	This label warns users of a strong magnetic field. Interaction with metallic objects may produce pinch hazards. Persons with medical implants must keep back 30 cm (12 in.). Label number: 125309778.
	Wiring pin-out overview	This label provides wiring information for the straight section and 180 deg. section. Label number: 4788755

Label Locations

This section describes the location of the safety labels on the SuperTrak conveyor.

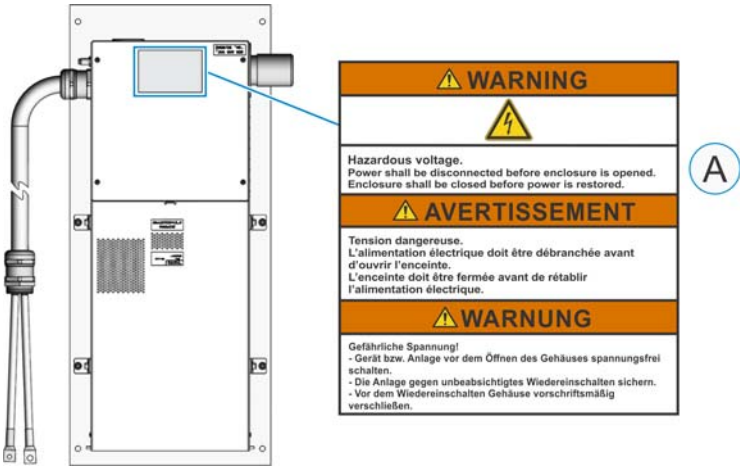
Pallet Label

The pallet has the following label:

ID	Label	Location
A	Caution - Strong Magnetic Field Label number: 125309778. See *Other Labels* on page 14.	Side of each pallet.

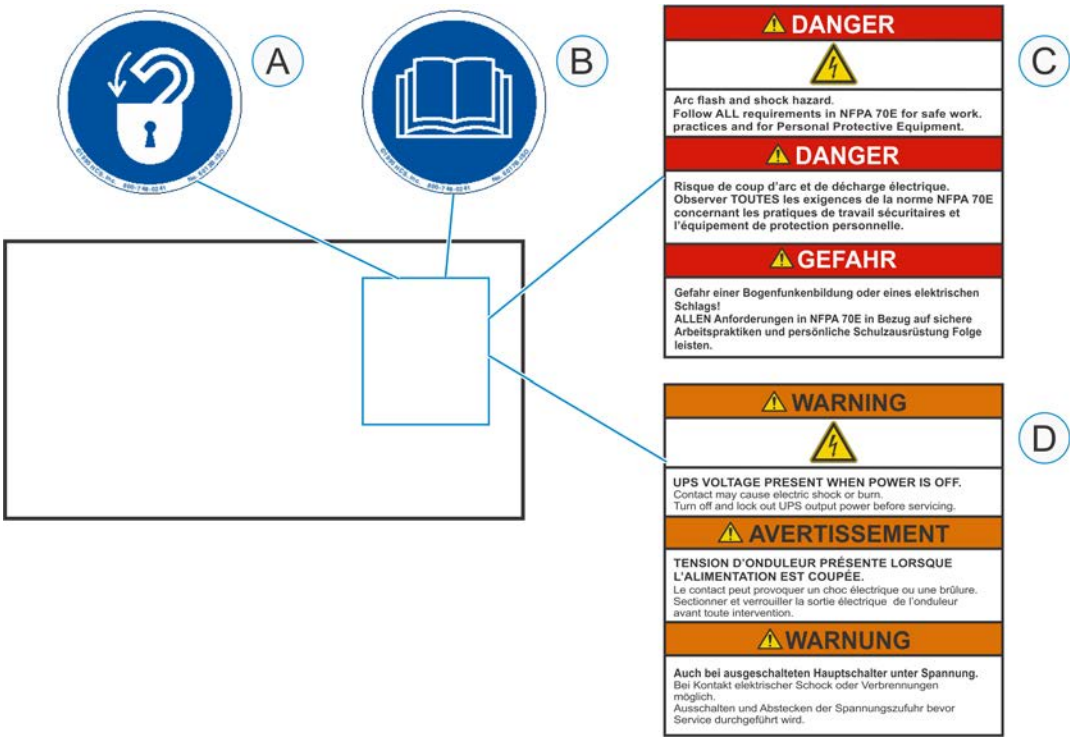
Power Supply Label

This power supply has the following label:



ID	Label	Location
A	Warning - Hazardous voltage. Label number: C459-49. See *Other Labels* on page 14.	Side of each pallet.

Control Panel Labels



ID	Label	Location
A	Mandatory Lockout and Tagout Label number: 6013X-ISO. See *Mandatory Action Labels* on page 13.	Outside door of the control panel.
B	Read and Understand the Manual Label number: 6017X-ISO. See *Mandatory Action Labels* on page 13.	
C	Danger - Arc Flash and Shock Hazard Label number: C459-53. See *Other Labels* on page 14.	
D	Warning - UPS Voltage Present Label number: C459-54. See *Other Labels* on page 14.	

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SuperTrak Conveyor Overview

The SuperTrak conveyor is a high-speed pallet transport system. It allows the direction, acceleration, speed, and position of each pallet to be individually programmed. Integrated collision avoidance eliminates pallet-to-pallet contact and provides auto-queuing at process stations.

This section provides the following overview information about the SuperTrak conveyor:

Features

Some features of the SuperTrak conveyor include:

- Integration flexibility: works with any programmable logic controller (PLC)
- Fast indexing: maximum speed of 4 m/s (13.1 ft./s)
- Acceleration: 4G for a 1 kg (2.2 lb) payload, 1G for a 10 kg (22 lb) payload
- Precision pallet control: stop repeatability of ±0.01 mm (0.00039 in.)
- High payload: each pallet can hold 10+ kg (22+ lb)[1]
- Scalable: modular system provides design flexibility
- Sealed system: resistant against debris from harsh environments and liquid-sealed
- Low maintenance: has few moving parts

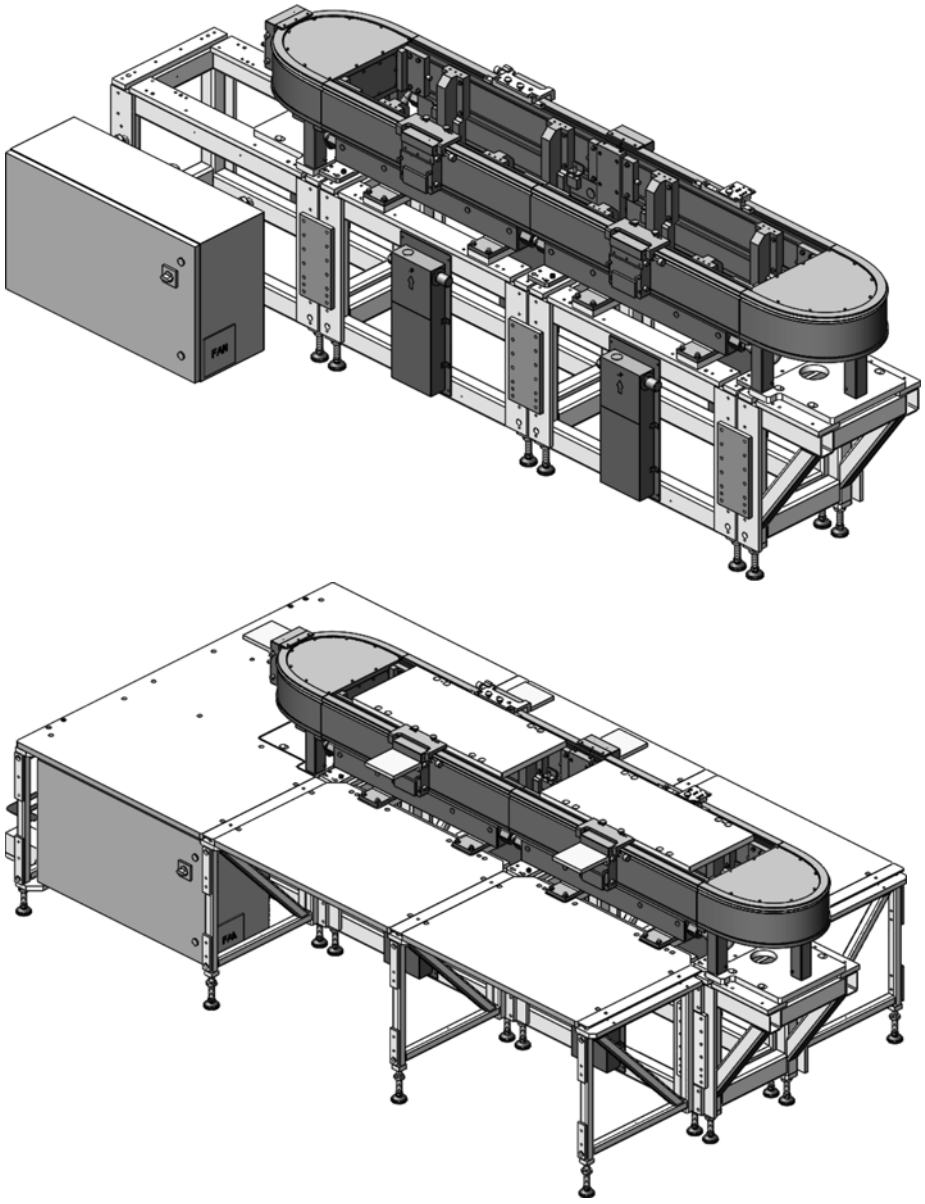
See *Specifications* on page 237 for a complete list of SuperTrak conveyor specifications.

1.Higher payloads are possible. Contact ATS with application details.

SuperTrak Conveyor Configurations

The standard SuperTrak conveyor is available in modular sections, to allow for various SuperTrak conveyor configurations.

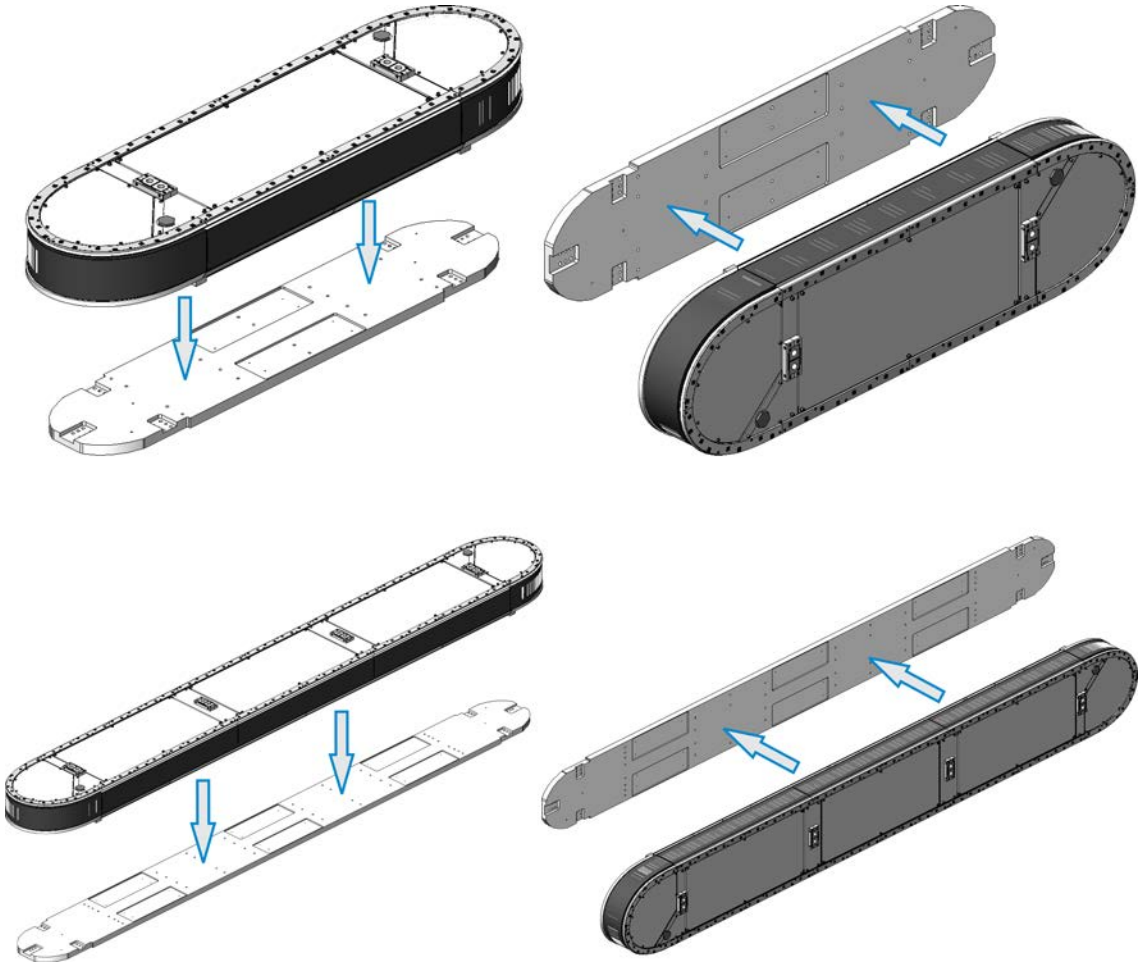
For example:



See *Calculate the Installation Space* on page 46 for additional information about the modular SuperTrak conveyor sections.

The SuperTrak conveyor can also be comprised of sections with low stands in a horizontal or vertical (also known as over/under) configuration. For this method, the SuperTrak conveyor is mounted on a plate.

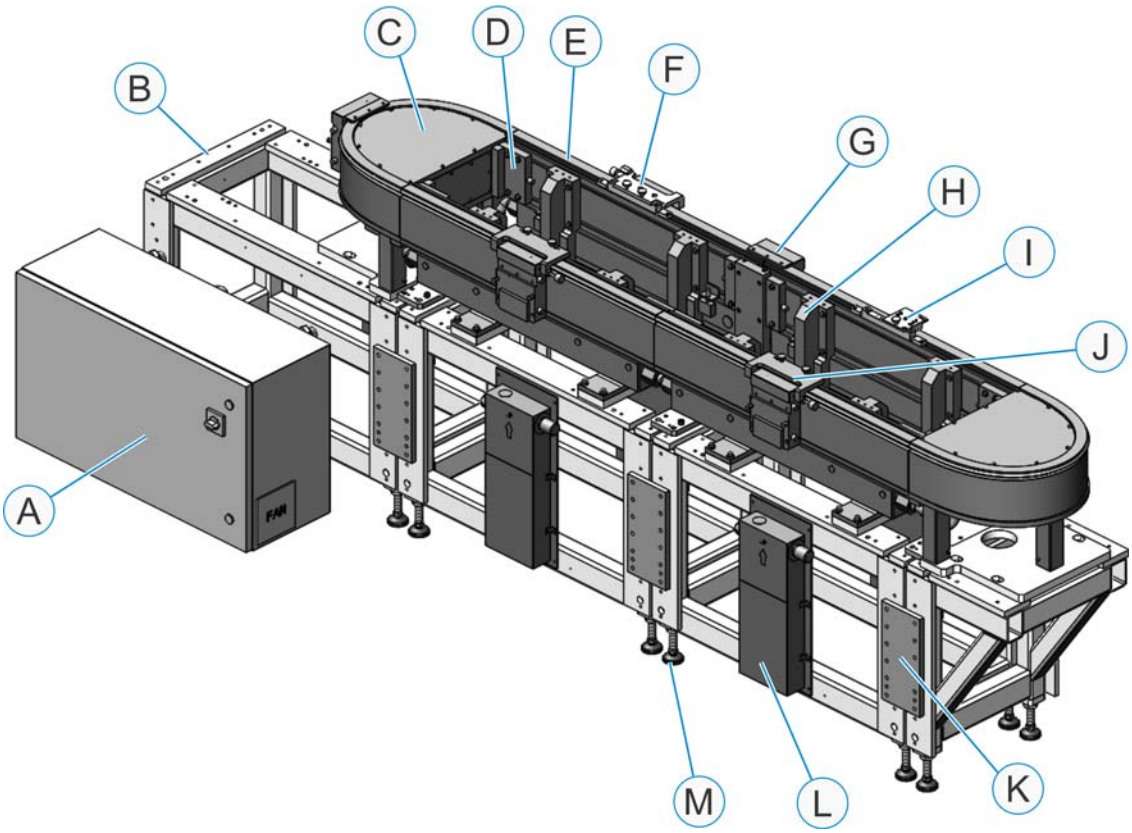
For example:



See *Straight Section with RME Data Sheet* on page 281, and *180 Deg. Section (500 mm) with LS Data Sheet* on page 285 for additional information about these SuperTrak conveyor sections.

SuperTrak Conveyor Components

SuperTrak conveyor components are configured, based on the required application. This illustration provides an example of one configuration. It describes the components that a typical SuperTrak conveyor includes.



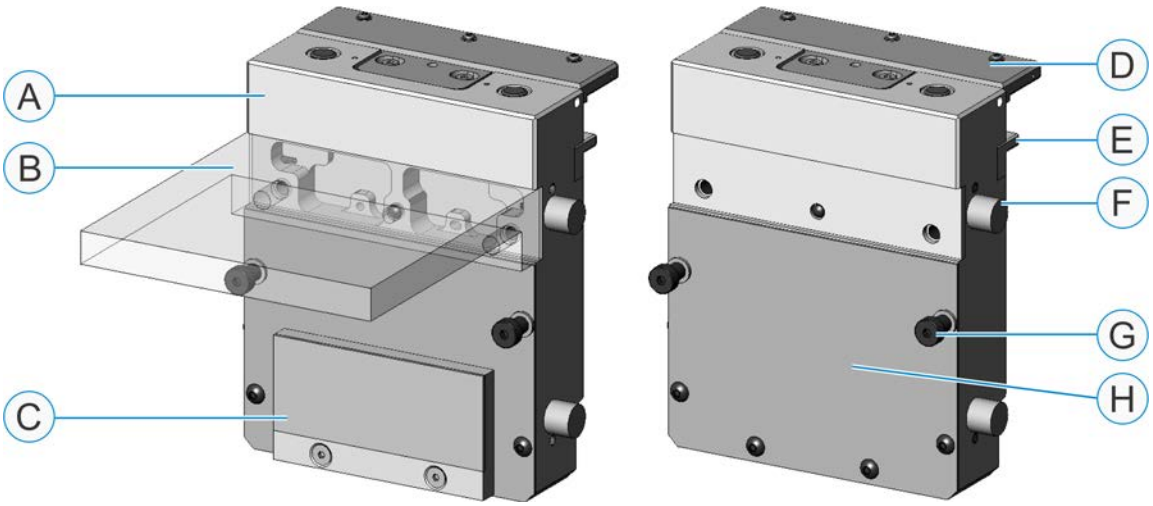
A	Control panel See *Control Panel* on page 38.	**F**	Pallet See *Pallet* on page 23.
B	Straight section See *Straight Section* on page 25.	**G**	Wedge adjust
C	Power supply See *Power Supply* on page 40.	**H**	Stand with height adjustment
D	Connection plate	**I**	180 deg. section See *180 Deg. Section* on page 34.
E	Leveling foot	**J**	Proloto base (frame)

Pallet

The pallet provides a transport platform for carrying production parts along a SuperTrak conveyor. The pallet shelf (not included) is customized for the customer product.

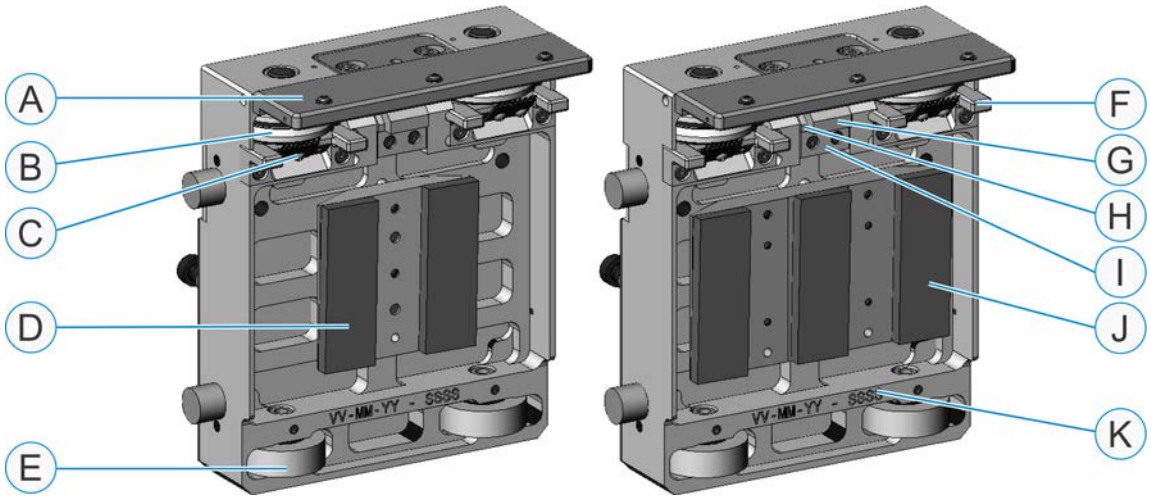
See *Pallet Data Sheet* on page 267 for additional information.

Pallet - Front View



ID	Component Name	Description
A	Pallet base	The main body of the pallet.
B	Pallet shelf (not included)	Carries the customer product from station to station. The pallet shelf is customer-specific. The illustration is provided for reference only.
C	IR tag (optional)	Provides a unique pallet number for each pallet for fixture tracking.
D	Encoder strip bracket	Contains the encoder strip.
E	Anti-tip block (1 of 2)	Protects the pallet during unexpected impact and contains the anti-static brush.
F	Bumper	Provides cushion to the pallet when pallets are manually moved. Bumpers can be modified or extended to accommodate wider pallet shelves.
G	Shoulder screws (1 of 2)	Provides pallet removal tool connection points, which are used during pallet installation and removal.
H	Front cover plate	Provides access to the magnet assembly screws.

Pallet - Back View



ID	Component Name	Description
A	Encoder strip bracket	Contains the encoder strip.
B	V-wheel (1 of 2)	Travels on the upper v-rail of the straight section.
C	Anti-static brush (1 of 2)	Dissipates static that is created during pallet motion.
D	2-Magnet assembly	Supports the pallet against the upper v-rail, and generates the forces needed to control pallet motion. All pallets on the SuperTrak conveyor are either 2-magnet or 3-magnet.
E	Flat wheel (1 of 2)	Travels on the flat wear strip of the straight section.
F	Anti-tip block (1 of 2)	Protects the pallet during unexpected impact and keeps the pallet on the SuperTrak conveyor when unplanned Z-axis forces are applied to the pallet. It contains the anti-static brush.
G	Lubrication felt	Lubricates the upper v-rail of the straight section and 180 deg. section.
H	Lubrication holder	Contains the spring-loaded lubrication felt.
I	Lubrication locking block	Secures the lubrication holder.
J	3-Magnet assembly	Supports the pallet against the upper v-rail, and generates the forces needed to control pallet motion. All pallets on the SuperTrak conveyor are either 2-magnet or 3-magnet.
K	Serial number	Provides the serial number of the pallet.

Straight Section

Straight sections are connected in series to create a path for pallets to travel on.

Straight Section Power Options

If a pallet moving at high speed transfers from a standard straight section to a low power straight section, the electro-magnetic field aggressively stops the pallet, even when there is no power.

Two (2) types of straight sections are available: standard, and low power (optional).

In a typical SuperTrak conveyor all straight sections are standard. In applications where operators need to interact directly with a pallet, one or more adjacent straight sections can be low power.

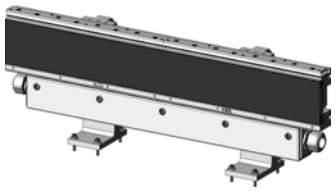
The following table summarizes the features of each type of straight section:

Feature	Standard Straight Section	Low Power Straight Section
Benefits	Provides fast, high-precision part handling.	Allows for applications to be designed that allow operators to interact directly with a pallet.
Input voltage	28VDC	15VDC
Maximum acceleration	4g for a 1 kg (2.2 lb) payload, 1g for a 10 kg (22 lb) payload	0.1g for a 10 kg (22 lb) payload
Maximum velocity	4 m/s (13.1 ft./s)	0.15 m/s (0.49 ft./s)

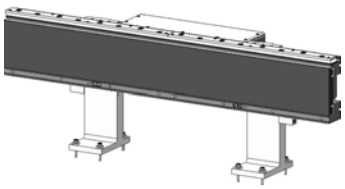
Straight Section Electronics Options

Straight sections are available with the electronics panel at the front or rear:

- Front mounted electronics (FME)

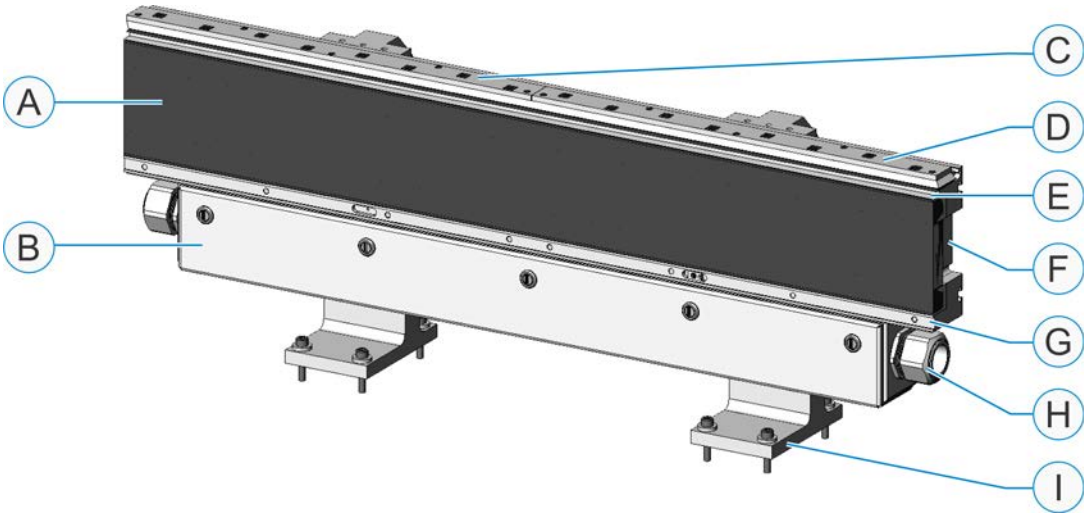


- Rear mounted electronics (RME)



See *Straight Section with FME Data Sheet* on page 279, and *Straight Section with RME Data Sheet* on page 281 for additional information.

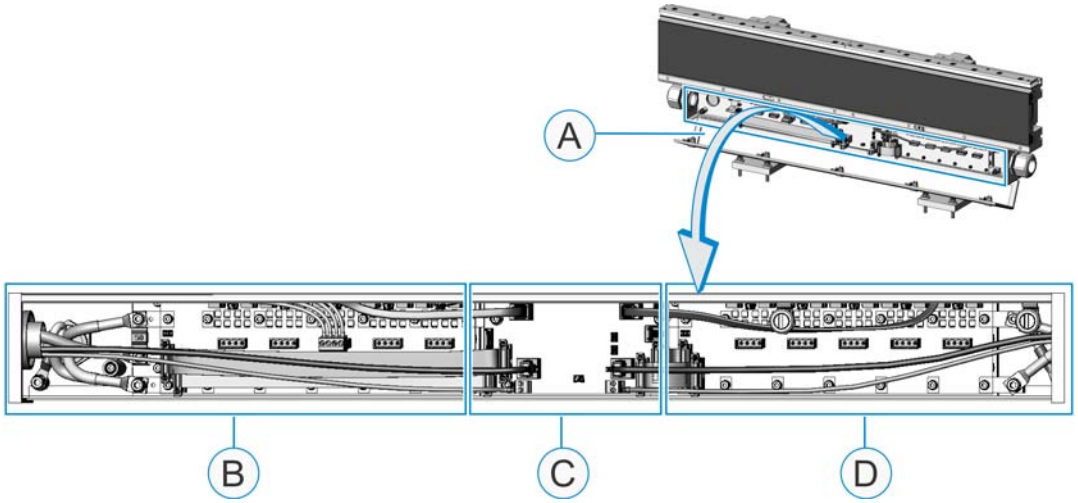
Straight Section - Electrical Door Closed



ID	Component Name	Description
A	Linear motor	Produces the electromagnetic force that propels the pallets. The linear motor includes: • 20 potted coils. • An iron core lamination assembly. See *Coils* on page 33 for information about coil numbering.
B	Electrical door (closed)	Encloses the electrical components. Straight sections are available with front mounted electronics (FME) as shown, or rear mounted electronics (RME).
C	Left encoder bracket	Measures the pallet position using encoder read heads. See *Encoder Brackets* on page 32 for information about encoder numbering.
D	Right encoder bracket	
E	Upper v-rail	Provides a track for the pallet V-wheels to travel on.
F	Track structure	Aluminum structure that forms the base of a track. All other track module components are mounted to the track structure.
G	Flat wear strip location	Provides a smooth surface for the pallet flat wheels to travel on.
H	Electrical interconnect	Connector for conduit that contains the power and network cables. See *Interconnect Kit (Straight Section to Straight Section)* on page 302.
I	Stand (1 of 2)	Mounts the section to the SuperTrak conveyor frame. Straight sections are available with tall stands (TS) as shown, or low stands (LS).

Straight Section - Electrical Door Open

The coil driver boards in the low power straight section are visually identical to the coil driver boards in the high power straight section, but they are different.



ID	Assembly Name	Description
A	Electrical door (open)	Provides access to the straight section circuit boards.
B	Left coil driver board	See *Left Coil Driver Board* on page 28, or *Left Coil Driver Board with a Power Supply Connected* on page 29.
C	Gateway board	See *Gateway Board* on page 30.
D	Right coil driver board	See *Right Coil Driver Board* on page 31.

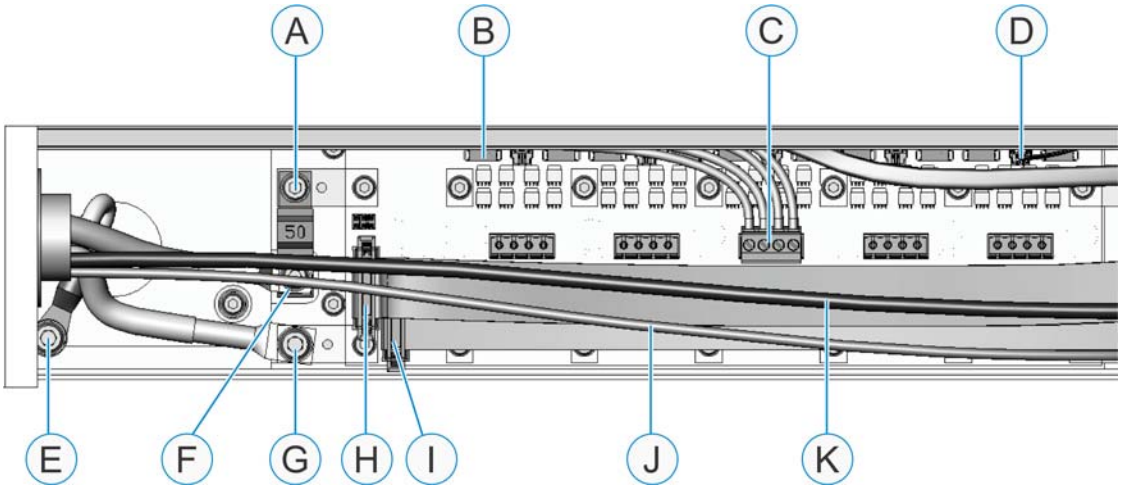
Left Coil Driver Board

NOTICE

- When a low power straight section is installed next to a high power straight section, make sure that a motor power connection is not used.
- If the SuperTrak conveyor is programmed with more than one safety circuit (different guard zones), remove the 28VDC motor power connection from the zone boundaries.

  See the *SuperTrak Conveyor Electrical Drawings* for additional information.

The left coil driver board and the right coil driver board are the same. The connections to the boards are different, so they are referenced as the "left" or "right" coil driver board. The 180 deg. section also includes a "center" coil driver board.



A	Motor power connection for a power supply	**G**	Common connection
B	Coil fuse (1 of 10; one for each coil)	**H**	Ribbon cable connection - connects to the top-left of the coil driver board
C	Coil connection[a] (1 of 5; two coils for each connection)	**I**	Ribbon cable connection - connects to the bottom-left of the coil driver board
D	Thermistor connector (1 of 5)	**J**	24V digital power cable (battery backup)
E	Frame ground connection	**K**	Gateway network cable
F	Motor power connection[b]		

a.The coil wires on the high power section are of larger gauge than the coil wires on the low power section.
b.The motor power connection is 28VDC between two (2) high power sections, and 15VDC between two (2) low power sections. There is no motor power connection between a high power section and a low power section.

Left Coil Driver Board with a Power Supply Connected

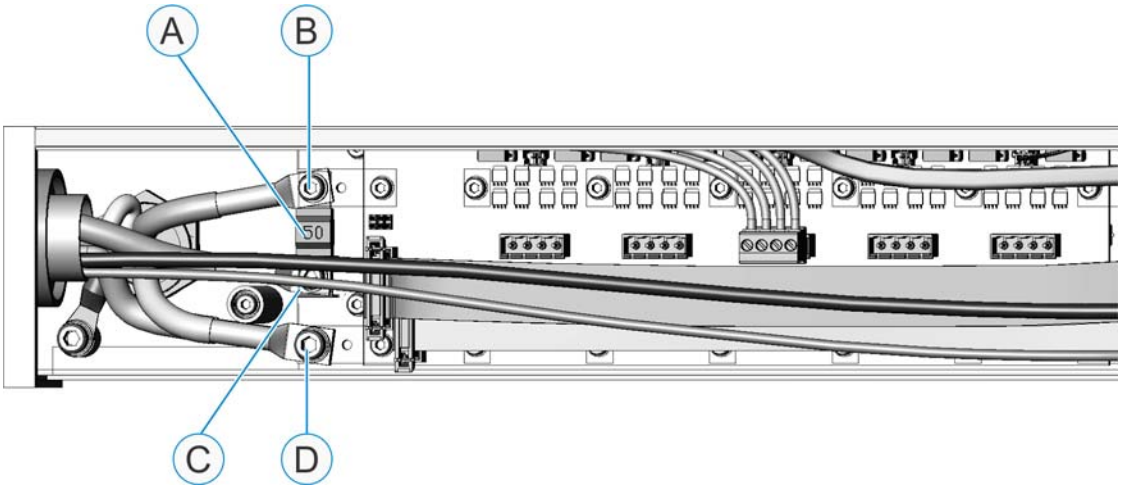
NOTICE

- When a low power straight section is installed next to a high power straight section, make sure that a motor power connection is not used.
- If the SuperTrak conveyor is programmed with more than one safety circuit (different guard zones), remove the 28VDC motor power connection from the zone boundaries.

  See the *SuperTrak Conveyor Electrical Drawings* for additional information.

The left coil driver board and the right coil driver board are the same. The connections to the boards are different, so they are referenced as the “left” or “right” coil driver board. The 180 deg. section also includes a “center” coil driver board.

This drawing indicates the connections that are different on the left coil driver board when a power supply is connected.



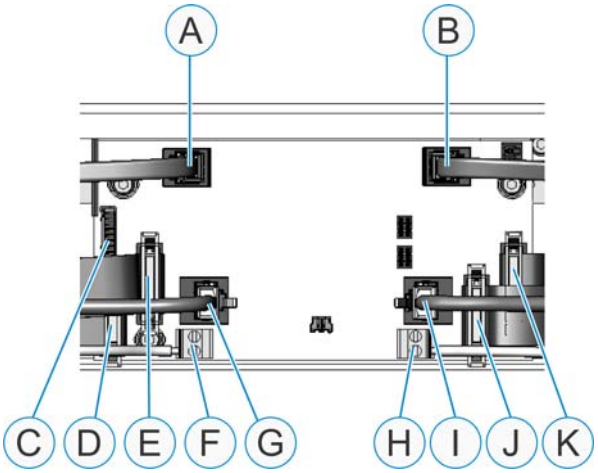
A	50A fuse	**C**	Motor power connection[a]
B	Power supply connection: 28VDC for standard straight section, or 15VDC for a low power straight section	**D**	Common connection

a. The motor power connection is 28VDC between two (2) high power sections, and 15VDC between two (2) low power sections. There is no motor power connection between a high power section and a low power section.

See *Install a Power Supply* on page 148.

Gateway Board

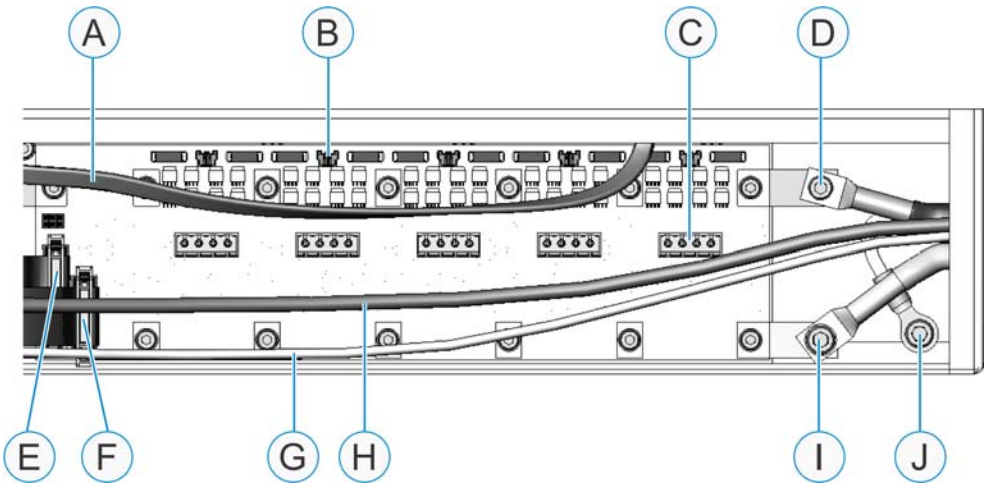
The 24V power consumption of the gateway board for straight sections and 180 deg. sections is 6W.



A	Left encoder cable port	**G**	Gateway network port
B	Right encoder cable port	**H**	24V digital power connection (battery backup)
C	IR reader connection (optional)	**I**	Gateway network port
D	Ribbon cable connection - connects to the bottom-left of the coil driver board	**J**	Ribbon cable connection - connects to the bottom-right of the coil driver board
E	Ribbon cable connection - connects to the top-left of the coil driver board	**K**	Ribbon cable connection - connects to the top-right of the coil driver board
F	24V digital power connection (battery backup)		

Right Coil Driver Board

The left coil driver board and the right coil driver board are the same. The connections to the boards are different, so they are referenced as the “left” or “right” coil driver board. The 180 deg. section also includes a “center” coil driver board.



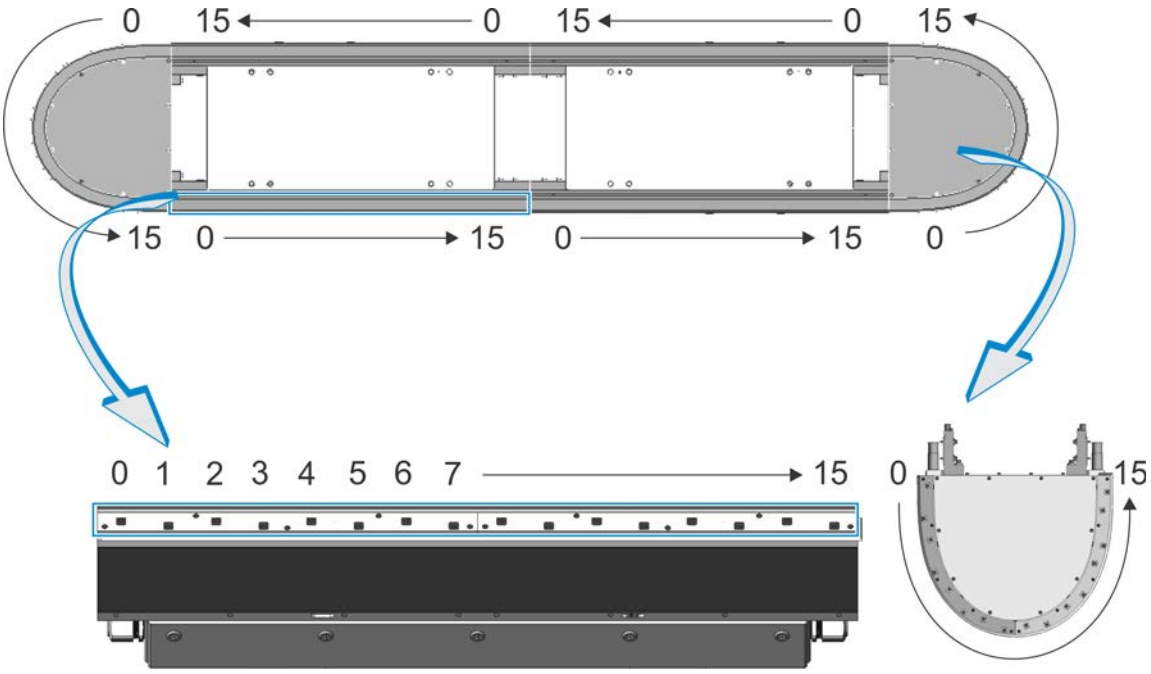
A	Right encoder cable	**F**	Ribbon cable connection - connects to the bottom-right of the coil driver board
B	Thermistor connector (1 of 5)	**G**	24V digital power cable (battery backup)
C	Coil connection (1 of 5: two coils for each connection)	**H**	Gateway network cable
D	Motor power connection[a]	**I**	Common connection
E	Ribbon cable connection - connects to the top-right of the coil driver board	**J**	Frame ground connection

a.The motor power connection is 28VDC between two (2) high power sections, and 15VDC between two (2) low power sections. There is no motor power connection between a high power section and a low power section.

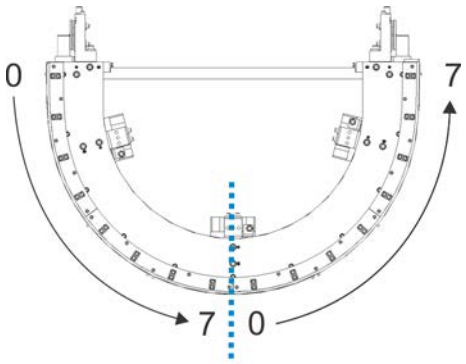
Encoder Brackets

Each straight section and 180 deg. section (500 mm) has two (2) encoder brackets: a left encoder bracket and a right encoder bracket. Every encoder bracket has eight (8) encoder read heads, which look like black squares on the top of the encoder bracket. The encoders are used for pallet position feedback.

Encoder numbering begins at the left side of a left encoder bracket and ends at the right side of the right encoder bracket. The following diagram illustrates how the encoders are numbered 0 to 15 from left to right, for each SuperTrak conveyor section:

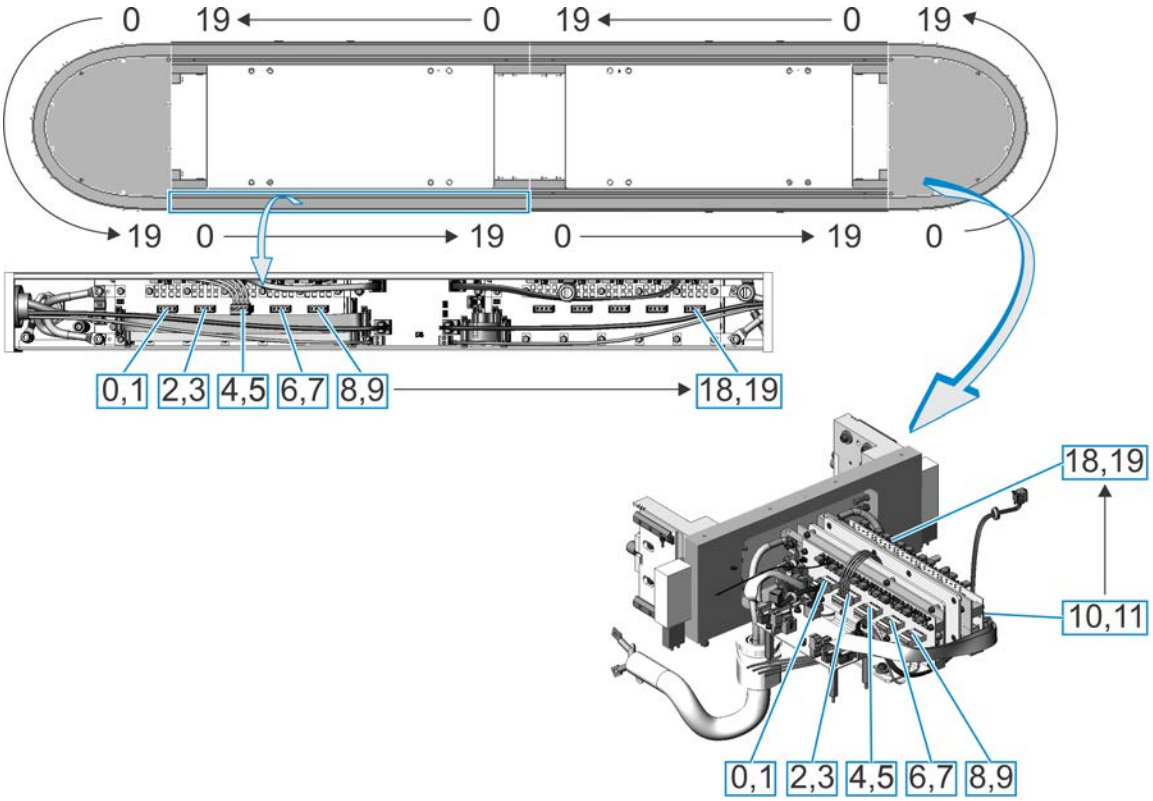


Each 180 deg. section (800 mm) has four (4) encoder brackets: a left encoder bracket, two (2) center encoder brackets, and a right encoder bracket. The functionality is the same as described above except that the encoders are numbered 0 to 7 from left to right.

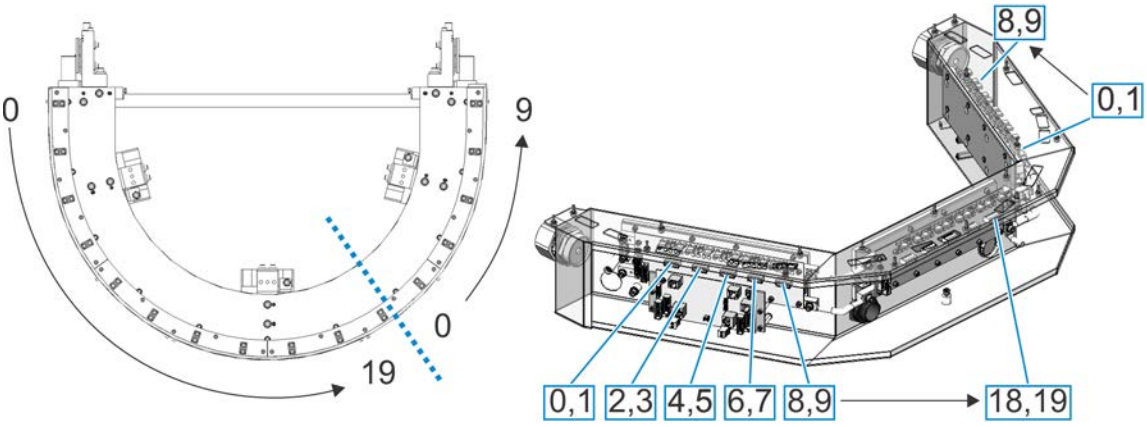


Coils

Each straight section and each 180 deg. section (500 mm) has twenty (20) coils. A coil pair is connected to each of the five (5) coil connections on the left coil driver board, and a coil pair is connected to each of the five (5) coil connections on the right coil driver board. The coils are numbered 0 to 19 from left to right.



Each 180 deg. section (800 mm) has thirty (30) coils. The functionality is the same as described above except that the 180 deg. section (800 mm) has three (3) coil driver boards. As shown, the coils are numbered 0 to 19, and then 0 to 9 from left to right.

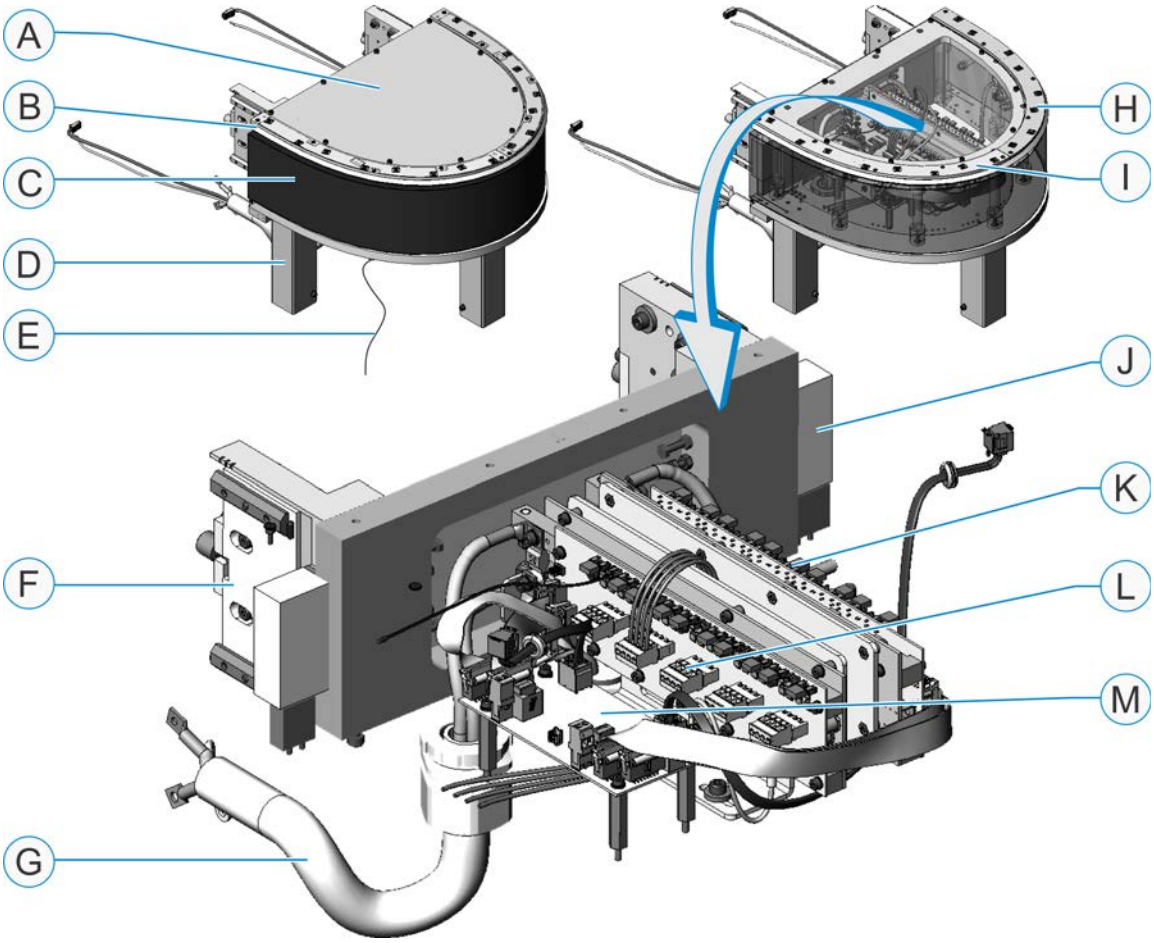


180 Deg. Section

A 180 deg. section provides a 500 mm or 800 mm 180° turning radius for the pallets to travel on. Each SuperTrak conveyor has two (2).

See *180 Deg. Section (500 mm) with TS Data Sheet* on page 283, *180 Deg. Section (500 mm) with LS Data Sheet* on page 285, and *180 Deg. Section (800 mm)* on page 287 for additional information.

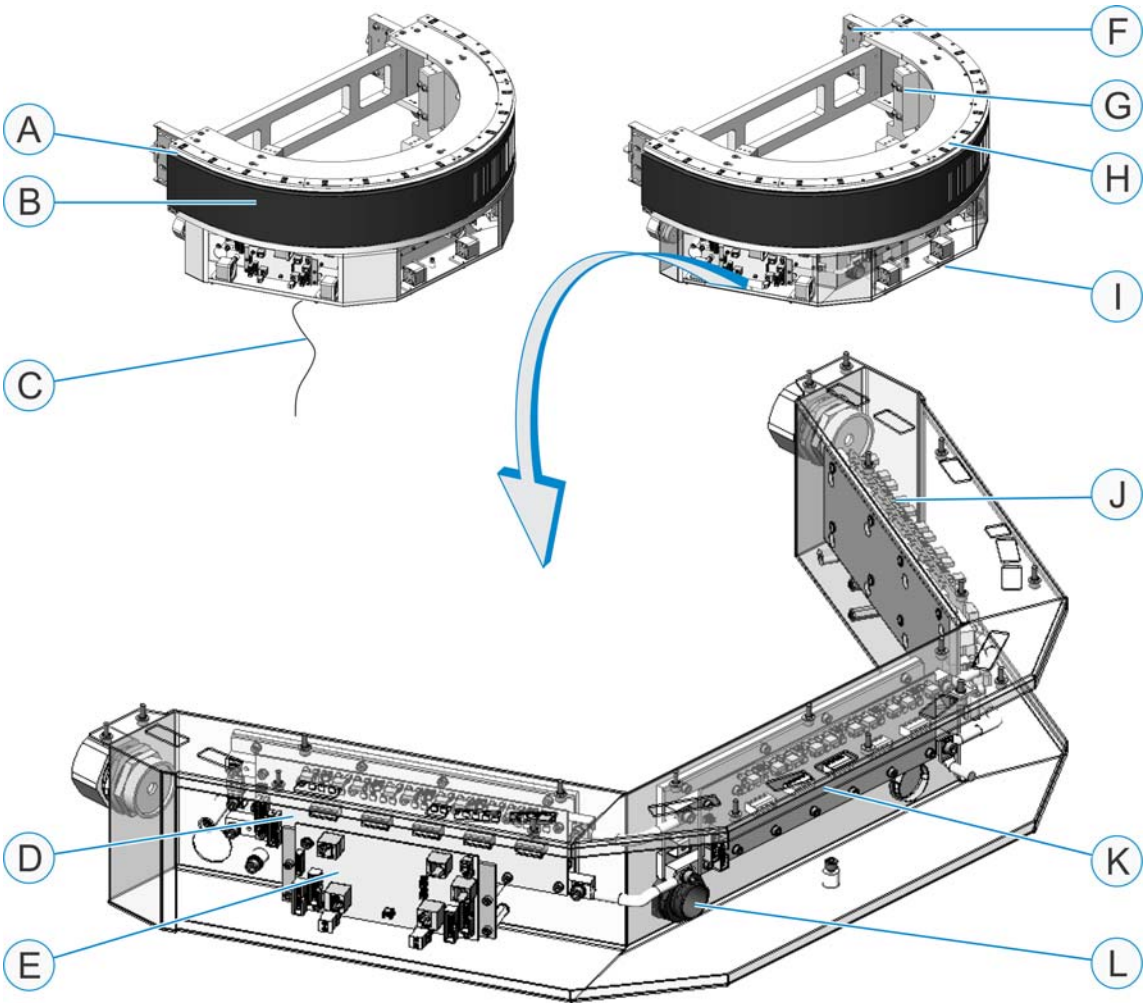
180 Deg. Section (500 mm)



ID	Component Name	Description
A	Top cover	Provides access to the electronic boards.
B	Upper v-rail	Provides a track for the pallet v-wheels to travel on. The upper v-rail of the 180 deg. section is 1030 mm (40.5 in.) in length

ID	Component Name	Description
C	Motor	Produces the electromagnetic force that propels the pallets. The motor includes: • Potted coils • Iron core lamination assembly See *Coils* on page 33 for information about coil numbering.
D	Stand (1 of 3)	Mounts the section to the SuperTrak conveyor frame. 180 deg. sections are available with tall stands (TS) as shown, or low stands (LS).
E	Ground wire	Provides the single point earth ground for the SuperTrak conveyor. Although each SuperTrak conveyor has two (2) 180 deg. sections, only one (1) 180 deg. section contains a single point earth ground wire. The single point earth ground wire is connected from the bottom plate of the 180 deg. section to the main electrical panel.
F	Wedge adjust	Connects the 180 deg. section to a straight section.
G	Electrical interconnect	Houses the power and network cables. See *Interconnect (SuperTrak Control Panel to 180 Deg. Section)* on page 303.
H	Right encoder bracket	Measures the pallet position using encoder read heads. See *Encoder Brackets* on page 32 for information about encoder numbering.
I	Left encoder bracket	
J	Magnetic shunt	An iron block.
K	Right coil driver board	See *Right Coil Driver Board* on page 31.
L	Left coil driver board	See *Left Coil Driver Board* on page 28, or *Left Coil Driver Board with a Power Supply Connected* on page 29
M	Gateway board	See *Gateway Board* on page 30.

180 Deg. Section (800 mm)



ID	Component Name	Description
A	Upper v-rail	Provides a track for the pallet v-wheels to travel on. The upper v-rail of the 180 deg. section is 1518.7 mm (59.79 in.) in length
B	Motor	Produces the electromagnetic force that propels the pallets. The motor includes: • Potted coils • Iron core lamination assembly See *Coils* on page 33 for information about coil numbering.

ID	Component Name	Description
C	Ground wire	Provides the single point earth ground for the SuperTrak conveyor. Although each SuperTrak conveyor has two (2) 180 deg. sections, only one (1) 180 deg. section contains a single point earth ground wire. The single point earth ground wire is connected from the bottom plate of the 180 deg. section to the main electrical panel.
D	Left coil driver board	See *Left Coil Driver Board* on page 28.
E	Gateway board (1 of 2)	See *Gateway Board* on page 30.
F	Wedge adjust, and a magnetic shunt	Connects the 180 deg. section to a straight section, and an iron core.
G	Adjustable stand (1 of 3)	Mounts the section to the SuperTrak conveyor frame.
H	Encoder bracket	Measures the pallet position using encoder read heads. See *Encoder Brackets* on page 32 for information about encoder numbering.
I	Electrical door (1 of 3)	Encloses the electrical components.
J	Right coil driver board (2 of 2) and gateway board (2 of 2)	See *Right Coil Driver Board* on page 31.
K	Right coil driver board (1 of 2)	See *Right Coil Driver Board* on page 31, and *Gateway Board* on page 30.
L	Electrical interconnect	Houses the power and network cables. See *Interconnect (SuperTrak Control Panel to 180 Deg. Section)* on page 303.

Control Panel

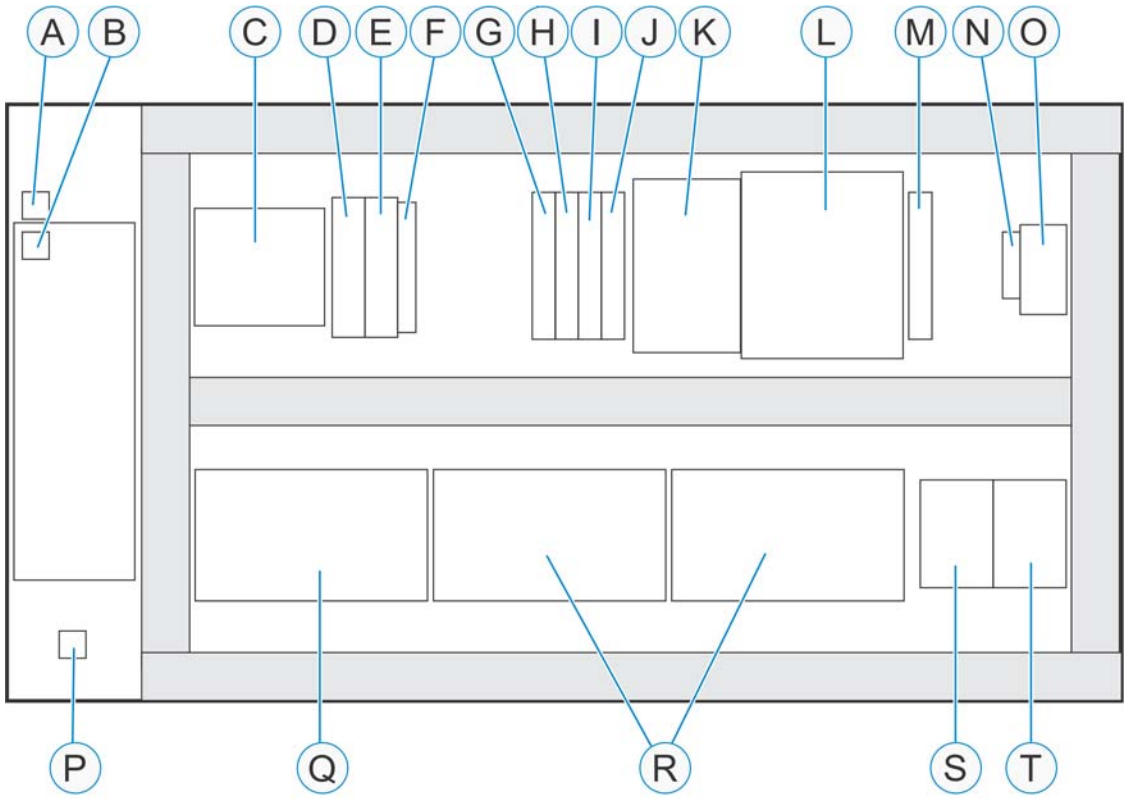
⚠WARNING Servicing an electrical panel that is still connected to its power source may cause injury or death. Unless directed otherwise, turn the **main power disconnect switch** to the OFF position. Lockout and tagout the switch before accessing and servicing the electrical panel. Only qualified electrical technicians should perform service on the electrical panel.

See *Hazardous Energy* on page 8 and *Lockout and Tagout* on page 11.

If an ATS control panel is not used, a line filter is required (for example, a Schaffner “FN 3256H-XX”).

The control panel provides power to the SuperTrak conveyor only. It is designed to be integrated with a main electrical panel, and requires a protective earth connection from the main electrical enclosure.

See *Control Panel Data Sheet* on page 290 for additional information.



A	Ground	**K**	24V digital power supply
B	Controller - TrackMaster EtherNet connection	**L**	Uninterrupted power supply (UPS)
C	Terminals	**M**	10A breaker - 24V digital power supply

D	PLC connection (EtherNet/IP, EtherCAT, or PROFINET)	**N**	UPS disconnect[a]
E	Bus controller (POWERLINK)	**O**	SuperTrak conveyor power disconnect switch (3 phase)[b]
F	Power supply module	**P**	Single point ground connection from the 180 deg. section
G	Breaker - enclosure fan	**Q**	Terminals
H	13A breaker - All SuperTrak conveyor digital power	**R**	Power supply breakers (space for 6 or 12 breakers)
I	6A breaker - controller	**S**	Safety contactor #1
J	2A breaker - I/O bus coupler	**T**	Safety contactor #2

a.Disconnects the 24V digital battery power
b.Disconnects the AC power to the SuperTrak conveyor.

Power Supply

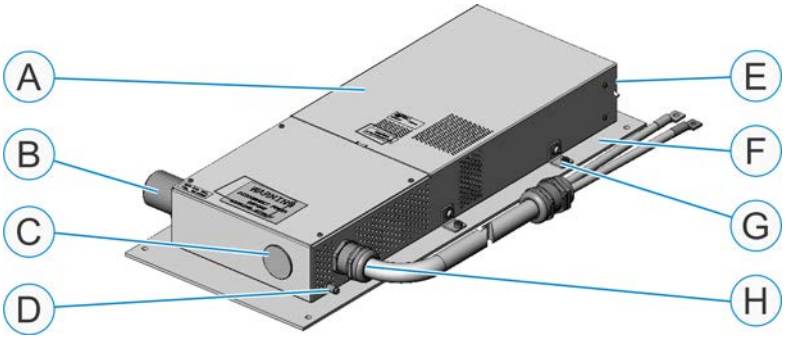
⚠WARNING Servicing an electrical panel that is still connected to its power source may cause injury or death. Unless directed otherwise, turn the **main power disconnect switch** to the OFF position. Lockout and tagout the switch before accessing and servicing the electrical panel. Only qualified electrical technicians should perform service on the electrical panel.

See *Hazardous Energy* on page 8 and *Lockout and Tagout* on page 11.

The power supply is an AC to DC power supply that provides 28VDC to the SuperTrak conveyor for pallet motion. Each power supply is wired to a control panel. Alternating-current (AC) electrical power is supplied to the power supply from the control panel by a cable plug.

The required number of power supplies varies depending on the demands of the specific SuperTrak conveyor.

Every power supply has a label affixed to it that indicates the date it was tested and the initials of the tester. This label verifies that the power supply was inspected and tested. If this label does not exist or an unauthorized replacement power supply is used, contact ATS for the correct power supply replacement.



A	Power supply cabinet	**E**	Power supply filter
B	AC power input plug	**F**	Power supply mounting plate
C	Alternate 28 VDC power output location	**G**	Power supply mounting brackets
D	Power supply OK signal	**H**	28 VDC power output location

See *Power Supply Data Sheet* on page 292, and *Install a Power Supply* on page 148 for additional information.

IR Reader Assembly (Optional)

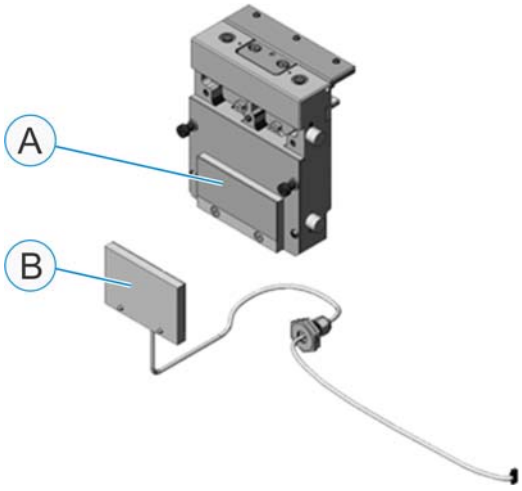
The IR reader assembly contains an infrared emitting diode (IR LED) that is classified as eye safe. The following standards and classifications apply:

- IEC/EN 60825-1 (2007-03), DIN EN 60825-1 (2008-05) “SAFETY OF LASER PRODUCTS - Part 1: equipment classification and requirements”, simplified method. This is classified as “Class 1”.
- IEC 62471 (2006), CIE S009 (2002) “Photo-biological Safety of Lamps and Lamp Systems”. This is classified as “Exempt”.
- DIRECTIVE 2006/25/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 5th April 2006 on the minimum health and safety requirements regarding the exposure of workers to risks arising from physical agents (artificial optical radiation) (19th individual directive within the meaning of article 16(1) of directive 89/391/EEC). This is classified as “Exempt”.

The infrared (IR) pallet ID system is an optional SuperTrak conveyor system that allows for a customized pallet ID to be assigned to each pallet. The IR reader assembly includes an IR tag and IR reader (with cable). It provides the following benefits:

- Simplifies SuperTrak conveyor recovery after a complete cold start.
- Provides data integrity when pallets are manually removed.
- Provides tracking of individual pallet fixtures.
- Pallet IDs are read “on-the-fly: pallets do not stop at the IR reader assembly.
- It induces the necessary power into the tags for reading purposes. Batteries are not required.

Integration of the IRID reader assembly with the SuperTrak conveyor is Plug-and-play. External PLC programming is not required.

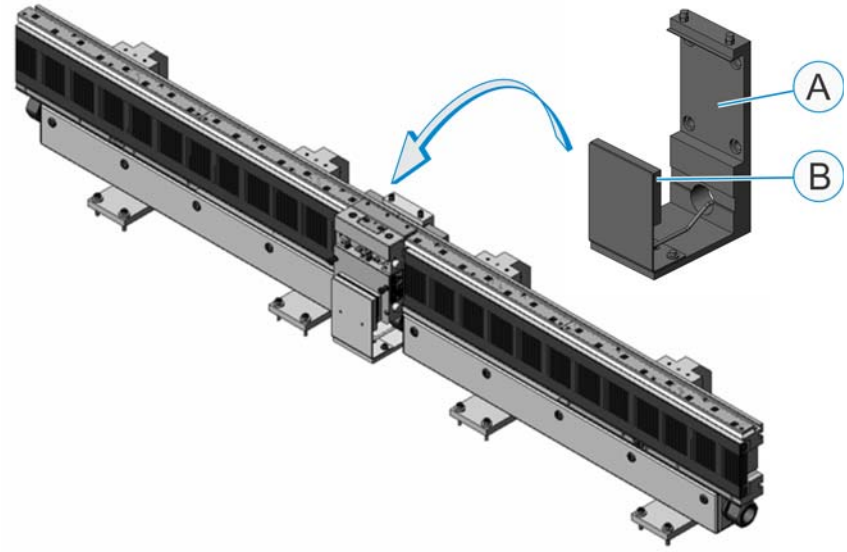


A	IR tag (read-only)
B	IR reader

See *IR Reader Components (Optional) Data Sheet* on page 295, and *IR Reader Mount Assembly (Optional)* on page 42 for additional information.

IR Reader Mount Assembly (Optional)

The infrared (IR) reader mount assembly is an optional assembly for mounting the IR reader assembly.

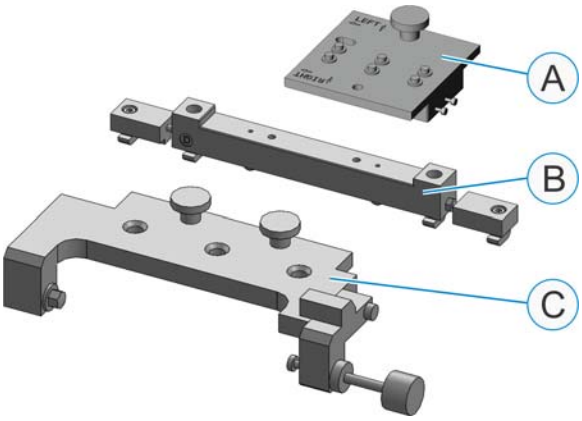


A	IR reader mount assembly	**B**	IR reader installation location

See *IR Reader Components (Optional) Data Sheet* on page 295, and *Install an IR Reader Mount Assembly* on page 98 for additional information.

Pallet Setup Tools (Optional)

The pallet setup tools are optional SuperTrak conveyor tools that allow you to align and calibrate SuperTrak pallet encoder strips.

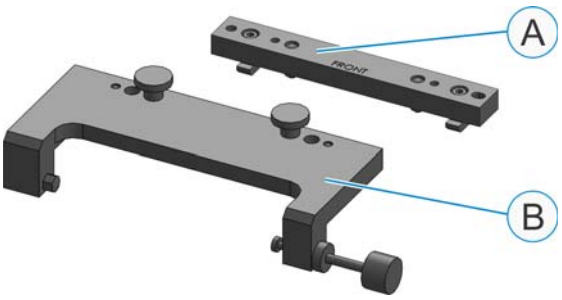


A	Pallet setup adjustable chip finder	**C**	Pallet setup removable locate
B	Pallet setup stationary mount		

See *Pallet Setup Tools (Optional) Data Sheet* on page 297 for additional information.

Station Setup Tools (Optional)

The station setup tools are optional SuperTrak conveyor tools that allow you to physically hold a pallet in a precise location in order to align system-specific station tooling to that pallet.



A	Station setup stationary mount	**B**	Station setup removal locate

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Installation

This section describes how to install the SuperTrak conveyor.

Prerequisites

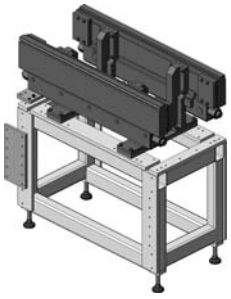
The following services and components are required to successfully install the SuperTrak conveyor:

- A non-compressing installation surface (for example; a concrete floor)
- Electrical connections to the SuperTrak conveyor control panel:
    - AC incoming power from the main electrical cabinet
        - North America: 208Y120+PE, 40A (or 20-30A on smaller systems)
        - Europe: 400Y230+PE, 40A (or 20-30A on smaller systems)
    - Safety circuit connection (fail safe digital 24V output to enable motor power)
    - PLC network connections (EtherNet/IP, PROFINET, or alternate)
- TrackMaster software
- Computer with Windows and network connectivity
- Ethernet cable
- Tools:
    - 0.5 mm (0.02 in.) shims
    - Feeler gages
    - Framing square
    - Mallet
    - Straight flat bar 38.5 cm (15.16 in.) long
    - Precision spirit level
    - Set of metric hex keys
    - Set of metric wrenches or spanners

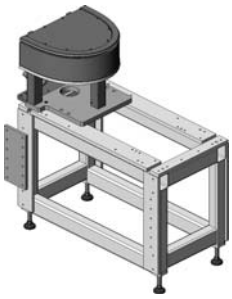
Calculate the Installation Space

Use the following measurements to calculate the required SuperTrak conveyor installation space.

Two Straight Sections with Prolato Frame (1m Linear Module Extension)

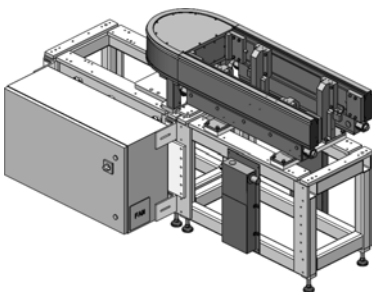
Image	Length	Width	Height	Weight
	1 m (3.28 ft)	0.55 m (1.8 ft)	1.1 m (3.6 ft)	272 kg (600 lbs)

180 Deg. Section with Prolato Frame

Image	Length	Width	Height	Weight
	1 m (3.28 ft)	0.55 m (1.8 ft)	1.1 m (3.6 ft)	247 kg (545 lbs)

Control Panel Assembly

This includes: one (1) 180 deg. section with prolato frame, two (2) straight sections with prolato frame, control panel, and power supply.

Image	Length	Width	Height	Weight
	2 m (6.56 ft)	0.92 m (3.02 ft)	1.1 m (3.6 ft)	588 kg (1296 lbs)

Install the SuperTrak Conveyor

- Make sure the installation is done on a non-compressing surface (for example; concrete), so the sections can be leveled and aligned correctly.
- A SuperTrak can contain a maximum of is sixty-two (62) sections: sixty (60) straight sections and two (2) 180 deg. sections. This is because the maximum number of gateways is 64. Each straight section has one (1) gateway, each 500 mm 180 deg. section has one (1) gateway, and each 800 mm 180 deg. section has two (2) gateways.

Complete the procedures in this section in the order that they are written.

1. Calculate the space required to install the SuperTrak conveyor, to verify that there is adequate space.

   See *Calculate the Installation Space* on page 46.

2. Complete one (1) of the following, depending on the type of frame that is used:
   - Install the SuperTrak conveyor on a prolato base.

     See *Install the SuperTrak Conveyor on a Prolato Base* on page 48.
   - Install the SuperTrak conveyor on a custom frame.

     See *Install the SuperTrak Conveyor Sections with Custom Stands on a Custom Frame* on page 49.
   - Install the SuperTrak conveyor in an over/under configuration.

     See *Install the SuperTrak Conveyor in an Over/Under Configuration* on page 62.
3. Install the required cable connections.

   See *Connections* on page 104.
4. Verify that the upper v-rail is adequately lubricated.

   If required, add an additional 20 drops of lubricant to the pallet lubrication felt, or manually wipe lubricant on the upper v-rail. Remove excess oil from the SuperTrak that may have dripped from the upper v-rail.

Install the SuperTrak Conveyor on a Prolato Base

1. Install the SuperTrak conveyor sections on prolato bases.

   See *Install the SuperTrak Conveyor on a Prolato Base* on page 48.

2. Install the first SuperTrak conveyor section.

   See *Install the First SuperTrak Conveyor Section* on page 82.

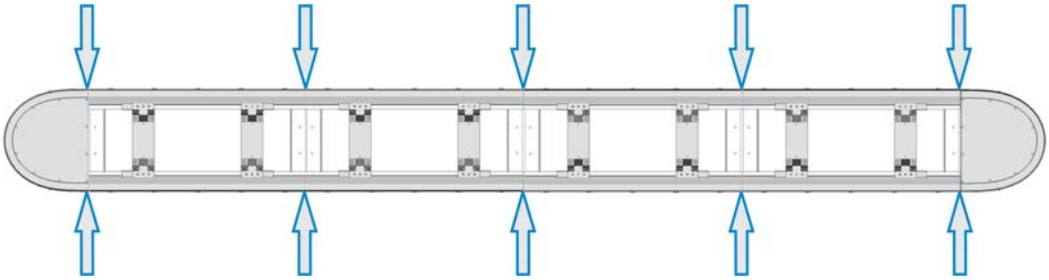
3. Install the next SuperTrak conveyor section.

   See *Connect Two SuperTrak Conveyor Sections Together* on page 85.

4. Repeat step 3 until all SuperTrak conveyor sections are connected together.

5. Verify that a 0.5 mm (0.02 in.) gap still exists between all sections.

   In the example below, the gap is checked in twenty (20) locations: at the top and bottom of each section join that is indicated by an arrow.

   See step 7 from *Connect Two SuperTrak Conveyor Sections Together* on page 85, if additional information is required.

6. Align the SuperTrak conveyor section joints.

   See *Align the SuperTrak Conveyor Section Joints* on page 87.

7. Align the SuperTrak conveyor section heights.

   See *Align the SuperTrak Conveyor Section Heights* on page 88.

8. Install the wedge adjust.

   See *Install a Wedge Adjust* on page 89.

9. Align the upper v-rail.

   See *Replace an Upper V-Rail* on page 205.

10. Install the lower flat wear strips.

    See *Replace a Flat Wear Strip* on page 208.

11. Install the pallets.

    See *Install a Pallet* on page 166.

12. If required, fine-adjust the upper v-rail.

    See *Fine-Adjust the Upper V-Rail* on page 91.

Install the SuperTrak Conveyor Sections with Custom Stands on a Custom Frame

DANGER

Always use appropriate lifting devices (for example, a forklift or crane) and use safe lifting practices and procedures when lifting a straight section or 180 deg. section.

See *Lift a SuperTrak Conveyor Section* on page 70.

ATS recommends that you obtain relevant information from your national Health and Safety Authority.

NOTICE

Make sure the custom frame is designed to hold the weight and force of the SuperTrak conveyor sections.

- This procedure assumes that the Y-axis movement of the custom stands is ≤0.002 in. (≤0.05 mm) when the stands are parallel, the stands allow for Y-axis and Z-axis adjustment, and the stands include the correct hole pattern.
- This procedure assumes that the custom frame includes the correct hole pattern on the top and sides of the frame.

See the SuperTrak conveyor *Mechanical Drawings* and the *SuperTrak GEN3 Design Considerations* documents for additional information.

This section describes how to install SuperTrak conveyor sections on custom stands and a custom frame. ATS stands and an ATS frame are shown for reference.

1. Inspect the frame to verify that it includes the correct features outlined in the SuperTrak conveyor *Mechanical Drawings.*
2. Position the frame on a flat non-compressing surface.
3. If custom stands are used, install the stands on the straight sections and 180 deg. sections; otherwise, proceed to step 4:
    a. Inspect the stands to verify that they include the correct features outlined in the *SuperTrak GEN3 Design Considerations* document.

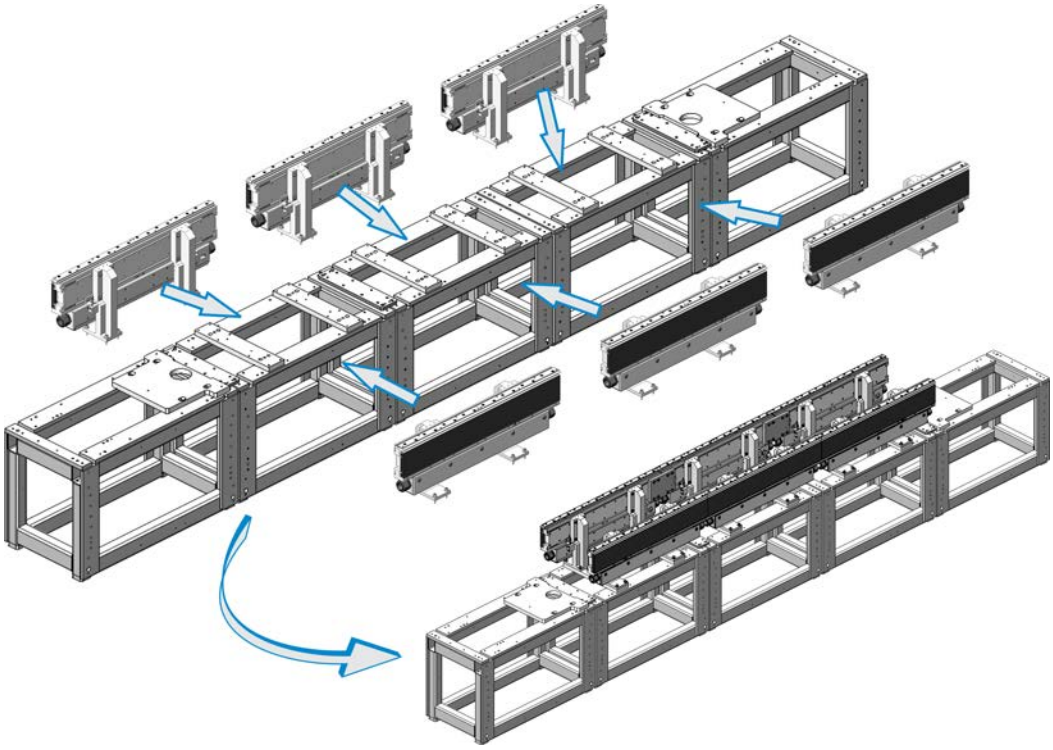
       This procedure assumes that the Y-axis movement of the custom stands is ≤0.002 in. (≤0.05 mm) when the stands are parallel, the stands allow for Y-axis and Z-axis adjustment, and the stands include the correct hole pattern.

    b. Lift the straight section or 180 deg. section.

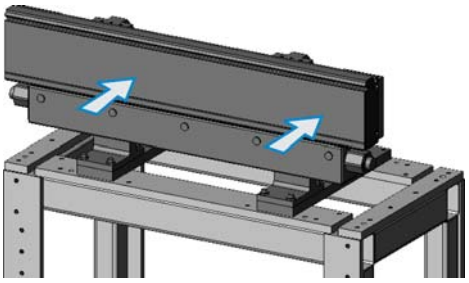
       See *Lift a SuperTrak Conveyor Section* on page 70.

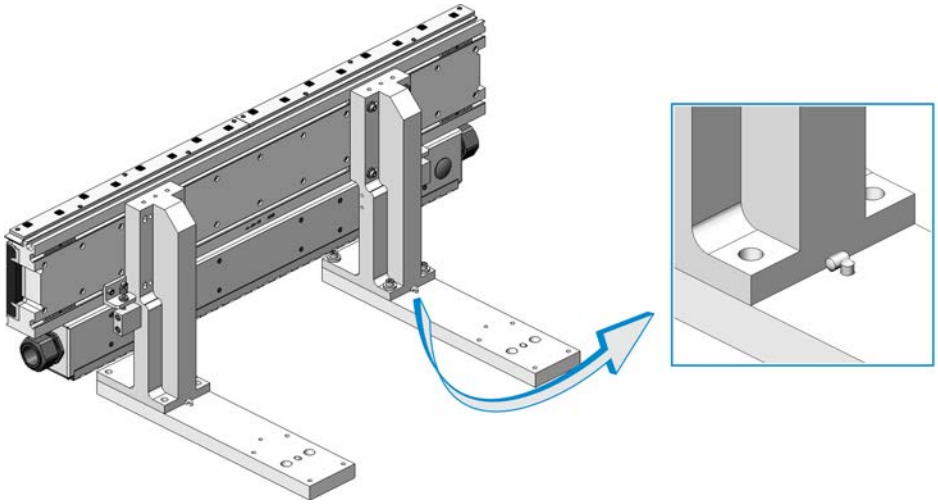
    c. As required, attach the stands to the straight section or 180 deg. section.

4. Position all straight sections on the frame, with the electrical box facing out.



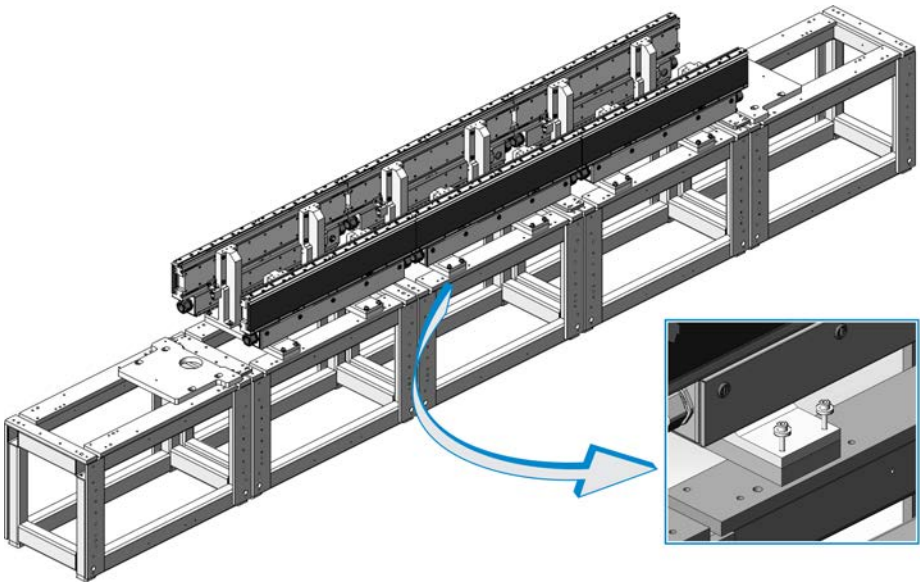
5. Push each straight section toward the center of the frame, so it is tight against the dowel pins in the frame.



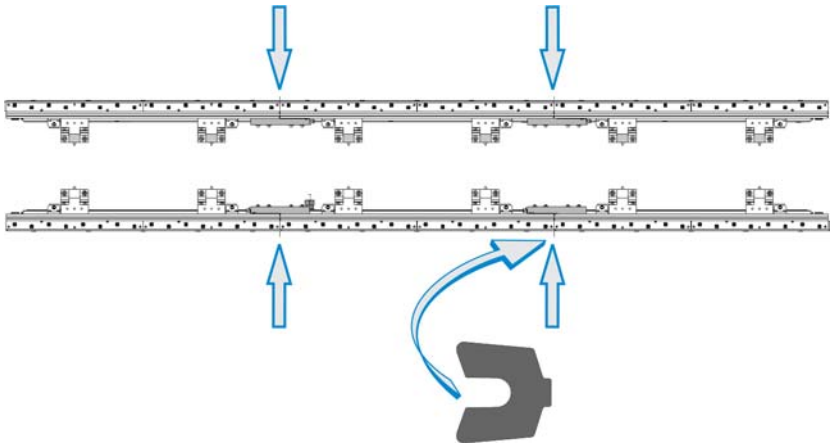


6. Loosely install four (4) screws into each stand base.

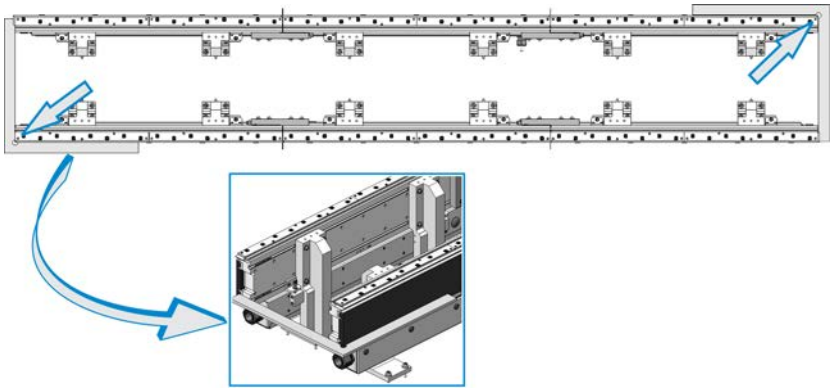
   It is very important that the screws are centered in the screw holes as much as possible. This allows for adjustment when sections are connected together later.



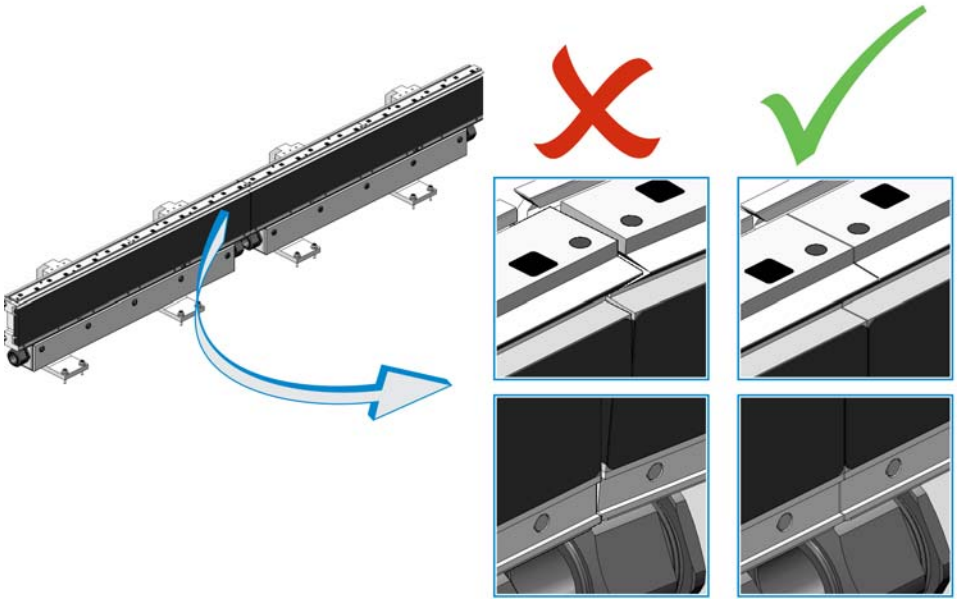
7. Adjust the position of the straight sections until:
    - Use shims to verify that a 0.5 mm (0.02 in.) gap exists between all straight sections (between the track structure [or aluminum extrusion], not between the linear motors [or motor laminations]).



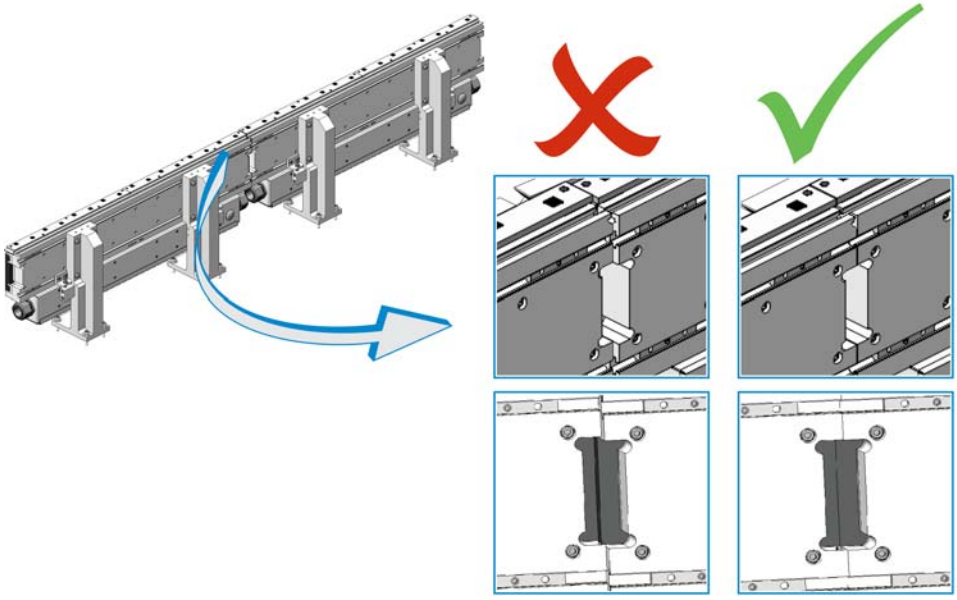
    - The two (2) straight sections are reasonably square at each end.



8. Verify that the following are aligned:
    - Upper v-rails and flat wear strip pockets.



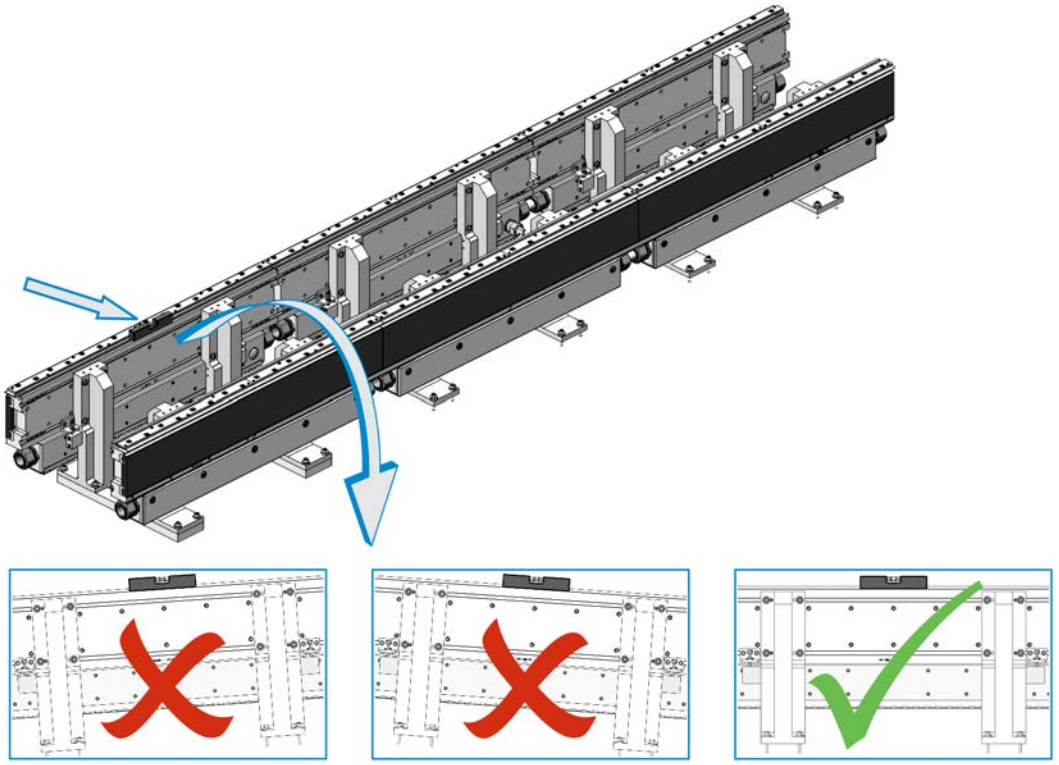
    - Back of the laminations at all joints.



Fix any major misalignment before proceeding with fine alignment.

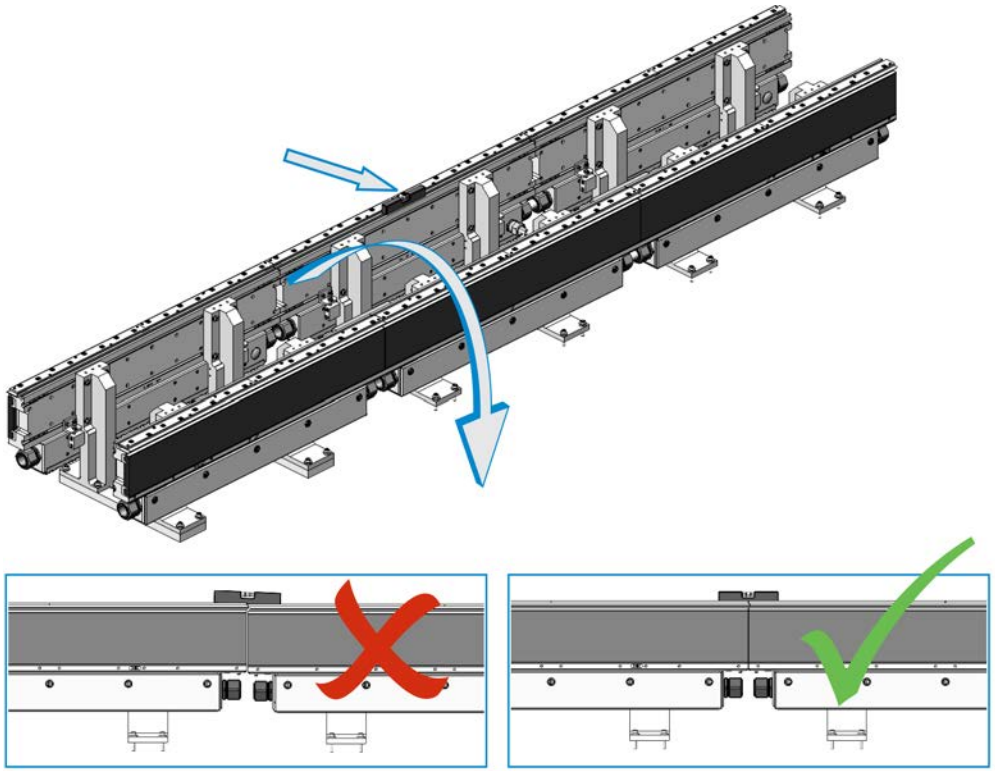
9. Level the first straight section.

   Place the precision level on the t-slot behind the encoder bracket of the straight section when leveling.



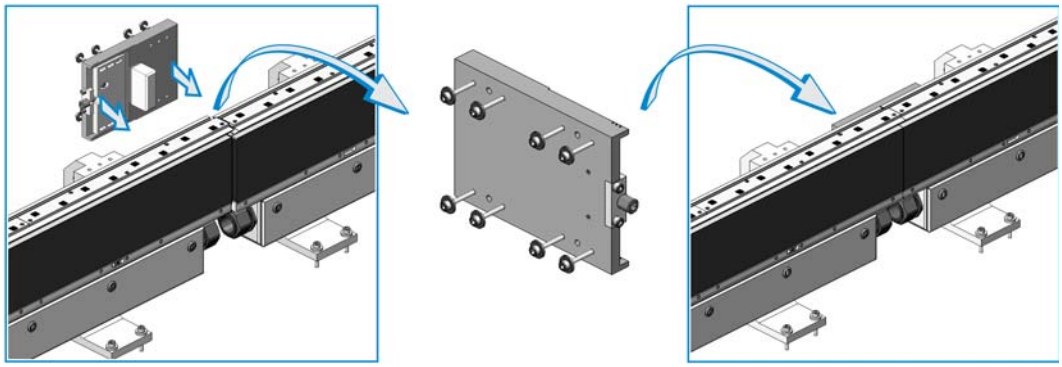
10. Level the second straight section, and then adjust it vertically to align the upper v-rails with the first straight section while keeping the section level.

    See *Align the SuperTrak Conveyor Section Joints* on page 87, and *Align the SuperTrak Conveyor Section Heights* on page 88 for additional information.



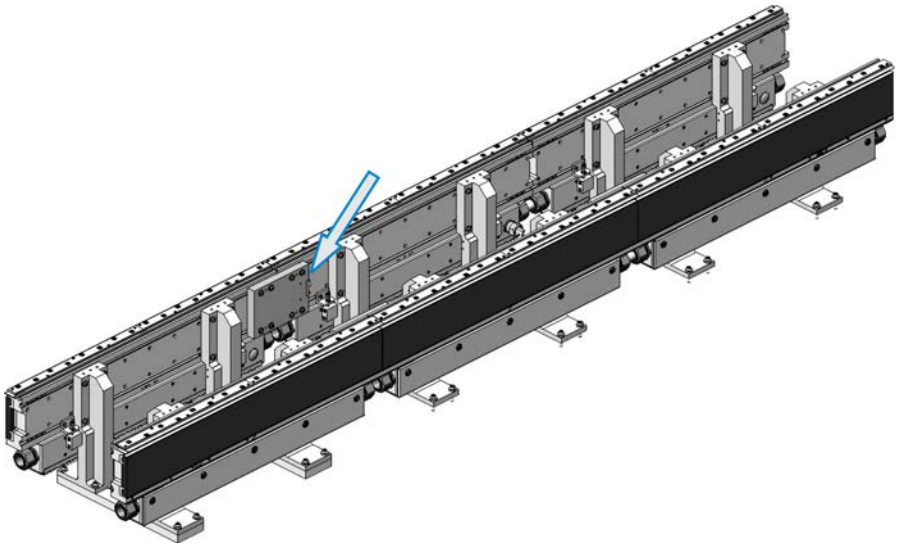
11. Install a wedge adjust between the straight sections.

    See *Install a Wedge Adjust - Straight Section* on page 89.

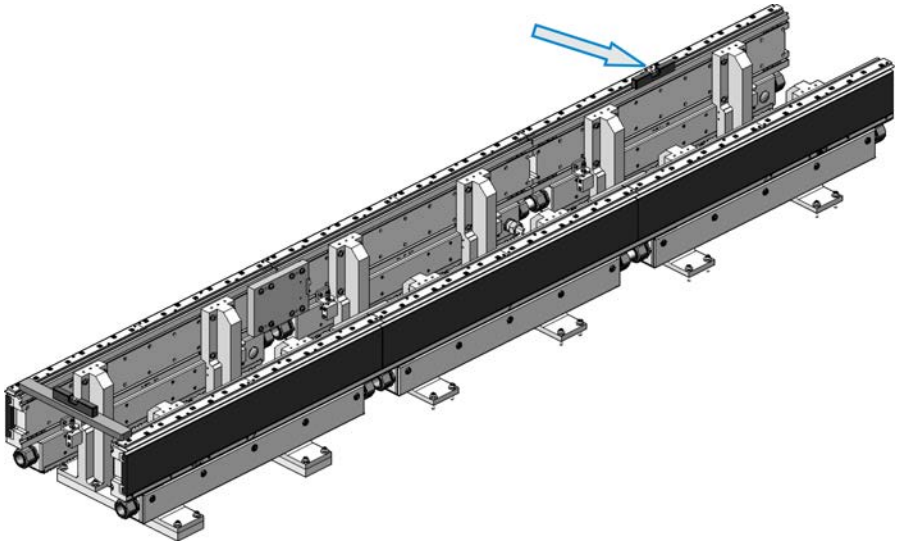


12. Adjust the wedge IN or OUT to align the upper v-rails. Only adjust when the wedge adjust screws are loose, and measure when the wedge adjust screws are tight.

    See *Fine-Adjust the Upper V-Rail* on page 91.

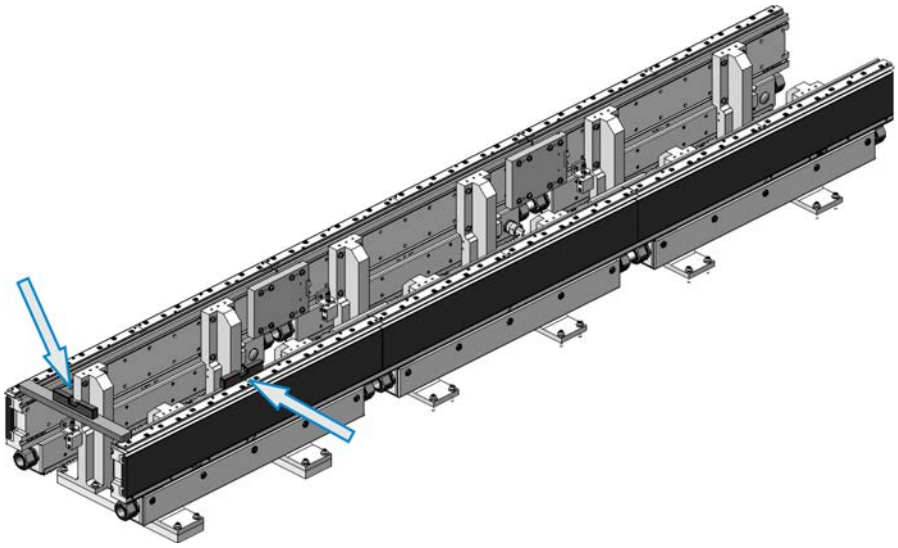


13. Repeat steps 10 to 12 for the remaining sections on the same side of the SuperTrak conveyor.

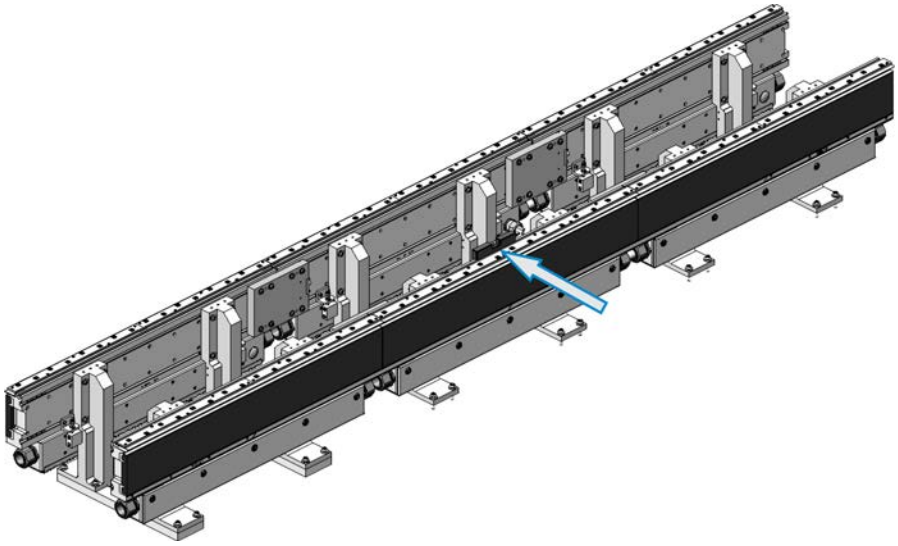


14. Return to the first straight section and lay a flat bar across it and the opposing straight section.

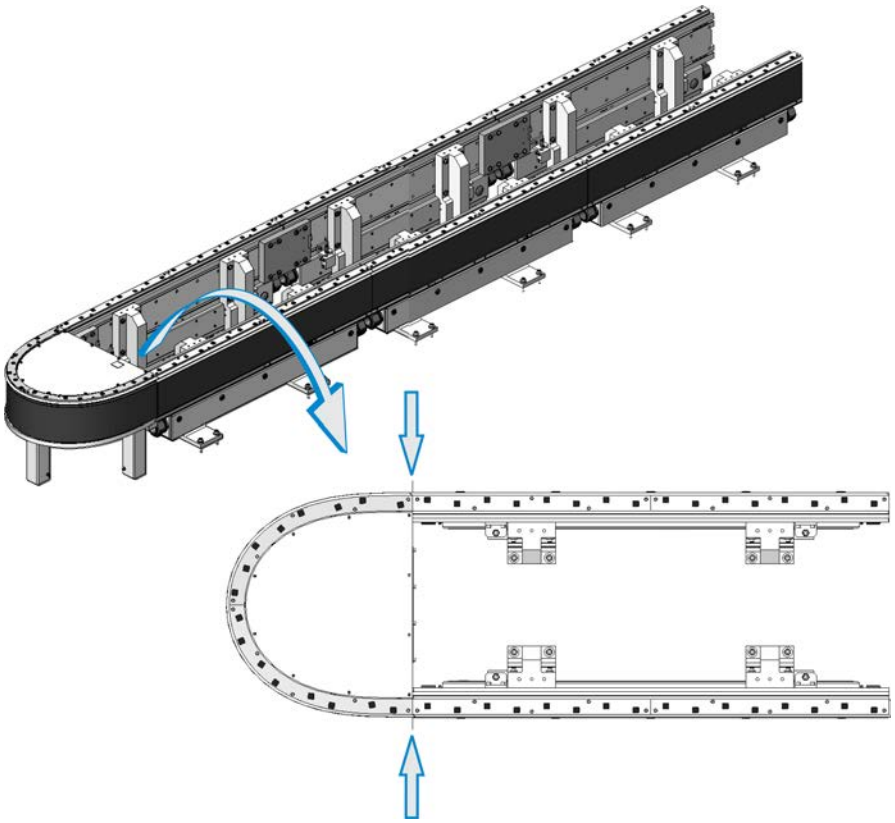
    Make sure the flat bar rests on the t-slot and not the encoder brackets. Level the opposing section with the first section.



15. Repeat steps 10 to 12 for the remaining sections on the same side of the SuperTrak conveyor.

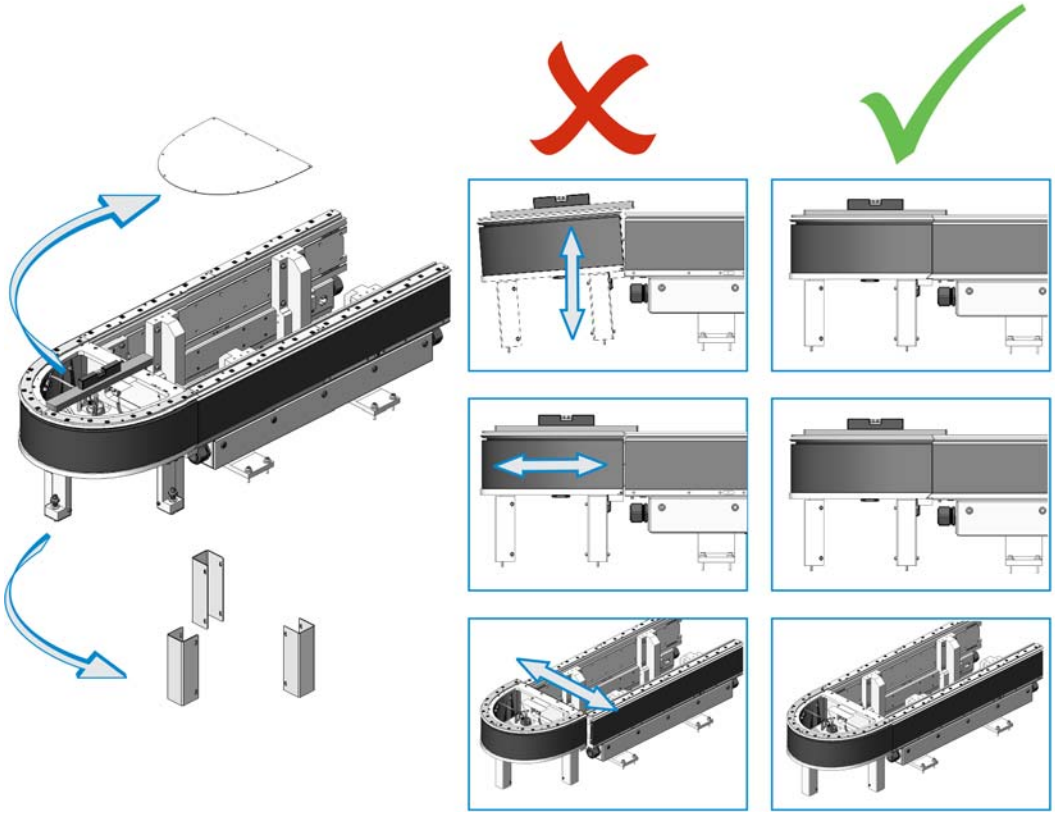


16. Install the first 180 deg. section.
17. Use shims to verify that a 0.5 mm (0.02 in.) gap exists between the 180 deg. section and each of the two (2) abutting straight sections (between the track structure [or aluminum extrusion], not between the linear motors [or motor laminations]).



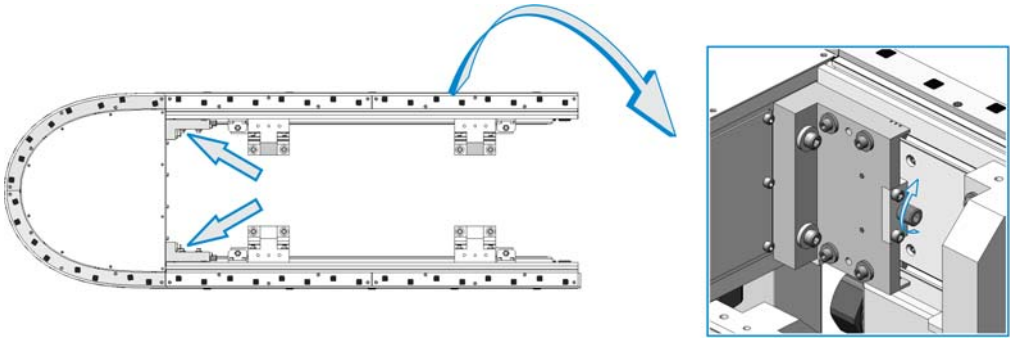
18. Remove the top cover from the 180 deg. section, remove the covers from the 180 deg. section stands, and then level the 180 deg. section.

    Adjust the vertical, horizontal, and side-to-side positions until the upper v-rails align with the straight sections, and the 180 deg. section is centered between the straight sections.



19. Tighten each of the three (3) 180 deg. section stand screws to the custom frame.
20. Install the wedge adjusts for the 180 deg. section.

    See *Install a Wedge Adjust - 180 Deg. Section* on page 90.

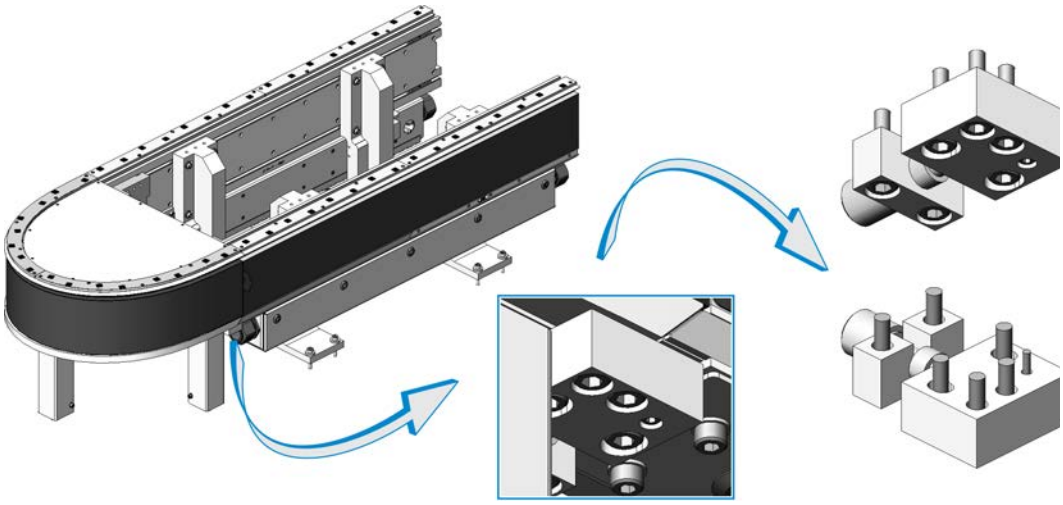


21. Align the upper v-rails by adjusting the wedge or adjusting the screws on the inside of the 180 deg. section.

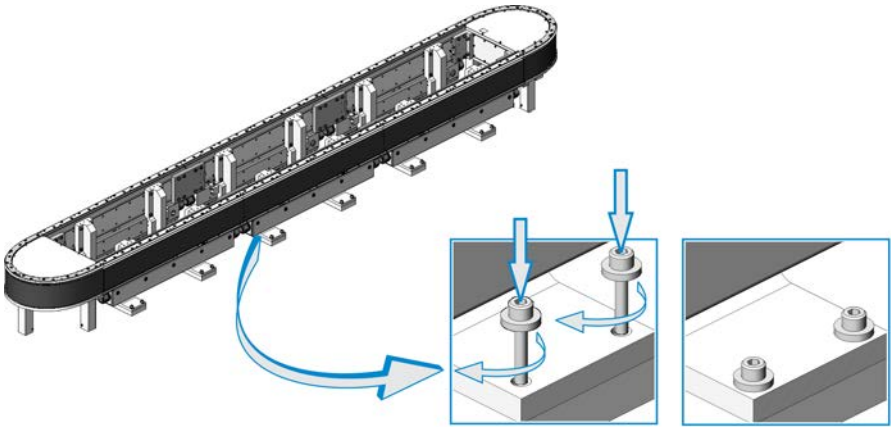
    See *Fine-Adjust the Upper V-Rail* on page 91.

22. Align the lower flat rails with the adjustment features mounted below the E-Turn plate.

    See *Align a Flat Wear Strip* on page 211.



23. Repeat steps 16 to 22 for the second 180 deg. section.
24. Tighten the four (4) screws at the base of each straight section stand.



25. Install the covers on the 180 deg. section stands.
26. Install the top covers on the 180 deg. sections
27. Install the lower flat wear strips.

    See *Replace a Flat Wear Strip* on page 208.

28. Install the pallets.

    See *Install a Pallet* on page 166.

29. If required, fine-adjust the upper v-rail.

    See *Fine-Adjust the Upper V-Rail* on page 91.

Install the SuperTrak Conveyor in an Over/Under Configuration

DANGER

Always use appropriate lifting devices (for example, a forklift or crane) and use safe lifting practices and procedures when lifting a straight section or 180 deg. section.

See *Lift a SuperTrak Conveyor Section* on page 70.

ATS recommends that you obtain relevant information from your national Health and Safety Authority.

NOTICE

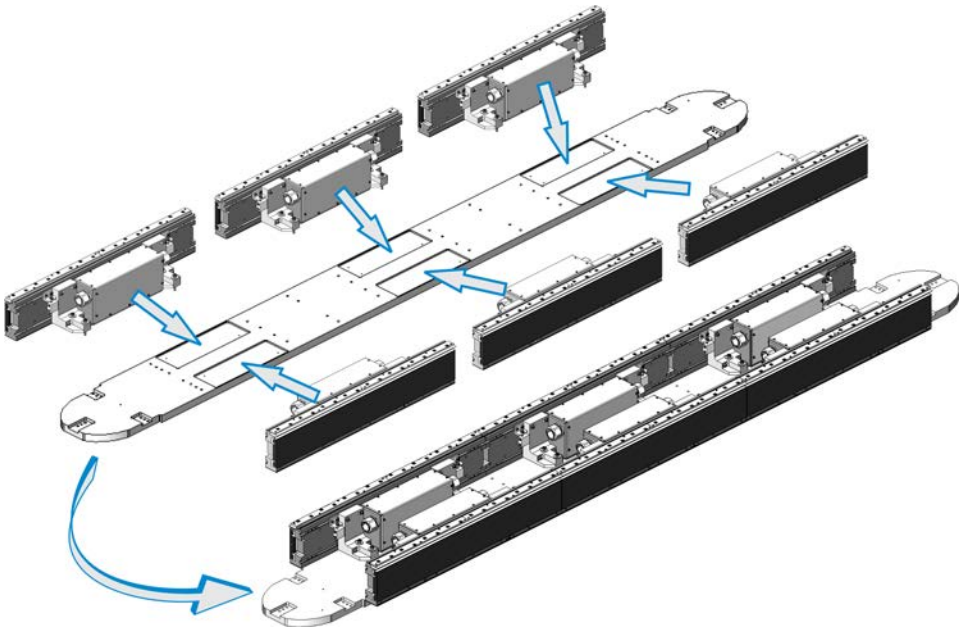
Make sure the frame is designed to hold the weight and force of the SuperTrak conveyor sections.

This procedure assumes that your frame includes the correct hole pattern on the top and sides of the frame.

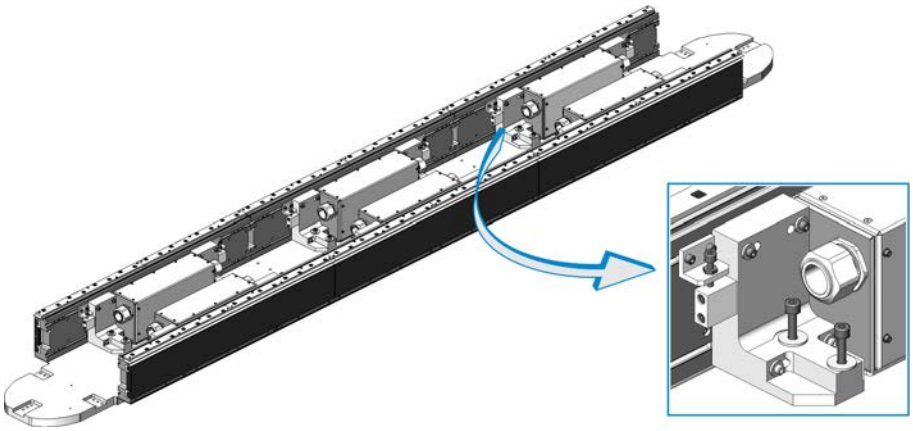
See the SuperTrak conveyor *Mechanical Drawings* for additional information.

This section describes how to install SuperTrak conveyor in an over/under configuration.

1. Inspect the base plate to verify that it includes the correct features outlined in the SuperTrak conveyor *Mechanical Drawings.*
2. Position the base plate across two (2) or more metal saw horses, with the slotted cut-outs facing up.
3. Mount all straight sections on the base plate, with the electrical box facing in.

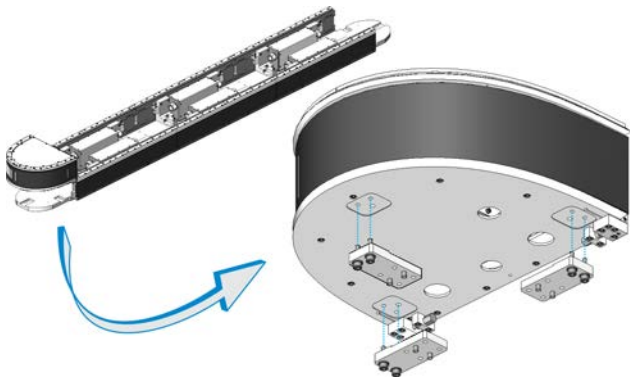


4. Loosely install four (4) screws into each straight section stand base. It is very important that the screws are centered in the screw holes as much as possible. This allows for adjustment when sections are connected together later.

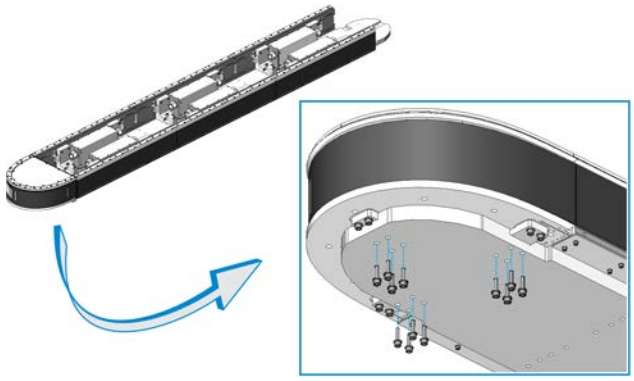


5. Install the two (2) 180 deg. sections:

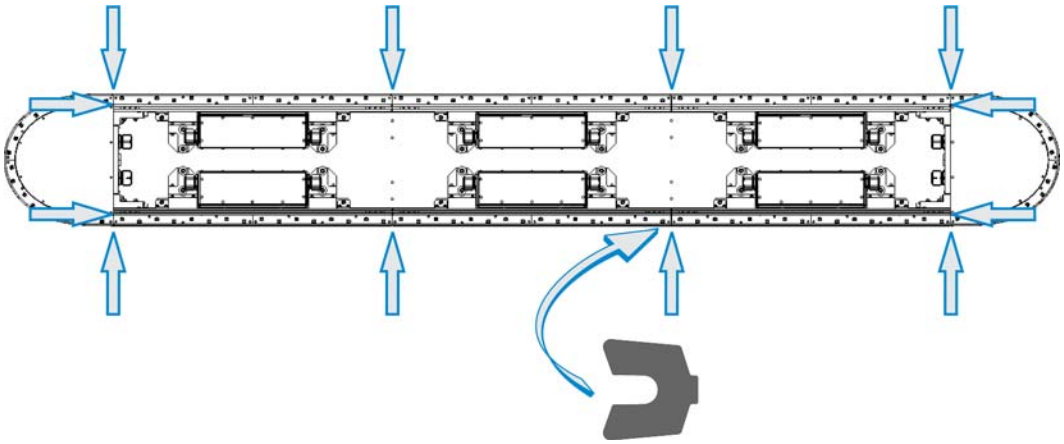
   a. Install three (3) mounting plates on the bottom of the 180 deg. sections with two (2) screws each.



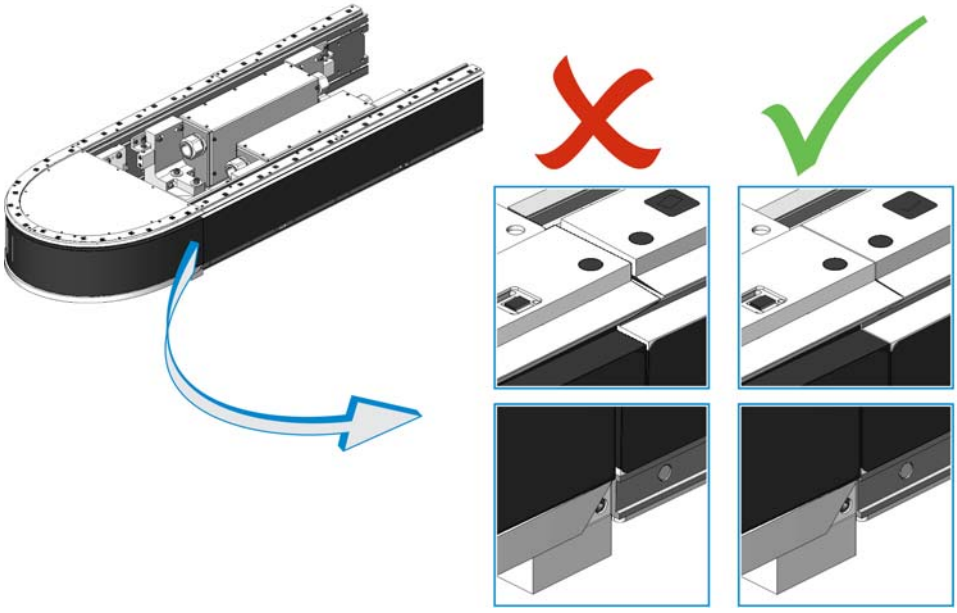
   b. Align the mounting plates on the 180 deg. section with the slots in the base plate, and then secure the 180 deg. section to the base plate with twelve (12) screws.



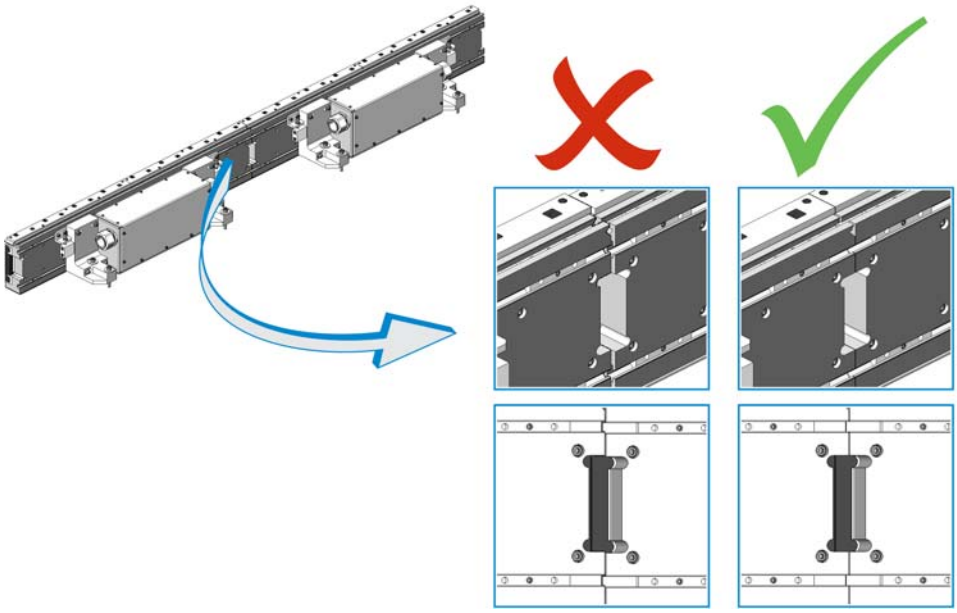
6. Adjust the position of all sections until a 0.5 mm (0.02 in.) gap exists between all sections (between the track structure [or aluminum extrusion], not between the linear motors [or motor laminations]).



7. Verify that the following are aligned:
    - Upper v-rails and flat wear strip pockets.

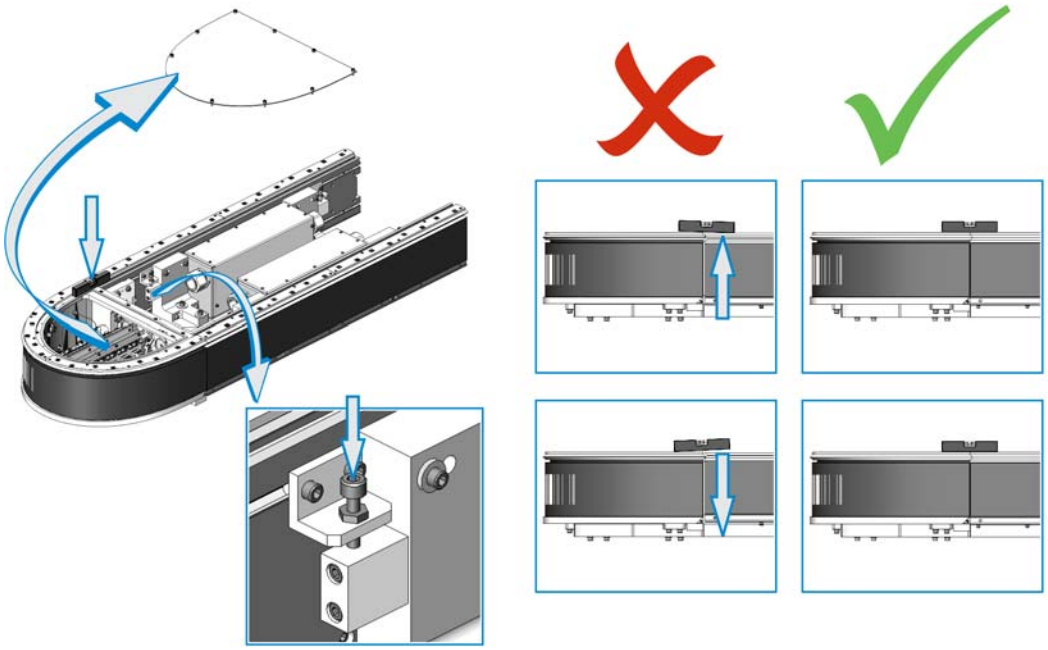


- Back of the laminations at all joints.



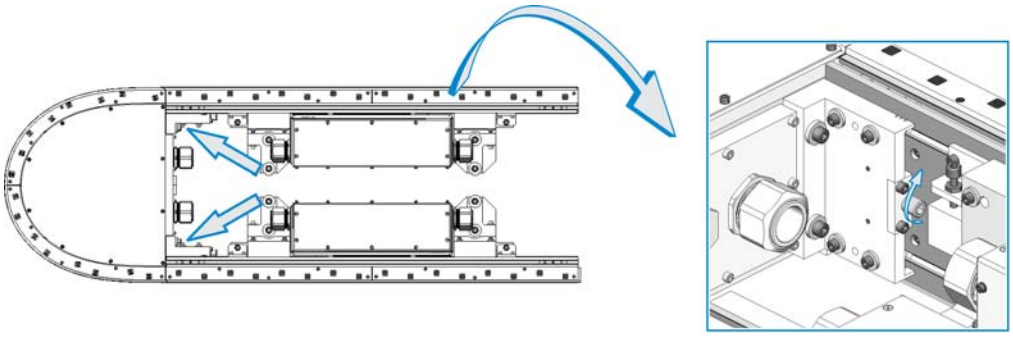
Fix any major misalignment before proceeding with fine alignment.

8. Remove the top cover from the 180 deg. section, and level the 180 deg. section.
   The height of the 180 deg. section is fixed. Adjust the height of the straight sections to align with the 180 deg. sections by using the straight section adjustment features.

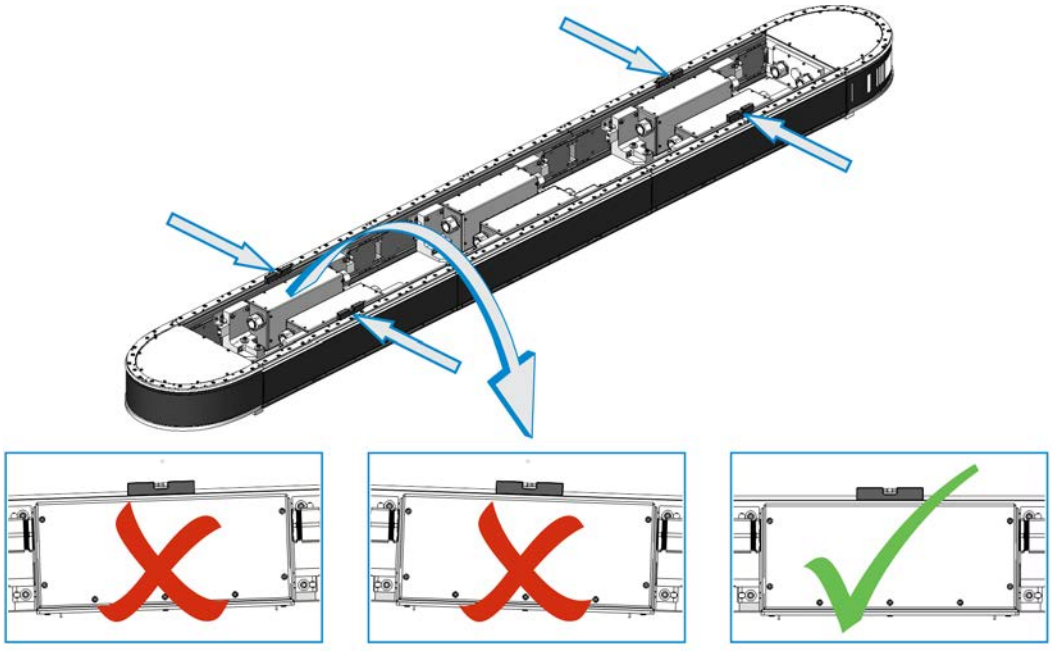


9. Install the wedge adjust for the 180 deg. sections.
   Place the precision level on the t-slot behind the encoder bracket of the straight section when leveling.

   See *Install a Wedge Adjust - 180 Deg. Section* on page 90.

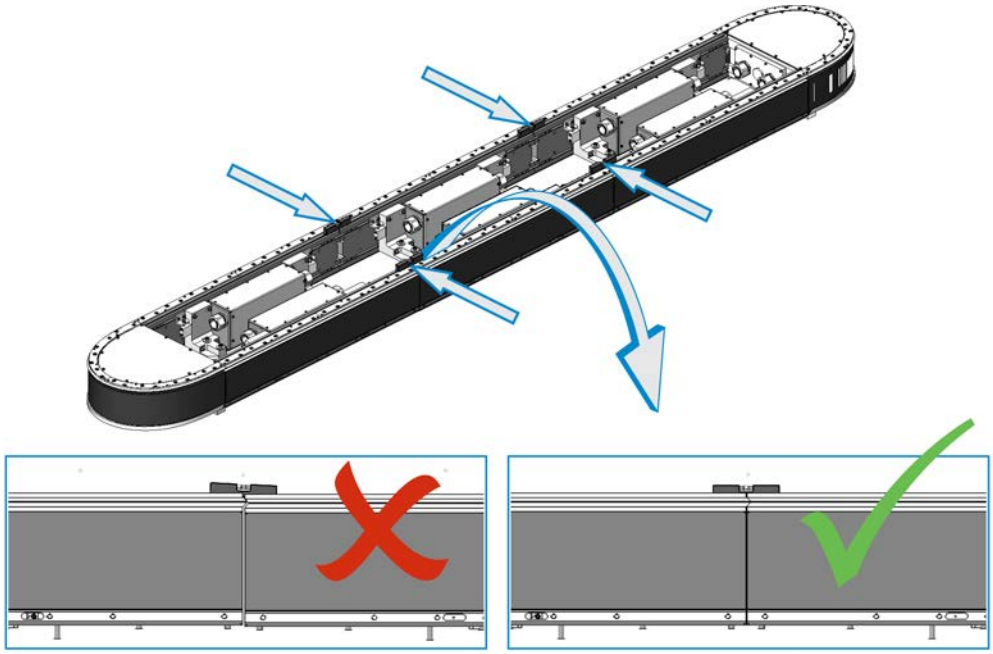


10. Level the straight sections next to the 180 deg. sections.
    Place the precision level on the t-slot behind the encoder bracket of the straight section when leveling.



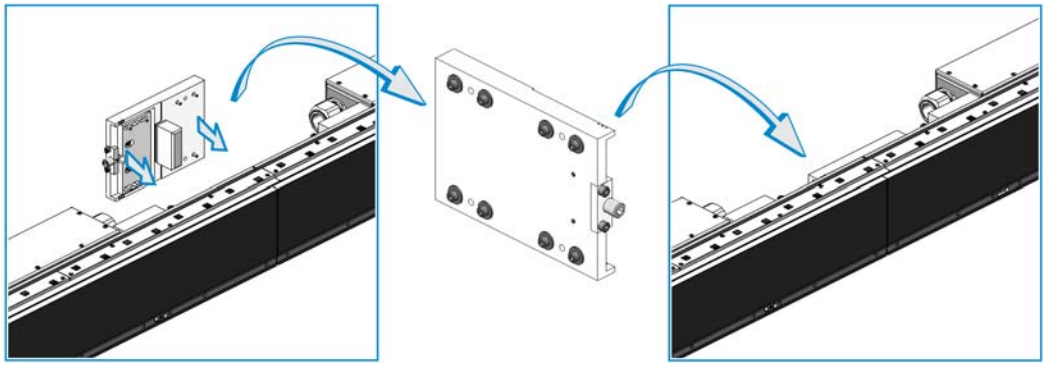
11. Level the straight sections in the middle of the track, and adjust them vertically to align the upper v-rails with the other straight sections.

    See *Align the SuperTrak Conveyor Section Joints* on page 87, and *Align the SuperTrak Conveyor Section Heights* on page 88 for additional information.

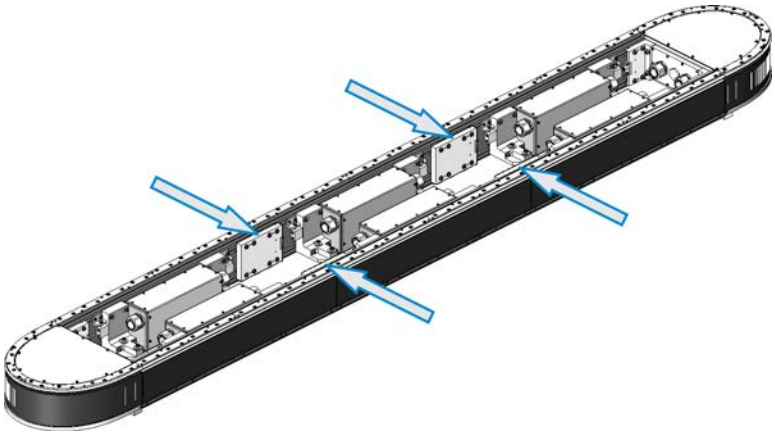


12. Install a wedge adjust between each of the straight sections.

    See *Install a Wedge Adjust* on page 89.



13. Adjust the wedges IN or OUT to align the upper v-rails. Only adjust when the wedge adjust screws are loose, and measure when the wedge adjust screws are tight.

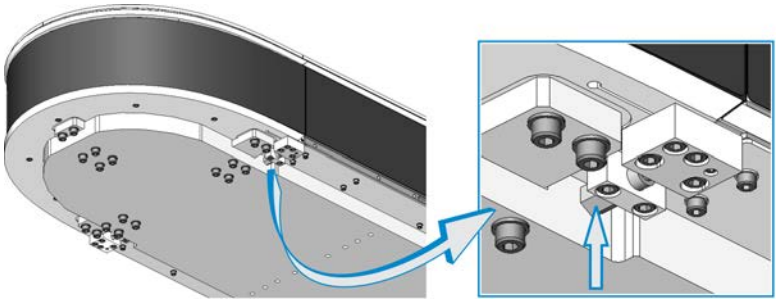


14. Align the upper v-rails by adjusting the wedge or adjusting the screws on the inside of the 180 deg. section.

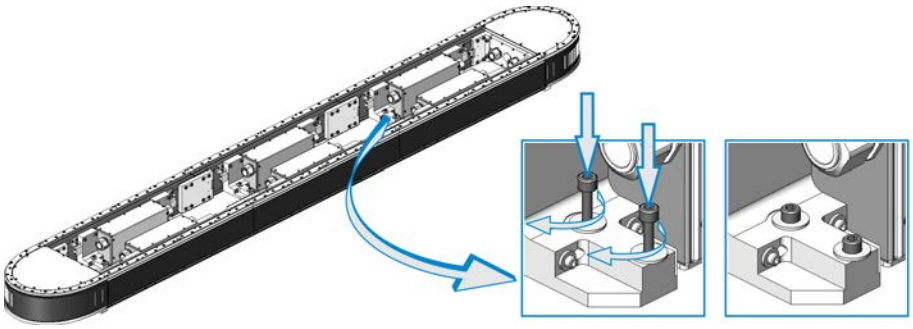
    See *Fine-Adjust the Upper V-Rail* on page 91.

15. Align the lower flat rails with the adjustment features mounted below the 180 deg. section.

    See *Align a Flat Wear Strip* on page 192.



16. Tighten the four (4) screws in each straight section stand base.



17. Install the lower flat wear strips.

    See *Replace a Flat Wear Strip* on page 189.

18. Lift the SuperTrak conveyor into position.

    Use correct lifting techniques with straps and a forklift.

19. Secure the base plate to the mounting frame.
20. Install the pallets.

    See *Install a Pallet* on page 147.

21. If required, fine-adjust the v-rails.

    See *Fine-Adjust the Upper V-Rail* on page 91.

Lift a SuperTrak Conveyor Section

DANGER

Always use appropriate lifting devices (for example, a forklift or crane) and use safe lifting practices and procedures when lifting a straight section or 180 deg. section.

ATS recommends that you obtain relevant information from your national Health and Safety Authority.

This section describes the correct lifting techniques for the following:

- Straight section

  See *Lift a Straight Section Assembly* on page 71.

- 180 deg. section (500 mm)

  See *Lift a 180 Deg. Section (500 mm)* on page 72.

- 180 deg. section (800 mm)

  See *Lift a 180 Deg. Section (800 mm)* on page 73.

Always use appropriate lifting devices and use safe lifting practices when moving a section. The following tools are required for this procedure:

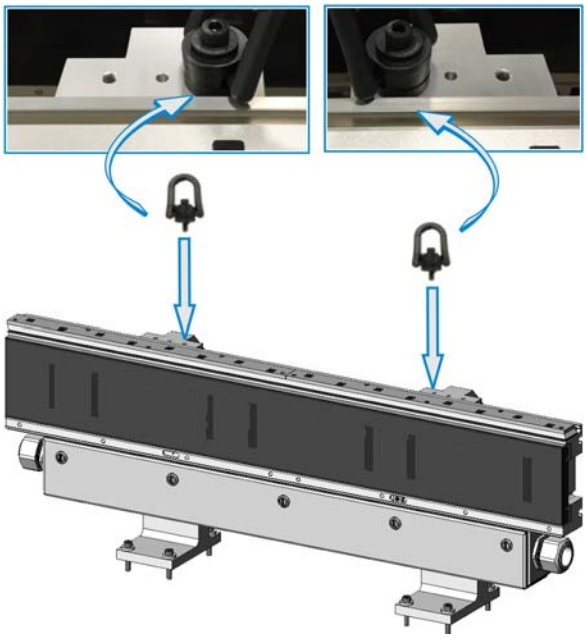
- Three (3) M8 rotating eye bolts

- Three (3) lifting straps, each with a minimum lifting capacity of 100 kg (220.5 lb)

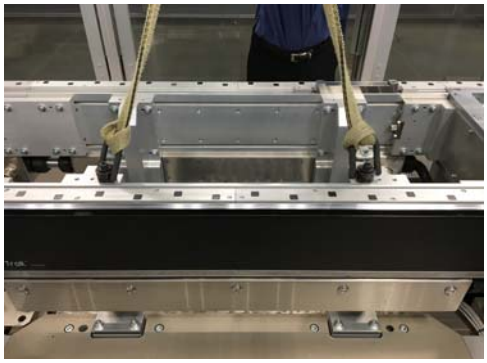
- Appropriate lifting device (for example; a forklift or crane)

Lift a Straight Section Assembly

1. Thread an M8 rotating eye bolt into the inner-most hole of each of the two (2) stands.



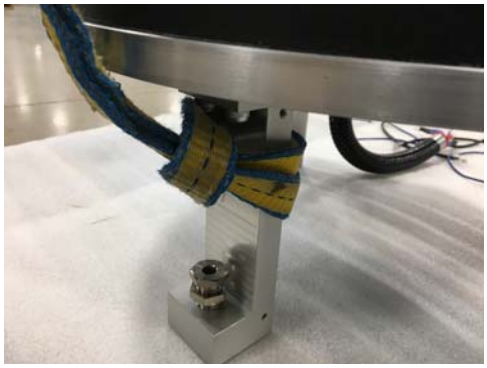
2. Attach each end of one (1) lifting strap to an eye bolt.



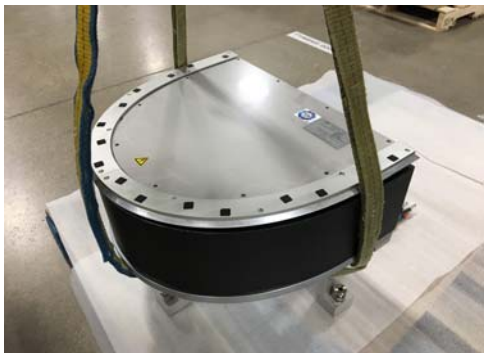
3. Use an appropriate lifting device, such as a forklift, to lift the straight section by the middle of the lifting strap.
4. When the straight section is in the required position, remove the lifting strap and two (2) eye bolts.

Lift a 180 Deg. Section (500 mm)

1. Wrap one (1) strap around each of the three (3) stands.



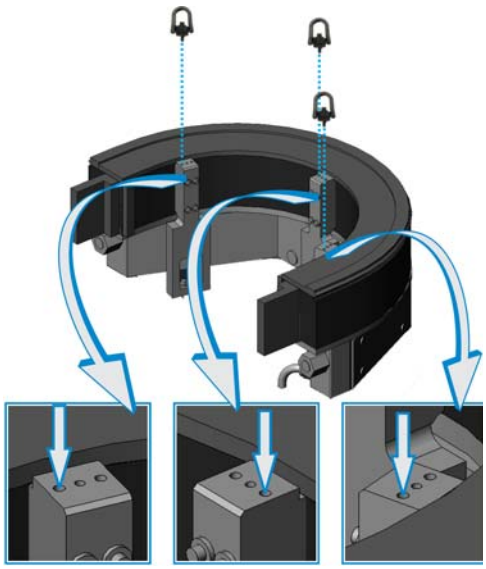
2. Use an appropriate lifting device, such as a forklift, to lift the 180 deg. section up by the ends of the lifting straps.



3. When the 180 deg. section is in the required position, remove the lifting straps.

Lift a 180 Deg. Section (800 mm)

1. Thread one (1) M8 rotating eye bolt into the top of each of the three (3) stands.



2. Attach one (1) strap to each of the three (3) M8 rotating eye bolts.

3. Use an appropriate lifting device, such as a forklift, to lift the 180 deg. section up by the ends of the lifting straps.
4. When the 180 deg. section is in the required position, remove the lifting straps.

Install a SuperTrak Conveyor Section on a Prolato Base

DANGER

Always use appropriate lifting devices (for example, a forklift or crane) and use safe lifting practices and procedures when lifting a straight section or 180 deg. section.

See *Lift a SuperTrak Conveyor Section* on page 70.

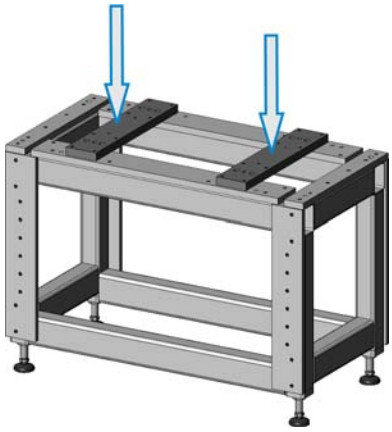
ATS recommends that you obtain relevant information from your national Health and Safety Authority.

This section describes how to install a straight section or a 180 deg. section on a prolato base.

Install a Straight Section on a Prolato Base

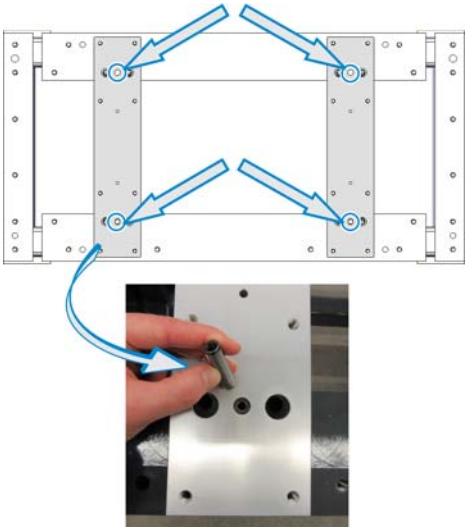
1. Install the two (2) cross-braces on top of the frame:

   a. Align a cross-brace with the frame holes.



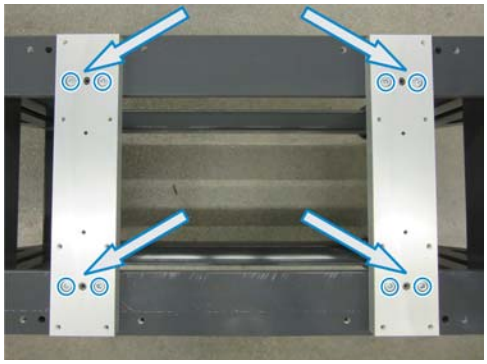
   b. Align a dowel pin with the cross-brace positioning hole. Make sure the threaded end is up.

   c. Use a mallet to tap the dowel pin through the cross-brace hole and into the frame. The top of the dowel pin is slightly under the cross-brace surface when installed correctly.

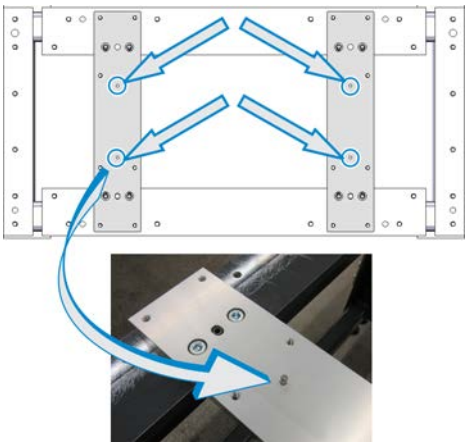


   d. Repeat step a to c for the second cross-brace.

e. Secure the cross-brace in position with four (4) screws.



f. Tap two (2) dowels halfway into the cross-brace. Make sure the dowel remains above the cross-brace surface.

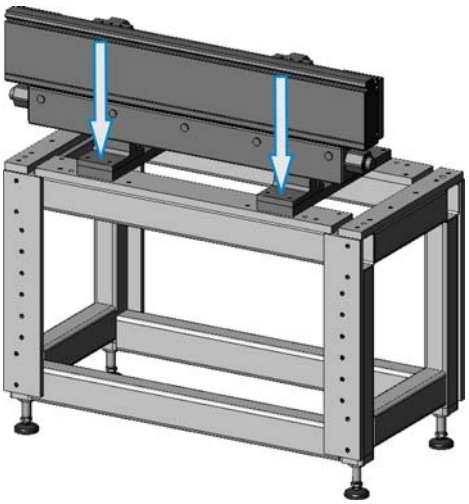


g. Repeat steps a to f for the second cross-brace.

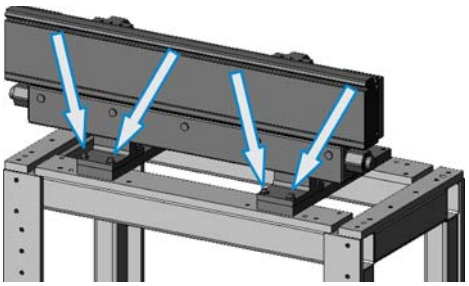
2. Install the first straight section on the frame:

a. Lift and position a straight section on the frame.

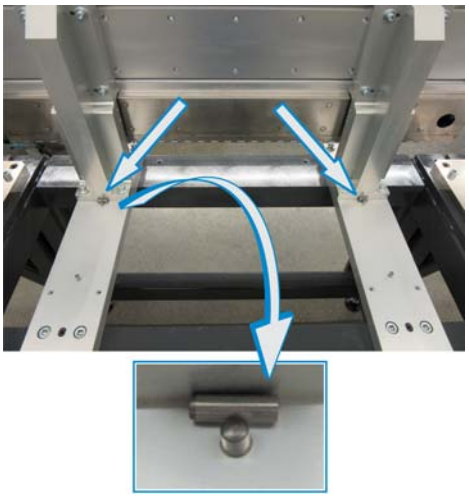
   Roughly center the straight section stands on the cross-braces. Make sure the straight section electrical box faces away from the frame.



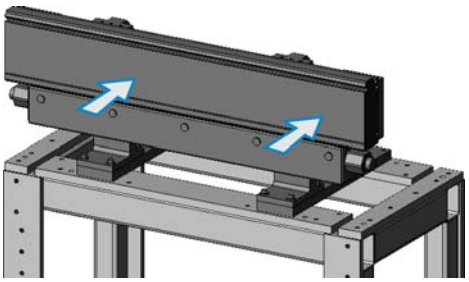
b. Loosely install eight (8) screws into the stand bases.



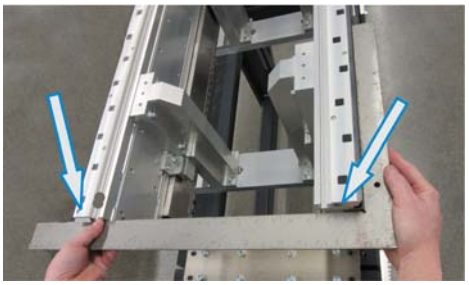
c. Position a dowel pin between each straight section stand and the cross-brace dowel pins.



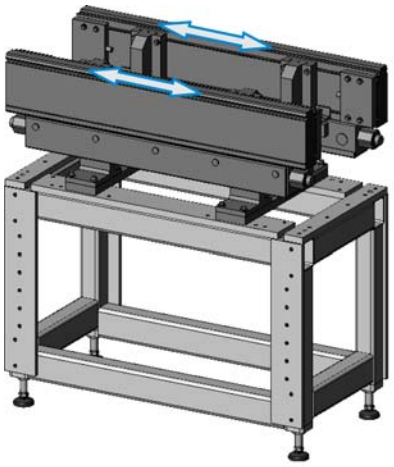
d. Push the straight section toward the center of the frame, so it is tight against the dowel pins.

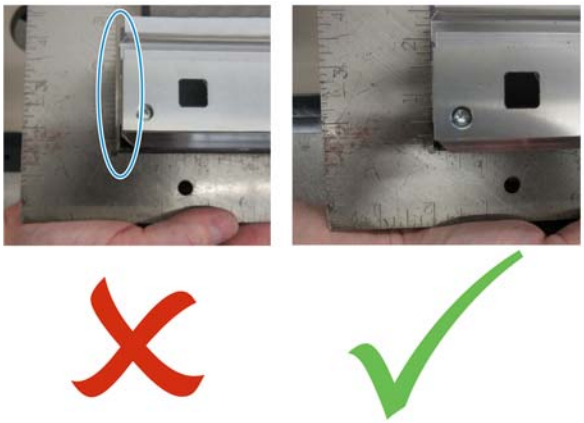


3. Repeat step 2 for the second straight section.
4. Check the alignment of the two (2) straight sections, by holding a square tight against the ends of the two (2) straight sections.



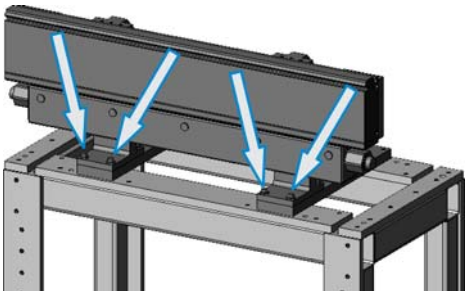
5. If the two (2) straight sections were not aligned in step 4, gently tap the straight section left or right (as required) until they are aligned.





6. Tighten the four (4) screws at the base of each straight section stand.

   It is very important that the screws are centered in the screw holes as much as possible. This allows for adjustment when sections are connected together later.

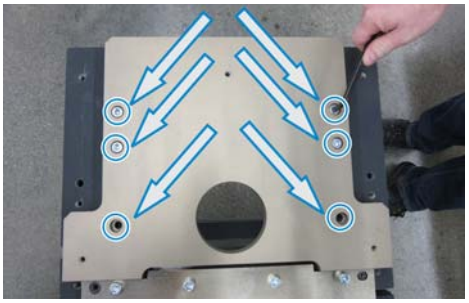


Install a 180 Deg. Section (500 mm) on a Prolato Base

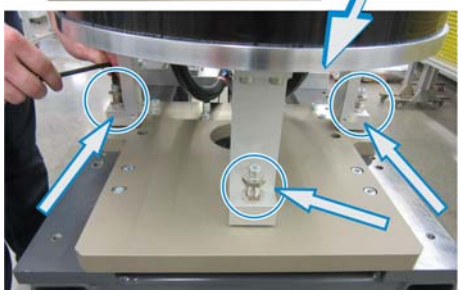
1. Install the 180 deg. plate on the frame:

   a. Align the 180 deg. plate with the frame holes.

   b. Install six (6) screws to secure the 180 deg. plate in position.



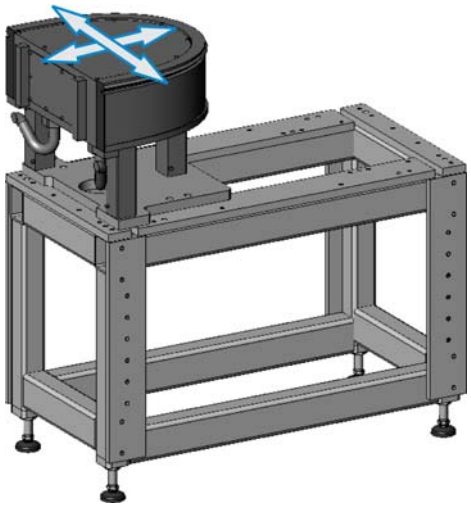
2. Lift and position a 180 deg. section on the 180 deg. plate.
3. Loosely install one (1) lock washer, and one (1) screw in each of the three (3) stand bases.



4. Level the 180 deg. section:

   a. Place a precision spirit level across the frame in the directions illustrated, to determine the leveling foot (or feet) that requires adjustment.

      For more precise measurements, remove the top cover from the 180 deg. section before leveling.



   b. Loosen the upper lock nut.

   c. Turn the leveling screw as required, to raise or lower the side of the 180 deg. section.

   d. Use a level to verify that the 180 deg. section is level.

   e. If the 180 deg. section is not level, repeat steps c to d.

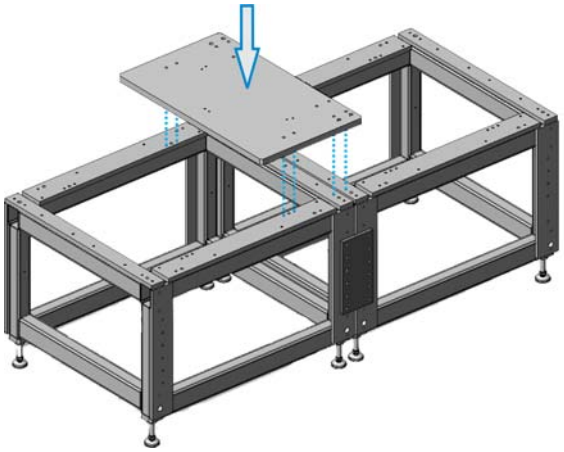
   f. Tighten the upper lock nut.

5. Tighten the three (3) screws from step 3.

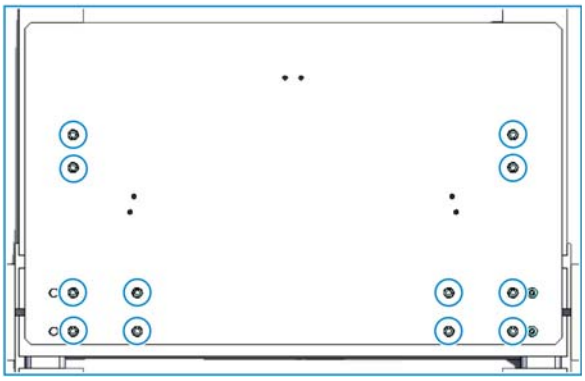
Install a Wide 180 Deg. Section (800 mm) on a Prolato Base

1. Install the wide 180 deg. plate on the frame:

   a. Align the wide 180 deg. plate with the frame holes.

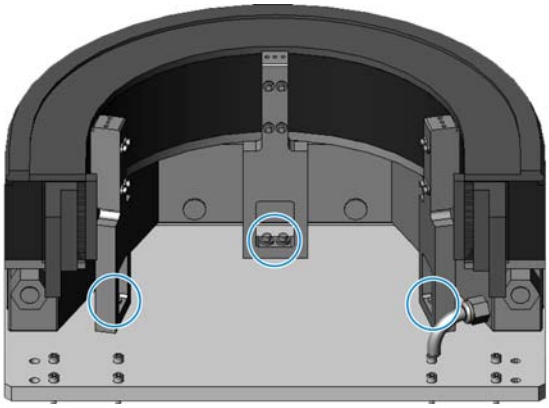


   b. Install twelve (12) screws to secure the wide 180 deg. plate in position.



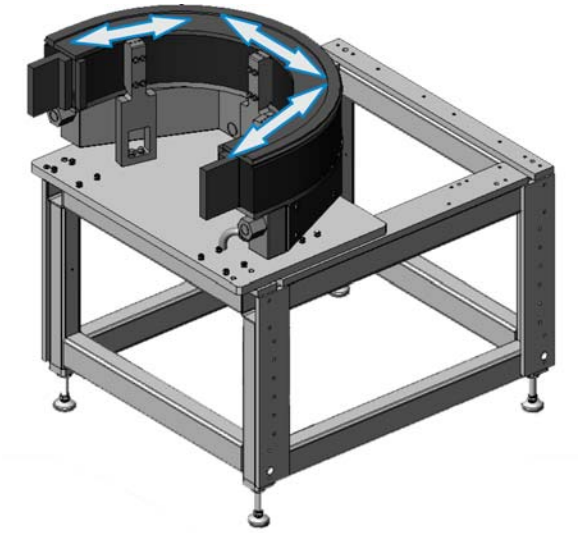
2. Lift and position a wide 180 deg. section on the wide 180 deg. plate.

3. Loosely install two (2) lock washers, and two (2) screws in each of the three (3) stand bases.



4. Level the wide 180 deg. section:

   a. Place a precision spirit level across the frame in the directions illustrated, to determine the leveling foot (or feet) that requires adjustment.



   b. Loosen the four (4) screws on each stand.

   c. Loosen the upper lock nut.

   d. Turn the leveling screw as required, to raise or lower the side of the wide 180 deg. section.

   e. Use a level to verify that the wide 180 deg. section is level.

   f. If the wide 180 deg. section is not level, repeat steps 4c to 4d.

   g. Tighten the upper lock nut.

5. Tighten the twelve (12) screws from step 4b, and the six (6) screws from step 3.

Install the First SuperTrak Conveyor Section

DANGER

Always use appropriate lifting devices (for example, a forklift or crane) and use safe lifting practices and procedures when lifting a straight section or 180 deg. section.

See *Lift a SuperTrak Conveyor Section* on page 70.

ATS recommends that you obtain relevant information from your national Health and Safety Authority.

NOTICE

To prevent system damage, keep the system sections upright at all times.

During installation, consider the size of the system. For large systems (>7 sections) install the middle straight section first and work your way out to each 180 deg. section. For small systems (<7 sections), installation can begin from the far left or right 180 deg. section.

In this procedure, “section A” references an installed straight section, 180 deg. section, or group of sections.

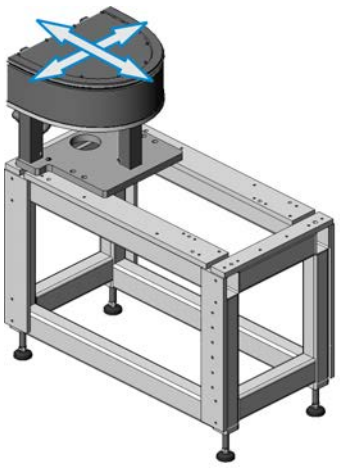
1. Position section A in the installation location.

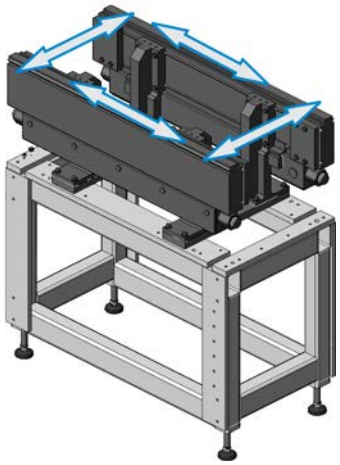
   Make sure the installation location has a non-compressing floor (for example; concrete), to correctly level and align section A.

2. Level the frame.

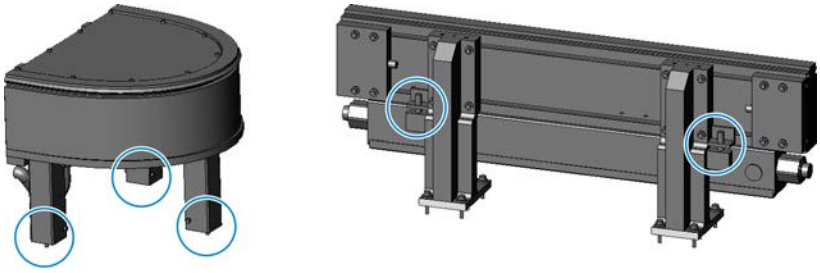
   See *Level the Frame* on page 84.

3. Place a precision spirit level across the top of section A in the directions illustrated, to determine if additional adjustment is required.



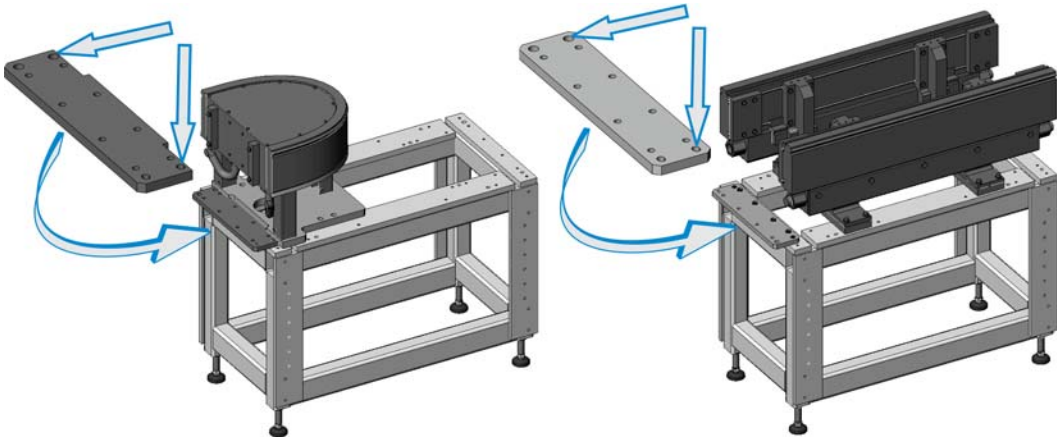


If the section is not level, adjust the required leveling screw.

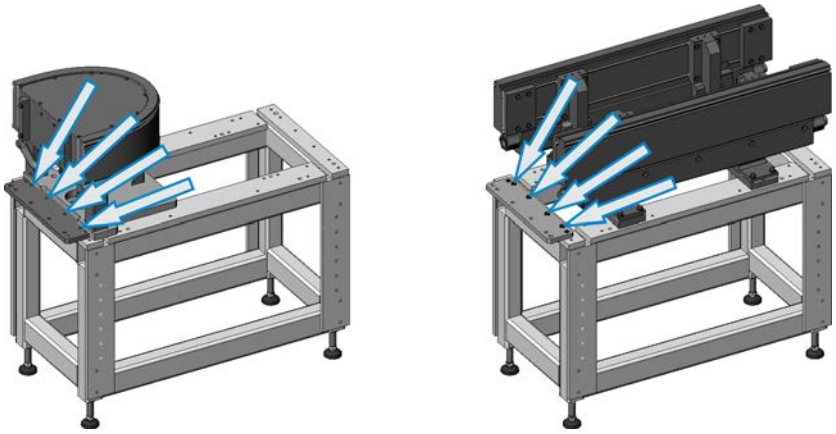


4. Install two (2) dowels through the outer holes of top connection plate, to position the top connection plate on the frame.

   The top connection plate for the 180 deg. section is notched; the straight section connection plate is not notched.



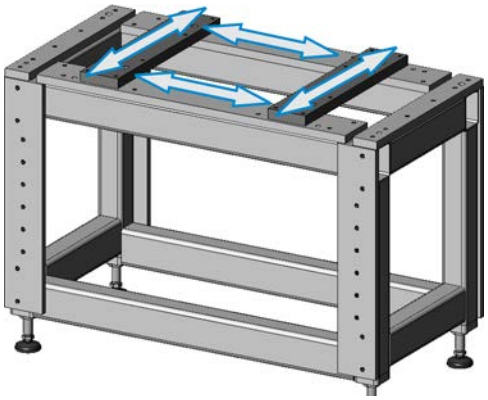
5. Install four (4) screws in the top connection plate to secure it in position.



Level the Frame

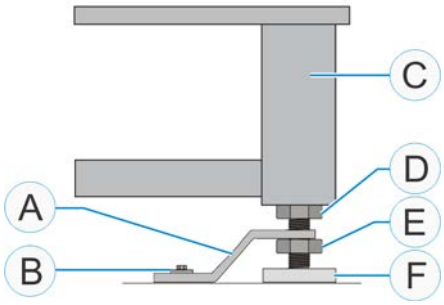
To accommodate varying floor heights, the leveling feet of the SuperTrak conveyor frame allow for individual height adjustment.

1. Place a precision spirit level across the frame in the directions illustrated, to determine the leveling foot (or feet) that requires adjustment.



2. If installed, remove the anchor bolt and hold down toe.

A	Hold down toe
B	Anchor bolt and washer
C	Frame
D	Upper lock nut
E	Lower lock nut
F	Leveling foot



3. Loosen the upper lock nut.
4. Turn the leveling foot as required, to raise or lower the table.
5. Use a level to verify that the table is level.
6. If the frame is not level, repeat steps 1 to 5.
7. Tighten the upper lock nut.
8. If required, install the hold down toe over the lower lock nut.
9. Tighten the anchor bolt.

Connect Two SuperTrak Conveyor Sections Together

DANGER

Always use appropriate lifting devices (for example, a forklift or crane) and use safe lifting practices and procedures when lifting a straight section or 180 deg. section.

See *Lift a SuperTrak Conveyor Section* on page 70.

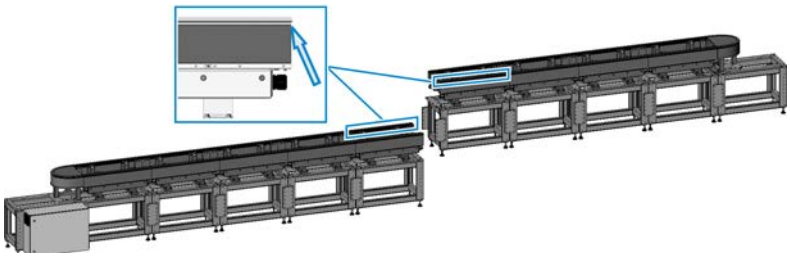
ATS recommends that you obtain relevant information from your national Health and Safety Authority.

NOTICE

- To prevent system damage, always keep the system sections upright.
- When two (2) large SuperTrak conveyor sections are joined together, remove the upper v-rail from the connecting straight sections.

  The upper v-rail overhangs the edge of the section; removal of the upper v-rail before joining the sections prevents upper v-rail and encoder bracket damage.

  It is also recommended to install the interconnect before the sections are joined together, for ease of installation.

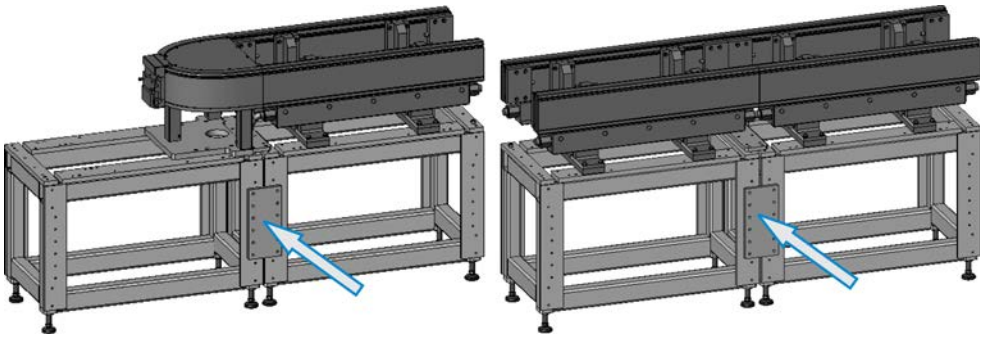


In this procedure, “section A” references an installed straight section, 180 deg. section, or group of sections. “Section B” is the straight section, 180 deg. section, or group of sections being installed next to section A.

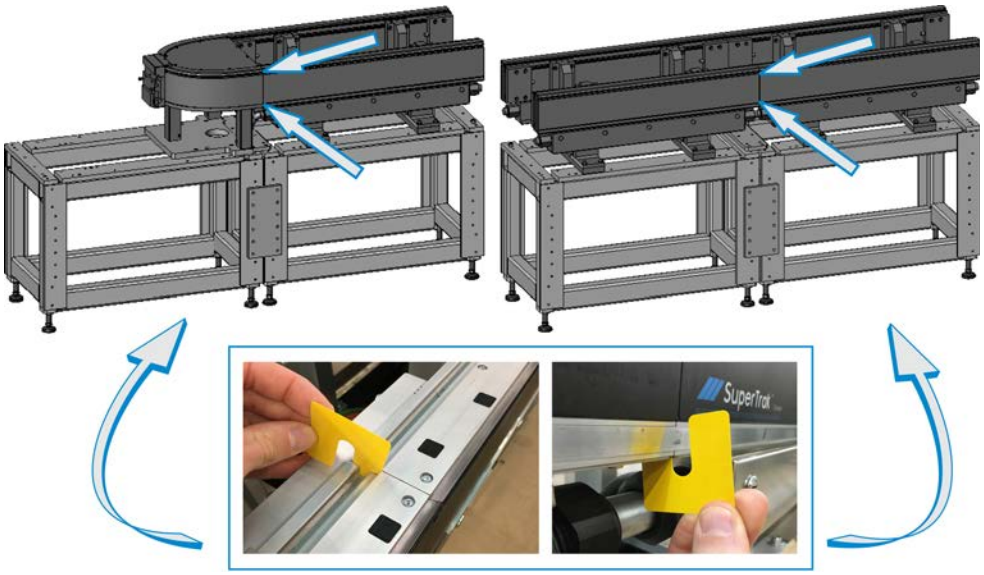
1. Align the section B with the section A, and then slide the section B under the top connection plate of section A.
2. If required, adjust the height of section B until the top of the frame touches the bottom of the top connection plate on section A.
3. Install two (2) dowels through the outer holes of top connection plate.
4. Level section B.

   See *Level the Frame* on page 84.
5. Loosely install four (4) screws in the top connection plate to secure section B in position.

6. Loosely connect the sides of the frames together. Install a side connection plate on each side of the frame with twelve (12) screws in each.



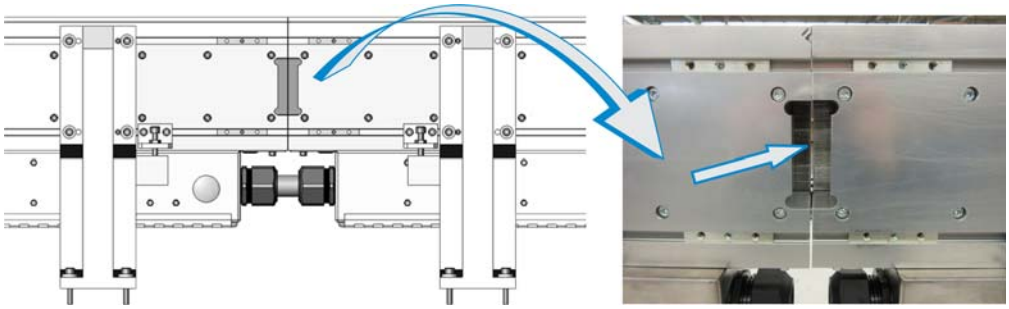
7. Use a 0.5 mm (0.02 in.) shim to verify that a 0.5 mm (0.02 in.) space exists between the aluminum surfaces of section A and section B.



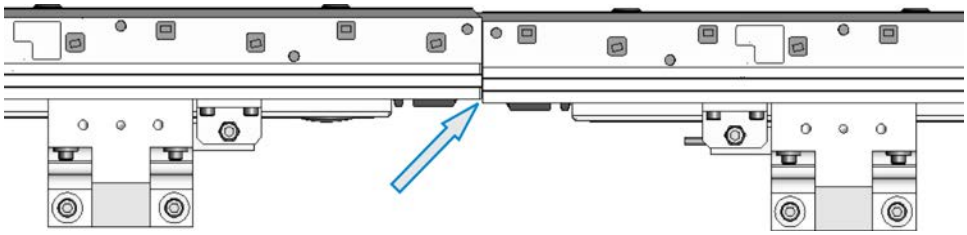
8. Tighten the four (4) screws from step 5.
9. Tighten the twenty-four (24) screws from step 6.

Align the SuperTrak Conveyor Section Joints

1. In the recess where the motor laminations meet, verify that the laminations align.

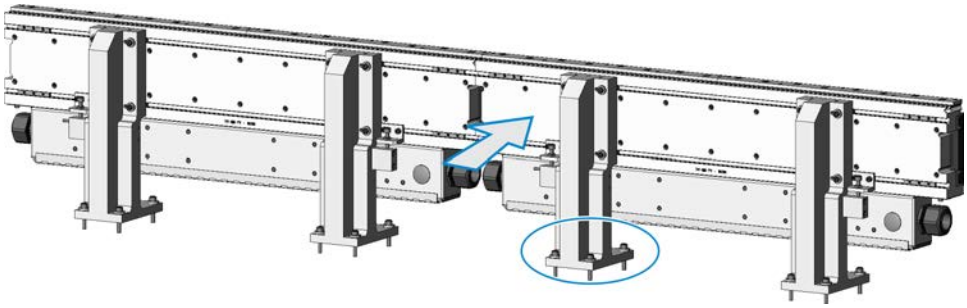


The image below provides a top view of two straight sections that are not aligned.



2. If the joints are not aligned:

   a. Loosen the four (4) screws on the base of the stand that requires adjustment.



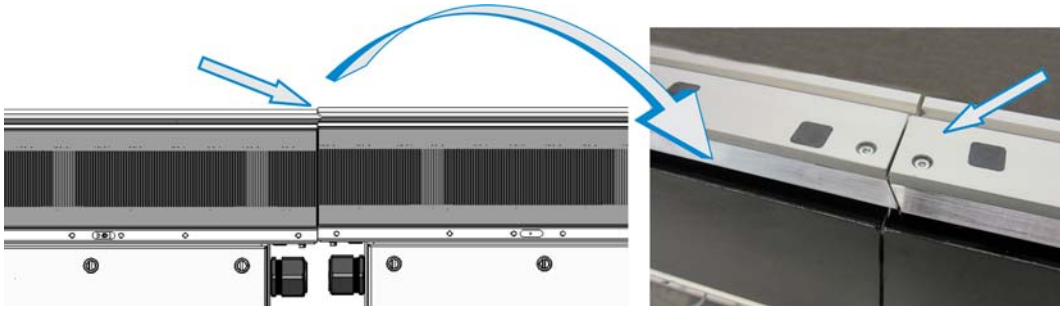
   b. Gently slide the section forward or back until the sections are aligned.

   c. Tighten the four (4) screws from step a.

   d. Repeat step 1.

Align the SuperTrak Conveyor Section Heights

1. At the upper v-rail joint, measure the offset between the two (2) upper v-rails. If the offset exceeds ±0.07 mm (0.0027 in.), the SuperTrak conveyor sections are not aligned.

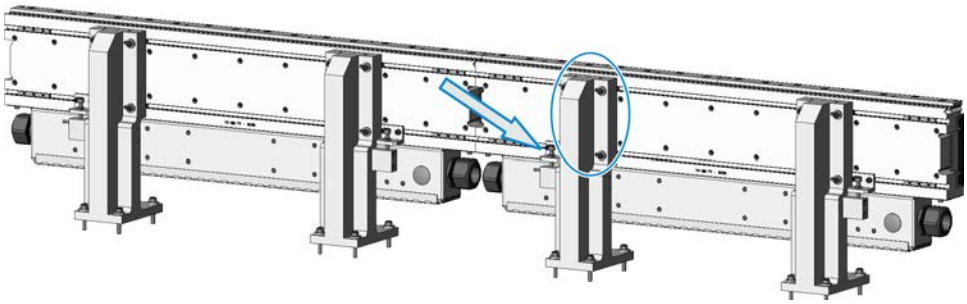


The image below illustrates a possible validation process, where two (2) indicators are mounted to a pallet to measure the offset between the two (2) upper v-rails.

2. If the height is not aligned:

   a. Loosen the four (4) screws on the top of the stand that requires adjustment.

   b. Adjust the height adjustment screw up or down until the height is aligned.



   c. Tighten the four (4) screws from step a.

   d. Repeat step 1.

Install a Wedge Adjust

The wedge adjust compensates for excess tolerance between SuperTrak conveyor sections.

Install a Wedge Adjust - Straight Section

1. Verify that the edge of the wedge adjust plate aligns with the center notch on the side of the wedge adjust. If required, turn the adjustment knob to obtain the correct position.

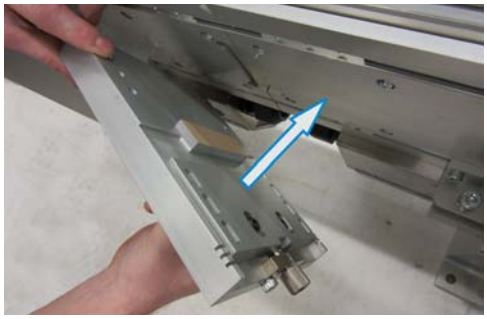
   Make sure that the foam piece is adhered to the wedge adjust, as shown in the photo.

2. Place the magnetic shunt into the opening between the two (2) straight sections.

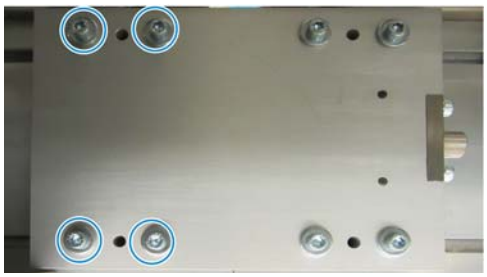
   Do not place any objects in the opening before the magnetic shunt is inserted. The magnetic shunt requires iron-to-iron contact with the motor core of each straight section.

3. Align the wedge across two (2) straight sections.

   Make sure the wedge holes align with the on the t-bars in the t-slot.



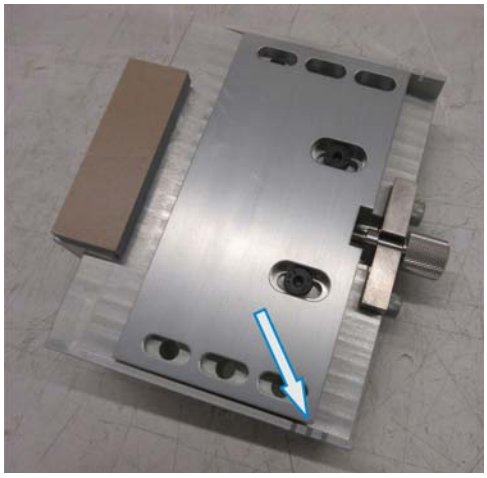
4. Loosely install eight (8) washers and eight (8) screws to install the wedge to the t-bars.
5. Tighten the four (4) screws on the non-adjustable side of the wedge.



Install a Wedge Adjust - 180 Deg. Section

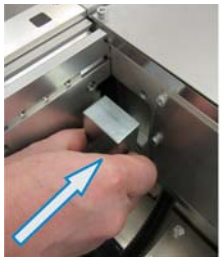
1. Verify that the edge of the wedge adjust plate aligns with the center notch on the side of the wedge adjust. If required, turn the adjustment knob to obtain the correct position.

   Also make sure that the foam piece is adhered to the wedge adjust as shown in the photo.



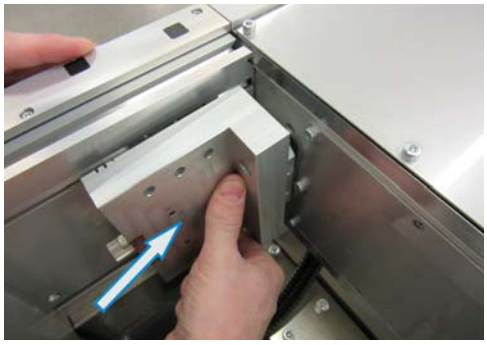
2. Place the magnetic shunt into the opening between the two (2) SuperTrak conveyor sections.

   Slide the magnetic shunt into the opening width-wise, and then push it sideways into location. Do not place any objects in the opening before the magnetic shunt is inserted. The magnetic shunt requires iron-to-iron contact with the motor core of both the straight section and the 180 deg. section.



3. Align the wedge adjust across the straight section and a 180 deg. section.

   The end of the wedge adjust slides into the opening that was used for the magnetic shunt installation.



4. Loosely install four (4) washers and four (4) screws on the straight section side, and then install and tighten two (2) washers and two (2) screws on the side of the 180 deg. section.

   Note that the screws installed on the 180 deg. section are larger.

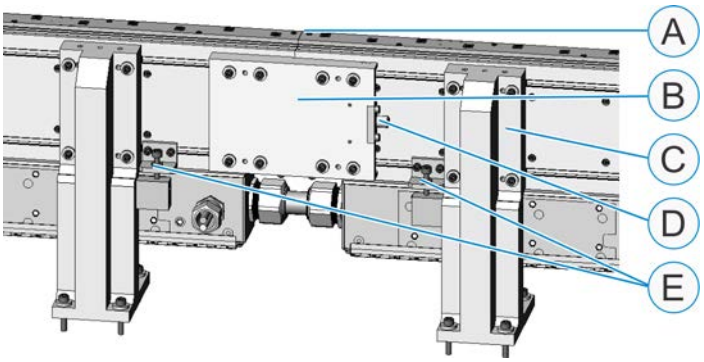
Fine-Adjust the Upper V-Rail

NOTICE The maximum vertical tolerance at the upper v-rail joint is 70 µm.

Upper v-rail alignment is an iterative process. Alternate between height and wedge adjustments until the upper v-rail is flush and the sound is consistent when a pallet is pushed past the upper v-rail join.

Fine-adjust the upper v-rail if the pallets make significant noise when traveling over the upper v-rails. This diagram indicates the location of the components that are referenced in this procedure.

A	Upper v-rail joint
B	Wedge adjust
C	Stand
D	Wedge adjustment knob
E	Height adjustment



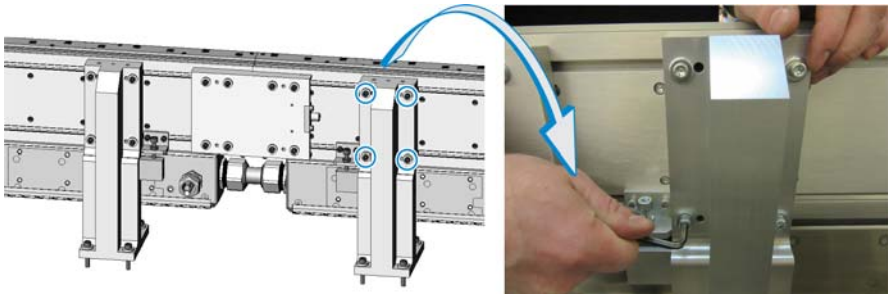
1. Verify that all stand and wedge screws are tight.
2. Complete one (1) of the following:
   - Run your finger over the upper v-rail joint.
   - Manually slide a pallet across the upper v-rail joint in both directions while you watch and listen to the pallet.

3. If you feel a ridge, or if the pallet makes any knocking sounds as it rolls over the upper v-rail joint, proceed to step 4; otherwise, the procedure is complete.
4. Determine which section is higher and by how much, and then complete one (1) of the following:
   - If the upper v-rail requires ±0.05 mm (±0.002 in.) adjustment, see *Adjust the Upper V-Rail ±0.05 mm (±0.002 in.) - Straight Section to Straight Section* on page 92.
   - If the upper v-rail requires >±0.05 mm (>±0.002 in.) adjustment, see *Specialized Upper V-Rail Adjustment - Straight Section to Straight Section* on page 96.

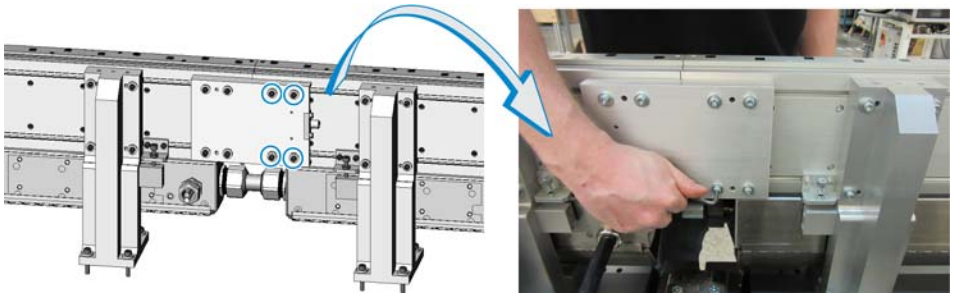
Adjust the Upper V-Rail ±0.05 mm (±0.002 in.) - Straight Section to Straight Section

1. If vertical upper v-rail adjustment is required, complete the following steps on the side that requires adjustment:

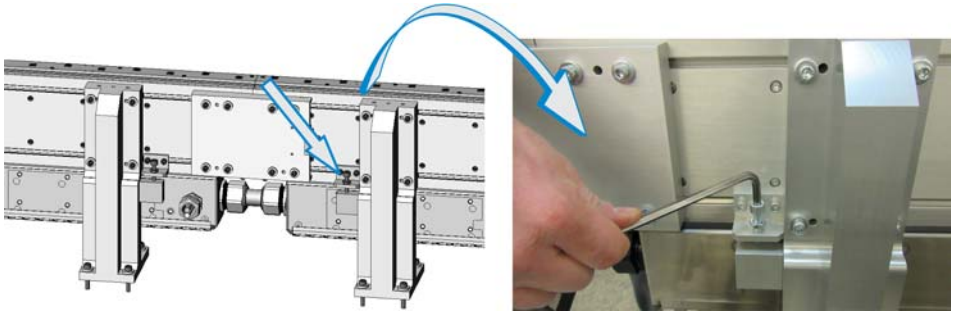
   a. Loosen the four (4) screws at the top of the stand.



   b. Loosen the four (4) wedge screws.



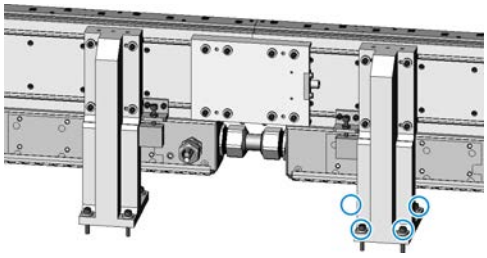
   c. Turn the height adjustment screw as required to adjust the upper v-rail height (UP or DOWN).



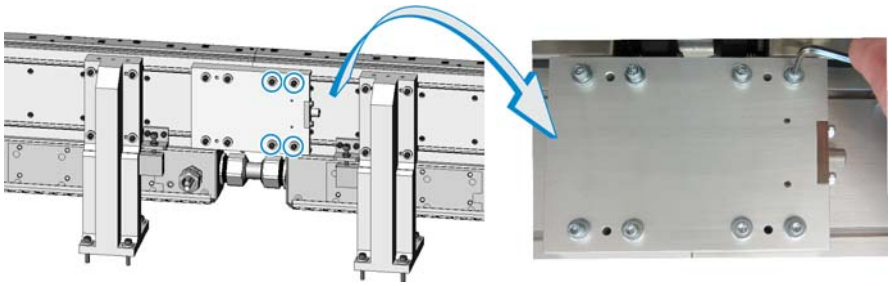
   d. Tighten the four (4) stand screws and four (4) wedge screws that were loosened in step a and b.

2. If horizontal (IN or OUT) upper v-rail adjustment is required, complete the following steps on the side that requires adjustment:

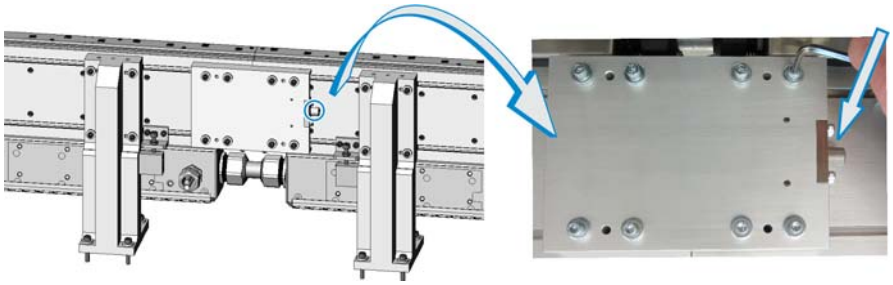
   a. Loosen the four (4) screws at the bottom of the stand.



   b. Loosen the four (4) wedge screws.



   c. Turn the wedge adjustment knob, as required, to adjust the upper v-rail IN or OUT.



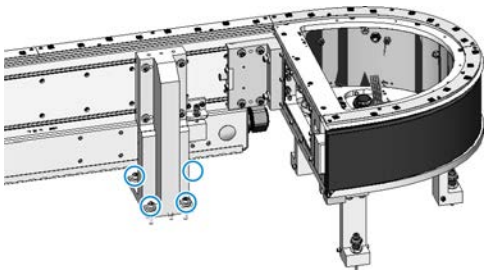
   d. Tighten the four (4) stand screws and four (4) wedge screws that were loosened in step a and b.

3. Repeat steps 2 to 4 of *Fine-Adjust the Upper V-Rail* on page 91.

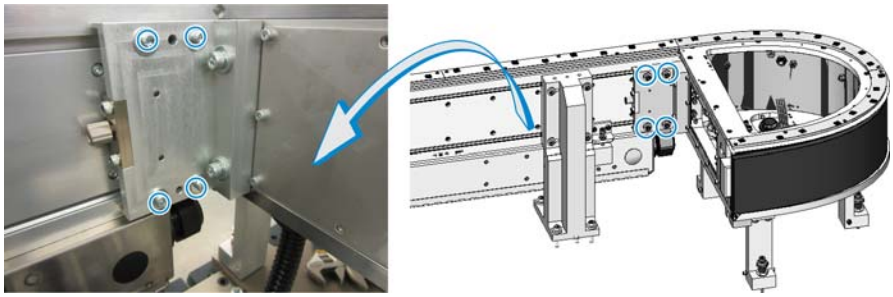
Adjust the Upper V-Rail ±0.05 mm (±0.002 in.) - Straight Section to 180 Deg. Section

1. If vertical upper v-rail adjustment is required, complete the following steps on the side that requires adjustment:

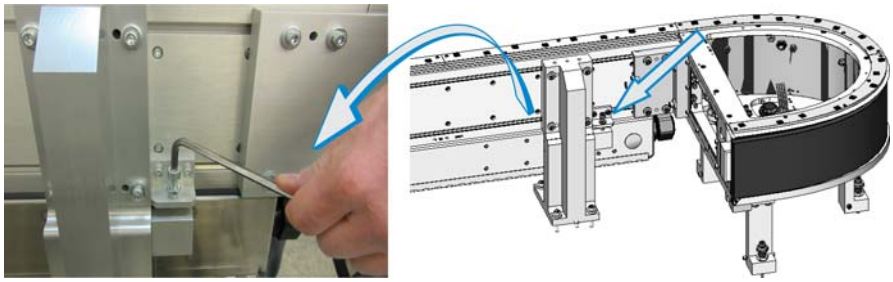
   a. Loosen the four (4) screws at the bottom of the stand.



   b. Loosen the four (4) wedge screws.



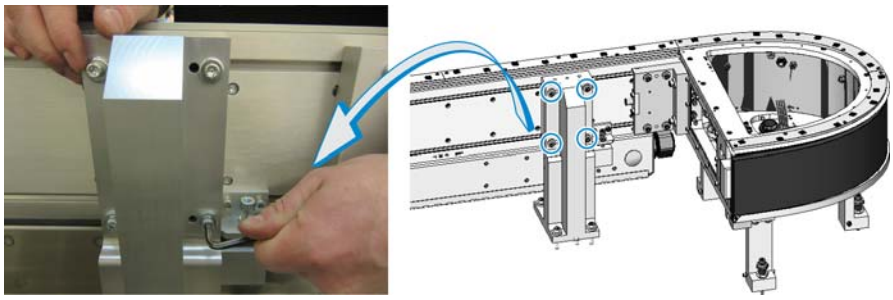
   c. Turn the height adjustment screw as required to adjust the upper v-rail height (up or down).



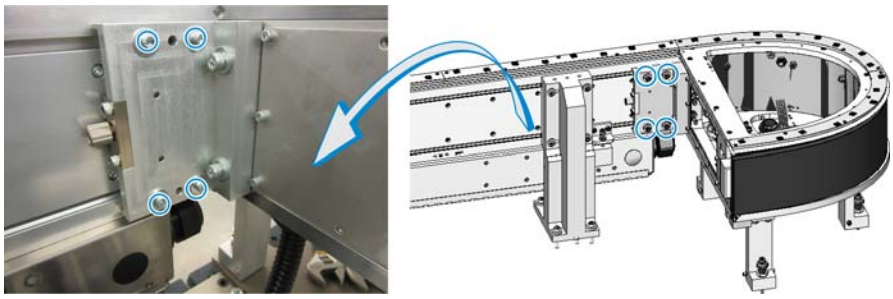
   d. Tighten the four (4) stand screws and four (4) wedge screws that were loosened in step a and b.

2. If horizontal (in or out) upper v-rail adjustment is required, complete the following steps on the side that requires adjustment:

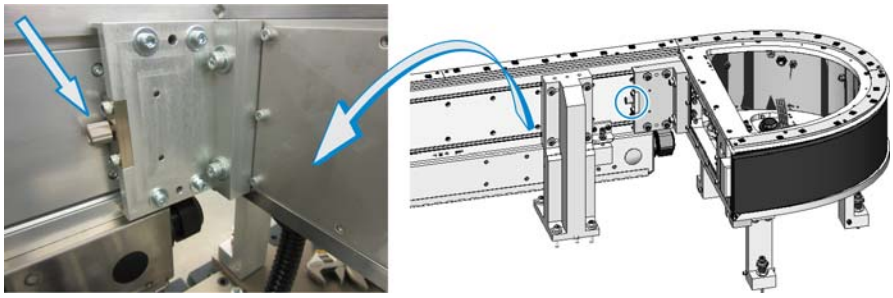
   a. Loosen the four (4) stand screws. This allows the stand to shift rather than flex against the rigid stand.



   b. Loosen the four (4) wedge screws.



   c. Turn the wedge adjustment knob, as required, to adjust the upper v-rail in or out.



   d. Tighten the four (4) stand screws and four (4) wedge screws that were loosened in step a and b.

3. Repeat steps 2 to 4 of *Fine-Adjust the Upper V-Rail* on page 91.

Specialized Upper V-Rail Adjustment - Straight Section to Straight Section

This is a specialized procedure that is not generally required.

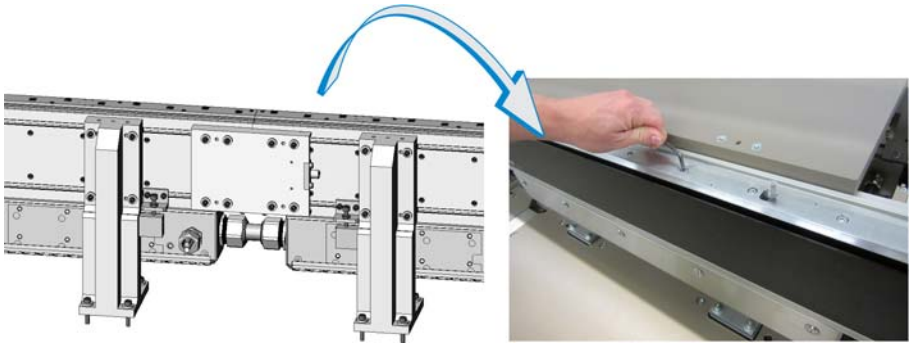
The most important alignment for pallets to travel smoothly is the upper v-rail alignment. The second most important alignment is the lower flat rail alignment. Minor misalignment is acceptable because the wear strip straddles it, but if it is misaligned too much, the wear strip will flex and create an audible “clicking” sound. The third most important alignment is the laminations. If these are not aligned, a magnetic “bump” can occur as pallets travel across it.

For all three alignments, the wedge adjust generally allows for alignment that is adequate enough.

1. Remove the encoder bracket.

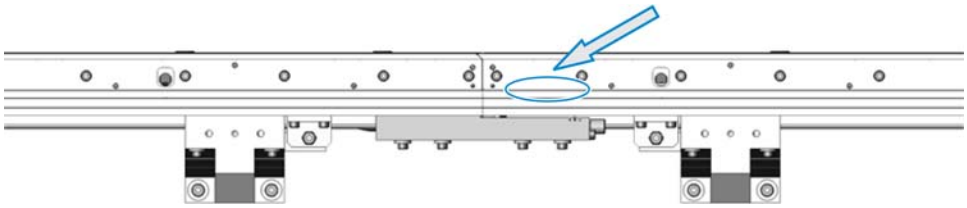
   See *Replace an Encoder Bracket* on page 142.

2. Loosen the upper v-rail screws.



3. At the end of the upper v-rail that requires adjustment, remove the 0.25 mm (0.01 in.) shim and replace it with a smaller or larger shim as required.

   For example, a shim would be placed in the area indicated if the right side required outward adjustment.



4. Re-install the encoder bracket that was removed in step 1.
5. Repeat steps 2 to 4 of *Fine-Adjust the Upper V-Rail* on page 91.

Specialized Upper V-Rail Adjustment - Straight Section to 180 Deg. Section

This is a specialized procedure that is not generally required.

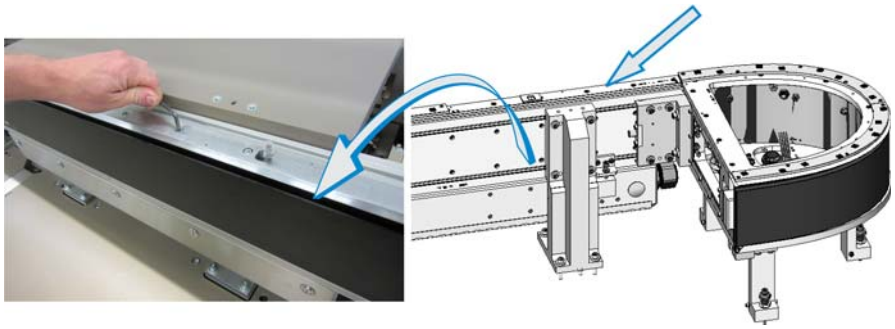
The most important alignment for pallets to travel smoothly is the upper v-rail alignment. The second most important alignment is the lower flat rail alignment. Minor misalignment is acceptable because the wear strip straddles it, but if it is misaligned too much, the wear strip will flex and create an audible “clicking” sound. The third most important alignment is the laminations. If these are not aligned, a magnetic “bump” can occur as pallets travel across it.

For all three alignments, the wedge adjust generally allows for alignment that is adequate enough.

1. Remove the encoder bracket.

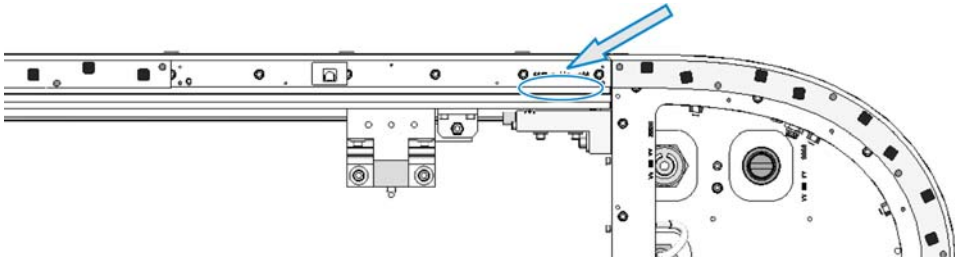
   See *Replace an Encoder Bracket* on page 142.

2. Loosen the upper v-rail screws.



3. At the end of the upper v-rail that requires adjustment, remove the 0.25 mm (0.01 in.) shim and replace it with a smaller or larger shim as required.

   For example, a shim would be placed in the area indicated if the right side required outward adjustment.



4. Re-install the encoder bracket that was removed in step 1.
5. Repeat steps 2 to 4 of *Fine-Adjust the Upper V-Rail* on page 91.

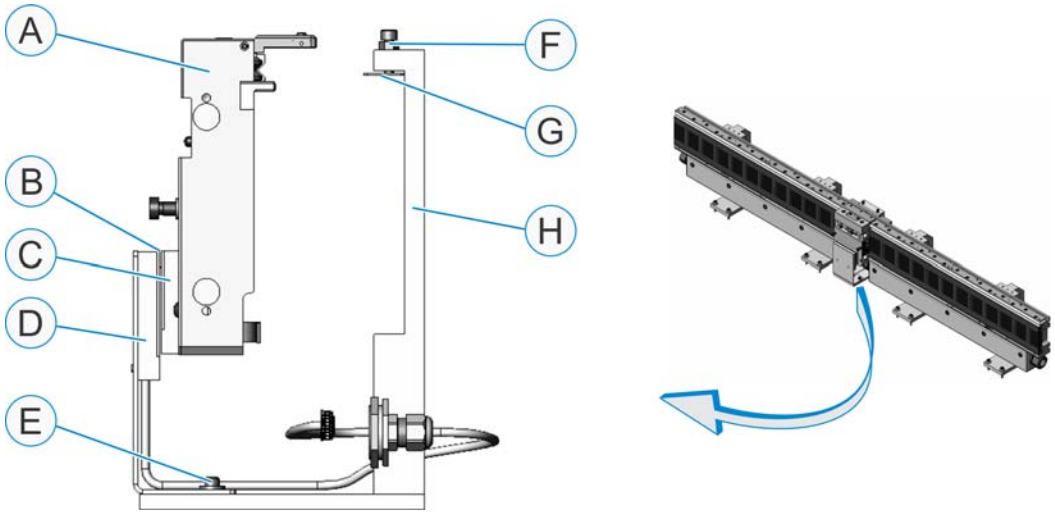
Install an IR Reader Mount Assembly

NOTICE

During this procedure, make sure the clamp plate (see “G” in the diagram below) is positioned between the clamp bolts and the joint plate when you slide the long side of the IR reader mount assembly under the joint of the two (2) adjacent straight sections. Failure to do so will result in joint plate damage.

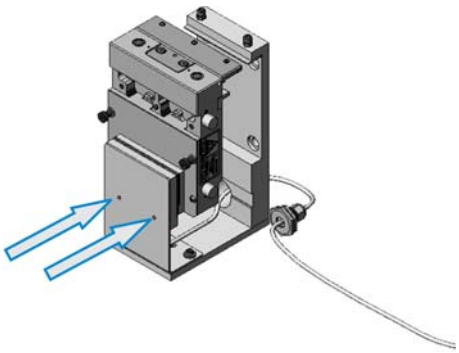
The IR reader mount assembly can be installed in one of the following locations:

- Custom location, if it meets the following criteria:
  - The air gap between the IR reader and IR tab is 1 mm (0.039 in.).
  - The IR reader is located in front of the SuperTrak conveyor section that it is plugged into.
  - There is no interference with a straight section electrical door.
- Across the joint of two (2) adjacent straight sections. This installation location prevents interference with the electrical door of the straight section.

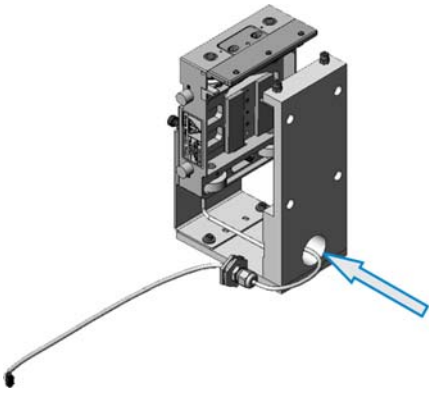


A	Pallet	**E**	Air gap adjustment screw (with slotted hole)
B	1 mm (0.39 in.) air gap	**F**	Clamp plate bolt (1 of 2)
C	IR tag (read-only)	**G**	Clamp plate
D	IR reader	**H**	IR reader mount assembly

1. Secure the IR reader to the IR reader mount assembly with two (2) screws.

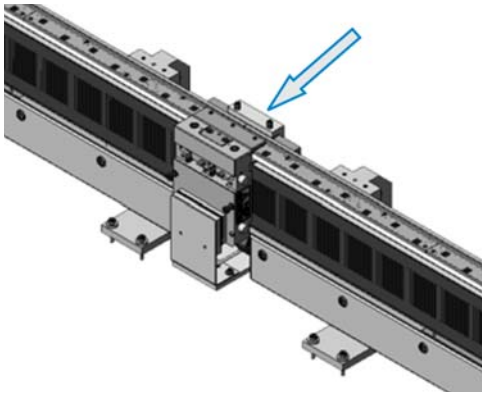


2. Route the IR reader cable through the IR reader mount assembly cable opening.

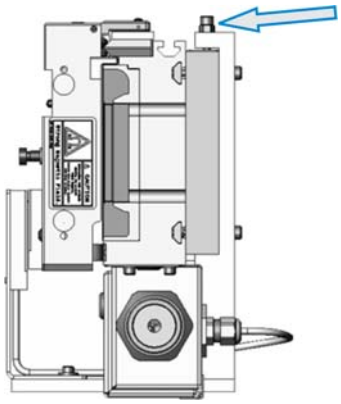


3. Slide the long side of the IR reader mount assembly under the joint of two (2) adjacent straight sections.

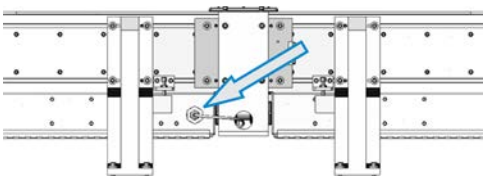
   To prevent joint plate damage, make sure the clamp plate is positioned between the clamp bolts and the joint plate.



4. Tighten the two (2) clamp screws, to hold the IR reader mount in position.

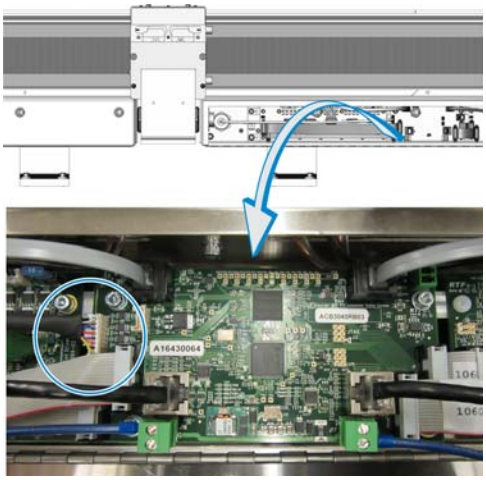


5. Route the IR reader cable into the back of the straight section electrical box, using the supplied knock-out reducer and strain relief connector.



6. Plug the IR reader cable into the IR reader connection on the gateway board. It must be connected to the gateway board of the SuperTrak conveyor section that the IR reader is mounted on.

   See *Gateway Board* on page 30.



7. Slide a pallet in front of the IR reader.
8. Verify that a 1 mm (0.39 in.) gap exists between the IR tag on the pallet and the IR reader. If required, adjust the air gap adjustment screw to increase or decrease the gap.
9. Configure the IR reader.

   See *Access the TrackMaster Built-in Help* on page 126.

Controls and Connections

This section provides the following information about SuperTrak conveyor controls, and connections:

TrackMaster Software

NOTICE

The lifespan of some SuperTrak components may be compromised when temperature-related TrackMaster configuration parameters are adjusted from the default value.

For optimum lifespan of SuperTrak conveyor component, do not increase the default value of the electronics temperature configuration parameter, and use caution when increasing the coil temperature configuration parameter:

- Coil Temperature Limit (°C); default=60, hard limit=90.
- Electronics Temperature Limit (°C); default=60, hard limit=70.

TrackMaster is a Windows-based application that monitors, configures, and is used to troubleshoot the SuperTrak conveyor.

Guarding

DANGER Unguarded devices may cause injury or death. Do not start or operate the equipment with guard doors open. Lockout and tagout all energy sources before entering the guarding. Make sure that all guard panels are in place and guard doors are closed before operating the equipment. Never bypass a safety component.

See *Hazardous Energy* on page 8 and *Lockout and Tagout* on page 11.

Guarding is a protective housing that separates users from dangers; such as, moving devices. The guarding is comprised of a framework fitted with fixed guarding panels, and removable guarding panels.

Fixed Guard Panels

Fixed guard panels should not be removed.

Removable Guard Panels

Removable guard panels are available for maintenance and should only be opened by a qualified technician. A tool is required to unlock and remove a panel and to lock a panel in position. These panels are not usually equipped with a safety switch; therefore, the system should not be operated with any of these panels removed.

Energy Controls

This section describes the energy controls on the SuperTrak conveyor.

SuperTrak Conveyor Power Disconnect Switch

⚠WARNING

Servicing an electrical panel that is still connected to its power source may cause injury or death. Unless directed otherwise, turn the **main power disconnect** switch to the OFF position. Lock out and tag out the switch before accessing and servicing the electrical panel. Only electrical technicians should perform service on the electrical panel.

See *Hazardous Energy* on page 8 and *Lockout and Tagout* on page 11.

The SuperTrak conveyor control panel is designed to be integrated with a main electrical panel, which includes a **main power disconnect** switch. Use the **main power disconnect** switch to turn OFF system power, but maintain digital (UPS) power in the control panel. Only use the **SuperTrak conveyor power disconnect** switch when replacing a SuperTrak conveyor electrical component.

The SuperTrak conveyor power disconnect switch is located on the control panel door.

Use the **SuperTrak conveyor power disconnect switch** when any electronic service or maintenance work is completed.

To isolate the SuperTrak conveyor power, turn the **SuperTrak conveyor power disconnect switch** to the OFF position. The switch is lockable in the OFF position to prevent accidental or unauthorized enabling of electrical power to the system.

See *Hazardous Energy* on page 8.

Uninterruptible Power Supply

An uninterruptible power supply (UPS) is located inside the control panel.

The UPS provides power to the controller and digital electronics. This maintains pallet position information and allows network communications to continue. The UPS does not provide motor power or cause pallet movement.

Connections

Connection information provided in this section is based on the use of the ATS SuperTrak control panel. The control panel meets UL certification and product testing. If an alternate electrical panel is used, it must meet the guidelines defined in the *SuperTrak GEN3 Design Considerations* document.

This section describes the following SuperTrak conveyor connections:

Straight Section to Straight Section Connections

See *Install an Electrical Interconnect Between Two Straight Sections* on page 157.

Straight Section to 180 Deg. Section Connections

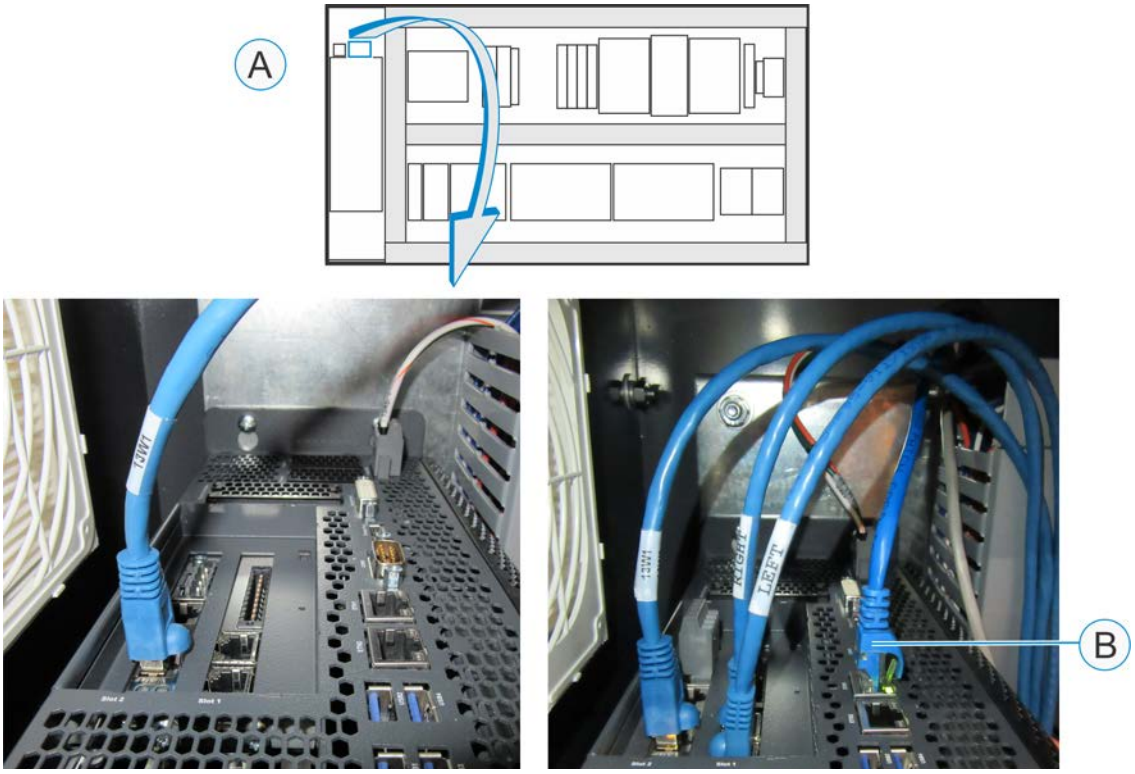
See *Install an Electrical Interconnect Between a Straight Section and a 180 Deg. Section* on page 157.

180 Deg. Section (500 mm) to SuperTrak Control Panel Connection

See *Install an Electrical Interconnect Between a 180 Deg. Section and a SuperTrak Control Panel* on page 158.

Ethernet Port Connection

The Ethernet port (ETH1) connection, located inside the control panel, provides TrackMaster software communication. Any computer (for example; a laptop or HMI) can connect to ETH1 with an Ethernet cable.



Before

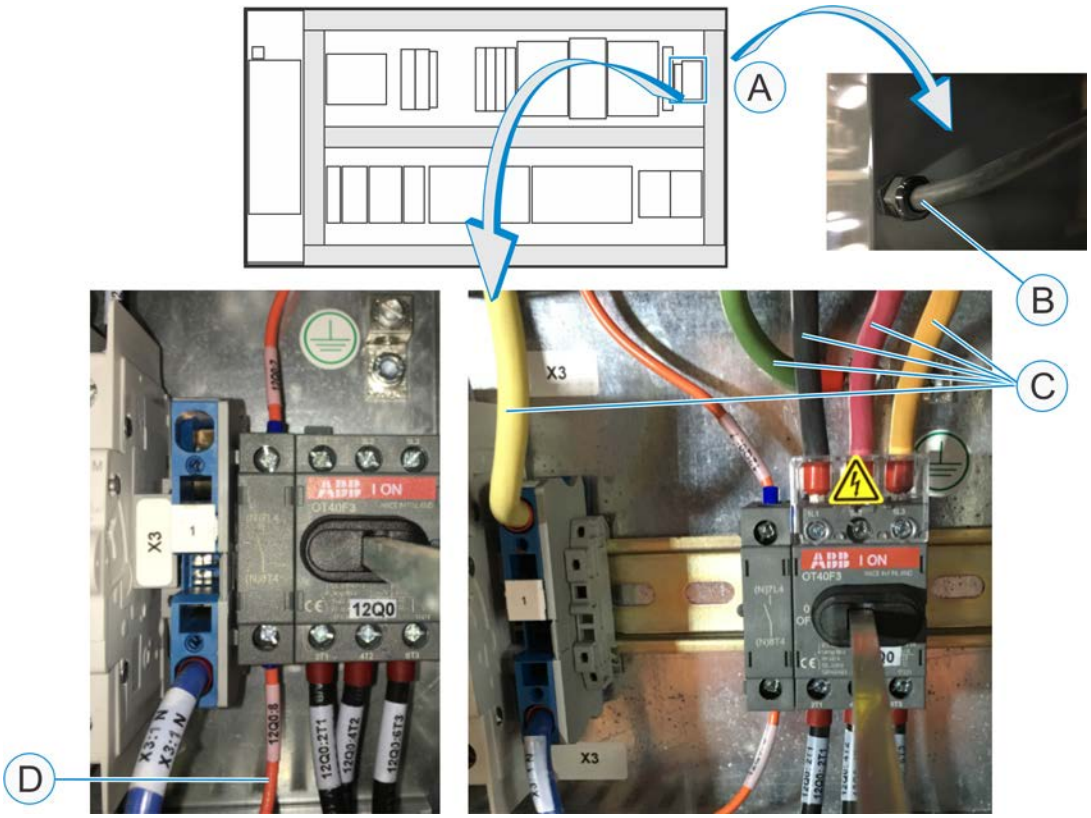
After

ID	Connection Number	Connection Type	Description
A	N/A	N/A	TrackMaster Ethernet port connection location.
B	ETH1	RJ45 Ethernet	Provides TrackMaster software communication.

Main Power Connection

For the power drop connection, phase orientation does not matter.

The main power cable (incoming) is wired through the back of the panel and into the main AC power disconnect connection, as illustrated:

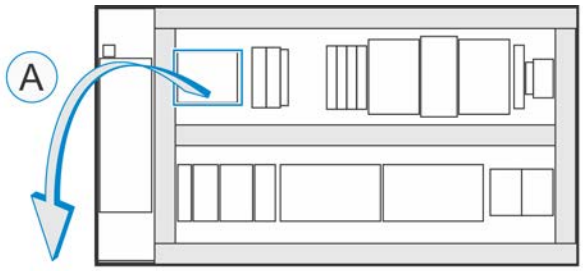


Before After

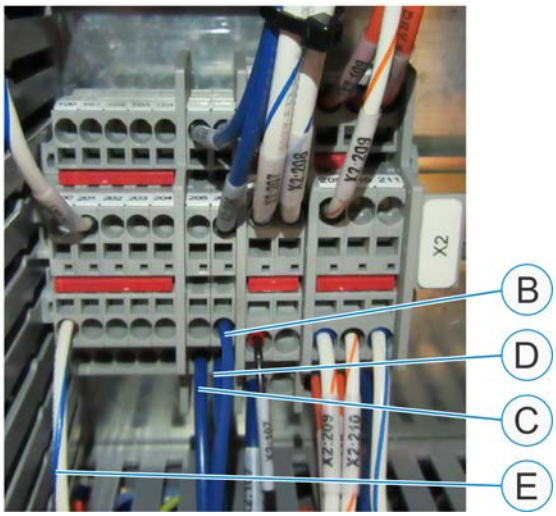
ID	Connection Number	Connection Type	Description
A	N/A	N/A	Main power connection location.
B	N/A	Main power cable	Main power supply (incoming) port at the back of the control panel.
C	N/A	Main power connection	Main power supply (incoming) connections: • Green - PE (ground) • Black, Red, Orange - Phase 1, 2, or 3 (in any order) • White - Neutral
D	12Q0:8	UPS	UPS power goes through the auxiliary contact on the main disconnect.

Safety Circuit Connection

The SuperTrak conveyor is integrated with a system safety circuit in the control panel. Wire the safety circuit as illustrated:



Before

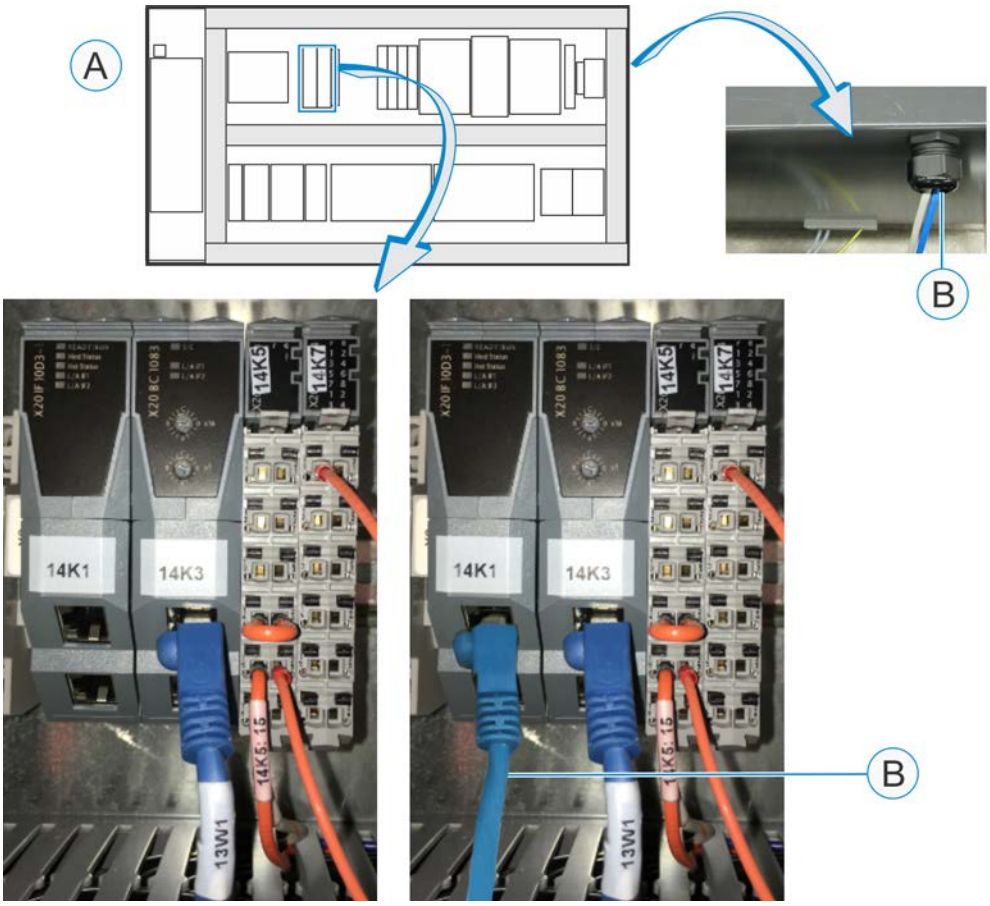


After

ID	Connection Number	Connection Type	Description
A	N/A	N/A	Safety circuit connection location.
B	206	Reset out	Required contactor safety monitoring connection.
C	105	24+ VDC	Incoming from the safety circuit (fail safe output).
D	106	Reset in	Required contactor safety monitoring connection.
E	200	0V Common	Incoming from the safety circuit.

PLC Connection

The programmable logic controller (PLC) connection is inside the control panel. An Ethernet cable is wired through the back of the panel and into the 14K1 PLC connection, as illustrated:



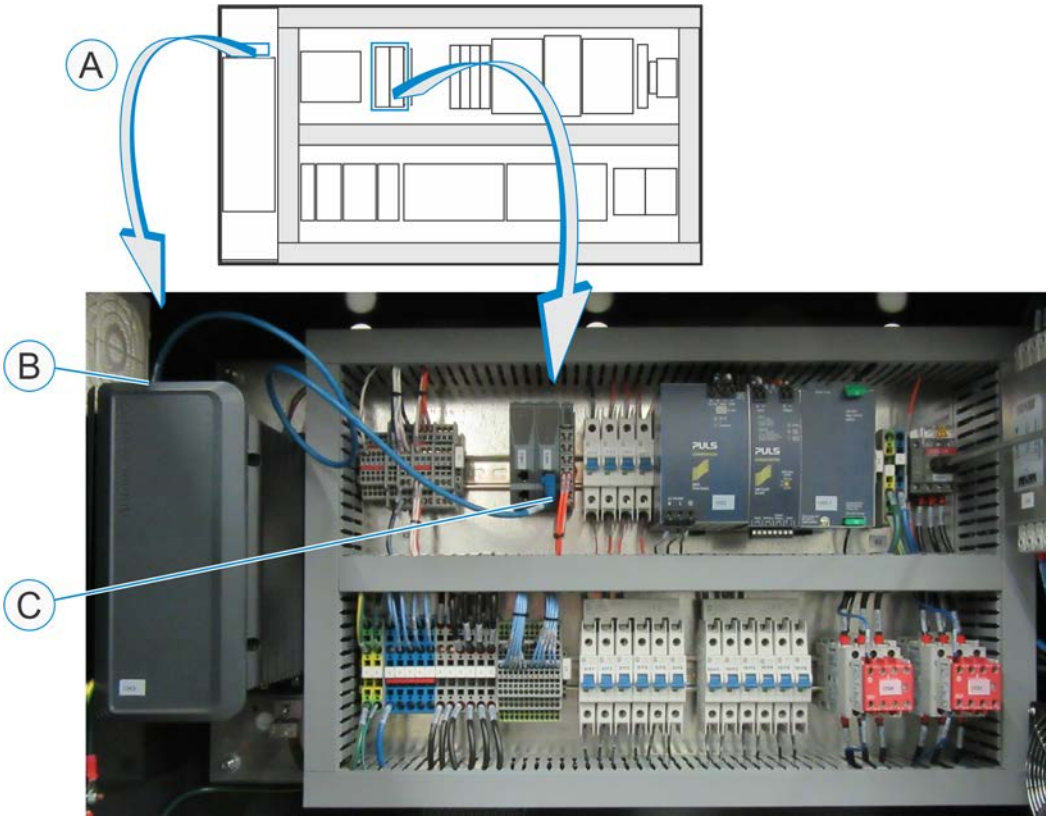
Before After

ID	Connection Number	Connection Type	Description
A	N/A	N/A	PLC connection location.
B	N/A	Ethernet cable for PLC Connection	Ethernet cable (incoming) port at the back of the control panel.
C	14K1	RJ45 PLC connection	Provides the programmable logic controller (PLC) connection using EtherNet/IP, PROFINET, or alternate.[a]

a.The electrical module is protocol-specific, and is supplied according to the customer's requirements.

Ethernet POWERLINK Connection

The Ethernet POWERLINK connection exists in the control panel when it is shipped. One end of an Ethernet cable is plugged into the front port of Slot 2 on the controller, and the other end of the cable is plugged into IF1 of the bus controller, as illustrated:



ID	Connection Number	Connection Type	Description
A	N/A	N/A	Ethernet POWERLINK connection location.
B	13K0:IF1/1	RJ45 POWERLINK connection	Connects to the controller (slot 2, front port).
C	14K3:1F1	RJ45 POWERLINK connection	Connects to the bus controller (upper port).

Gateway Network Connections

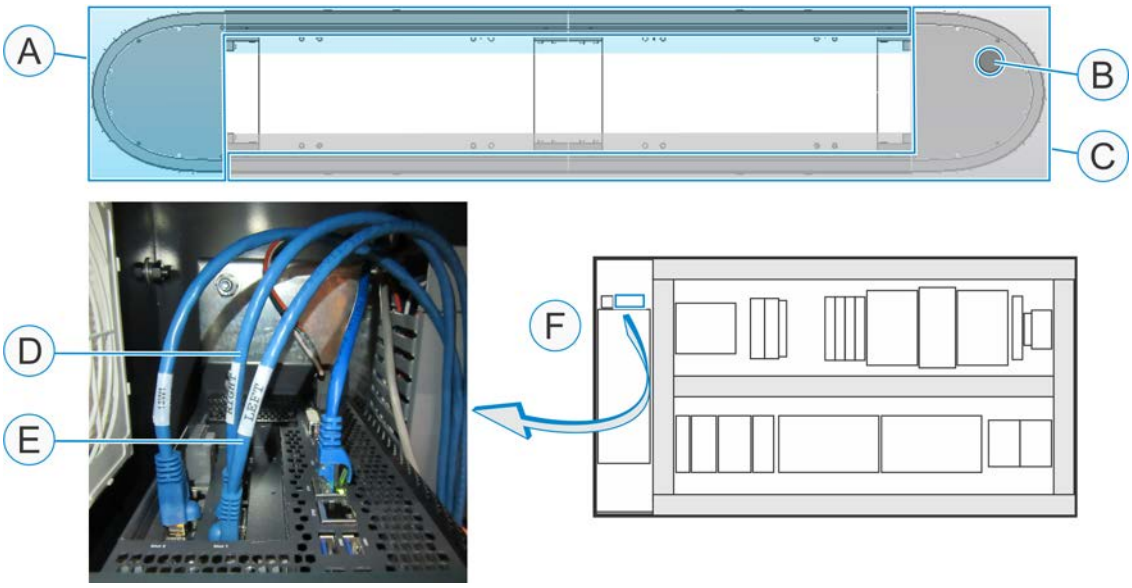
NOTICE Turn OFF the 24 V gateway power, and turn OFF the controller before connecting the gateway network.

Although the gateway network connections are implemented using standard Ethernet cables, it is not an Ethernet network and should not be connected to Ethernet devices.

The gateway network connections use Ethernet cables to connect an array of gateway boards to the controller.

Left and Right Gateway Networks

The SuperTrak conveyor is divided into two (2) networks: the left network, and the right network. Each network begins with a cable that is routed through the control panel electrical interconnect to the controller.

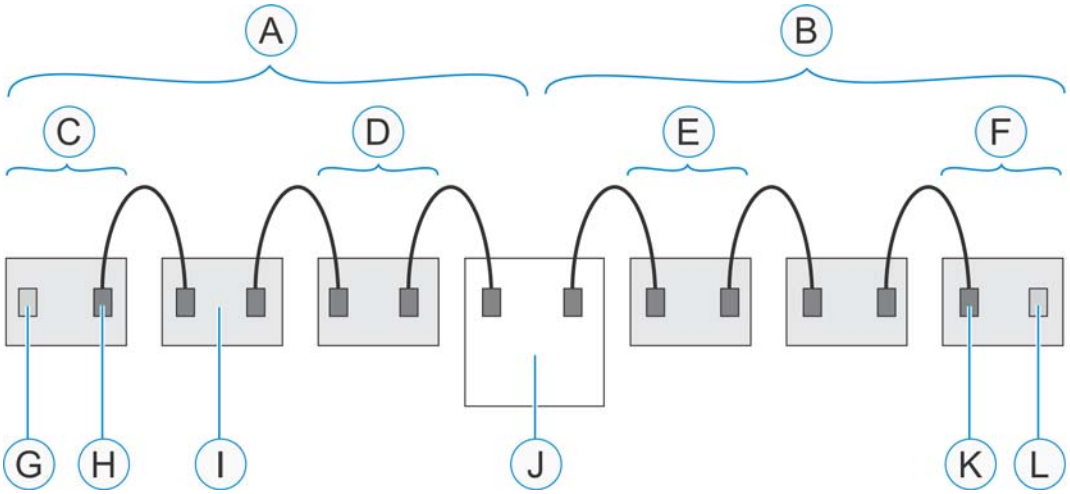


ID	Connection Type	Description
A	N/A	Right gateway network.
B	N/A	Control panel electrical interconnect. Left and right gateway network cables route to the control panel through a flexible conduit.
C	N/A	Left gateway network.
D	RJ45	Right gateway network Ethernet cable.
E	RJ45	Left gateway network Ethernet cable.
F	N/A	Left and right gateway network connection locations.

Gateway Board Connections

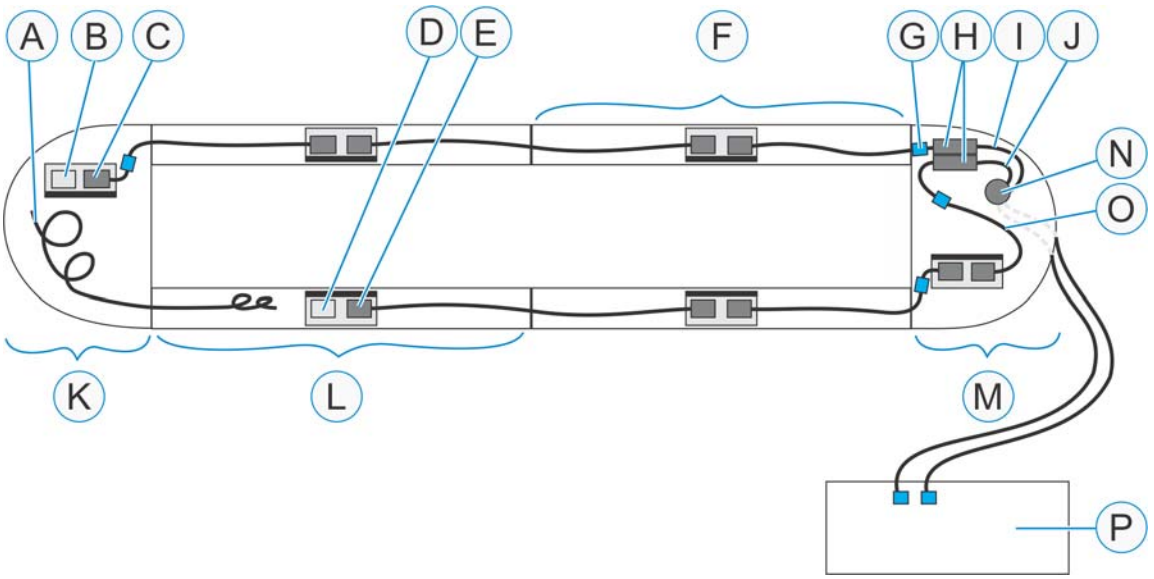
NOTICE Gateway network cables should never cross one another.

As illustrated below, the left gateway connections connect to the controller upstream using the right network ports, and connect from the controller downstream using the left network ports. The right gateway connections are opposite; they connect to the controller upstream using the left network ports, and connect from the controller downstream using the right network ports.



ID	Connection Type	Description
A	N/A	Left gateway network
B	N/A	Right gateway network
C	N/A	Left tail section (farthest from the controller)
D	N/A	Left head section (closest to the controller)
E	N/A	Right head section (closest to the controller)
F	N/A	Right tail section (farthest from the controller)
G	RJ45	Left network port (not connected)
H	RJ45	Right network port (connected)
I	N/A	Gateway board (1 of 6)
J	N/A	Controller
K	RJ45	Left network port (connected)
L	RJ45	Right network port (not connected)

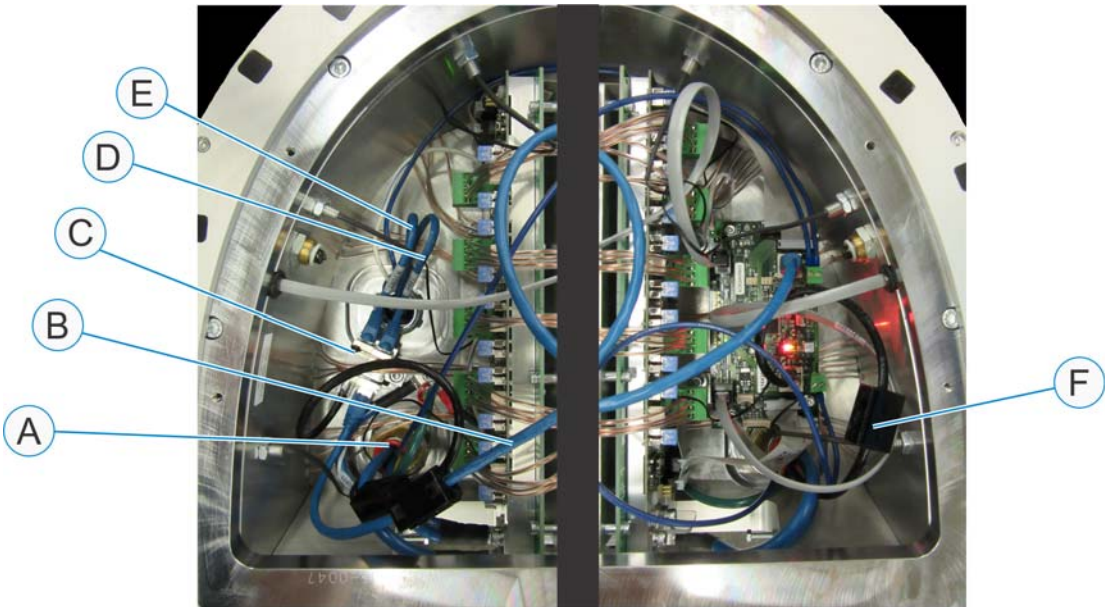
Straight Sections with 180 Deg (500 mm) Sections



ID	Connection Type	Description
A	N/A	Ethernet cable - not connected
B	RJ45	Right network port (not connected)
C	RJ45	Left network port (connected)
D	RJ45	Left network port (not connected)
E	RJ45	Right network port (connected)
F	N/A	Right head section
G	N/A	Ferrite (1 of 6)
H	RJ45	F-F coupler
I	RJ45	Ethernet cable - right network cable from controller (connected)
J	RJ45	Ethernet cable - left network cable from controller (connected)
K	N/A	Right tail section
L	N/A	Left tail section
M	N/A	Left head section
N	N/A	Control panel electrical interconnect
O	N/A	Left network patch cable
P	N/A	Control panel

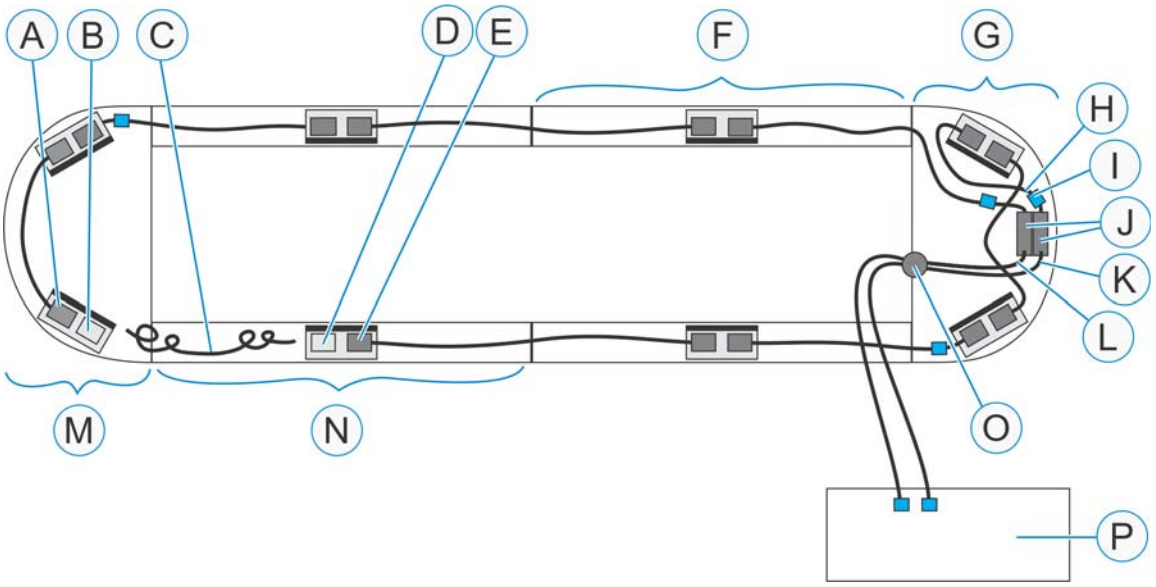
Sample Gateway Network Connections in a 180 Deg (500 mm) Section

The following image illustrates some of the gateway network connections. The black line through the center of the image joins two (2) images together.



A	Control panel electrical interconnect	**D**	Ethernet cable - left network cable from controller (connected)
B	Left network patch cable	**E**	Ethernet cable - right network cable from controller (connected)
C	F-F coupler	**F**	Ferrite (1 of 3 shown)

Straight Sections with 180 Deg (800 mm) Sections



ID	Connection Type	Description
A	RJ45	Left network port (connected)
B	RJ45	Right network port (not connected)
C	N/A	Ethernet cable - not connected
D	RJ45	Left network port (not connected)
E	RJ45	Right network port (connected)
F	N/A	Right head section
G	N/A	Left head section
H	N/A	Left network patch cable
I	N/A	Ferrite (1 of 6)
J	RJ45	F-F coupler
K	RJ45	Ethernet cable - left network cable from controller (connected)
L	RJ45	Ethernet cable - right network cable from controller (connected)
M	N/A	Right tail section
N	N/A	Left tail section
O	N/A	Control panel electrical interconnect
P	N/A	Control panel

Operating Procedures

This section provides the following SuperTrak conveyor operating procedures:

Pre-Start Inspection

NOTICE

Before the SuperTrak conveyor power is turned ON for the first time, complete the pre-power ON checks.

See *Pre-Power ON Checks* on page 118.

In addition, complete one (1) or more of the following to make sure the upper v-rail is adequately lubricated:

- Make sure there is a pallet for every 2 m of track.
- Add an additional 20 drops of lubricant to the pallet lubrication felt.
- Manually wipe lubricant onto the upper v-rail.

Remove excess oil from the SuperTrak that may have dripped from the upper v-rail.

During startup, the SuperTrak conveyor uses an identification process to locate unrecognized pallets. There could be uncontrolled pallet movement during this process. When all pallets are located, the SuperTrak conveyor switches to normal pallet control.

For systems where minor pallet collisions are acceptable, no action is required. Be aware that straight sections have minimal or no movement during startup, whereas 180 deg. sections may have significant movement.

For systems where pallet collisions are not acceptable, use the PLC code (or TrackMaster) before startup to determine which sections contain unrecognized pallets, and then manually move those pallets so the software can identify the pallet position.

	Task	Complete
1.	Verify that all users have been properly trained and instructed in safety procedures and SuperTrak conveyor operation.	
2.	Verify that the top and bottom rails are clean and that the pallets have had the proper preventive maintenance.	
3.	Inspect around the SuperTrak conveyor, to make sure there are no abnormal obstructions along the path that the pallets travel.	
4.	Verify that all energy sources have locks and tags removed.	
5.	Verify that no one is working inside the guarding.	
6.	Verify that all guarding is correctly installed and operational.	
7.	Complete the pre-power ON check to confirm that shorts do not exist in the system. See *Pre-Power ON Checks* on page 118.	
8.	Confirm that the sections are correctly aligned. Section joints and heights should not exceed ±0.07 mm (0.003 in.). See *Align the SuperTrak Conveyor Section Joints* on page 87, and *Align the SuperTrak Conveyor Section Heights* on page 88.	

	Task	Complete
9.	Disconnect the black section-to-section Ethernet cable at the end of the right network going into the left network to avoid any errors during start-ups. See *Gateway Network Connections* on page 110.	
10.	Confirm that the ETH1 port is used for TrackMaster to communicate with SuperTrak. See *Ethernet Port Connection* on page 105.	
11.	Confirm that the right and left network cables are correctly connected. See *Left and Right Gateway Networks* on page 110.	
12.	Open TrackMaster. The default IP address for the SuperTrak is 192.168.13.2. The computer must be connected to the ETH1 port on the controller computer. • Confirm the communication. • Confirm that faults and warnings do not exist. • Confirm that the latest controller software is installed (**Advanced** > **Firmware**)	
13.	Calibrate the encoders. See the TrackMaster built-in help for the calibration procedure.	
14.	Verify stable motion of a single SuperTrak pallet: 1. Install a single SuperTrak pallet on the SuperTrak conveyor. 2. Confirm that the motor power supply is ON. On TrackMaster, check the `Motor Power` column on the **System Status/Control** screen. 3. Move the pallet around the system at a high speed (2500 mm/sec). 4. Verify that no abnormal sounds or pallet instability is detected.	
15.	Verify stable motion of all SuperTrak pallets: 1. Turn the motor power OFF. On TrackMaster, check the `Motor Power` column on the **System Status/Control** screen. 2. Install all required SuperTrak pallets on the SuperTrak conveyor. 3. Verify that the number of pallets on TrackMaster match the physical number of pallets on the SuperTrak conveyor. 4. Turn the motor power ON. 5. Move the pallets around the system at high speed (2500 mm/sec). 6. Verify that no abnormal sounds or pallet instability is detected.	

Pre-Power ON Checks

NOTICE

- Before the SuperTrak conveyor power is turned ON for the first time, complete the pre-power ON checks.
- If a straight section or 180 deg. section is added or removed, complete the pre-power ON checks.
- If a circuit board or power cable is replaced, complete the pre-power ON checks.

Complete the pre-power ON check procedure before you turn the SuperTrak conveyor power ON:

- After completing a new SuperTrak conveyor installation.
- After a straight section or 180 deg. section is added or removed.
- After a circuit board is replaced.
- After a power cable is replaced.

Prerequisites

- Digital multimeter
- Set of metric hex keys

Procedure

1. Open the electrical door of a straight section.
2. Set a digital multimeter to measure resistance.
3. Measure the resistance between the following:
    - Motor power connection and the common connection.

      See *Measure the Resistance Between the Motor Power Connection and the Common Connection* on page 119.
    - Ground (frame) and the common connection.

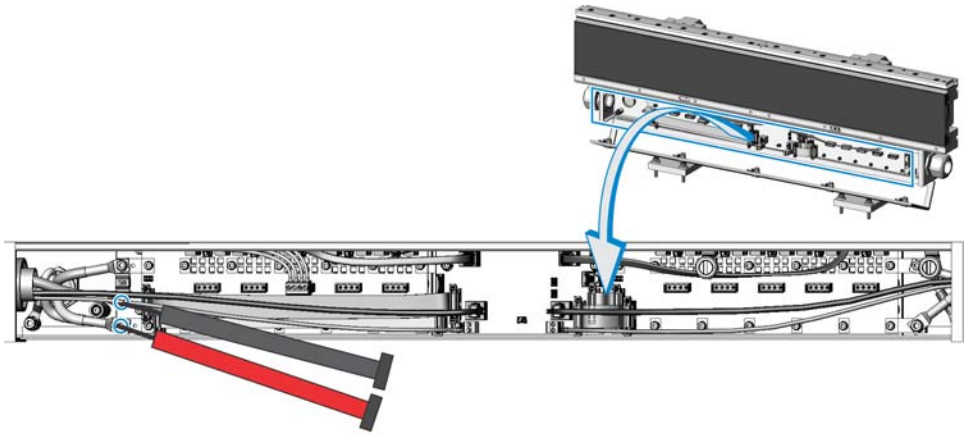
      See *Measure the Resistance Between the Ground (Frame) and the Common Connection* on page 120.
    - Common connection and the 24V digital power connection.

      See *Measure the Resistance Between the Common Connection and the 24V Digital Power Connection* on page 121.
    - Motor power connection and the 24V digital power connection.

      See *Measure the Resistance Between the Motor Power Connection and the 24V Digital Power Connection* on page 122.
4. If all step 3 resistance tests pass, it is safe to turn the SuperTrak conveyor power ON.

Measure the Resistance Between the Motor Power Connection and the Common Connection

1. Test the resistance as shown below:

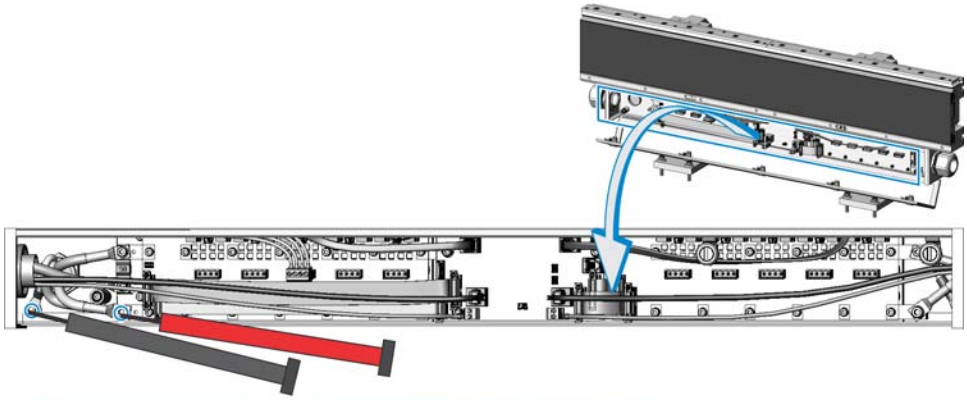


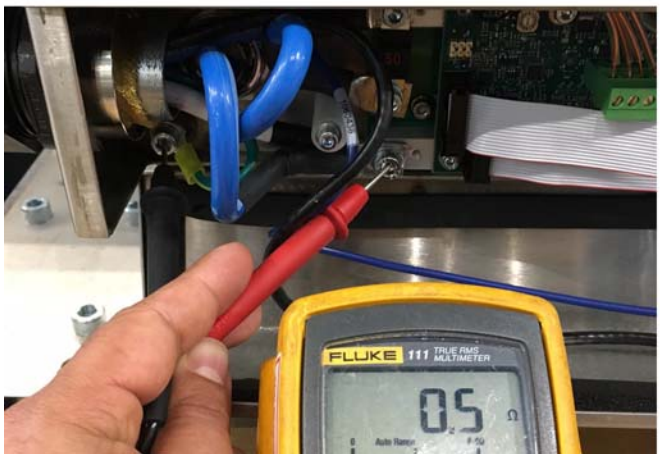
2. Look at the value displayed on the multimeter screen and determine if the resistance is acceptable:
    - Pass - The value is initially <10Ω and then slowly rises to >10Ω. This occurs because the capacitors are charging.
    - Fail - The value quickly settles at <5Ω. This indicates that a short exists.

      See *A short exists between the motor power connection and the common connection or ground (frame).* on page 222.

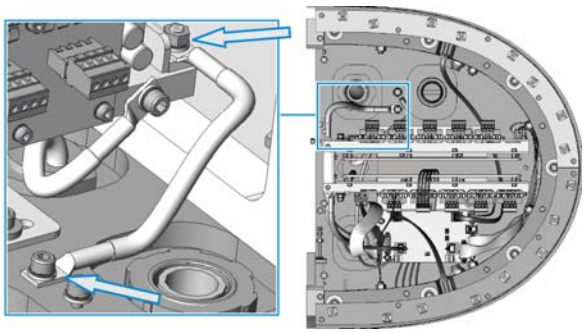
Measure the Resistance Between the Ground (Frame) and the Common Connection

1. Test the resistance as shown below:



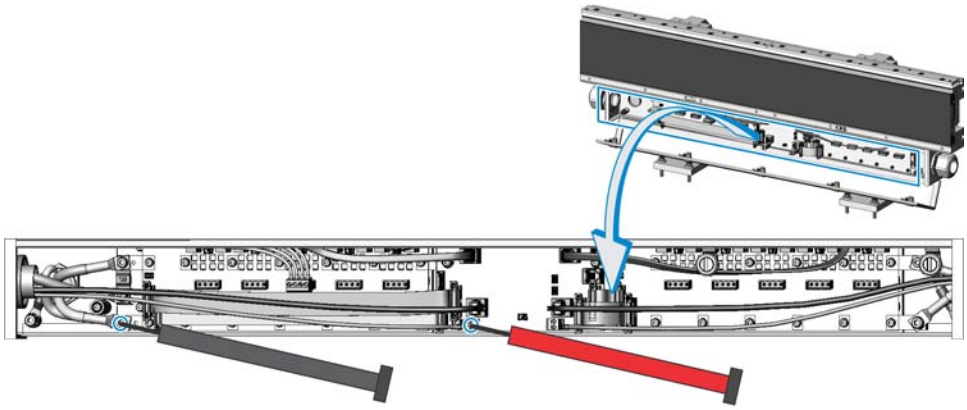


2. Look at the value displayed on the multimeter screen and determine if the resistance is acceptable:
    - Pass - The value is <1Ω.
    - Fail - The value is >1Ω.
3. Verify that the bonding jumper is correctly installed in the 180 deg. section that contains the control panel electrical interconnect.



Measure the Resistance Between the Common Connection and the 24V Digital Power Connection

1. Test the resistance as shown below:

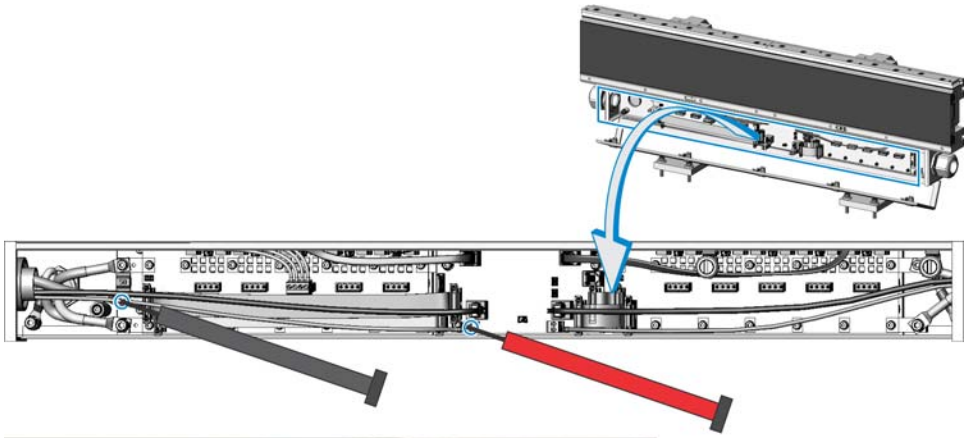


2. Look at the value displayed on the multimeter screen and determine if the resistance is acceptable:
    - Pass - The value is initially <500Ω and then quickly rise to >1000Ω. This occurs because the capacitors are charging.
    - Fail - The value quickly settles at <5Ω. This indicates that a short exists.

      See *A short exists between the 24V digital power connection and the common connection or ground (frame).* on page 223.

Measure the Resistance Between the Motor Power Connection and the 24V Digital Power Connection

1. Test the resistance as shown below:



2. Look at the value displayed on the multimeter screen and determine if the resistance is acceptable:
   - Pass - The value is >10Ω.
   - Fail - The value is <10Ω. This indicates that a short exists.

     See *A short exists between the motor power connection and the 24V digital power connection.* on page 223.

SuperTrak Conveyor Power ON Behavior

The SuperTrak conveyor is typically integrated with a larger automation system. This section describes the SuperTrak conveyor power ON procedure and does not include any steps for the larger system.

Each section has two (2) power connections:

- Motor power (28VDC for high power sections, or 15VDC for low power sections)
- Digital power (24V)

Motor power turns OFF with the safety circuit, but digital power remains ON.The digital power maintains feedback from the encoders, so that the SuperTrak conveyor continues to monitor the pallet positions.

The SuperTrak conveyor digital power turns ON when the **main power disconnect switch** is placed in the ON position (if the **SuperTrak conveyor power disconnect switch** is in the ON position). This provides power to the SuperTrak conveyor controller, encoders, and other digital electronics in the motors. The SuperTrak Conveyor digital power can be ON prior to the main disconnect turning ON if the UPS has battery power remaining.

When the system is in a safe state and cell power is ON, the system safety circuit turns the fail safe output ON to the SuperTrak conveyor control panel, which turns the SuperTrak conveyor motor power supplies ON. This must only occur when the guard doors are closed and the system is in a safe state to start operation. To avoid rapid switching of the SuperTrak conveyor power supplies, the system safety circuit must be configured with a minimum 2 second delay after the fail safe output turns OFF before it turns back ON.

When the PLC is ready to allow pallet motion, the PLC enables the SuperTrak conveyor by turning ON defined bits on the PLC network. Pallet movement does not occur until the PLC enables pallet motion. The PLC can enable pallet motion at the system level or for individual sections. The PLC must verify that all robots and tooling are clear before it enables pallet motion.

When the PLC enables pallet movement, the SuperTrak conveyor initializes the pallets, returns them to their proper starting location, and then moves pallets as required.

The system startup procedure varies, depending on whether the UPS has timed out or not and digital power was lost:

- If digital power is not lost, all pallet locations and data are maintained. The system continues to work from where it left off.
- If digital (UPS) power is lost and a cold start occurs, the pallets travel to the default target locations and the PLC decides what to do next for startup.

Multiple options are available to manage system startup after a cold start, for example:

- The PLC can cycle all pallets around the SuperTrak conveyor, determine the pallet ID, return the pallets to the stations they left off, and continue running.
- If the PLC knows that the line was purged, the pallets can all go to the first processing station by default and the system can start running.
- The PLC can send all pallets to a reject station where any parts partially processed are removed and the system starts over after a cold start.
- The SuperTrak conveyor digital electronics can be wired to the equivalent of a panel lighting circuit that does not lose power when the main disconnect is switched OFF. In this case, the SuperTrak conveyor pallet positions and data are always maintained unless the entire plant loses power and the battery backed UPS times out.

SuperTrak Conveyor Power OFF Behavior

To stop the system, the PLC disables the SuperTrak conveyor over the network at the appropriate time. This is typically triggered by a system **cycle stop** or **cycle end** button on the PLC-controlled operator interface. For example:

- The PLC can complete all current operations, move tooling clear, and then disable the SuperTrak conveyor.
- The PLC can completely purge the line of parts, and then disable the SuperTrak conveyor. When the system stops, the user turns the **main power disconnect switch** to the OFF position.

When the PLC detects that the safety circuit is open (for example; a guard door is open, or an emergency stop button is activated), it immediately drops the enable signal to the SuperTrak conveyor. This causes pallets to decelerate to a controlled stop. At the same time, the system safety circuit maintains the fail safe output to the SuperTrak conveyor for a time delay OFF of 100-300 milliseconds. The amount of time is configured based on pallet speed and payload, to make sure that there is adequate time for the pallets to stop. A 300 millisecond delay is adequate for a pallet with high payload traveling at full speed.

The disable delay time is set in both the system safety circuit and in the TrackMaster software (see **Section Parameters** > **Section Disable Delay Time**). When the disable delay time is correctly configured, pallets come to a controlled stop and avoid bumping on an abrupt cell power OFF. If a disable delay time is not configured (**Section Disable Delay Time** is set to zero [0]), the SuperTrak conveyor shorts the coils to help decelerate the pallets on cell power OFF, which minimizes how far the pallets coast.

TrackMaster Procedures

TrackMaster is not required to operate the SuperTrak conveyor; however, it is useful for troubleshooting and configuring the SuperTrak conveyor.

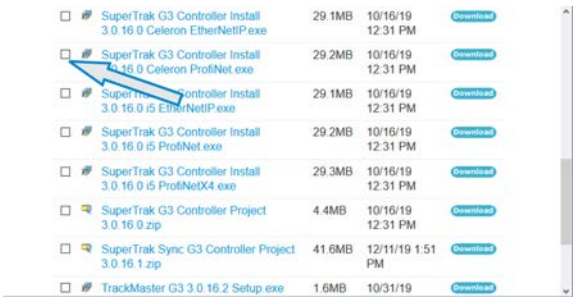
TrackMaster is a Windows-based application that monitors, configures, and is used to troubleshoot the SuperTrak conveyor.

Download TrackMaster

1. Email *supertrak_support@atsautomation.com* to obtain a login account.
2. Navigate to *http://atsautomation.leapfile.com/*.
3. Click **File Portal**.

4. Enter your **Login ID** and **Password**, and then click **Login**.
5. Click **SuperTrak G3**.
6. Complete one (1) of the following:
   - Select the checkbox(es) of the required software version, and then click **Download Selected**.

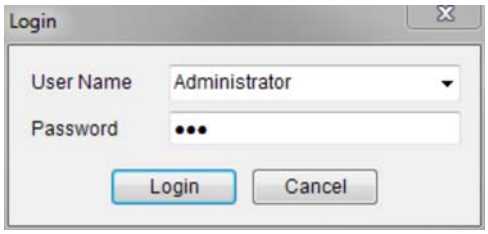
   - Click a folder to view the folder contents, select the checkbox(es) of the required files, and then click **Download**.



Login to TrackMaster

1. Open TrackMaster.
2. Click **File** > **Login**.
3. Enter your **User Name** and **Password**.

   User accounts and the associated permissions are configurable. The software includes the following initial accounts: **Administrator**, **Programmer**, **Maintenance**, and **Operator**. All passwords are initially **password**.



4. Click **Login**.

   If login is successful, TrackMaster displays the SuperTrak Connections dialog; otherwise, TrackMaster displays an error message and the Login dialog.

   See *Access the TrackMaster Built-in Help* on page 126.

Access the TrackMaster Built-in Help

See the **Quick Start** section for initial SuperTrak conveyor connection and configuration instructions.

1. Open TrackMaster.
2. Click **Help** > **Contents**.

Monitor the SuperTrak Conveyor

It is important to be aware of the state of SuperTrak conveyor during operation. When you are aware of how the SuperTrak conveyor correctly works, it is easier to notice when a change occurs. Some things to notice include:

- Watch all devices for smooth operation. If a device does not seem to be operating correctly, stop the SuperTrak conveyor and notify a service technician.
- Be aware of the speed at which the components function. If they appear to move slower than usual or are progressively getting slower, maintenance may be required.
- Watch for debris accumulation on the upper v-rail. This is an indication that the pallets require immediate lubrication.
- Watch for debris accumulation on the lower rails. Wipe down the lower rails with a clean cloth dampened with isopropyl alcohol or equivalent.
- Watch for repeated faults and listen for pallet noise. Inspect and repair the pallet as required.
- Listen for knocking sounds as the pallets travel over the upper v-rail joins. Knocking sounds are an indication that the upper v-rail requires adjustment.

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Technician Procedures

This section provides the following technician procedures:

Electrical Procedures

DANGER Completing any maintenance procedures with the SuperTrak conveyor electrically powered may result in serious injury or death. Lock out and tag out all electrical energy sources before part service or replacement.

See *Hazardous Energy* on page 8, and *Lockout and Tagout* on page 11.

NOTICE To prevent damage to electrical components from electrostatic discharge (ESD), always use an ESD wrist strap when working with electrical components. An ESD wrist strap prevents the buildup of static electricity.

This section provides SuperTrak conveyor electrical procedures.

Replace a Coil Driver Board

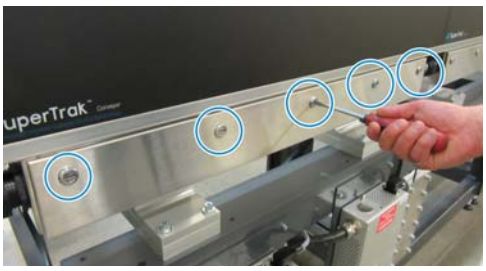
This section describes how to replace a coil driver board in a straight section or in a 180 deg. section.

Remove a Coil Driver Board - Straight Section

NOTICE To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the coil driver board. An ESD wrist strap prevents the buildup of static electricity.

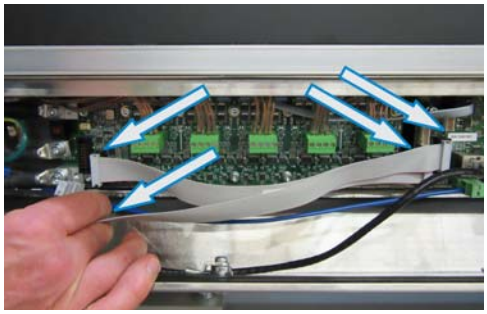
1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Use a flat head screwdriver to unlock the five (5) locks, and then open the electrical door.



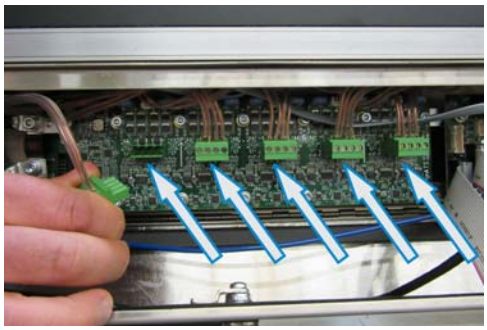
4. Unplug the two (2) ribbon cables.

   Pull each of the four (4) ribbon cable plugs straight out.



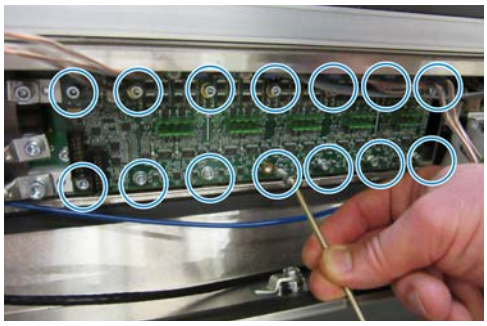
5. Unplug the five (5) coil plugs.

   Pull each coil plug straight out.



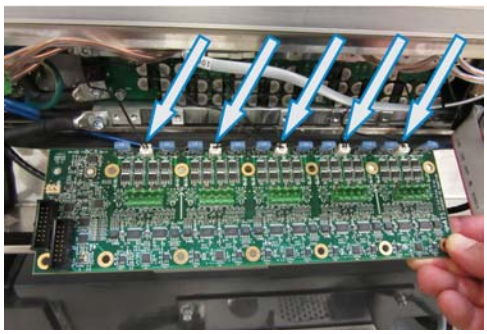
6. Remove the fourteen (14) screws that secure the coil driver board to the bus bar.

   Note that one (1) screw is nylon. This screw is located in the upper-left corner of the coil driver board.



7. Pull the coil driver board straight down and out, and then disconnect the five (5) thermistor connections.

   Squeeze the tabs for each thermistor connector plug and then pull straight out.



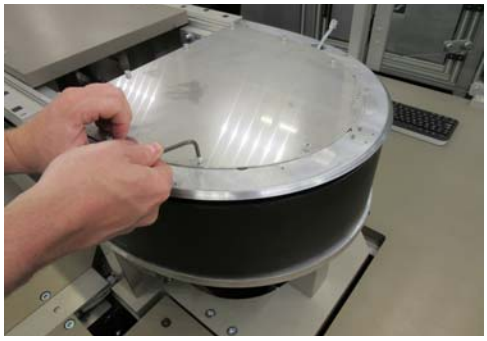
Remove a Coil Driver Board - 180 Deg. Section (500 mm)

NOTICE

To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the coil driver board. An ESD wrist strap prevents the buildup of static electricity.

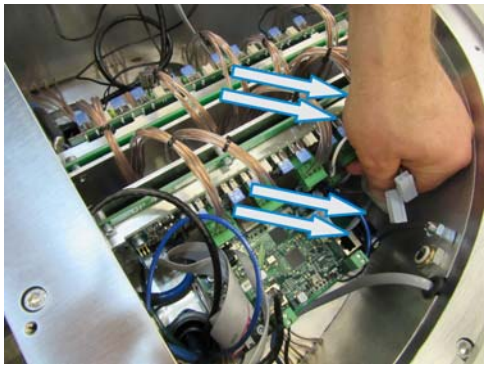
1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Remove ten (10) screws and ten (10) washers from the top cover of the 180 deg. section, and then lift and remove the top cover.



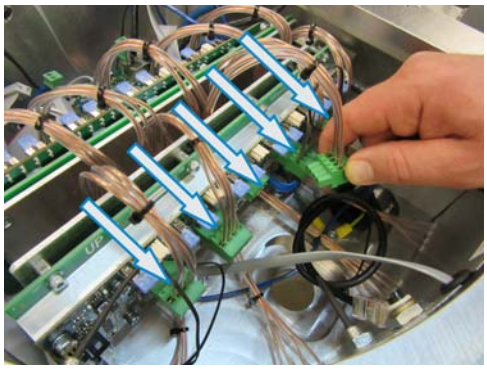
4. Unplug the two (2) ribbon cables.

   Pull each of the four (4) ribbon cable plugs straight out.

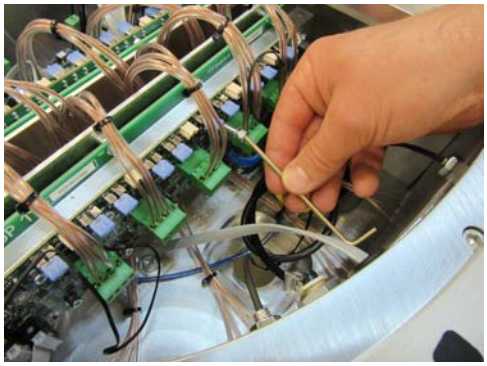


5. Unplug the five (5) coil plugs.

   Pull each coil plug straight out.

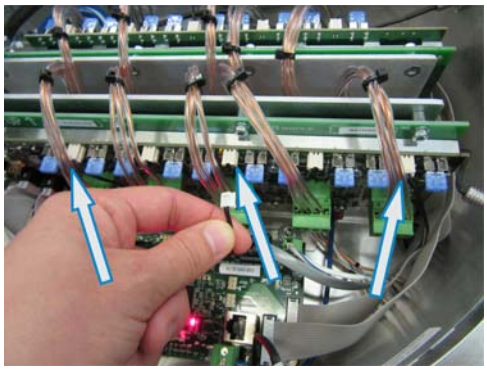


6. Remove the fourteen (14) screws that secure the board to the bus bar.



7. Disconnect the three (3) thermistor connections.

   Squeeze the tabs for each thermistor connector plug and then pull straight out.



8. Lean the coil driver board forward and lift straight up.

Remove a Coil Driver Board - 180 Deg. Section (800 mm)

NOTICE

To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the coil driver board. An ESD wrist strap prevents the buildup of static electricity.

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Use a flat head screwdriver to remove the screws from the electrical door, and then set the electrical door aside.
4. Remove the gateway board.

   Complete steps 4 to 9 of the *Remove a Gateway Board - Straight Section or 180 Deg. Section (800 mm)* on page 135.
5. Remove the coil driver board.

   Complete steps 4 to 7 of the *Remove a Coil Driver Board - Straight Section* on page 129.

Install a Coil Driver Board - Straight Section or 180 Deg. Section (800 mm)

NOTICE

- To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the coil driver board. An ESD wrist strap prevents the buildup of static electricity.
- During installation, do not pinch any wires behind the coil driver board when screws are installed. This can cause an electrical short.

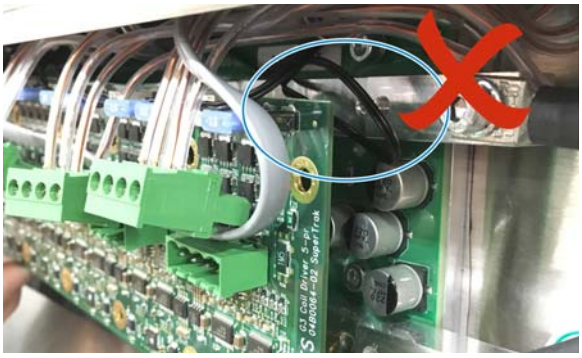
If required, reference *Left Coil Driver Board* on page 28, and *Left Coil Driver Board with a Power Supply Connected* on page 29 during this procedure.

1. Remove the old coil driver board.

   See *Remove a Coil Driver Board - Straight Section* on page 129.

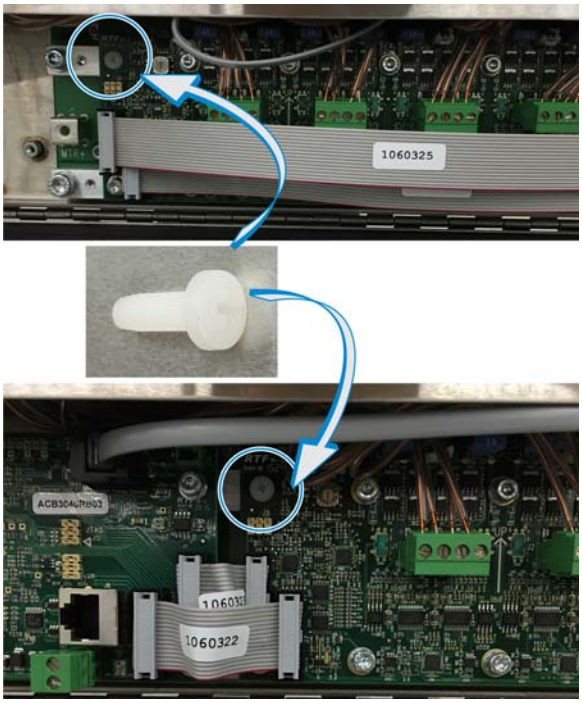
2. Inspect the new coil driver board, to make sure it contains ten (10) 15 A fuses.
3. Connect the five (5) thermistor connections.
4. Align the coil driver board with the screw holes inside the straight section or 180 deg. section.

   Make sure there are no wires behind the coil driver board.



5. Secure the coil driver board in position with fourteen (14) screws.

   Make sure that the screw in the upper-left corner of the coil driver board is nylon, and that the coil driver board wires are clear of the screws.



6. Connect the five (5) coil plugs.
7. Connect the two (2) ribbon cables.

Install a Coil Driver Board - 180 Deg. Section (500 mm)

NOTICE

- To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the coil driver board. An ESD wrist strap prevents the buildup of static electricity.
- During installation, take care not to pinch wires when the coil driver board screws are installed. This can cause an electrical short.

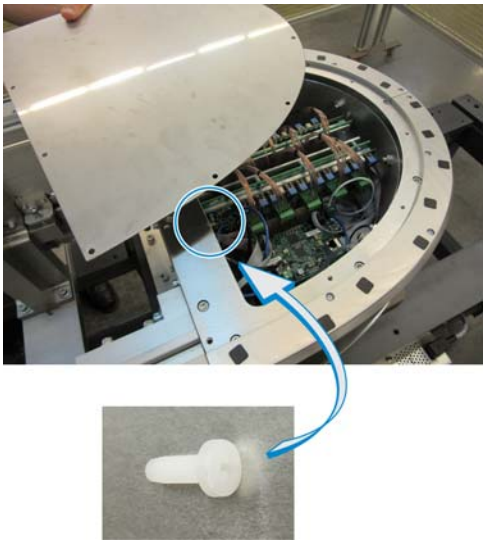
If required, reference *Left Coil Driver Board* on page 28, and *Left Coil Driver Board with a Power Supply Connected* on page 29 during this procedure.

1. Remove the old coil driver board.

   See *Remove a Coil Driver Board - 180 Deg. Section (500 mm)* on page 131.

2. Inspect the new coil driver board, to make sure it contains ten (10) 15 A fuses.
3. Align the coil driver board with the screw holes inside the straight section or 180 deg. section.
4. Secure the coil driver board in position with fourteen (14) screws.

   Make sure that the screw in the upper left corner of the coil driver board is nylon.



5. Connect the five (5) coil plugs.
6. Connect the two (2) ribbon cables.
7. Connect the three (3) thermistor connections.

Replace a Gateway Board

This section describes how to replace a gateway board in a straight section or in a 180 deg. section

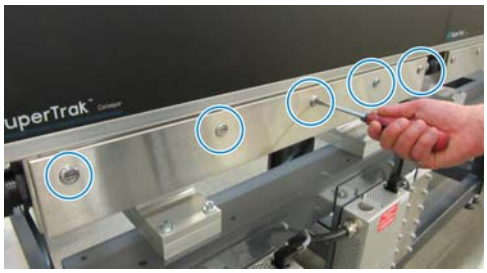
Remove a Gateway Board - Straight Section or 180 Deg. Section (800 mm)

NOTICE

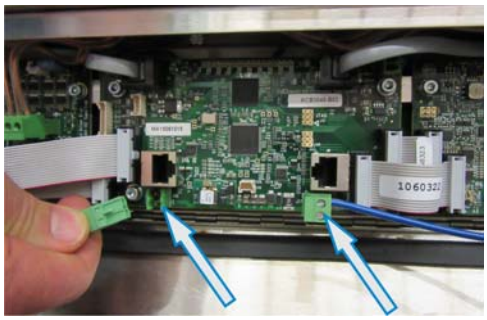
To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the gateway board. An ESD wrist strap prevents the buildup of static electricity.

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

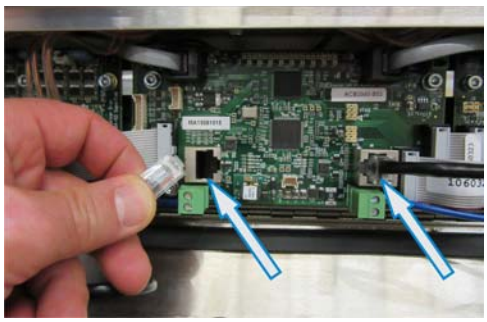
   See *Lockout and Tagout Locations* on page 12.
3. Use a flat head screwdriver to unlock the five (5) locks, and then open the electrical door.



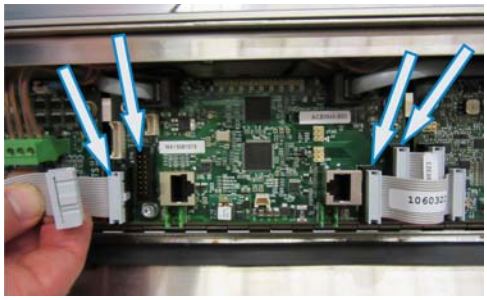
4. Unplug the two (2) 24V digital power connections.



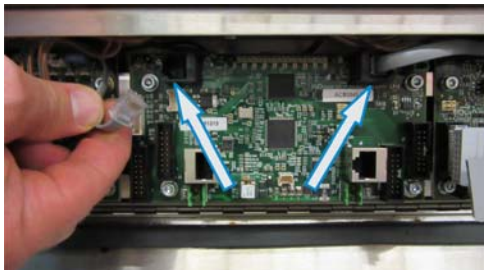
5. As required, unplug one (1) or two (2) motor network connection cables.



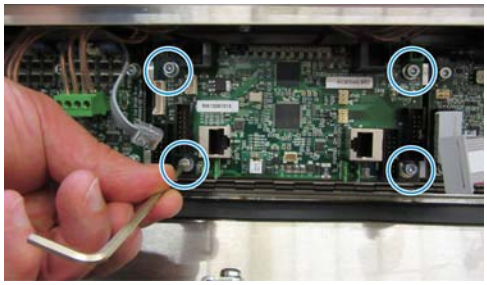
6. Unplug the four (4) ribbon cables.



7. Disconnect the two (2) encoder cables (right and left).

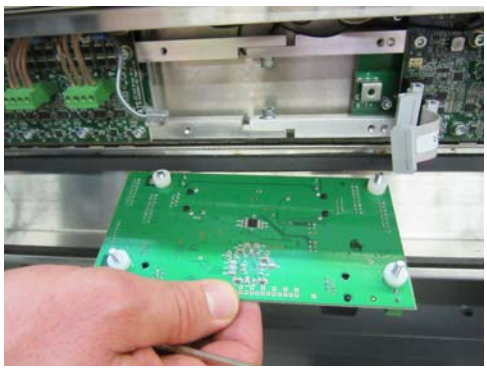


8. Loosen, do not remove, all four (4) connection screws.



9. Remove the gateway board.

   As illustrated, verify that three (3) white plastic spacers are connected to each screw.



10. If the gateway board is being returned for repair, remove the hardware (screws, washers, and spacers), and make sure the gateway board is packaged in an ESD safe bag.

Remove a Gateway Board - 180 Deg. Section (500 mm)

NOTICE

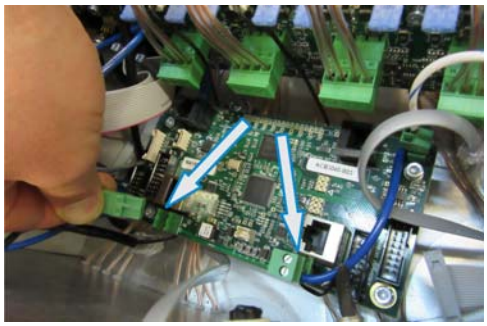
To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the gateway board. An ESD wrist strap prevents the buildup of static electricity.

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

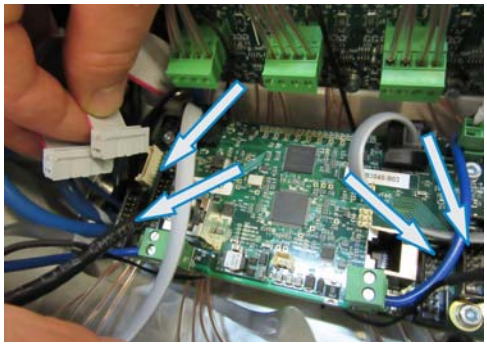
   See *Lockout and Tagout Locations* on page 12.

3. Remove ten (10) screws and ten (10) washers from the top cover of the 180 deg. section, and then lift and remove the top cover.

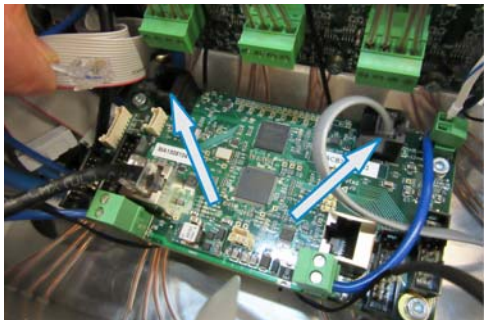
4. Disconnect the two (2) 24V digital power connections.



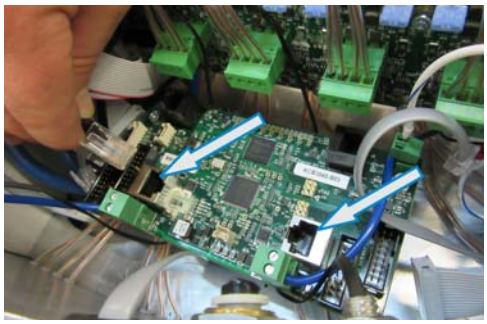
5. Unplug the four (4) ribbon cables.



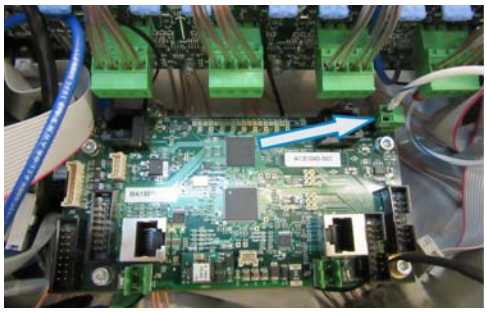
6. Unplug the two (2) encoder cables (right and left).



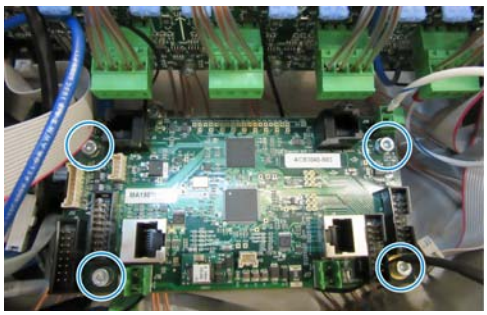
7. As required, unplug one (1) or two (2) motor network connection cables.



8. Disconnect the ground wire.



9. Remove the four (4) connection screws.



10. Remove the gateway board.
11. If the gateway board is being returned for repair, remove the hardware (screws, washers, and spacers), and make sure the gateway board is packaged in an ESD safe bag.

Install a Gateway Board - Straight Section or 180 Deg Section (800 mm)

NOTICE

To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the gateway board. An ESD wrist strap prevents the buildup of static electricity.

If required, reference *Gateway Board* on page 30 during this procedure.

1. Remove the old gateway board:

   See *Remove a Gateway Board - Straight Section or 180 Deg. Section (800 mm)* on page 135.

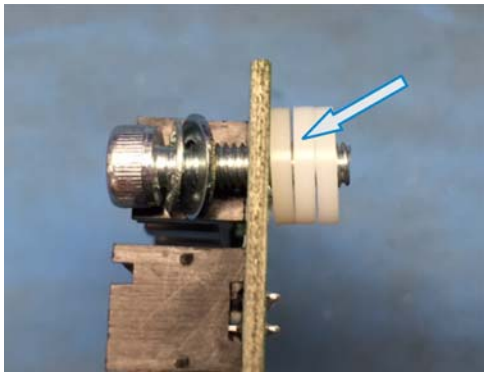
2. Assemble the gateway board:

   a. Install a toothed washer on each of the four (4) screws.

   b. Install flat washer on each of the four (4) screws.

   c. Insert each of the four (4) screws through the gateway board.

   d. Install three (3) white plastic spacers on the end of each of the four (4) screws.

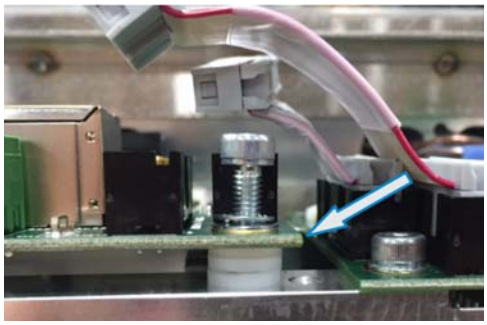
   

   Make sure the spacers are within a thread or two of the end of the screw.

3. Align the screws in the gateway board with the threaded holes inside the straight section.

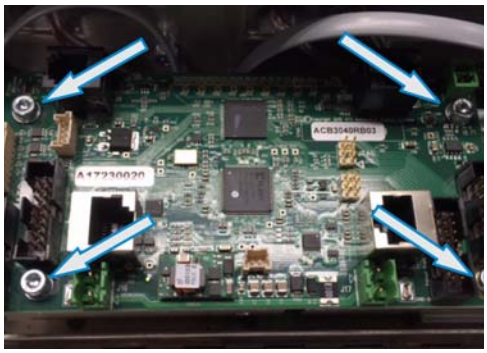
   

4. On each of the four (4) corners of the gateway board, verify that the gateway board sits flat on the white plastic spacers.

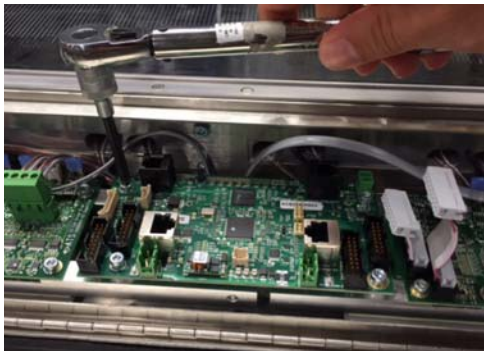
   

5. Secure the gateway board in position with four (4) screws. To prevent distortion of the gateway board, tighten one (1) screw at a time, working around the board in a clockwise direction.

   Depending on how the screws and white spacers bind, it may be necessary to tighten each screw a thread at a time.



6. Torque each of the four (4) screws to 18 lbf-in (2 Nm).



7. Reconnect the cables to the gateway board:

   a. Connect the two (2) encoder cables (right and left).

   b. Connect the four (4) ribbon cables.

   c. As required, connect one (1) or two (2) motor network connection cables.

   d. Connect the two (2) 24V digital power connections.

8. Close the electrical door, and then lock the five (5) locks with a flat head screwdriver.

Install a Gateway Board - 180 Deg. Section (500 mm)

NOTICE

To prevent electrical board damage from electrostatic discharge (ESD), use an ESD wrist strap when working with the gateway board. An ESD wrist strap prevents the buildup of static electricity.

If required, reference *Gateway Board* on page 30 during this procedure.

1. Remove the old gateway board:

   See *Remove a Gateway Board - 180 Deg. Section (500 mm)* on page 137.

2. Verify that the gateway board does not contain any white plastic spacers, and then align the gateway board with the screw holes inside the 180 deg. section.
3. Secure the gateway board in position with four (4) screws.
4. Connect the ground wire.
5. As required, connect one (1) or two (2) motor network connection cables.
6. Connect the two (2) encoder cables (right and left).
7. Connect the four (4) ribbon cables.
8. Connect the two (2) 24V digital power connections.
9. Align the top cover on the 180 deg. section.
10. Install ten (10) screws and ten (10) washers to secure the top cover in position.

Replace an Encoder Bracket

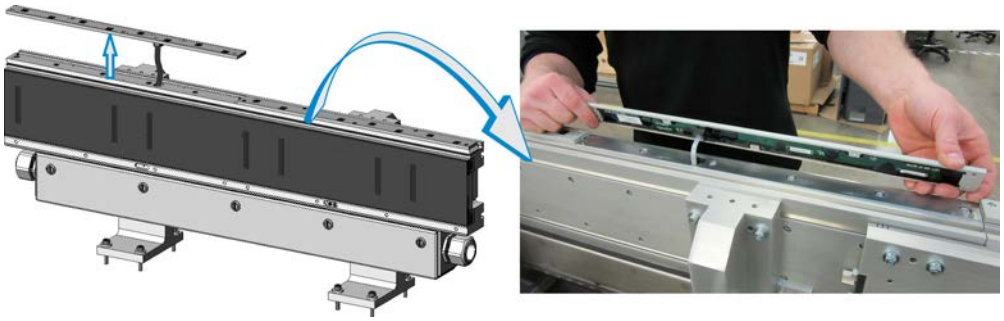
There are two (2) encoder brackets on each straight section and on each 180 deg. section. Replace the encoder bracket if a SuperTrak conveyor fault indicates that replacement is required.

Remove an Encoder Bracket - Straight Section

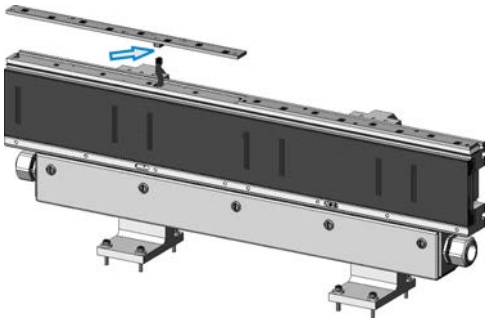
1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Remove the five (5) encoder bracket screw caps.

4. Remove the five (5) encoder bracket screws.
5. Lift the encoder bracket straight up, off the two locating dowels.



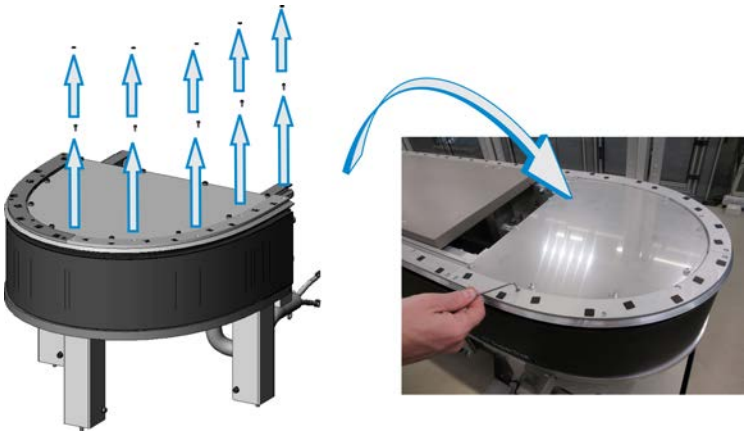
6. Disconnect the RJ11 plug from the encoder bracket connection.



Remove an Encoder Bracket - 180 Deg. Section

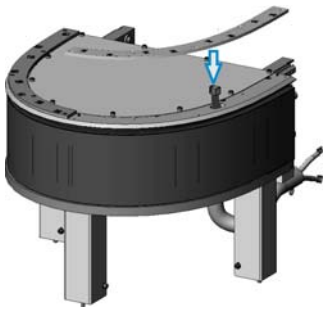
1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Remove the five (5) encoder bracket screw caps.



4. Remove the five (5) encoder bracket screws.
5. Lift the encoder bracket straight up, off the two locating dowels.

6. Disconnect the RJ11 plug from the encoder bracket connection.



Install an Encoder Bracket - Straight Section

Power to the controller and gateways should OFF while installing encoders, and then turned ON before calibration.

1. If required, remove the old encoder bracket.

   See *Remove an Encoder Bracket - Straight Section* on page 142.

2. Connect the RJ11 plug to the new encoder bracket connection.
3. Align the encoder bracket with the locating dowels.
4. To prevent damage to the RJ11 connection, make sure it is aligned with the RJ11 opening.
5. Press the encoder bracket firmly down onto the locating dowels.
6. Secure the encoder bracket in position with five (5) screws.
7. Install an encoder bracket screw cap over each of the five (5) screws.
8. Remove locks and tags.
9. Turn the **SuperTrak conveyor power disconnect switch** to the ON position.
10. Calibrate the motor with the new encoder bracket.

    See the TrackMaster built-in help for the calibration procedure.

11. If the straight section has a pallet setup stationary mount installed, reference the encoder positions.

    See *Reference the Encoder Position* on page 200.

Install an Encoder Bracket - 180 Deg. Section

1. If required, remove the old encoder bracket.

   See *Remove an Encoder Bracket - 180 Deg. Section* on page 143.

2. Install the new encoder bracket. This procedure is the same as the straight section procedure.

   See *Install an Encoder Bracket - Straight Section* on page 144.

Replace a Motor Thermistor

A thermistor replacement fault can be set to be ignored in the TrackMaster software. This allows the SuperTrak conveyor to continue to run until the thermistor can be replaced at a convenient time.

See the TrackMaster built-in help for additional information.

Motor thermistor connections are made with the coil driver boards. Replace a motor thermistor if a SuperTrak conveyor fault indicates that replacement is required.

Replace a Thermistor - Straight Section or 180 Deg. Section (800 mm)

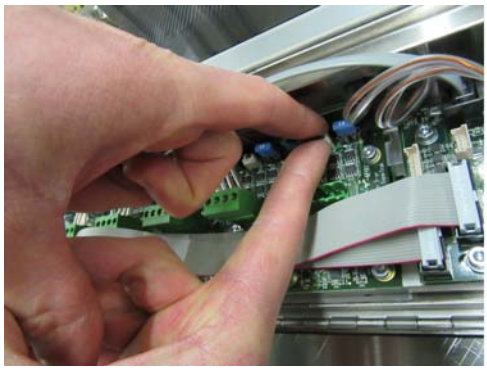
There are ten (10) thermistors in each straight section: five (5) on the left coil driver board, and five (5) on the right coil driver board.

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

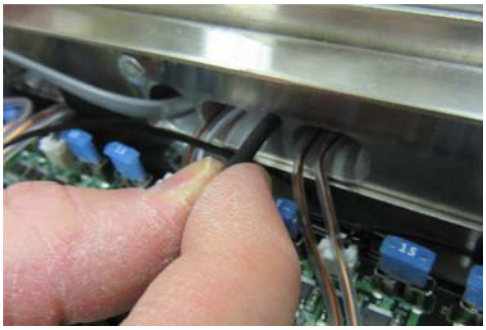
   See *Lockout and Tagout Locations* on page 12.
3. Open the straight section electrical door.
4. If access to the motor thermistor is blocked, disconnect the applicable coil connection.

5. Unplug the thermistor connector from the coil driver board.

   To unplug the thermistor connector, use the index finger from each hand (left image), or your thumb and index finger (right image).

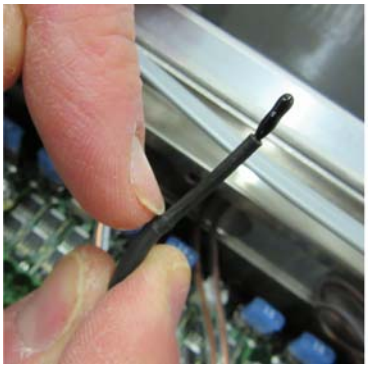


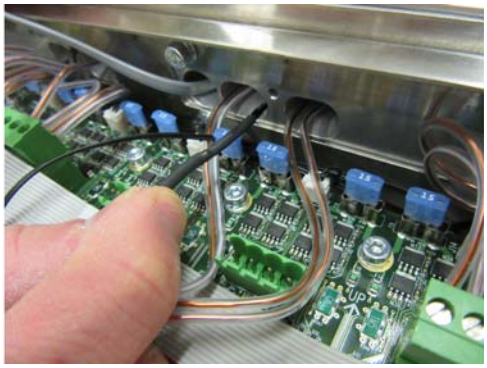
6. Pull the old thermistor wire straight out from the thermistor hole.



7. Slide the end of the new thermistor wire into the thermistor hole until you feel resistance.

   The thermistor tapers. During installation, the thick ridge creates a friction fit against the sides of the thermistor hole.





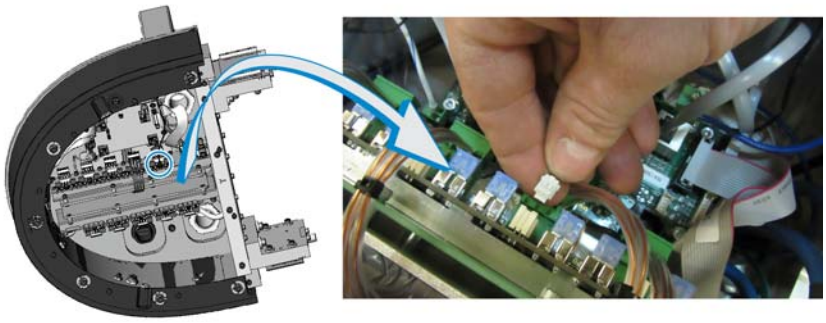
8. Plug the new thermistor connector into the electrical board.
9. Route the thermistor wire under the electrical board.
10. If required, connect any coil connections that were disconnected in step 4.

Replace a Thermistor - 180 Deg. Section (500 mm)

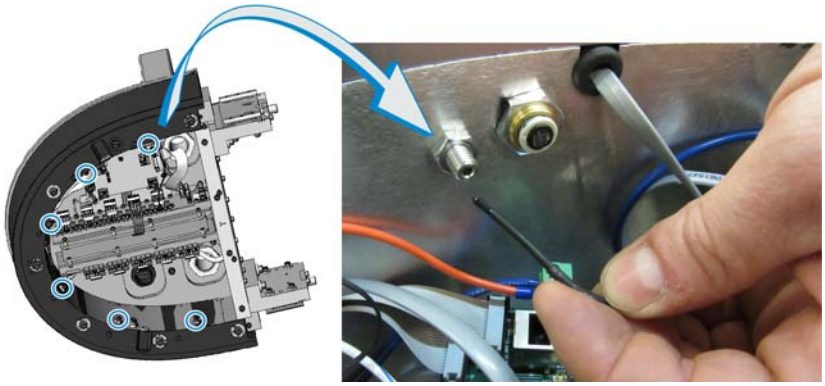
There are six (6) thermistors in each 180 deg. section.

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Remove the 180 deg. section top cover.



4. Unplug the thermistor connector from the coil driver board.
5. Pull the old thermistor wire straight out from the thermistor hole.



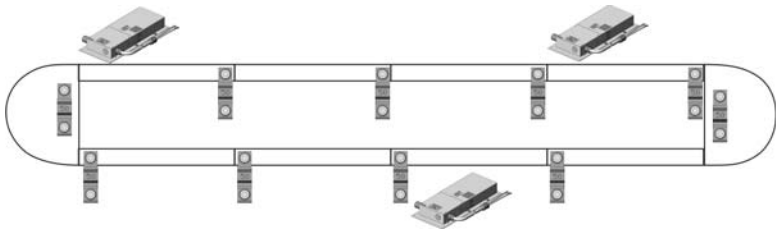
6. Slide the end of the new thermistor wire into the thermistor hole until you feel resistance.

   The thermistor tapers. During installation, the thick ridge creates a friction fit against the sides of the thermistor hole
7. Plug the new thermistor connector into the electrical board.
8. Route the thermistor wire under the electrical board.

Install a Power Supply

NOTICE

- Make sure the power supply is wired correctly during installation. Incorrect wiring causes component damage.
- The length of the 28VDC power cable (between the power supply and track section) must be the same for all power supplies on the same system to obtain the correct voltage and power balancing.
- It is recommend to distribute the power supplies as evenly as possible around the SuperTrak conveyor. For example:



If possible, install the power supplies on the sections with the highest performance demands.

For a wiring overview, see the wiring pin-out overview label located on the electrical door of each straight section and 180 deg. section during this procedure.

See *Other Labels* on page 14.

The number of installed power supplies varies, depending on the demands of the specific SuperTrak conveyor.

This diagram describes the location of the components that are required to install the power supply.

A	Power supply OK signal
B	28 VDC power output location
C	Mounting plate
D	Mounting bracket (1 of 4)
E	Mounting plate screw (1 of 4)
F	AC power input plug
G	Tested label

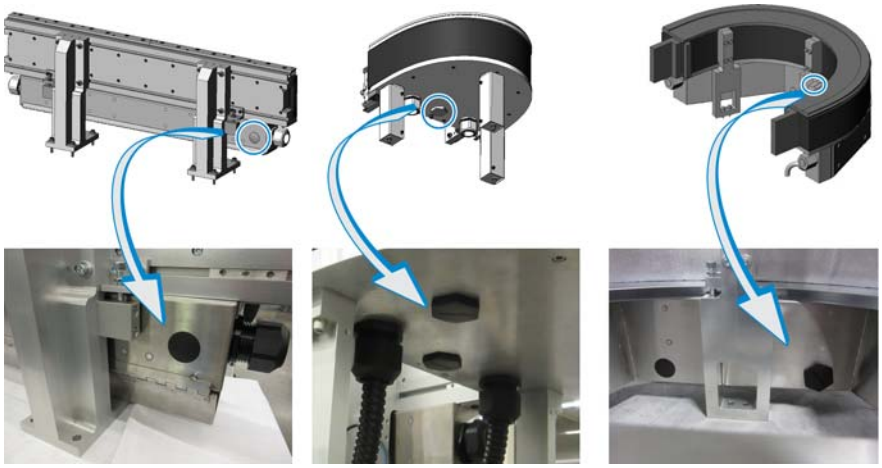
See *Power Supply* on page 40.

Replace or Install a New Power Supply

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

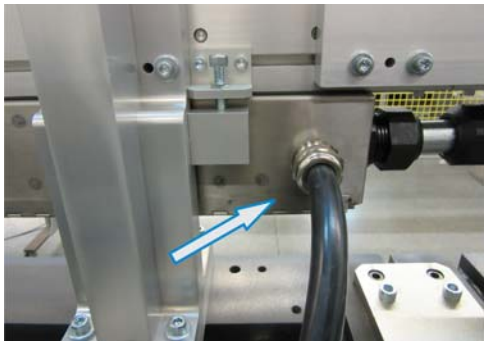
   See *Lockout and Tagout Locations* on page 12.
3. If you are installing a new power supply, complete the following:
   a. Determine the power supply installation location.
   b. Drill and tap four (4) holes into the frame.

      The holes must align with the mounting plate holes.
   c. Secure the mounting plate to the frame with four (4) screws.
   d. As required, remove the black plug from the back of the straight section or the bottom of the 180 deg. section.



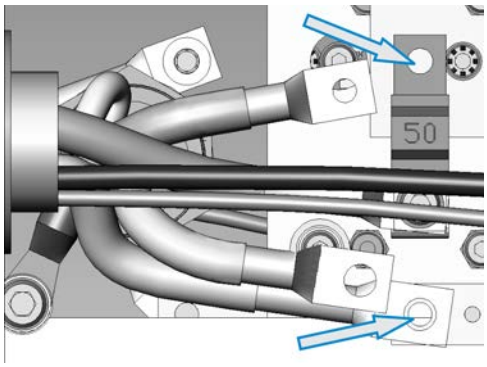
   e. Proceed to step 5.
4. If you are replacing an existing power supply:
   a. Remove the four (4) screws that secure it to the mounting plate.
   b. Disconnect the power supply wire connections from the SuperTrak conveyor (not from the power supply).
5. Secure the new power supply to the mounting plate with one (1) screw in each of the four (4) mounting brackets.
6. As required, complete one (1) of the following to access the left coil driver board:
   - Open the electrical door at the base of the straight section.
   - Remove the top cover from the 180 deg. section. It may also be helpful to remove the panel on the back of the 180 deg. section.

7. Feed the 28 VDC power output cable through the plug opening (step 3d) and then tighten the connection.



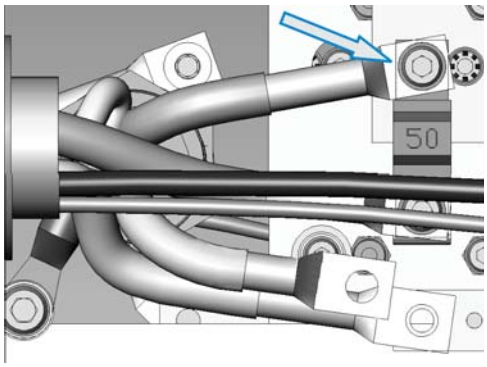
8. Connect the power supply cables to the left coil driver board:

   a. Remove the screw from the top of the 50A fuse, and the screw from the common connection wire.



   b. Align the positive (+) 28VDC motor power wire of the power supply with the top of the 50A fuse.

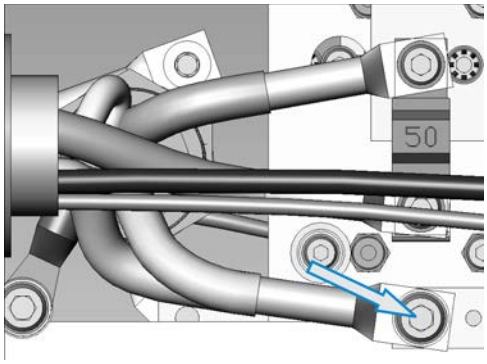
   c. Secure the wire and fuse in position with a lock nut, washer, and screw.



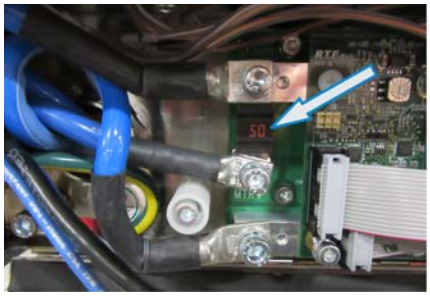
   d. Align the negative (-) common wire from the left electrical interconnect, and the negative (-) common wire of the power supply with the common connection.

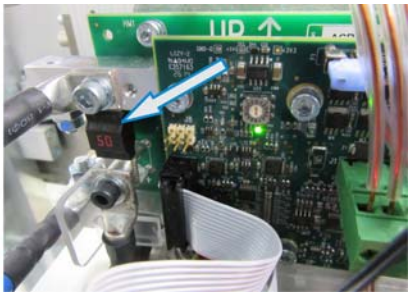
      These two (2) wires both have a white stripe on them.

   e. Repeat step 8c.

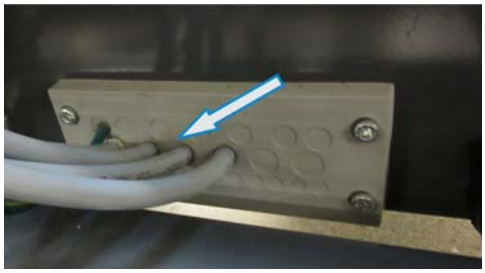


f. Verify that the wiring is the same as the *Left Coil Driver Board with a Power Supply Connected* on page 29.



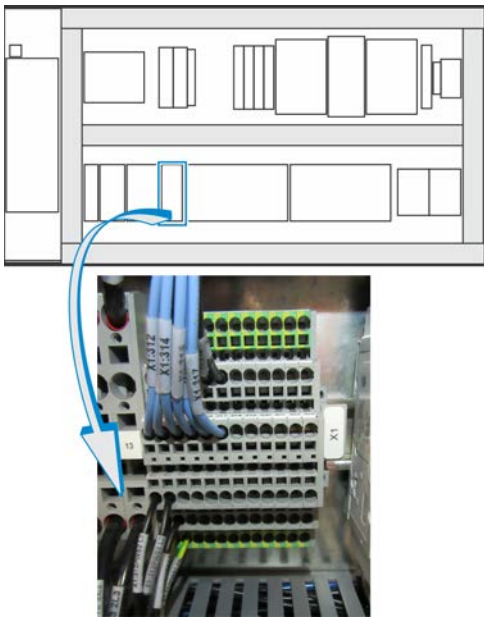


9. Feed the AC power input cable through the cable entry plate at the back of the control panel.



10. Connect the AC power input plug to the terminal strip (-X1) in the control panel.

    The control panel can have six (6) or twelve (12) breakers. The base control panel includes six (6), with an option to increase to twelve (12).



11. As required, complete one (1) of the following to connect the power supply OK signal:
    - Connect the power supply OK signal to a field-mounted remote input block, for PLC monitoring.
    - Connect to the control panel discrete input.

Replace the Main Motor Fuse

A 50A fuse is installed on the left coil driver board when a power supply is installed for the motor. The 50A fuse bridges the two (2) 28VDC motor power connections. Fuse replacement may be required if a low motor voltage fault displays.

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Access the left coil driver board:
   - Open the electrical door at the base of the straight section, or
   - Remove the top cover from the 180 deg. section.
4. Remove a screw from each of the two (2) 28VDC motor power connections.

5. Remove the 50A fuse.
6. Align a new 50A fuse with the two (2) 28VDC motor power connections.

7. Install a screw through each of the two (2) 28VDC motor power connections and into the 50A fuse.

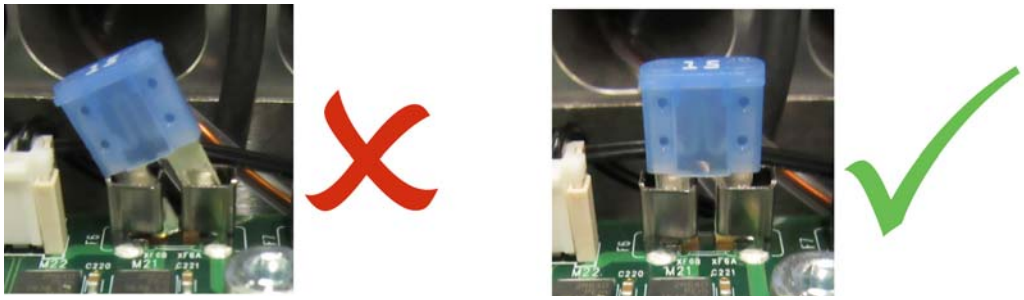
   Make sure each screw has a washer and lock nut as illustrated.

Replace a Coil Fuse

It is possible for the SuperTrak conveyor to operate when a coil fuse is blown; however, the pallet stop control is affected.

Each coil driver board has ten (10) 15A fuses; there is a dedicated fuse for each coil. If a SuperTrak conveyor fault indicates that fuse replacement is required, remove the fuse and test it. If the fuse is blown, replace it. If the fuse is not blown, verify that the fuse is seated correctly.

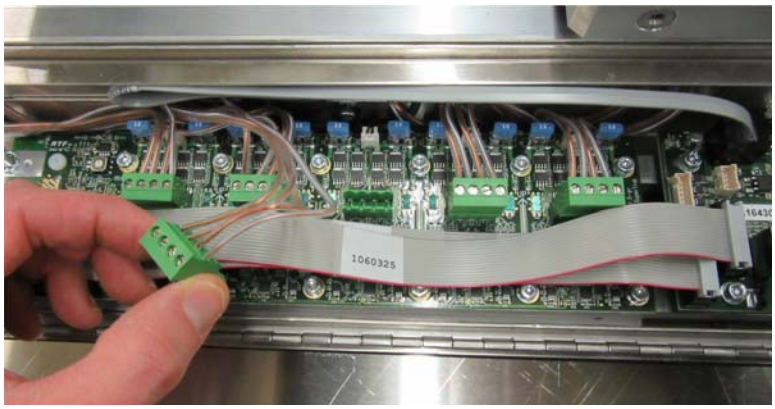
The images below indicate correct and incorrect fuse installation.



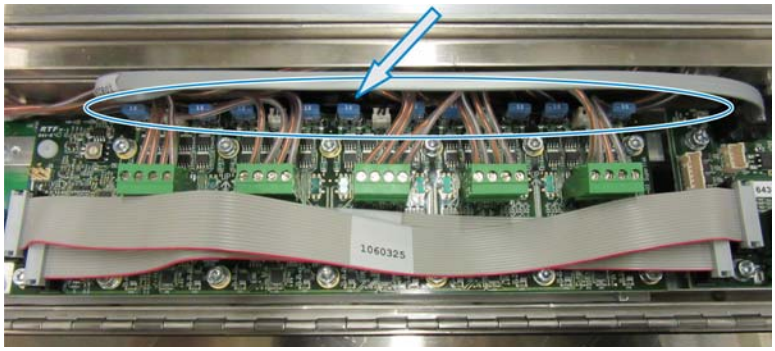
Replace a Coil Fuse - Straight Section or 180 Deg. Section (800 mm)

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Open the electrical door at the base of the straight section.
4. If access to the fuse is blocked, disconnect the applicable coil connection.



5. Pull the 15A fuse straight out from the slot.



6. Install a new 15A fuse straight into the fuse slot.

   Make sure the fuse is centered and seated correctly during installation.

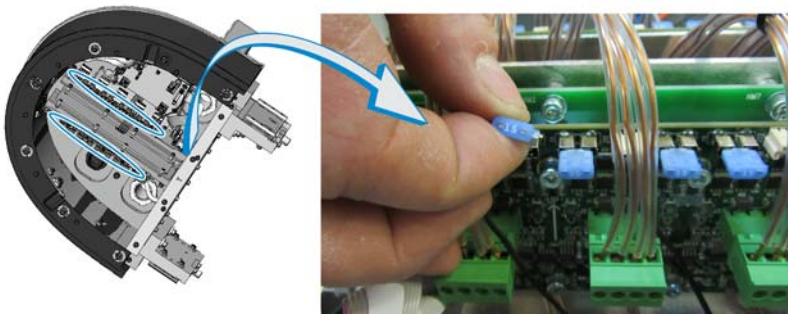
7. If required, connect any coil connections that were disconnected in step 4.

Replace a Coil Fuse - 180 Deg. Section (500 mm)

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.

3. Remove the top cover from the 180 deg. section.
4. Pull the 15A fuse straight out from the slot.



5. Install a new 15A fuse straight into the fuse slot.

   Make sure the fuse is centered and seated correctly during installation.

Install an Electrical Interconnect

For a wiring overview, see the wiring pin-out overview label located on the electrical door of each straight section and 180 deg. section during this procedure.

See *Other Labels* on page 14.

Use these procedures to install electrical interconnects during initial system installation:

- *Install an Electrical Interconnect Between Two Straight Sections* on page 157
- *Install an Electrical Interconnect Between a Straight Section and a 180 Deg. Section* on page 157
- *Install an Electrical Interconnect Between a 180 Deg. Section and a SuperTrak Control Panel* on page 158

Use these procedures to replace an existing electrical interconnect, or access wires within an electrical interconnect:

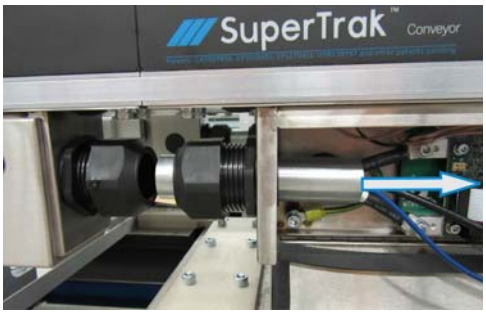
- *Remove an Electrical Interconnect - Straight Section* on page 156
- *Remove an Electrical Interconnect - 180 Deg. Section* on page 156
- *Install an Electrical Interconnect Between Two Straight Sections* on page 157
- *Install an Electrical Interconnect Between a Straight Section and a 180 Deg. Section* on page 157
- *Install an Electrical Interconnect Between a 180 Deg. Section and a SuperTrak Control Panel* on page 158

Remove an Electrical Interconnect - Straight Section

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Open the electrical door of the two (2) adjacent straight sections.
4. Disconnect and remove all wires that run through the metal conduit.
5. Loosen the strain relief connectors on the side of the two (2) adjacent straight sections.
6. Slide the metal conduit out through the cable access hole.

   Slide the metal conduit to the right, so it exits through the left side of the electrical panel.



Remove an Electrical Interconnect - 180 Deg. Section

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Remove ten (10) screws and ten (10) washers from the top cover of the 180 deg. section, and then lift and remove the top cover.
4. Open the electrical door of the adjacent straight section.

   Use a flat head screwdriver to unlock the five (5) locks, and then open the electrical door.
5. Disconnect and remove all wires that run through the flexible conduit.
6. Loosen the strain relief connector on bottom of the 180 deg. section and on the adjacent straight section.
7. Remove the flexible conduit.

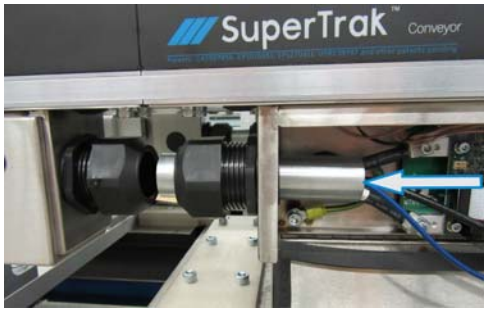
Install an Electrical Interconnect Between Two Straight Sections

1. If required, remove the existing electrical interconnect.

   See *Remove an Electrical Interconnect - Straight Section* on page 156.

2. Slide the metal conduit in through the cable access hole and the two (2) strain relief connectors.

   Always start the metal conduit from left side of the straight section electrical panel.



3. With the metal conduit flush with the strain relief connectors, tighten the two (2) strain relief connectors.

4. Feed the required wiring through the metal conduit and connect as required.

   See *Left Coil Driver Board* on page 28, *Gateway Board* on page 30, and *Right Coil Driver Board* on page 31 for connection information.

Install an Electrical Interconnect Between a Straight Section and a 180 Deg. Section

1. If required, remove the existing electrical interconnect.

   See *Remove an Electrical Interconnect - 180 Deg. Section* on page 156.

2. Carefully bend the flexible conduit, so that one end is in the straight section strain relief connectors and the other end is in the 180 deg. section strain relief connectors.

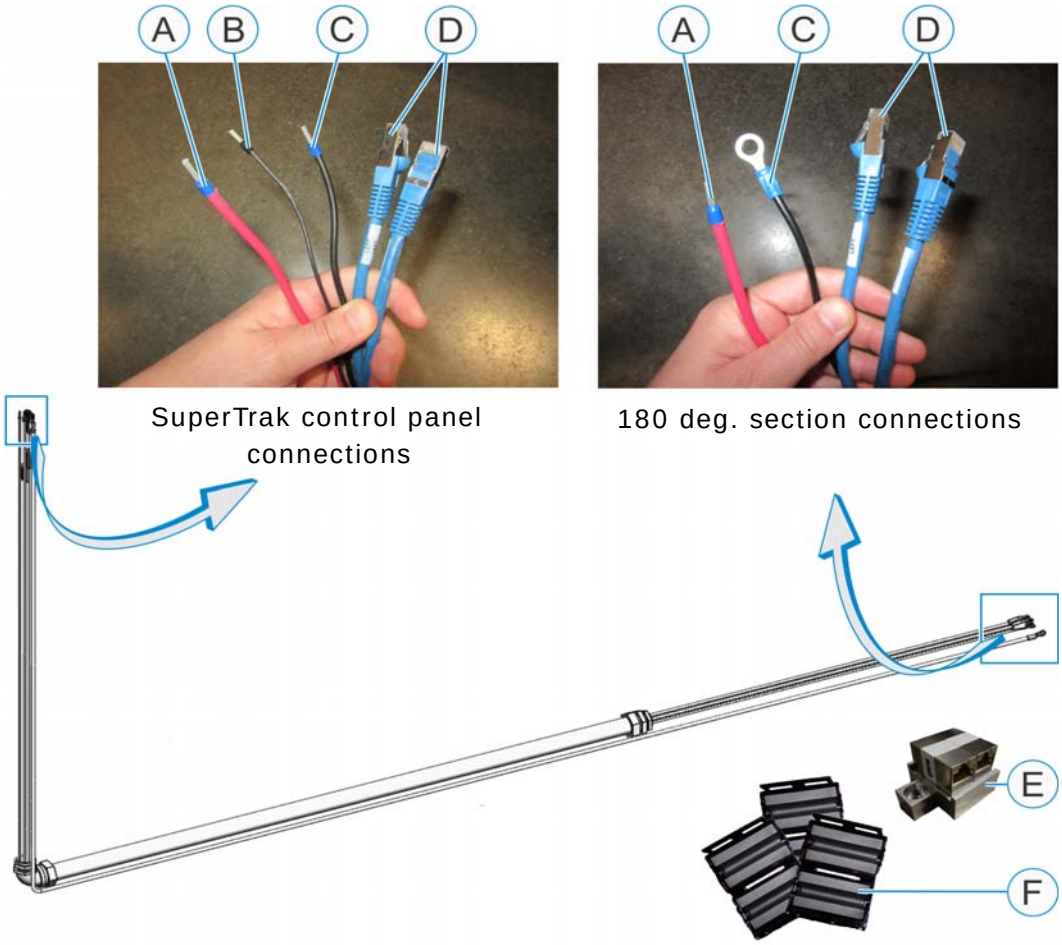
3. Tighten the two (2) strain relief connectors.

4. Feed the required wiring through the metal conduit and connect as required.

   See *Left Coil Driver Board* on page 28, *Gateway Board* on page 30, *Right Coil Driver Board* on page 31, *180 Deg. Section (500 mm)* on page 34, and *180 Deg. Section (800 mm)* on page 36 for connection information.

Install an Electrical Interconnect Between a 180 Deg. Section and a SuperTrak Control Panel

The electrical interconnect has four (4) wires on one end and five (5) wires on the other, it also includes a left network patch cable (not shown), an F-F coupler, and three (3) ferrites.



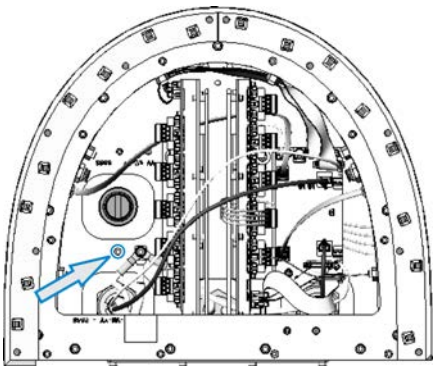
A	24VDC digital power (red or blue)	**D**	Ethernet cables - left and right network cables (blue)
B	Digital shield cable (black)	**E**	F-F coupler
C	Common connection (black or white with blue stripe)	**F**	Ferrite (1 of 3)

The procedure begins with connecting the end with four (4) wires to the 180 deg. section.

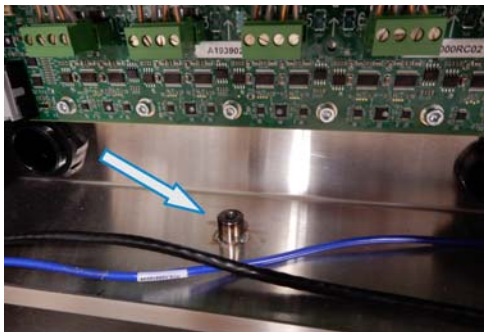
1. Install the F-F coupler:

   a. As applicable, align the coupler with the mounting screw hole. Carefully lift the wires, so the F-F coupler fits below them:

      - For the 500 mm section, remove the top cover to access the mounting location.

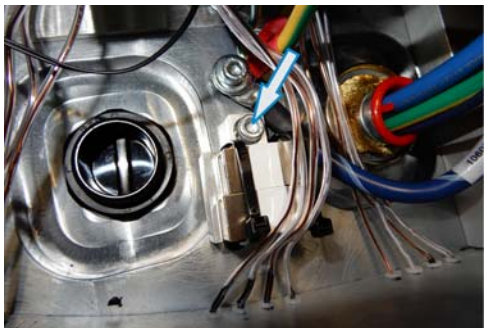


      - For the 800 mm section, remove the center electrical panel to access the mounting location.

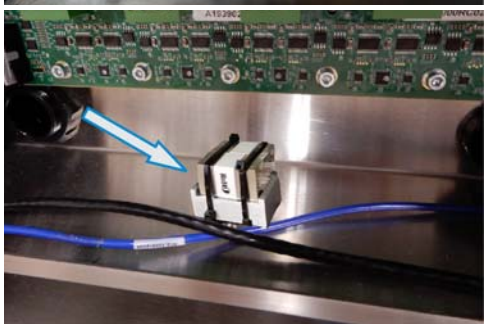


   b. As applicable, secure the F-F coupler in position using a screw:

      - For the 500 mm section, the F-F coupler installation is as shown.



      - For the 800 mm section, the F-F coupler installation is as shown.



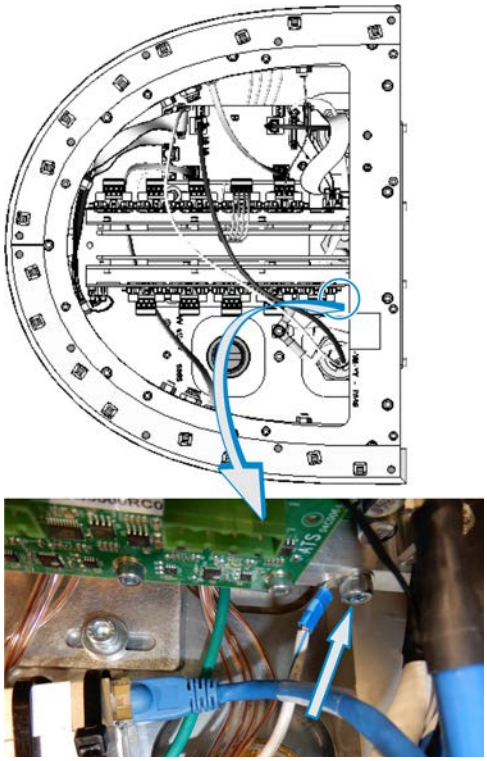
2. As applicable, remove the black wire plug from the 180 deg section:
   - For the 500 mm section, the wire plug is located at the bottom.

   - For the 800 mm section, the wire plug is located on the back (inside).

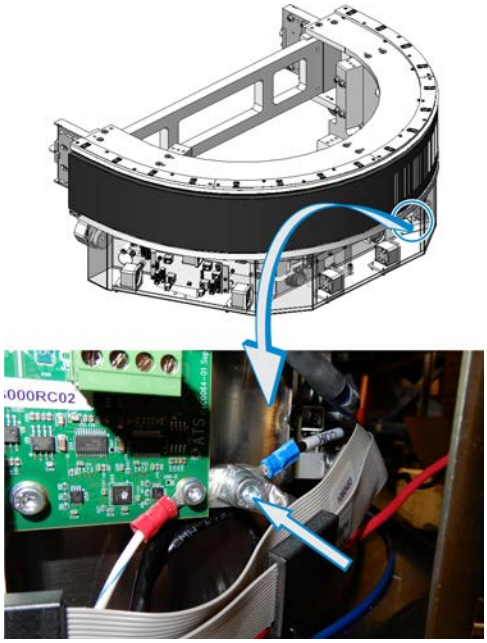
3. Feed the four (4) cables of the interconnect cable through the plug opening on the 180 deg. section.
4. Secure the threaded end of the interconnect cable in the plug opening of the 180 deg. section using the supplied lock nut.

5. As applicable, connect the common connection wire (COM) to the 180 deg. section. Remove the mounting screw, align the common connection wire with the screw hole, and then reinstall the mounting screw:

   - For the 500 mm section, the connection is located near the bottom-right corner of the right coil driver board.

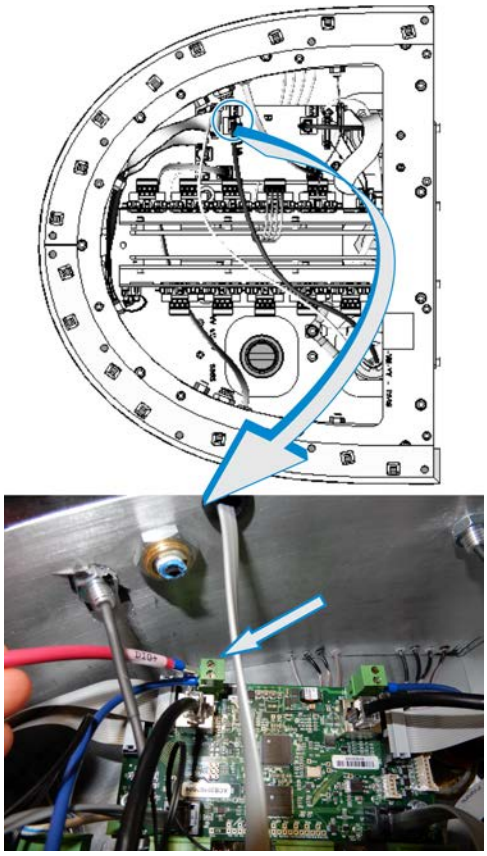


   - For the 800 mm section, the connection is located near the bottom-right corner of the right coil driver board that is in the center electrical panel.

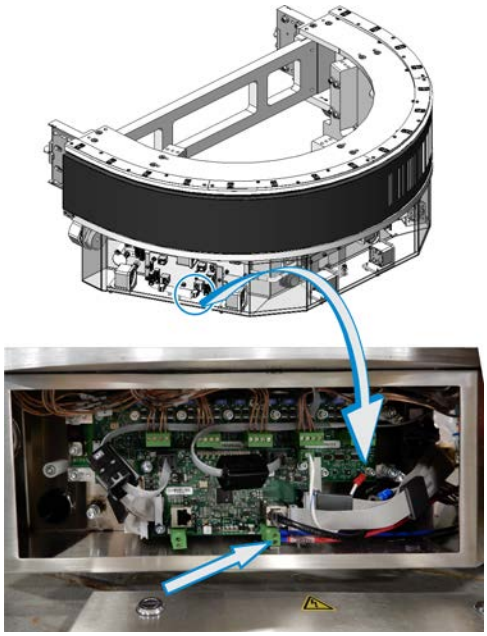


6. As applicable, connect the 24 VDC digital power wire (DIG+) to the J17 connector on the gateway board of the 180 deg. section:

   - For the 500 mm section, the connection is located on the gateway board inside the section.

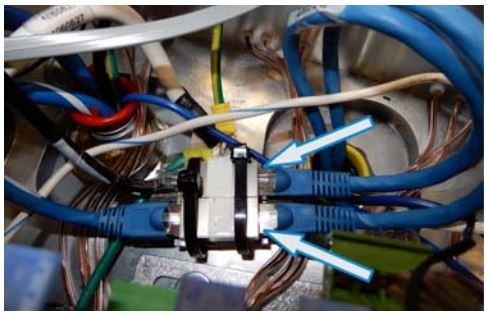


   - For the 800 mm section, the connection is located on the gateway board in the left electrical panel.

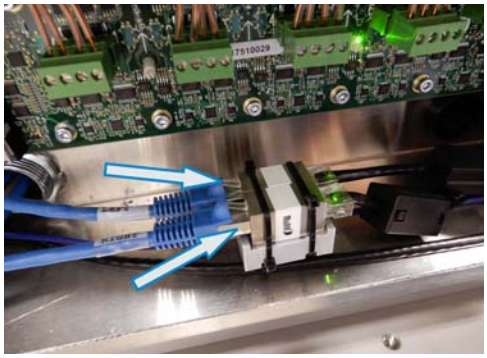


7. As applicable, connect the two (2) Ethernet cables (left and right network cables) to the F-F coupler:

   - For the 500 mm section, connect the cables on the right side of the F-F coupler.



   - For the 800 mm section, connect the cables to the left side of the F-F coupler.



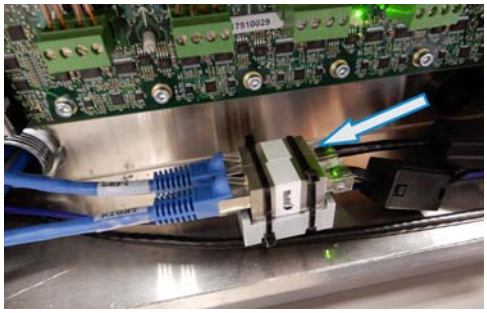
8. Install a ferrite onto the left network patch cable.

   Make sure the ferrite is within 10 cm (4 in.) of the connector.

9. As applicable, connect the left network patch cable to the F-F coupler:

   - For the 500 mm section, connect the cable opposite from the left network cable.

   - For the 800 mm section, connect the cable opposite from the left network cable.

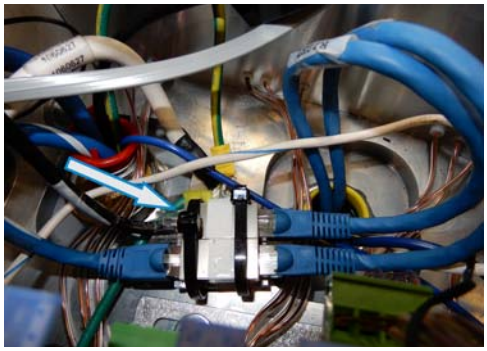


10. Verify that a ferrite exists on the end of each gateway network cable entering the 180 deg. section from the adjoining straight section.

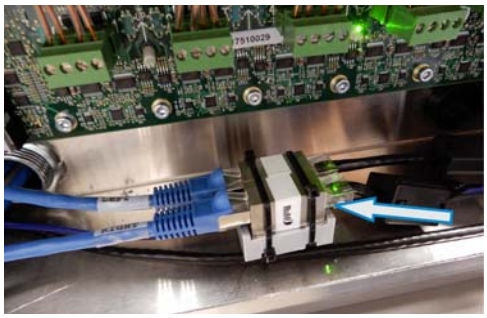
    Make sure each ferrite is within 10 cm (4 in.) of the connector.

11. As applicable, connect the gateway network cable from the adjoining straight section on the right to the F-F coupler:

    - For the 500 mm section, connect the cable opposite from the right network cable.

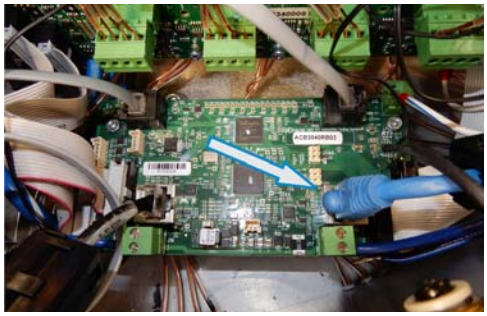


    - For the 800 mm section, connect the cable opposite from the right network cable.

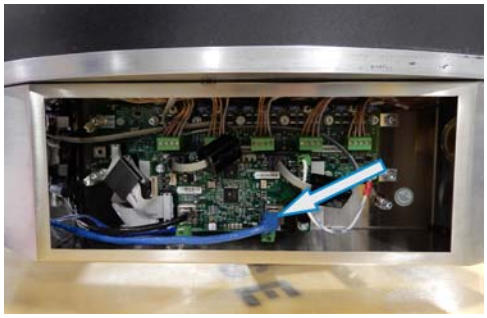


12. As applicable, connect the other end of the left network patch cable:

    - For the 500 mm section, connect the cable to the gateway board within the 500 mm section.



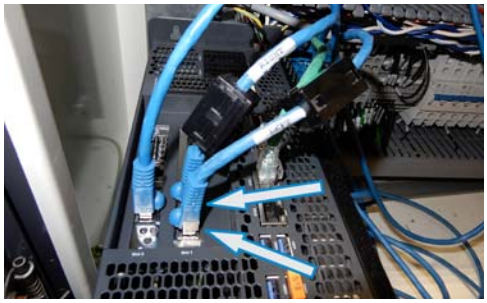
    - For the 800 mm section, connect the cable to the gateway board in the right electrical enclosure within the 800 mm section.



13. Feed the five (5) cables of the interconnect cable through the plug opening at the back of the SuperTrak control panel.
14. Secure the end of the interconnect cable in the opening of the control panel using the supplied lock nut.
15. Install a ferrite on the end of the left and right network cables.

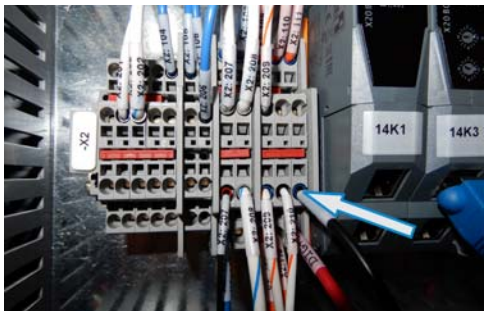
    Make sure each ferrite is within 10 cm (4 in.) of the connector.
16. Connect the other end of the left and right network cables to the controller in the SuperTrak control panel.

    See *Left and Right Gateway Networks* on page 110.



17. Connect the common connection wire (COM) to -X2:211 in the SuperTrak control panel.

    This is a black wire or a white wire with a blue stripe, depending on the system version.

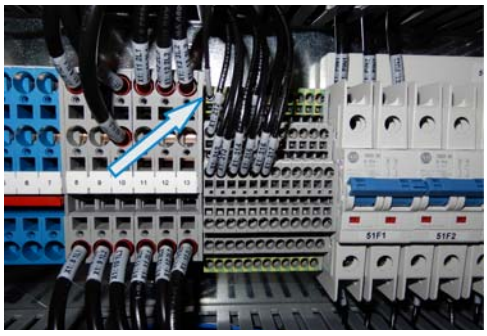


18. Connect the 24VDC digital power wire (DIG+) to -X2:111 in the SuperTrak control panel.

    This is a red wire or blue wire, depending on the system version.

19. Connect the digital shield wire (GND) to -X1:112 in the SuperTrak control panel.

    This is a black wire.



Mechanical Procedures

DANGER Always make sure the safety circuit is open (which turns OFF the SuperTrak conveyor motor power) when completing any mechanical procedures.

See *Hazardous Energy* on page 8.

Some equipment requires periodic adjustment to re-establish the accuracy and desired output of the SuperTrak conveyor. ATS recommends replacing defective devices rather than repairing them. Only qualified technicians should perform maintenance tasks.

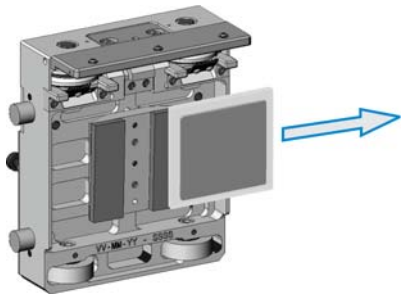
Install a Pallet

CAUTION

- The magnetic field generated by the pallet magnets can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the pallet and the implant location. The magnetic field may also induce magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment and magnetic data carriers can also be affected by magnetic fields. Install a keeper plate on the pallet magnet to reduce the magnetic field to a safe level.
- Make sure the motor power is OFF when a pallet is installed on the SuperTrak conveyor. The external safety circuit must turn the failsafe output to the control panel OFF when the guard doors are open, to disable the motor power.

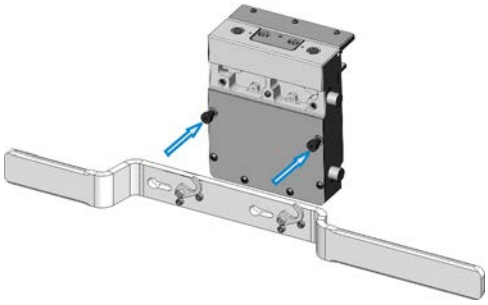
NOTICE The magnetic attraction between the permanent magnets of the pallet and the motor increases as the distance decreases. Prevent strong impact of the pallet with the motor or damage can occur.

1. Open the safety circuit.
2. Slide the keeper plate off the pallet magnet assembly.



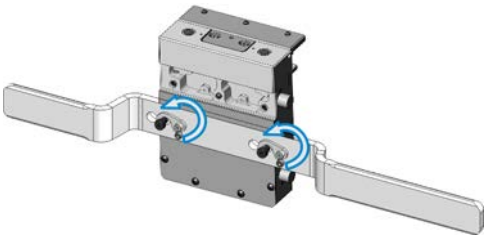
3. Install the pallet removal tool on the pallet:

   a. Align the pallet removal tool holes with the pallet shoulder screws and then position the tool against the front of the pallet.



   b. Slide the pallet removal tool to the left, to locate the shaft of the two (2) shoulder screws into the tool slots.

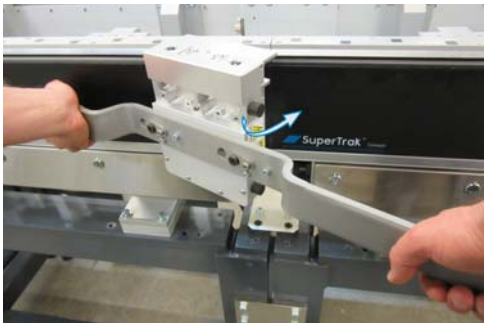
   c. Rotate a locking finger over each of the two (2) shoulder screws.



4. Lift the pallet using the handles of the pallet removal tool.

   Make sure the encoder strip bracket is positioned at the top of the pallet.

5. Hold the pallet removal tool firmly. Rest the top left corner of the pallet on the upper v-rail of the SuperTrak conveyor, and then, align the anti-tip block of the pallet with the slot below the upper v-rail.



6. Hold the pallet level. With the anti-tip block in the left slot, rotate the pallet toward the motor until the anti-tip block on the right side moves into the slot below the upper v-rail.

   Prevent strong impact of the pallet with the motor or damage could occur.

7. Remove the pallet removal tool from the pallet.

8. Verify that a 0.5 mm (0.02 in.) gap exists between the encoder strip bracket and the encoder bracket.

   See *Adjust a Pallet Shim* on page 182 for how to correctly measure or (if required) adjust the gap.

Remove a Pallet

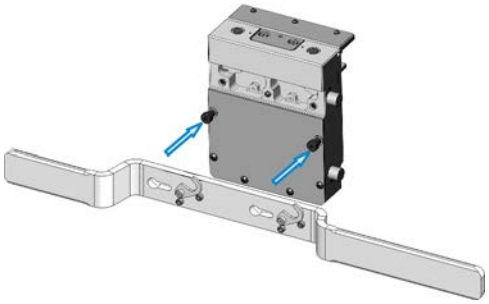
⚠CAUTION

- The magnetic field generated by the pallet magnets can be harmful to pacemaker wearers. Maintain a minimum distance of 31 cm (12 in.) between the pallet and the implant location. The magnetic field may also induce magnetic materials into motion, creating potential projectiles or pinch points. Various electronic equipment and magnetic data carriers can also be affected by magnetic fields.
- Always install a keeper plate on the pallet magnet when a pallet is removed from the SuperTrak conveyor to reduce the magnetic field to a safe level.
- Make sure the motor power is OFF when a pallet is installed on the SuperTrak conveyor. The external safety circuit must turn the failsafe output to the control panel OFF when the guard doors are open, to disable the motor power.

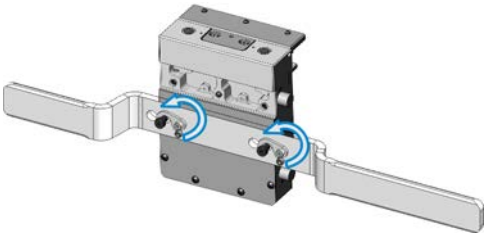
NOTICE

The magnetic attraction between the permanent magnets of the pallet and the motor increases as the distance decreases. Prevent strong impact of the pallet with the motor or damage can occur.

1. Open the safety circuit.
2. Install the pallet removal tool on the pallet:
   a. Align the pallet removal tool holes with the pallet shoulder screws and then position the tool against the front of the pallet.

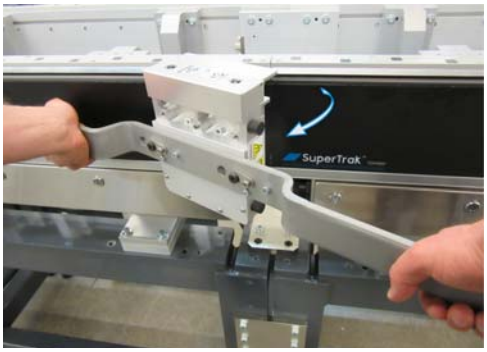


   b. Slide the pallet removal tool to the left, to locate the shaft of the two (2) shoulder screws into the tool slots.
   c. Rotate a locking finger over each of the two (2) shoulder screws.



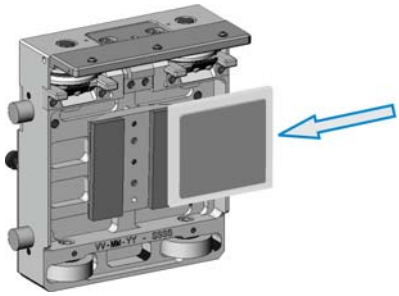
3. Pry or tilt the pallet away from the motor: firmly hold both pallet removal tool handles, and then pull the right handle while resisting with the left handle

   At approximately 15 degrees the magnetic pull decreases and the pallet can be removed from the motor.



4. Slide a keeper plate over the pallet magnet assembly with the polycarbonate side of the keeper plate against the pallet magnet.

   The keeper plate reduces the magnetic field produced by the magnet. The lexan creates a gap between the magnets and the steel plate. Hold the keeper plate in a manner that avoids fingers getting caught between the keeper plate and the magnets.

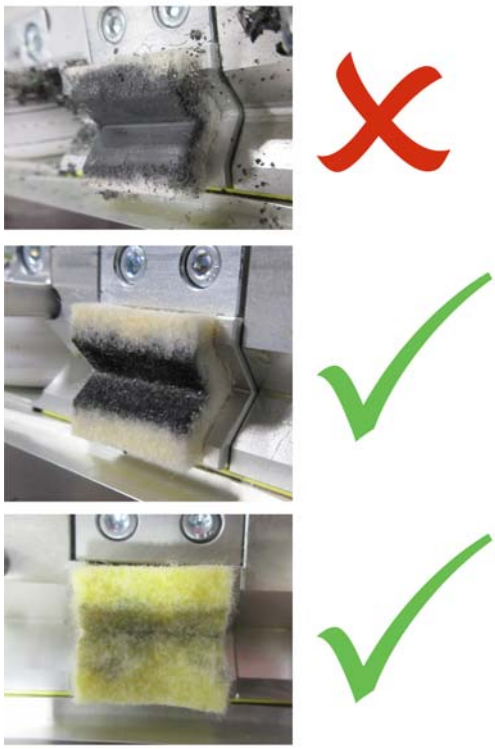


Inspect a Pallet

NOTICE Handle pallets carefully to avoid damage to the pallet components.

Inspect pallets for wear on a regular basis and each time a pallet is removed from the SuperTrak conveyor. Inspect the pallet:

Pallet Component	Inspection	Resolution
Anti-static brush	Verify that the two (2) screws that secure the anti-static brush are tight.	Tighten any loose anti-static brush screws.
	The nominal length of a new anti-static brush is 4.05 mm (0.159 in.). When 0.5 mm (0.02 in.) of the anti-static brush is worn away, it will not make contact with the upper v-rail. Visually inspect the anti-static brush. Make sure that at least 90% of the bristles remain. If more than 20% of the bristles are worn away, replace the anti-static brush.	Replace the anti-static brush. See *Replace a Pallet Anti-Static Brush* on page 181.
Bumpers	Verify that all bumpers are installed and compliant with the SuperTrak conveyor application. If required, install or adjust the bumpers. See the main system mechanical drawings for compliance information. For example, the bumpers may require extensions.	Replace the pallet bumper. See *Replace a Pallet Bumper* on page 173.
Encoder strip	Visually inspect the encoder strip and the encoder bracket for damage. Use a magnetic viewing film to verify the magnetic poles.	If required, replace the encoder bracket. See *Replace an Encoder Bracket* on page 142, and *Inspect a Pallet Encoder Strip* on page 216.
Screws	Verify that all pallet screws are secure. Make sure components do not have unexpected movement. The only components that should have movement are: v-wheels, spring-compliance of the lubrication Felt, anti-static bristles, and a small amount of vertical movement in the flat wheels (≤0.5 mm [≤0.02 in.]).	If required, tighten the screws.

Pallet Component	Inspection	Resolution
Lubrication felt	Visually inspect the lubrication felt. Make sure the felt is in good condition. 	If required, replace the lubrication felt. See *Replace a Pallet Lubrication Felt* on page 185.
	Verify that the lubrication felt contains lubricant. If debris accumulates on the upper v-rail, it is possible that all lubrication felts require lubricant.	Lubricate the lubrication felt. See *Lubricate the Pallet Lubrication Felt* on page 219.
	Test the lubrication felt spring compliance. Manually push the lubrication felt and then let go. The lubrication felt spring should spring back out and not jam.	If the lubrication felt spring jams, loosen the lubrication locking block screws, re-seat the lubrication locking block, and tighten the screws. If the lubrication felt spring does not spring back reliably, replace the lubrication felt spring. See *Replace a Pallet Spring* on page 186.

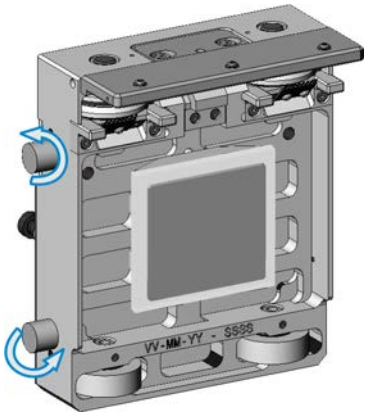
Pallet Component	Inspection	Resolution
Magnet assembly	Visually inspect the magnet assembly for damage or wear (for example; cracks or flaking magnet plating).	Replace the pallet magnet assembly. See *Replace a Pallet Magnet Assembly* on page 180.
	Visually inspect the magnet assembly for dirt or debris.	Clean dirt and debris off of the magnet assembly, using a clean, soft cloth. Wipe metal debris to a corner or edge of the magnet and then pull it off.
Wheels	• Check each flat wheel for vertical and horizontal movement. A small amount of vertical play (≤0.5 mm [≤0.02 in.]) in the flat wheels is normal and acceptable. If a flat wheel does not sit firmly in position, replace the flat wheel and make sure that the spacers are present. • Check each v-wheel for vertical movement. If the v-wheel does not sit firmly in position, tighten the screw at the top of the v-wheel.	See *Replace the Pallet Flat Wheels* on page 174, and *Replace the Pallet V-Wheels* on page 176.
	Turn each wheel to make sure it moves freely. Replace any wheels that do not move freely.	
	Visually inspect each flat wheel for wear or damage. Replace any badly damaged wheels. If a wheel has a groove worn into it, this may indicate that the flat wear strips, located on the straight section or 180 deg. section, are pitted. The flat wear strip may require replacement. Visually inspect v-wheels. If a wheel is damaged, make sure the upper v-rail is not damaged and that it is correctly aligned.	See *Replace a Flat Wear Strip* on page 208, *Replace the Pallet V-Wheels* on page 176, and *Replace an Upper V-Rail* on page 205.

Replace a Pallet Bumper

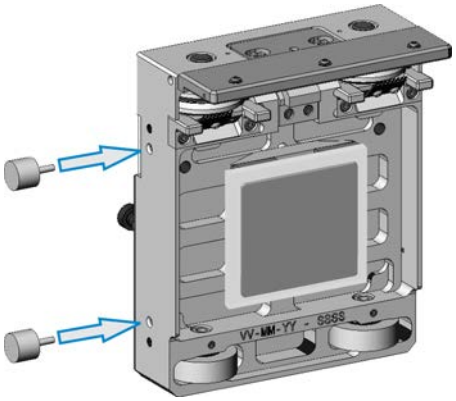
1. Remove the pallet from the SuperTrak conveyor.

   See *Remove a Pallet* on page 168.

2. Turn the bumper counter-clockwise and remove the bumper.



3. Align the replacement bumper threads with the bumper spacer (if used) or with the bumper hole on the pallet.



4. Turn the bumper clockwise until it is snug against the pallet.

Replace the Pallet Flat Wheels

Inspect the flat wheels and spacers. Replace the flat wheels if they are worn (vertical play exceeds 0.5 mm [0.02 in.]) or damaged.

See *Typical Pallet Wheel Lifespan* on page 269 for additional information.

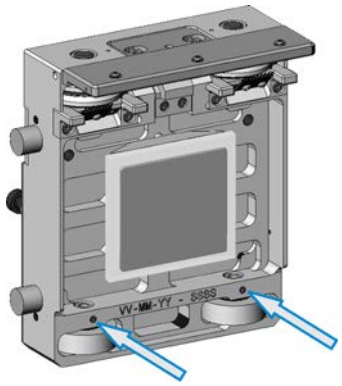
Remove the Pallet Flat Wheels

1. Remove the pallet from the SuperTrak conveyor.

   See *Remove a Pallet* on page 168.

2. Loosen the two (2) wheel set screws.

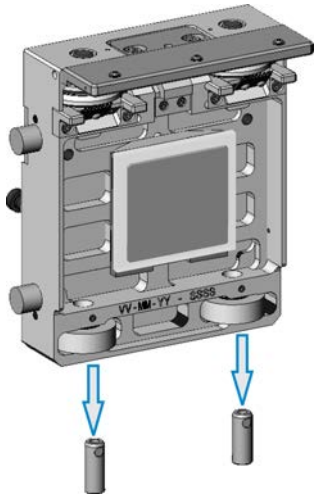
   For ease of disassembly, rest the pallet on the shoulder screws or on the encoder strip bracket.



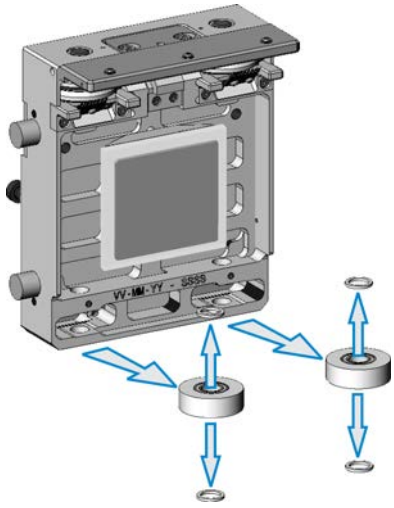
3. Attempt to manually push the shaft out. If snug, thread a dowel puller into the shaft and pull the shaft out.

   If the shaft does not come out, loosen the set screw more.

4. Repeat step 3 for the second shaft.



5. Remove the flat wheels and two (2) spacers for each flat wheel.

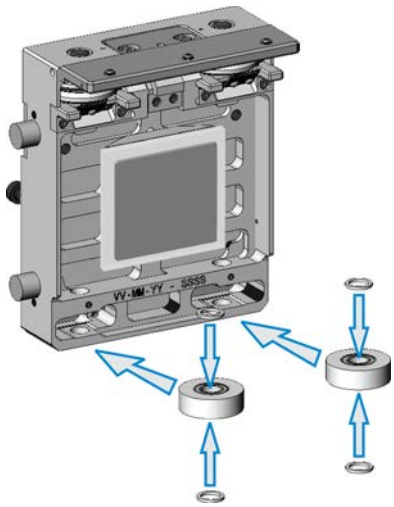


Install the Pallet Flat Wheels

1. Hold a spacer on each side of the bearing of the new flat wheel and insert the flat wheel into the pallet body.

   For ease of assembly, rest the pallet on the shoulder screws or upside down on the encoder strip bracket.

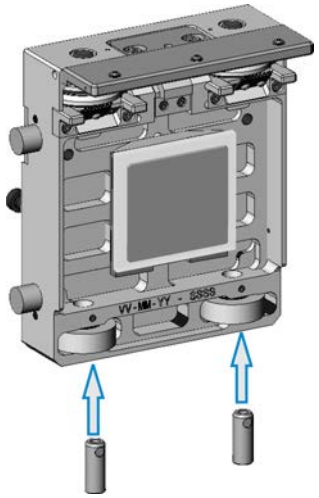
2. Align the spacer and flat wheel with the hole in the pallet body.



3. Position a dowel over the pallet body hole with the flat side of the shaft facing the set screw.
4. Attempt to manually push the shaft in.

   If tight, use a mallet to gently tap the shaft until the top of the shaft is flush with the pallet body.

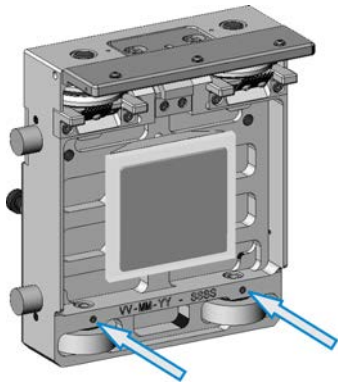
5. Repeat steps 1 to 4 for the second flat wheel.



6. Fully remove the set screws, to verify that the flat of the shaft is aligned with the set screw.

   If the set screw contacts the round of the shaft, it can score the shaft and make it difficult to remove the shaft later.

7. Install and tighten the two (2) wheel set screws.



Replace the Pallet V-Wheels

It is recommended to replace the pallet v-wheels in pairs.

Inspect the v-wheels for gouges, pits, or wear; replace if they are worn or damaged.

Pallet v-wheel wear varies depending on the system application. It is recommended that you verify the accuracy of critical pallet features over time, as required by the application. This allows you to compare the measurements to your process limits and recognize when replacement is necessary.

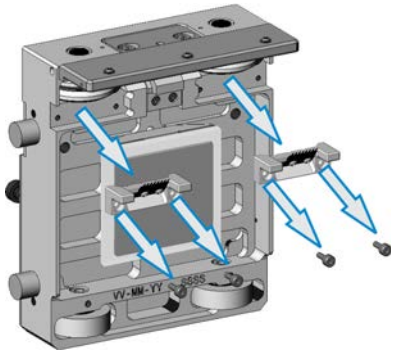
See *Typical Pallet Wheel Lifespan* on page 269 for additional information.

Remove the Pallet V-Wheels

1. Remove the pallet from the SuperTrak conveyor.

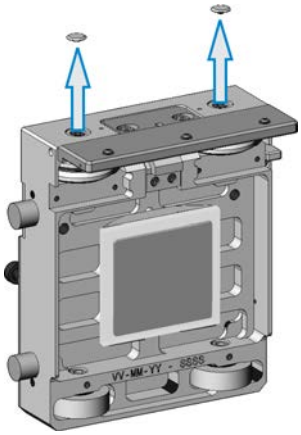
   See *Remove a Pallet* on page 168.

2. Remove the two (2) screws that secure the anti-tip block in position.
3. Remove the anti-tip block.
4. Repeat steps 2 to 3 for the second anti-tip block.

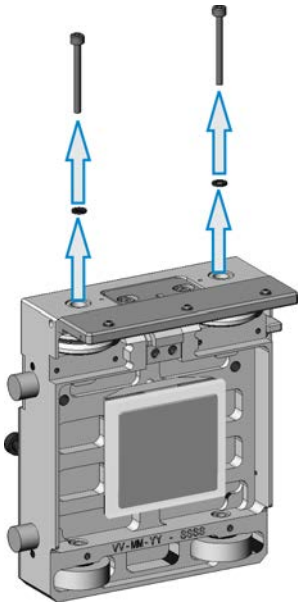


5. Remove the two (2) plastic caps on the top of the pallet.

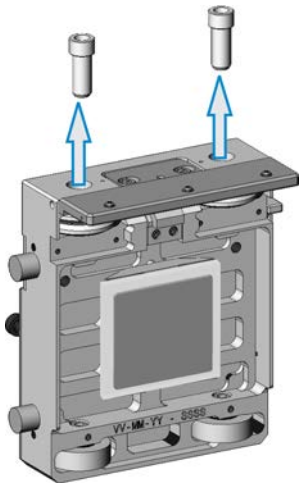
   For ease of disassembly, rest the pallet on the shoulder screws or on the encoder strip bracket.



6. Remove the screw and washer that secures the v-wheel in position.
7. Repeat step 6 for the second v-wheel.

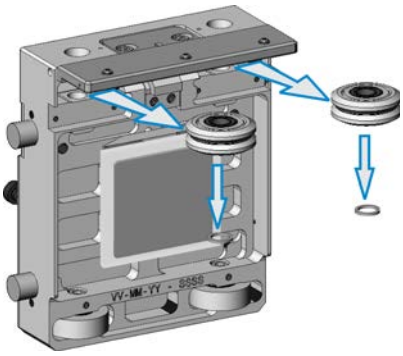


8. Attempt to manually pull the v-wheel shaft out. If snug, thread a dowel puller into the shaft and pull the shaft out.
9. Repeat step 5 for the second shaft.



10. Remove the v-wheel and the spacer that is on the bottom of the v-wheel.

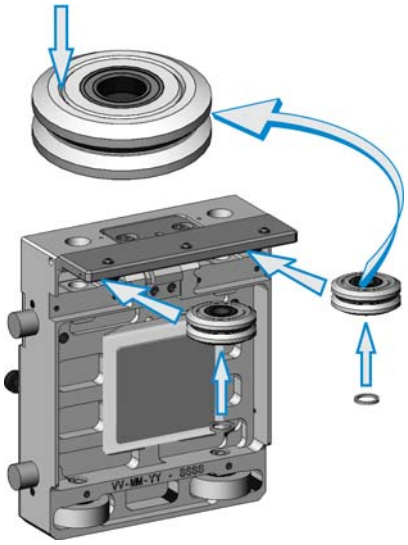
    Place the spacer in a safe location.



Install the Pallet V-Wheels

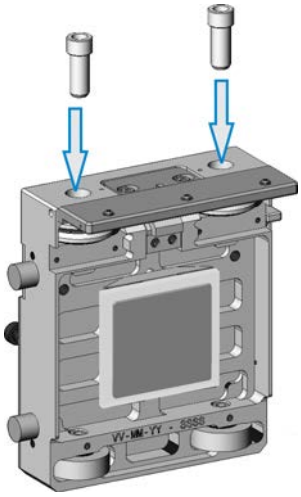
1. Hold the new v-wheel so that the side with the groove is facing up.
2. Hold a spacer on the bottom of the new v-wheel and insert them into the pallet body.

   For ease of assembly, rest the pallet on the shoulder screws or upside down on the encoder strip bracket.



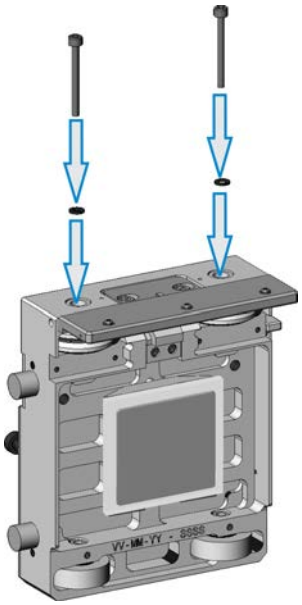
3. Align the spacer and v-wheel holes with the holes in the pallet body.
4. Manually insert the shaft through the v-wheel and spacer.

   If tight, use a mallet to gently tap the shaft until the top of the shaft is flush with the pallet body.

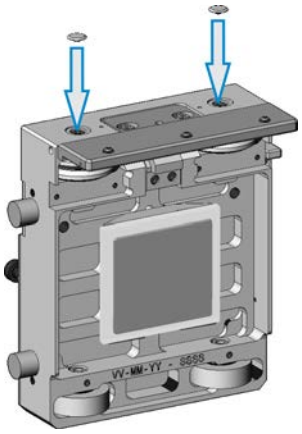


5. Repeat steps 1 to 4 for the second v-wheel.

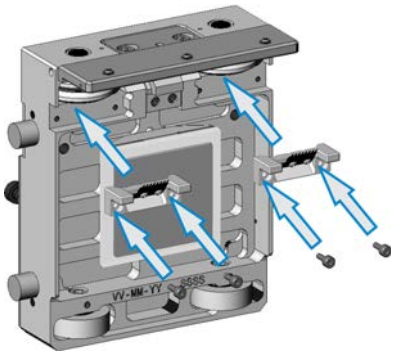
6. Install and a washer and screw into each of the two (2) v-wheel shafts, and then tighten.



7. Install a plastic cap over each of the two (2) screws.



8. Install an anti-tip block in position, and then secure it in position with two (2) screws.



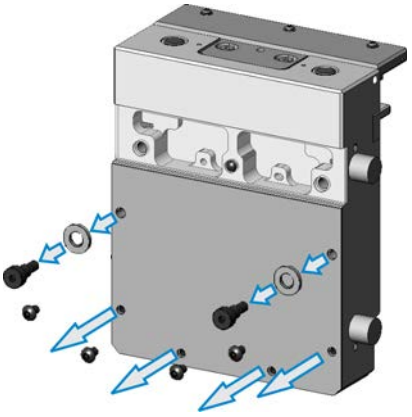
9. Repeat step 8 for the second anti-tip block.

Replace a Pallet Magnet Assembly

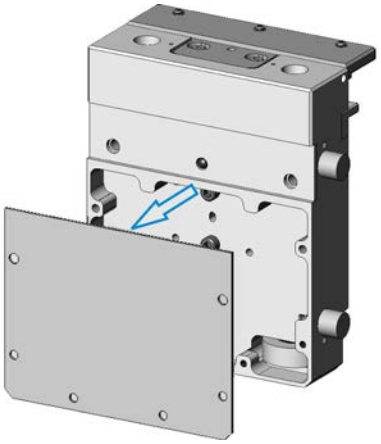
1. Remove the pallet from the SuperTrak conveyor.

   See *Remove a Pallet* on page 168.

2. Remove the four (4) screws and two (2) shoulder bolts from the front cover plate.

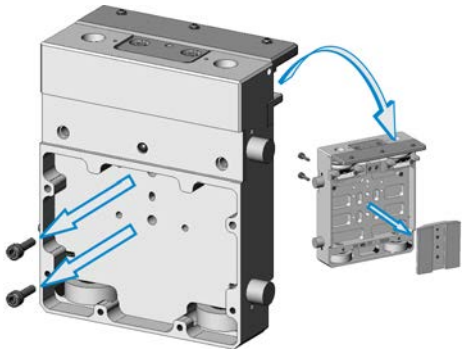


3. Remove the front cover plate from the pallet.



4. While supporting the magnet assembly, remove the two (2) or four (4) magnet assembly screws (as required).
5. Align the new magnet assembly (2-magnet or 3-magnet, as required) with the pallet dowel holes.

   The magnet assembly can only be installed in one direction: it cannot be assembled upside down.



6. As required, secure the 2-magnet assembly in position with two (2) screws, or the 3-magnet assembly with four (4) screws.
7. Align the front cover plate with the pallet.
8. Secure the front cover plate in position with four (4) screws and two (2) shoulder bolts.

Replace a Pallet Anti-Static Brush

NOTICE The anti-static bristles can be bent out of shape if mishandled. Take care not to damage the anti-static bristles during this procedure.

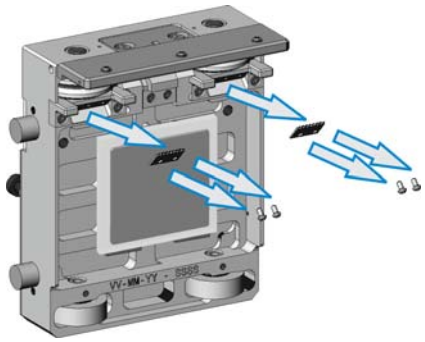
The nominal length of a new anti-static brush is 4.05 mm (0.159 in.). When 0.5 mm (0.02 in.) of the anti-static brush is worn away, it will not make contact with the upper v-rail. Replace an anti-static brush if more than 20% of the brush bristles are worn away.

Remove an Anti-Static Brush

1. Remove the pallet from the SuperTrak conveyor.

   See *Remove a Pallet* on page 168.

2. Remove the two (2) screws that secure the anti-static brush in position.
3. Remove the anti-static brush.

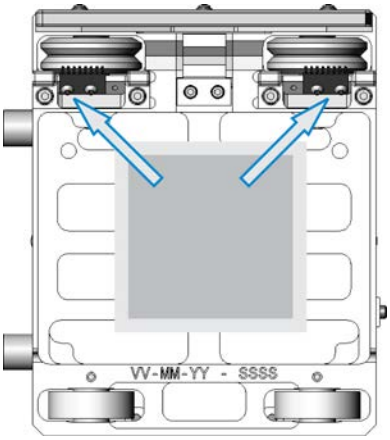


Install an Anti-Static Brush

1. Align the new anti-static brush with the outer holes of the anti-tip block.

   Make sure the bristles of the anti-static brush face up, toward the V-wheel.

2. Install two (2) screws to secure the anti-static brush in position.

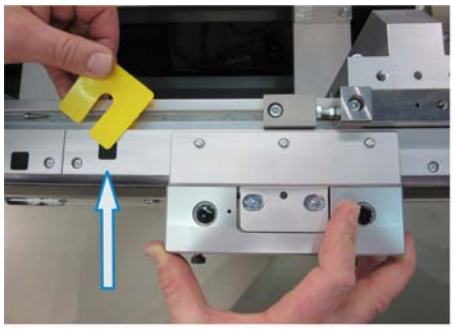


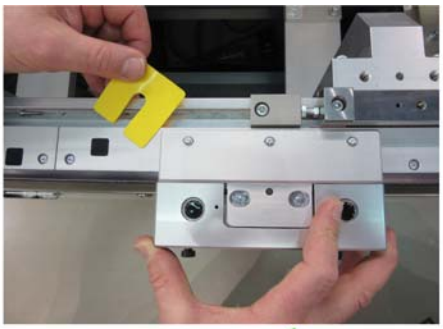
Adjust a Pallet Shim

The pallet shim is factory-set to obtain a 0.5 mm (0.02 in.) gap between the pallet encoder bracket and the SuperTrak conveyor encoder bracket. Adjust the pallet shim if the gap is outside of the range of 0.5 mm (0.02 in.) +/- 0.3 mm (0.01 in.).

1. With the pallet installed, measure the gap between the pallet encoder strip bracket and the SuperTrak conveyor:

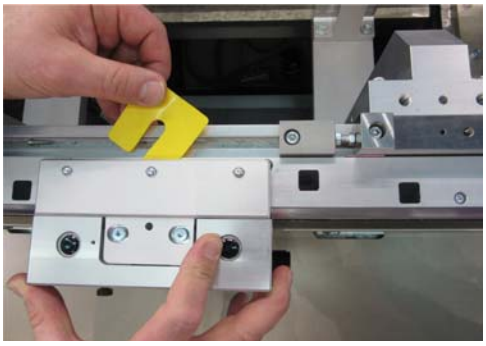
    a. Place a 0.5 mm (0.02 in.) plastic shim on the aluminum surface of the encoder bracket. Do not place the shim over an encoder.





    b. Slide the pallet over the shim.

    c. Use different size shims to determine if the gap is greater or less than 0.5 mm (0.02 in.), and by how much.

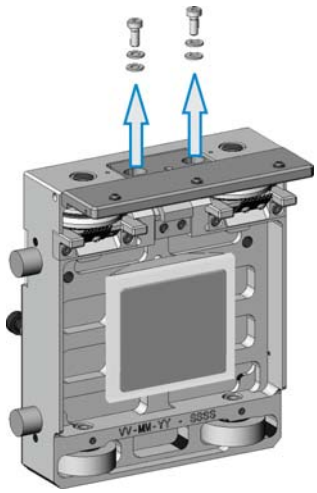


2. If the gap is greater than 0.5 mm (0.02 in.) +/- 0.3 mm (0.01 in.), verify that the pallet shim is the problem (not the v-wheels or encoder strip):

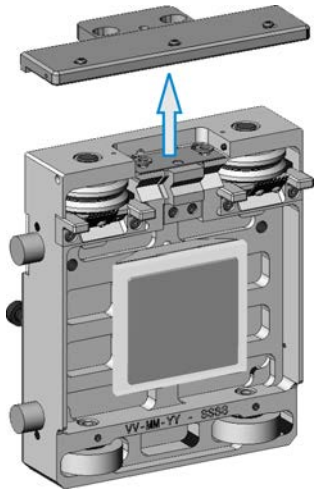
    - Make sure that the v-wheels are secure with no vertical play. If the v-wheels have vertical movement; secure the v-wheels in position, and then re-measure the encoder strip gap.
    - Make sure that the encoder strip is secure and flush with the encoder bracket. If required; replace the encoder strip, and then re-measure the encoder strip gap.

      See *Replace a Pallet Encoder Strip* on page 187.

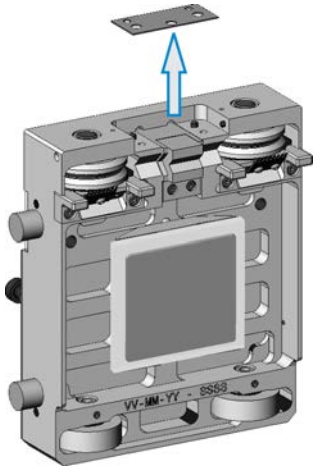
3. Remove the two (2) outer set screws, located on the side of the pallet.
4. Loosen the two (2) inner set screws, located on the side of the pallet.
5. Remove the two (2) screws, two (2) lock washers, and two (2) flat washers that secure the encoder strip bracket in position.



6. Lift and remove the encoder strip bracket.



7. Lift and remove the pallet shim.



8. Measure the current combined shim thickness.
9. Use shims to adjust the gap to 0.5 mm (0.02 in.).

   Shims are available in a range of sizes from ATS.
10. Align the new pallet shim with the pallet dowels, and then place in position.

    The shim can only be installed one way.
11. Position the encoder strip bracket in position.
12. Secure the encoder strip bracket in position with one (1) flat washer, one (1) lock washer, and one (1) screw in each of the two (2) screw holes.
13. Repeat step 1.
14. Align the encoder strip bracket.

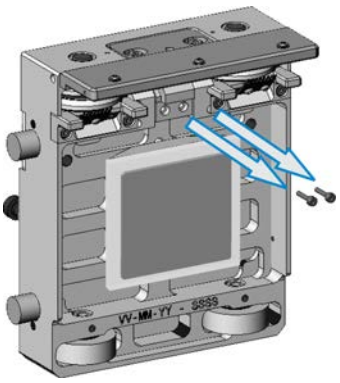
    See *Adjust the Pallet Encoder Bracket (Primary Encoder Strip)* on page 201.

Replace a Pallet Lubrication Felt

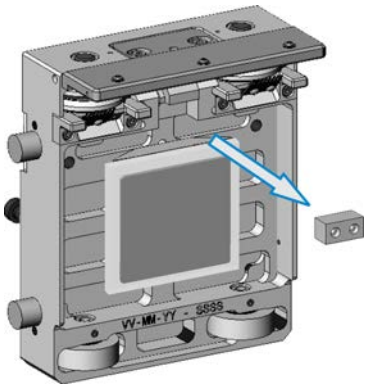
1. Remove the pallet from the SuperTrak conveyor.

   See *Remove a Pallet* on page 168.

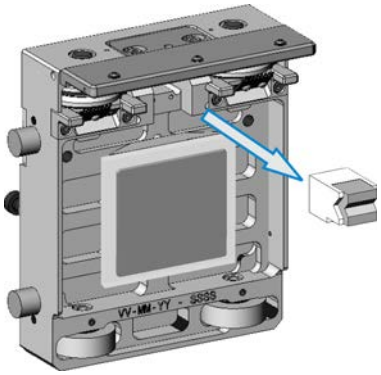
2. Remove the two (2) lubrication locking block screws.



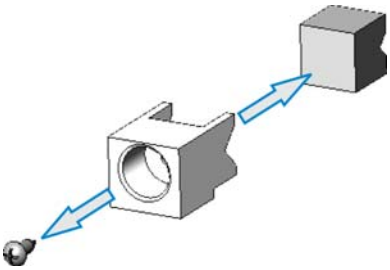
3. Remove the lubrication locking block.



4. Remove the lubrication holder.



5. Remove the screw from the back of the lubrication holder, and then remove the lubrication felt from the lubrication holder.



6. Position a new lubrication felt into the lubrication holder.

   Make sure the V-groove of the lubrication felt aligns with the V-groove of the lubrication holder.

7. Install one (1) screw in the back of the lubrication holder and into the lubrication felt.

8. Insert the lubrication holder into the pallet.

   Make sure the V-groove of the lubrication Felt is horizontal with the pallet V-wheels.

9. Install the lubrication locking block over the base of the lubrication holder.

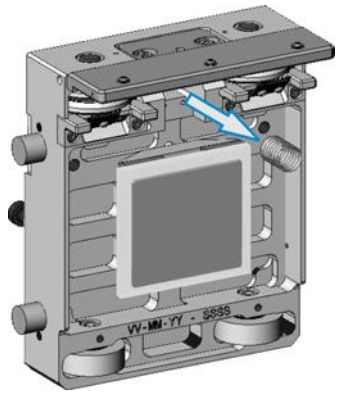
10. Secure the lubrication locking block in position with two (2) screws.

11. Lubricate the lubrication felt.

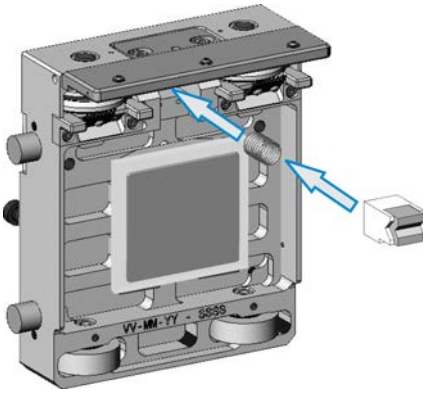
    See *Lubricate the Pallet Lubrication Felt* on page 219.

Replace a Pallet Spring

1. Complete steps 1 to 4 of *Replace a Pallet Lubrication Felt* on page 185.
2. Remove the spring.



3. Position a new spring into the pallet.
4. Complete steps 6 to 10 of *Replace a Pallet Lubrication Felt* on page 185.



Replace a Pallet Encoder Strip

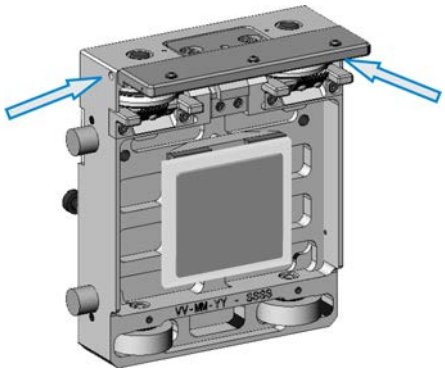
NOTICE Pallet encoder strips can be damaged by magnets. Never clean a pallet encoder strip with a magnet.

1. Remove the pallet from the SuperTrak conveyor.

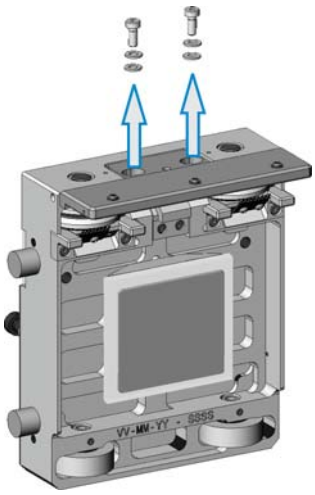
   See *Remove a Pallet* on page 168.

2. Loosen the two (2) set screws on the side of the pallet.

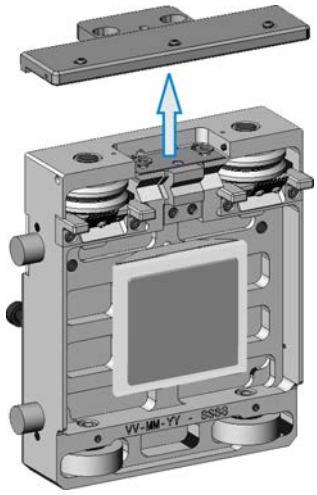
   There is one set screw on each side of the pallet.



3. Remove the two (2) screws, two (2) lock washers, and two (2) flat washers that secure the encoder strip bracket in position.



4. Lift and remove the encoder strip bracket.



5. Obtain a replacement encoder bracket with a new encoder strip mounted. Order this part from ATS.
6. Align the encoder strip bracket that has a new encoder strip with the pallet.
7. Secure the encoder strip bracket in position with two (2) screws, two (2) lock washers, and two (2) flat washers.
8. Align the encoder strip bracket.

   See *Adjust the Pallet Encoder Bracket (Primary Encoder Strip)* on page 201.
9. Install the pallet on the SuperTrak.

   See *Install a Pallet* on page 166.
10. Verify that a 0.5 mm (0.02 in.) +/- 0.3 mm (0.01 in.) gap exists between the encoder strip bracket and the encoder bracket.

    If the gap is less than 0.5 mm (0.02 in.) +/- 0.3 mm (0.01 in.), see *Adjust a Pallet Shim* on page 182.

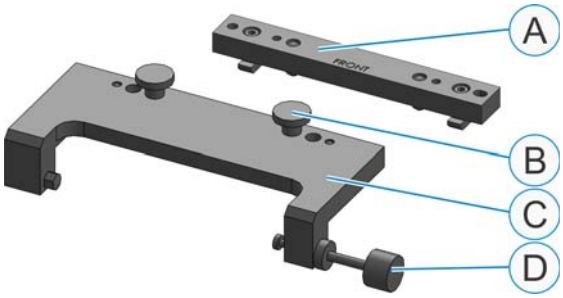
Install a Station Setup Fixture

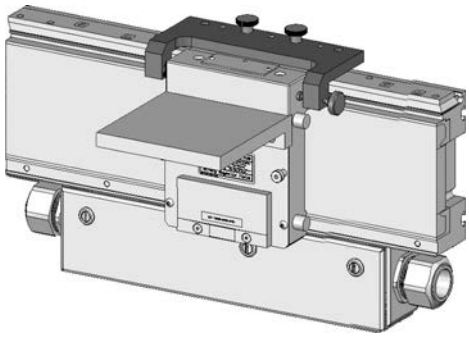
NOTICE

- Improper use of a station setup fixture may cause damage to the pallets or tools.
- Do not move or adjust a station setup fixture without the assistance of a trained technician.
- Remove all removable locating plates before operating the SuperTrak conveyor.

Install a station setup fixture when station tooling alignment verification is required.

A	Station setup stationary mount
B	Top thumb screw (1 of 2)
C	Station setup removable locate
D	Side thumb screw





1. Position a pallet below a station setup stationary mount.
2. Place the station setup removable locate over the pallet.
3. Tighten the two (2) top thumb screws to secure the station setup removable locate to the station setup stationary mount.
4. Lightly tighten the side thumb screw to lock the pallet in position against the datum. The side thumb screw has an integrated slip clutch to prevent over-tightening.

Remove a Station Setup Fixture

1. Loosen the side thumb screw.
2. Loosen the two (2) top thumb screws.
3. Lift the station setup removable locate straight up, to remove it from the pallet.
4. As required, complete one of the following procedures:
    - Store the station setup removable locate in a safe place for future use.
    - Turn the station setup removable locate around, so the side thumb screw is on the inside of the SuperTrak conveyor, and then tighten the two (2) top thumb screws to secure it in position for future use.

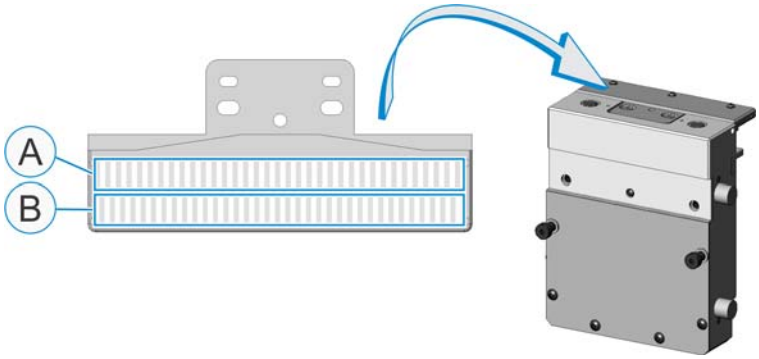
Align a Pallet Encoder Strip Bracket

NOTICE

- Improper use of a pallet setup fixture may cause damage to the pallets or tools.
- Do not move or adjust a pallet setup fixture without the assistance of a trained technician.
- Remove all removable locating plates before operating the SuperTrak conveyor.

- Encoder strip bracket alignment must be completed on a straight section.
- Adjust pallet encoder strips consistently to improve pallet-to-pallet repeatability.

Each pallet encoder bracket contains two (2) encoder strips: a primary encoder strip, and a secondary encoder strip. Each encoder strip is aligned differently. This procedure describes how to align both encoder strips; however, the secondary encoder strip is factory-aligned, and should not require adjustment.

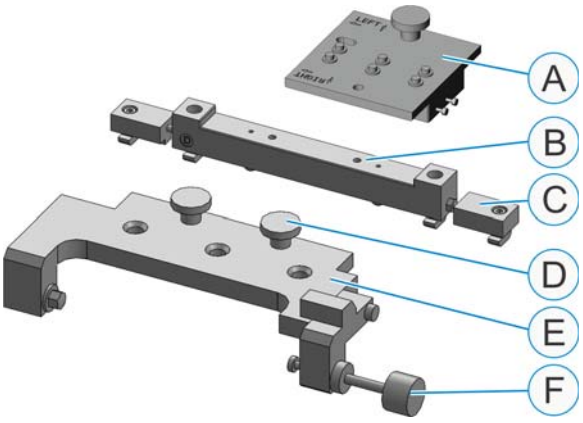


A	Primary encoder strip
B	Secondary encoder strip

Align a pallet encoder strip bracket if the encoder strip bracket is removed during maintenance, or if the pallet position faults regularly occur on the 180 deg. section.

The following diagram describes the setup tools that are used during this procedure.

A	Pallet setup adjustable chip finder (chip finder)
B	Pallet setup stationary mount (stationary mount)
C	Adjust bock (1 of 2)
D	Top thumb screw (1 of 2)
E	Pallet setup removable locate (removable locate)
F	Side thumb screw



1. Install a pallet setup stationary mount on a straight section.

   See *Install a Pallet Setup Stationary Mount* on page 192.

2. Optionally, for systems that require tight tolerances, verify that the pallet setup stationary mount is parallel with the upper-v-rail.

   See *Verify Pallet Setup Stationary Mount Parallelism* on page 193.

3. Center the pallet setup stationary mount with an encoder on the straight section encoder bracket.

   See *Center a Pallet Setup Stationary Mount with an Encoder* on page 194.

4. Verify that the pallet setup stationary mount is in the correct position.

   See *Verify the Pallet Setup Stationary Mount Position* on page 198.

   The pallet setup stationary mount is now centered with an encoder on the straight section.

5. Determine the distance between two encoders.

   See *Reference the Encoder Position* on page 200.

6. If required, center the encoder bracket with the center of the pallet.

   See *Adjust the Pallet Encoder Bracket (Primary Encoder Strip)* on page 201.

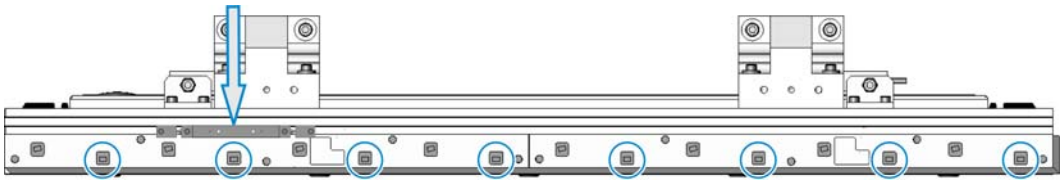
7. If required, align the secondary encoder strip with the primary encoder strip.

   See *Adjust a Secondary Encoder Strip* on page 203.

Install a Pallet Setup Stationary Mount

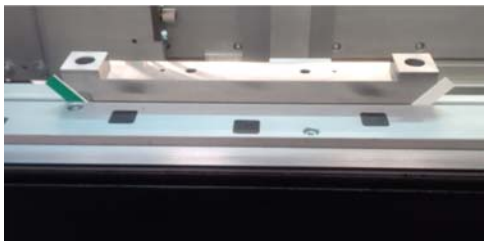
1. Position a stationary mount on a straight section. Make sure the datum surface, which is etched with the a “D”, faces toward the encoders. Roughly center the stationary mount with an odd-numbered encoder.

   In the example below, all odd-numbered encoders are circled. The stationary mount is aligned with encoder 3 (the 4th encoder from the left).

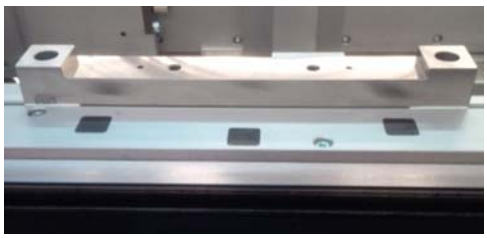


2. Install shims between the encoder bracket and the stationary mount, to bias the stationary mount to the back of the t-slot.

   In the example on the right, a green and white 0.729 mm (0.028 in.) shim is installed on the left, and a white 0.653 mm (0.025 in.) shim is installed on the right to bias the stationary mount to the back.

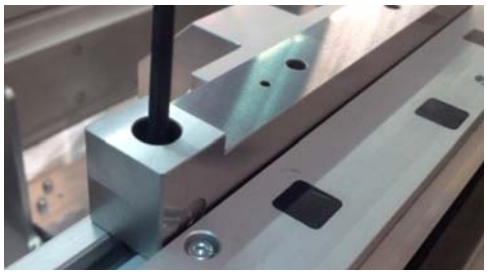


3. Lower the shims all the way down.

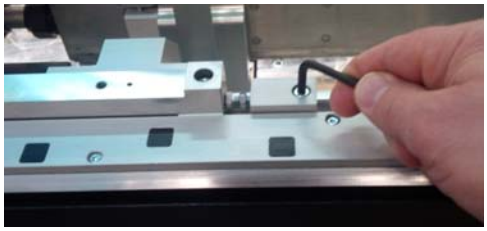


4. Snug the two (2) stationary mount screws.

   Make sure the t-nuts turn and lock into the t-slots.



5. Position an adjust block at the end of the stationary mount, and secure it in position with one (1) screw.
6. Repeat step 5 at the other end of the stationary mount.



Verify Pallet Setup Stationary Mount Parallelism

This procedure is optional. It is okay if the nominal for a particular system is slightly off from true nominal (for example; off by 10-20 µm). The important thing is that all pallets on the SuperTrak system are adjusted to the same nominal.

This procedure is optional. It describes how to verify stationary mount parallelism. If a stationary mount is parallel with the upper v-rail, the system nominal is slightly closer to true nominal.

1. Install a stationary mount.

   See *Install a Pallet Setup Stationary Mount* on page 192.

2. Mount a dial indicator on a pallet, such that it contacts the datum face of the stationary mount.

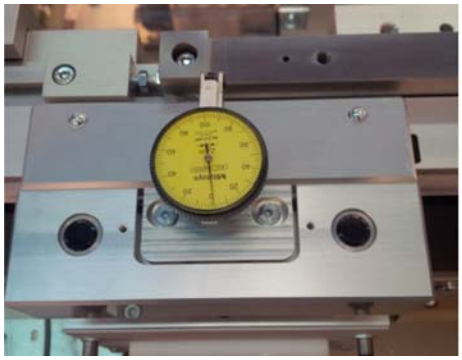
   For example; mount a dial indicator to the top or side of a pallet with a rigid clamp.

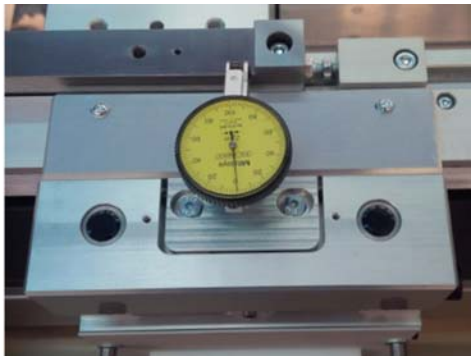
3. Note the dial indicator measurements as you slowly slide the pallet, from left to right, along the stationary mount.

4. Based on the dial indicator results, complete one (1) of the following:

   - If the dial indicator measurements are the same on each side of the stationary mount, the face of the stationary mount is parallel with the upper v-rail. The procedure is complete.

     For example:

   - If the value on the dial indicator is different on each side of the pallet setup stationary location, the face of the stationary mount is not parallel with the upper v-rail. Proceed to step 4.

5. Replace the shims, installed in step 1, with shims that are the correct size to improve parallelism.

6. Repeat steps 2 to 3.

Center a Pallet Setup Stationary Mount with an Encoder

1. If required, install a stationary mount.

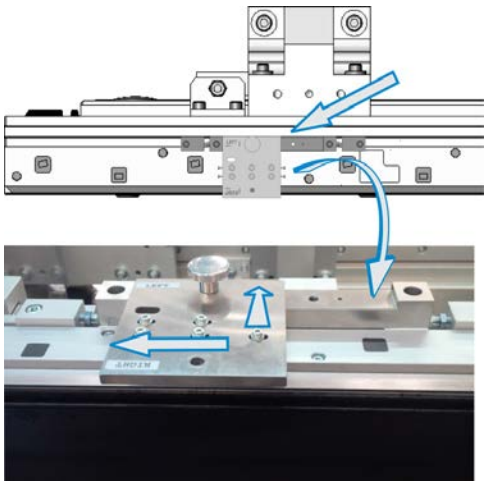
   See *Install a Pallet Setup Stationary Mount* on page 192.

2. Install the chip finder on the left side of the stationary mount:

   a. Align the chip finder with the left side of the stationary mount.

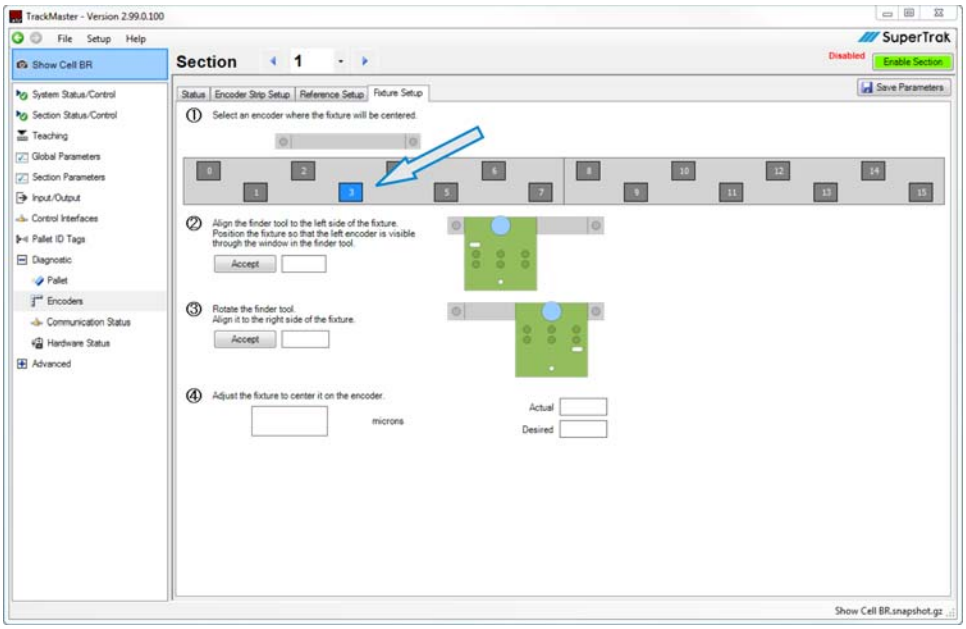
   b. Loosely secure the chip finder in position using the thumb screw.

   c. Firmly hold the chip finder back and to the left (corner crowd), and then tighten the thumb screw.



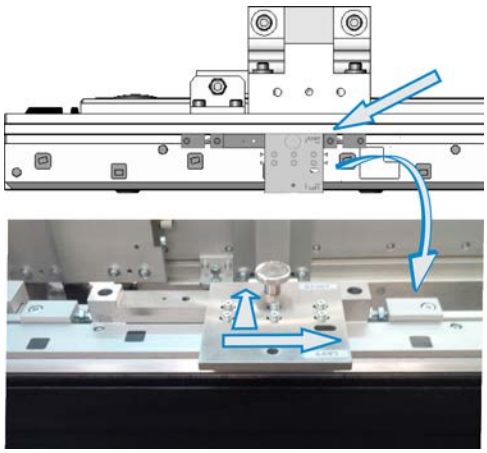
3. In the TrackMaster software, expand **Diagnostics**, and then click **Encoders**.
4. Click the **Fixture Setup** tab.
5. Click the encoder that the stationary mount is aligned with.

   For example; if the stationary mount was installed at encoder 3, “3” would be selected.



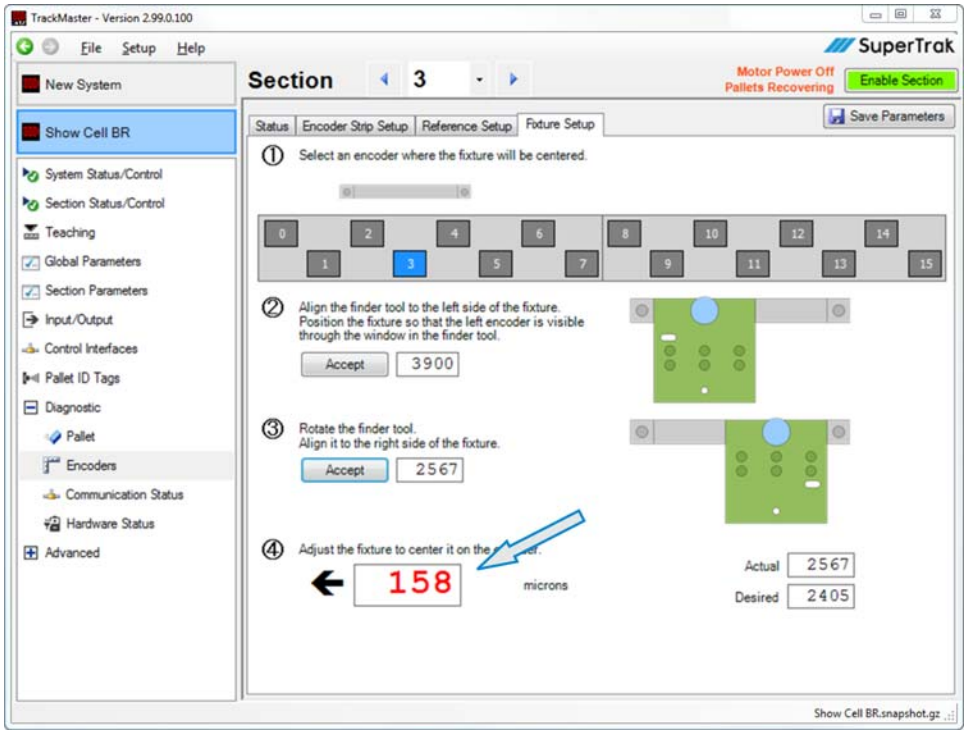
6. For step 2 on the TrackMaster screen, click **Accept**.

7. Remove the chip finder from the left side of the stationary mount and turn it 180°.
8. Install the chip finder on the right side of the stationary mount:
   a. Align the chip finder with the left side of the stationary mount.
   b. Loosely secure the chip finder in position using the thumb screw.
   c. Firmly hold the chip finder back and to the left, and then tighten the thumb screw.

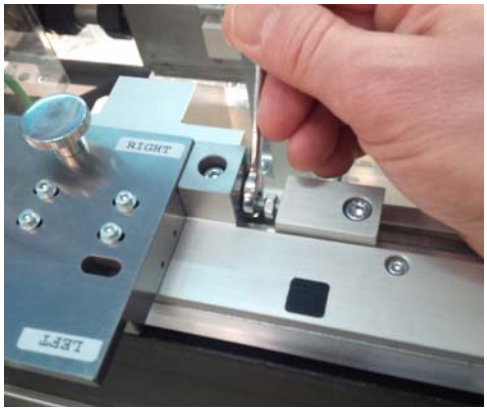


9. For step 3 on the TrackMaster screen, click **Accept**.
10. View the value displayed in step 4 on the TrackMaster screen to determine the direction and distance to adjust the pallet setup station locate.

    For example; this screen indicates that the pallet setup station locate must be adjusted to the left 158 microns.

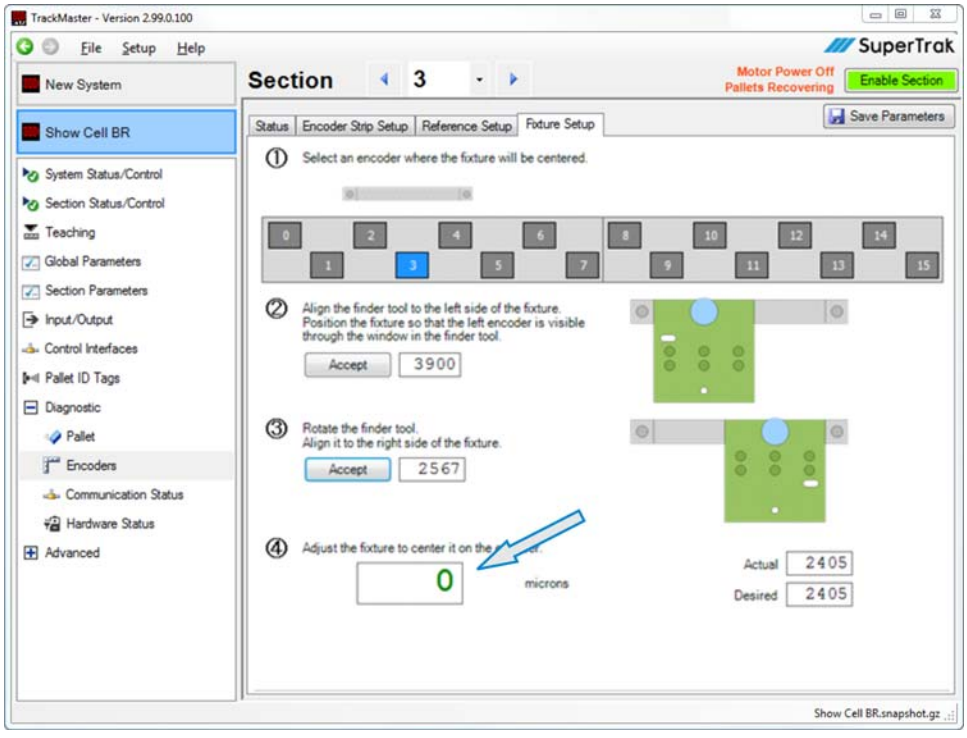


11. As required, adjust the position of the pallet setup station locate:
    a. Slightly loosen the two (2) stationary mount screws.
    b. Use a wrench to loosen the lock nut.
    c. Use a wrench to turn the hex head bolts as required to fine-adjust the position of the pallet setup station locate.



12. Click the first **Accept** button again, to restart the process.
13. Repeat steps 3 to 12, until the pallet setup station locate position is ±2 microns.

    In the example below, the pallet setup station locate is precisely centered.



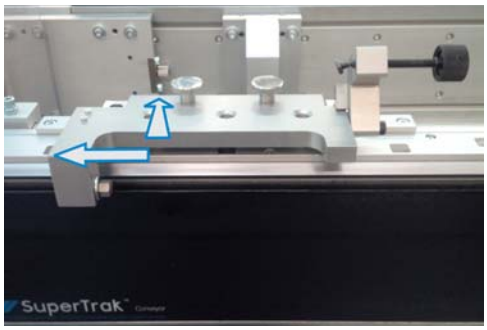
14. Tighten the two (2) stationary mount screws.

15. Snug the two (2) hex head bolts against the stationary mount.
16. Tighten the two (2) station locate lock nuts.
17. Loosen the adjust block screws, snug them up to each end of the stationary mount, and then tighten the screws.
18. Remove the chip finder from the stationary mount.

Verify the Pallet Setup Stationary Mount Position

Complete this procedure to verify that the stationary mount is in the correct position. A pallet with a correctly aligned encoder bracket (master or reference pallet) is required for this procedure.

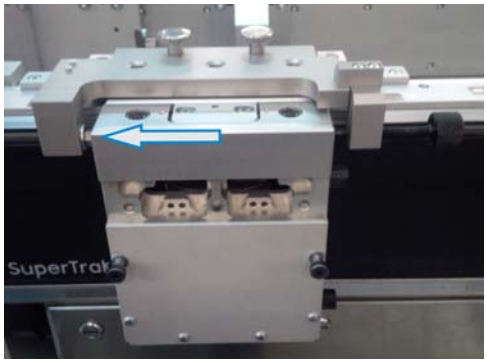
1. Install the pallet setup removable locate:
    a. Align a removable locate with the stationary mount.
    b. Firmly hold the removable locate back and to the left, and then tighten the two (2) top thumb screws.



2. Lock a pallet in position:
    a. Lift the side thumb screw up.
    b. Slowly position a pallet with a correctly adjusted encoder bracket under the removable locate. This pallet is the master (reference) pallet.

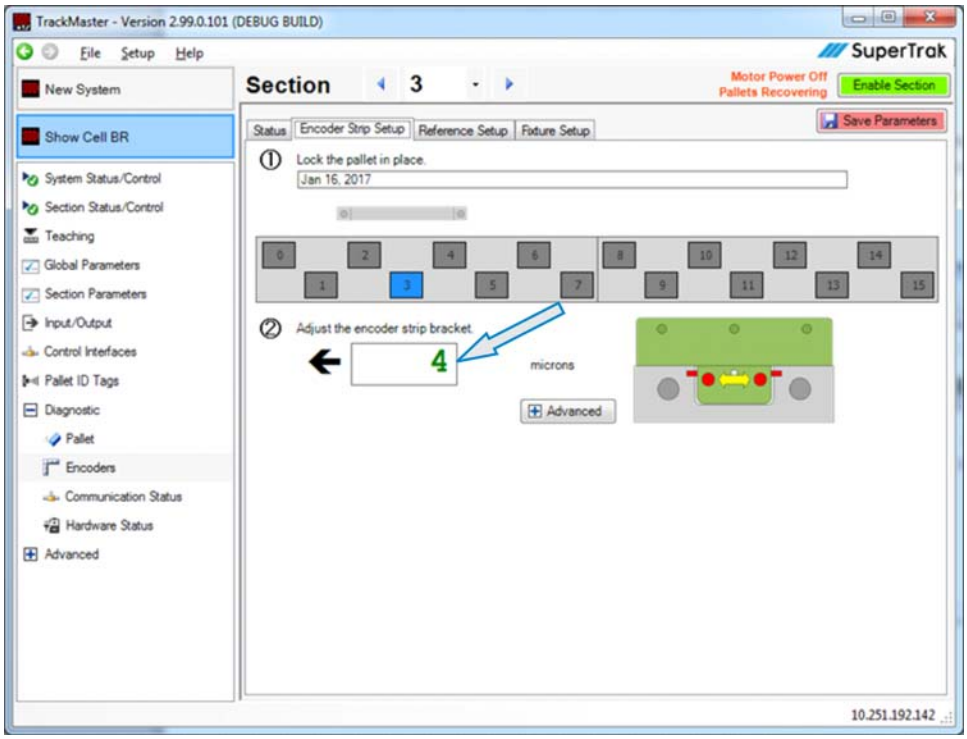
       Do not force the pallet against the datum of the removable locate because this could shift the tooling out of position.
    c. Lower the side thumb screw down.
    d. Hold the pallet to the left, and then lightly tighten the side thumb screw to lock the pallet in position against the datum.

       Pallet setups can vary by ±5 microns if inconsistent pressure is applied. Use consistent pressure when locking a pallet in position.



3. In the TrackMaster software, expand **Diagnostics**, and then click **Encoders**.
4. Click the **Encoder Strip Setup** tab.

5. View the value displayed in step 2 on the TrackMaster screen. If the stationary mount is good, the value should be within ±4 microns, like the example below.



Reference the Encoder Position

Complete this procedure to measure the physical distance between two encoders on the straight section encoder bracket.

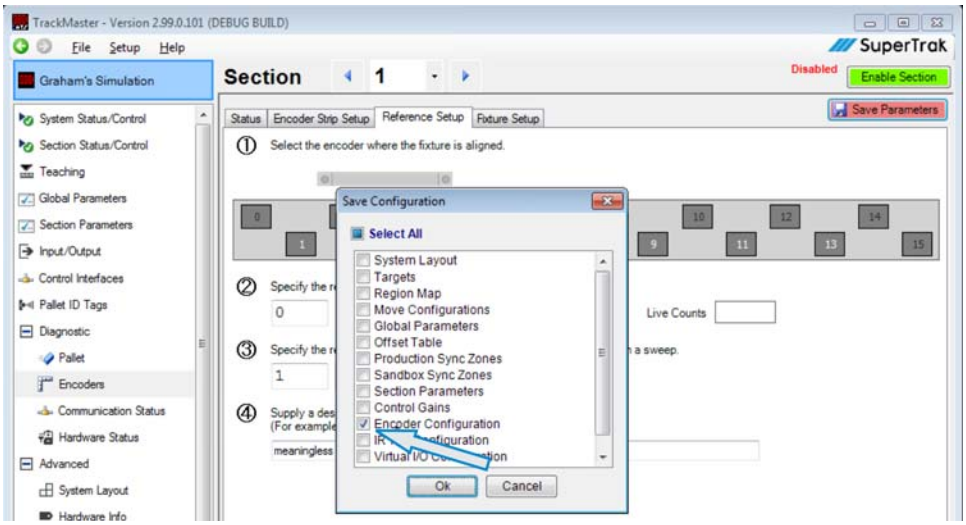
Redo this procedure if an encoder bracket is replaced on a straight section that has a stationary mount installed.

1. Complete steps 1-4 of *Verify the Pallet Setup Stationary Mount Position* on page 198.
2. Click the **Reference Setup** tab.
3. Click the encoder that the stationary mount is aligned with.
4. Click **Capture Live Counts**.

   The primary reference values display.
5. Click **Begin Sweep**.
6. Remove the pallet from the pallet setup removable locate:
   a. Loosen the side thumb screw to release the pallet.
   b. Raise the side thumb screw.
   c. Slide the pallet to the right (~15 cm [~6 in.]).

      TrackMaster calculates and displays the secondary reference values.
7. Click **Save Parameters**, located in the top right of the screen.

   Encoder Configuration is selected by default on the Save Configuration dialog.



8. Click **OK**.
9. Note the following information for your records: your name, date, the pallet number that was used for the procedure, and the removable locate number.

Adjust the Pallet Encoder Bracket (Primary Encoder Strip)

For optimal pallet-to-pallet repeatability, make sure all the pallets on the SuperTrak have the same encoder strip value in TrackMaster. It is more important for all pallet encoder strips to be set the same, than for the encoders to be set 0.

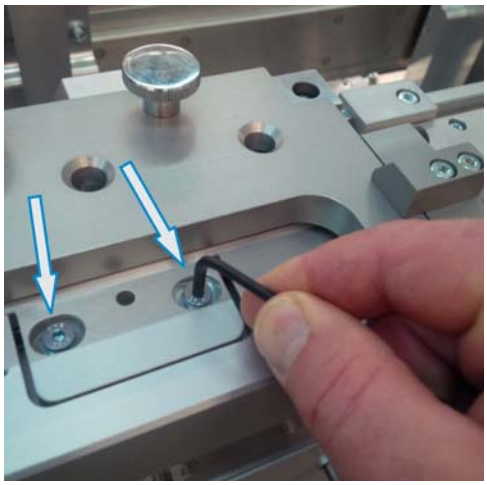
Adjust the pallet encoder bracket (primary encoder strip) if:

- The pallet encoder strip bracket is replaced.
- The pallet encoder strip bracket height is adjusted.
- An alignment issue is identified with the pallet (for example; the specific pallet causes a lot of faults, or the plot data is bad when the encoder calibration verification procedure is completed).

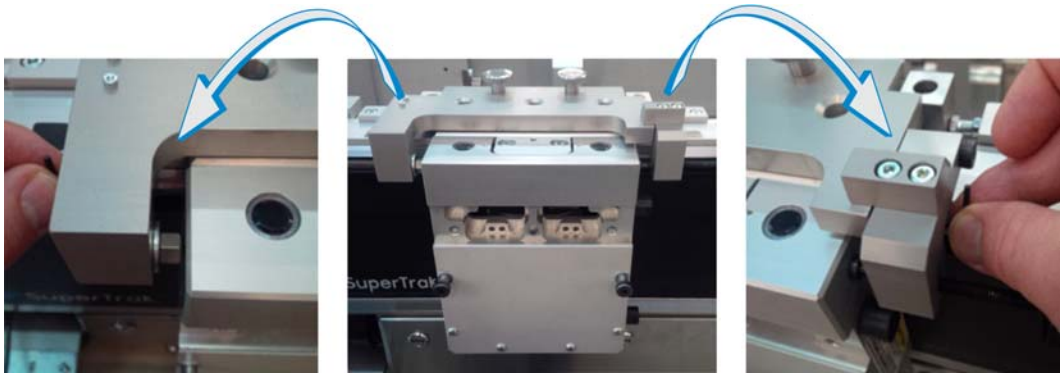
This procedure describes how to center the pallet encoder bracket with the center of the pallet.

1. Lock a pallet in position.
2. In the TrackMaster software, expand **Diagnostic**, and then click **Encoders**.
3. Click the **Encoder Strip Setup** tab.
4. View the value below step 2 (`Adjust the encoder strip bracket`) on the TrackMaster screen, and then complete one (1) of the following:
    - If the value is good (green), it will be within ±4 microns. The procedure is complete.
    - If the value is not good (red), continue to step 5.
5. Slightly loosen the two (2) screws that secure the encoder strip bracket in position. Only loosen the screws enough to make a fine movement.

    Make sure the hex key is fully-engaged with the screw to avoid stripping the screw head.



6. On each side of the encoder bracket, insert a hex key into the hole and engage the recessed set screw.



7. Turn the hex key(s) the required amount in the required direction to correctly adjust the encoder bracket. Aim for a pallet position that is within a few microns; the value on the TrackMaster screen should be green.

   It is helpful to loosen one set screw as you tighten the other. Do not over-tighten these set screws, or the bracket may shift out of position.

8. Tighten the two (2) encoder bracket screws from step 5.
9. Verify that the pallet position did not change (see step 4). If the value did change, repeat steps 4 to 8.

Adjust a Secondary Encoder Strip

NOTICE During this procedure, do not over-tighten the side screws because it can bend the secondary strip.

This procedure describes how to align the secondary encoder strip with the primary encoder strip. Complete this procedure if a pallet is causing faults, and the primary strip alignment has already been verified.

1. Verify that the primary encoder strip is aligned.

   See *Adjust the Pallet Encoder Bracket (Primary Encoder Strip)* on page 201.

2. Remove the pallet from the pallet setup removable locate:

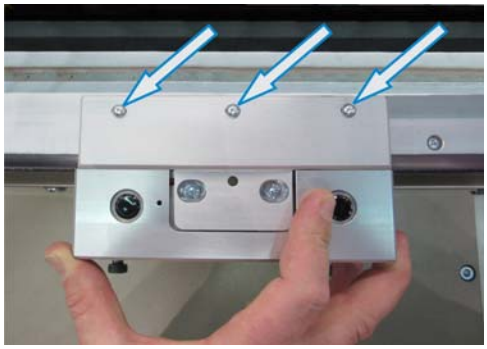
   a. Loosen the side thumb screw to release the pallet.

   b. Raise the side thumb screw.

   c. Slide the pallet to the right.

3. Loosen the three (3) screws on the edge of the pallet encoder bracket. Only loosen the screws enough to make a fine movement.

   Make sure the hex key is fully-engaged with the screw to avoid stripping the screw head.



4. Install an M2.5 x10 mm screw into each side of the pallet encoder bracket.

   Do not over-tighten the screws.

5. Install the pallet below the removable locate.

   Slide the pallet in position slowly. Make sure the pallet does not bang against the datum of the removable locate because this could shift the tooling out of position.

6. On TrackMaster, click **+ Advanced**.

   If required, click **Diagnostic** > **Encoders**, and then click the **Encoder strip Setup** tab first.

7. View the value below step 3 (**Make a coarse adjustment to the secondary strip**) on the TrackMaster screen, and then complete one (1) of the following:

   - If the value is good (green), continue to step 9.

     This value may not be zero (0), especially if the strip was previously aligned correctly. The goal is to align the secondary strip close enough to enable the fine adjustment.

   - If the value is not good (red), continue to step 8.

8. As required, turn the side screws (from step 4) the required amount and in the required direction until the value is good (green).

   The secondary strip is pinched between the side screws. Do not over-adjust the screws because it could bend the secondary strip.

9. Click **Accept**.

10. Slide (sweep) the pallet to the right, away from the removable locate:

    a. Loosen the side thumb screw to release the pallet.

    b. Raise the side thumb screw.

    c. Slide the pallet to the right (~15 cm [~6 in.]).

11. Repeat steps 6.

12. View the value below step 5 (**Lock the pallet again, and make a fine adjustment to the secondary strip.**) on the TrackMaster screen, and then complete one (1) of the following:

    - If the value is good (green), continue to step 13.

      Aim for a value close to zero (0).

    - If the value is not good (red), repeat step 8.

13. Tighten the three (3) screws from step 3.

14. Verify that the values are still good.

15. Click **Finish**.

16. Remove the two (2) screws from step 4.

Replace an Upper V-Rail

Replace the upper v-rail if it becomes damaged.

Remove an Upper V-Rail - Straight Section

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Remove the left and right encoder brackets.

   See *Remove an Encoder Bracket - Straight Section* on page 142.
4. Remove eleven (11) screws from the upper v-rail.

5. Note the position of the 0.25 mm (0.01 in.) shim, and then place the shim in a safe location.
6. Slide the upper v-rail out in the forward direction clear of the motor.

   The v-slots at the ends of the upper v-rail prevent it from being lifted straight up.

7. Clean the top of the straight section with a soft cloth to remove any debris.

Remove an Upper V-Rail - 180 Deg. Section

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

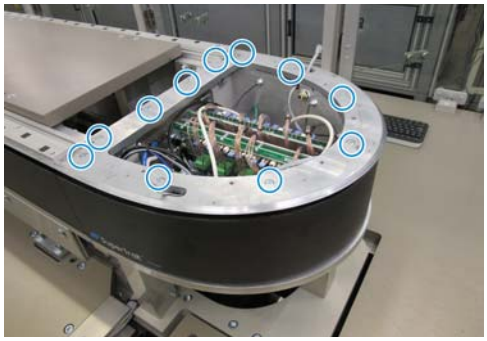
   See *Lockout and Tagout Locations* on page 12.
3. Remove the upper v-rail from the two (2) adjacent straight sections.

   See *Remove an Upper V-Rail - 180 Deg. Section* on page 205.
4. Remove the left and right encoder brackets from the 180 deg. section.

   See *Remove an Encoder Bracket - 180 Deg. Section* on page 143.

5. Remove ten (10) screws and ten (10) washers from the top cover of the 180 deg. section, and then lift and remove the top cover.

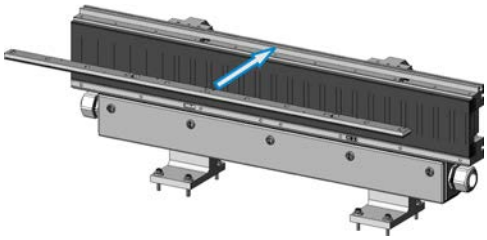
6. Remove eleven (11) screws from the top plate.



7. Lift the top plate straight up to remove it.
8. Clean the top of the 180 deg. section with a soft cloth to remove any debris.

Install an Upper V-Rail - Straight Section

1. Hold the new upper v-rail horizontally, with the counter-bore side up.
2. Slide the new upper v-rail between the upper v-rails of the adjacent straight sections.



3. Equally divide the gap between the ends of the upper v-rail.

   The gap should be close to 0.5 mm (0.02 in.) on both sides.
4. Install the 0.25 mm (0.01 in.) shims. Restore them to the position you made note of during the removal procedure.
5. Install eleven (11) screws into the top of the upper v-rail, while keeping the back of the upper v-rail biased to the structure.
6. Reinstall the left and right encoder brackets.

   See *Install an Encoder Bracket - Straight Section* on page 144.

7. Verify joint alignment on both ends and adjust if necessary.

   See *Fine-Adjust the Upper V-Rail* on page 91.

8. Calibrate the encoders.

   See the TrackMaster built-in help for the calibration procedure.

Install an Upper V-Rail - 180 Deg. Section (500 mm)

1. Hold the new 180 deg. top plate horizontally with the counter-bore side up.
2. Position the top plate down onto the top of the 180 deg. section.

   The top plate must align with features in the top of the 180 deg. section.

   To prevent damage to the RJ11 connections, make sure the cables are aligned with the RJ11 openings in the top plate.

3. Install eleven (11) screws to secure the top plate in position.
4. Align the top cover on the 180 deg. section.
5. Install ten (10) screws and ten (10) washers to secure the top cover in position.
6. Reinstall the left and right encoder brackets.

   See *Install an Encoder Bracket - 180 Deg. Section* on page 144.

7. Verify joint alignment on both ends and adjust if necessary.

   See *Fine-Adjust the Upper V-Rail* on page 91.

8. Calibrate the encoders.

   See the TrackMaster built-in help for the calibration procedure.

Replace a Flat Wear Strip

NOTICE

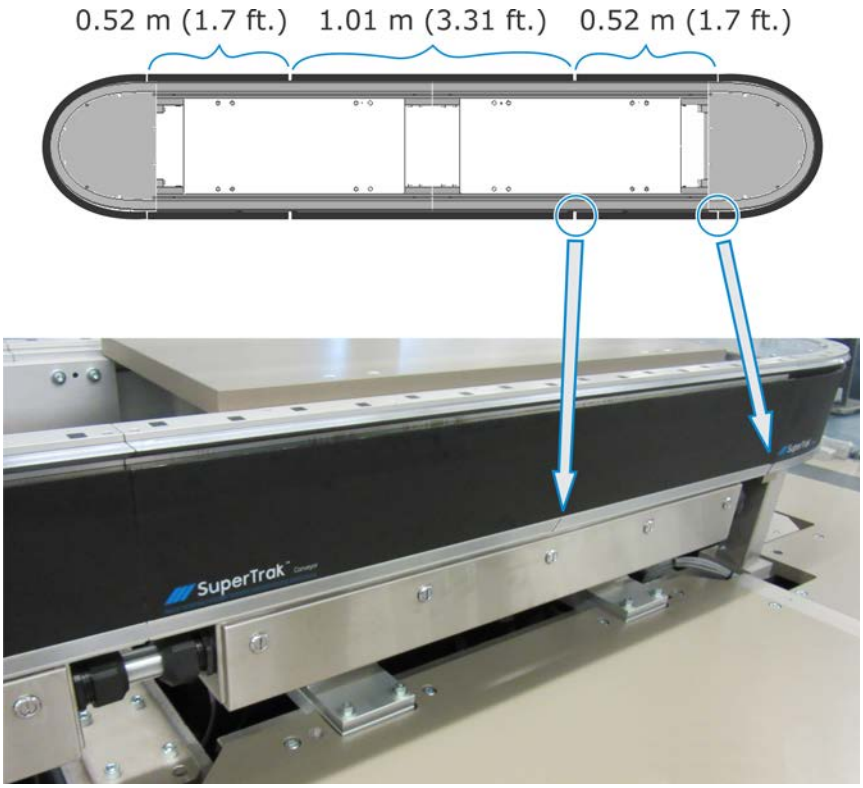
- The flat wear strip must be installed before pallets move on the SuperTrak conveyor. If a flat wear strip is not installed, pallets will jam against the motors.
- The distance between flat wear strips must be 0.5 mm (0.02 in.).

Replace a flat wear strip if it becomes damaged.

There are three (3) flat wear strip lengths:

- 1.01 m (3.31 ft.) spans across two (2) straight sections.
- 0.52 m (1.70 ft.) spans across a straight section and a 180 deg. section (500 mm).
- 0.545 m (1.70 ft.) spans across a straight section and a 180 deg. section (800 mm).

As illustrated, the flat wear strip bridges the join between each SuperTrak conveyor section:



Remove a Flat Wear Strip

1. Open the safety circuit.
2. Place a strong magnet on the front surface of one end of the wear strip.

3. Holding onto the magnet, pull the wear strip straight out of the channel.

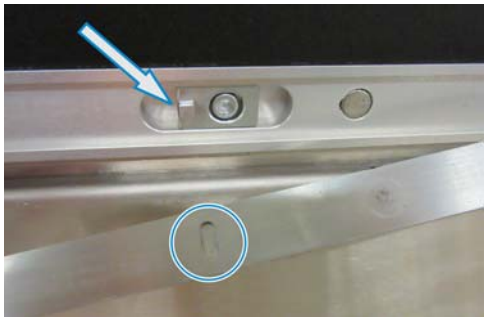
   The flat wear strip is held in position with permanent magnets. Use the magnet to pull the flat wear strip away from the permanent magnets.

4. Remove any dirt or debris from the flat wear strip channel.

   See *Clean the SuperTrak Conveyor* on page 215.

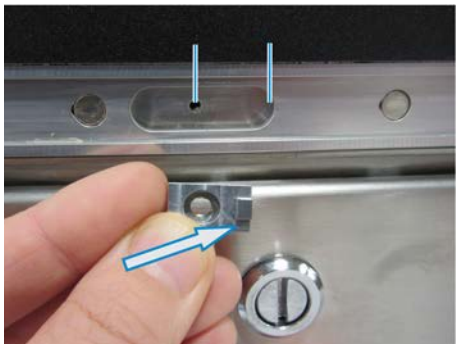
Install a Flat Wear Strip

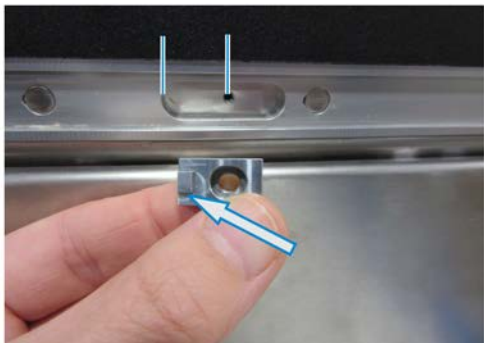
1. Verify that the flat wear strip is the correct length for the installation location.
2. Hold the flat wear strip next to the installation location and verify that a locator exists where the slot of the wear strip aligns with the SuperTrak conveyor section.



3. If required, install a locator:

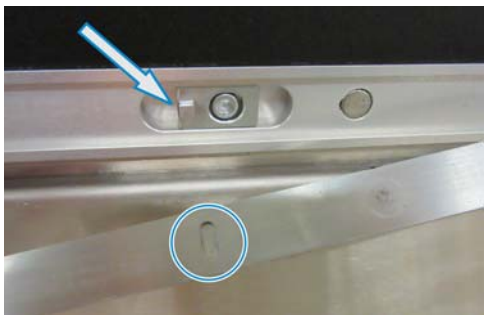
    a. Align the locator with the slot of the SuperTrak conveyor section so that the tab faces the long opening. The screw hole is not centered in the slot, one side of the slot is longer than the other.





    b. Install a screw to secure the locator in position.

4. Align the flat wear strip slot with the locator tab.

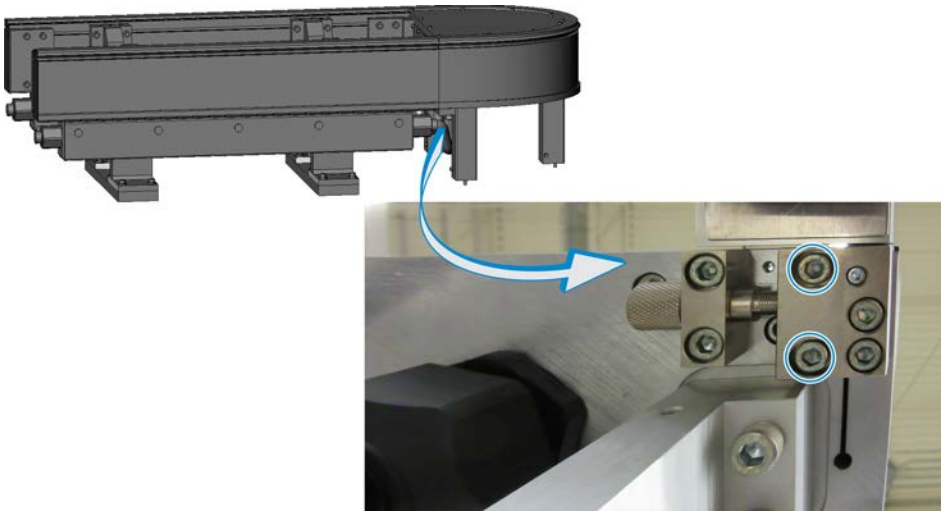


5. Release the flat wear strip. The channel magnets pull the flat wear strip into the channel.
6. If the flat wear strip does not sit flat in the channel, adjust the locator position:
    a. Loosen the locator screw.
    b. As required, slide the locator left or right.
    c. Tighten the locator screw.
7. If the flat wear strip join between a straight section and a 180 deg. section does not sit flat, see *Align a Flat Wear Strip* on page 211.

Align a Flat Wear Strip

The flat wear strip is not removable on the 180 deg. section. Adjustment tooling, located under the 180 deg. section, provides in-and-out adjustment of the flat wear strip on the 180 deg. section.

1. Loosen the two (2) screws that secure the flat wear strip adjustment tooling in position.



2. Turn the adjustment knob as required, until the flat wear strip on the 180 deg. section aligns with the flat wear strip on the straight section.
3. Tighten the two (2) screws from step 1.

Replace a Motor Cover Label

Each motor includes a protective motor cover label. This is the black label with the SuperTrak conveyor logo in the bottom left corner. Replace the motor cover label if it becomes damaged.

Remove the Damaged Motor Cover Label

1. Turn the **SuperTrak conveyor power disconnect switch** to the OFF position.
2. Lock out and tag hazardous energy.

   See *Lockout and Tagout Locations* on page 12.
3. Peel off the old cover label.
4. Clean off any adhesive residue from the motor face.

   Use an adhesive residue cleaner (such as Goo Gone) to remove the adhesive residue, and then clean the motor with isopropyl alcohol or equivalent so the new cover label adheres correctly.

Install a New Motor Cover Label

1. Peel off the backing from the new motor cover label.
2. Align the top of the motor cover label with the top edge of the motor.

3. Slowly tilt the motor cover label toward the motor until it is adhered to the motor.
4. Starting from the center of the motor cover label, run your hands over the label to remove any air pockets.
5. Trim away any portions of the motor cover label that extend past the edge of the motor.

Maintenance

Maintenance is an important part of the continued and proper operation of the SuperTrak conveyor. Failure to perform maintenance as required, and in accordance with your ATS contract, voids the warranty. Maintain accurate and complete records regarding SuperTrak conveyor maintenance and any completed service procedures.

Warranty excludes consumable items and wear parts, such as but not limited to fuses, filters, or lubricants, which by their nature require periodic replacement.

All technicians involved with maintaining the SuperTrak conveyor must be qualified and must read and understand the SuperTrak conveyor process and safety guidelines.

See *Safety Information* on page 5.

This section provides the following SuperTrak conveyor maintenance information:

Scheduled Maintenance

NOTICE The scheduled maintenance tables in this section provide a recommended frequency for each maintenance task. Adjust the frequency according to your installation environment. For example; cleaning may need to be more or less frequent, depending on the environment.

This section provides SuperTrak conveyor preventive maintenance tables.

SuperTrak Conveyor Components

Component	Frequency	Task	Description
Flat wear strip	Weekly	Clean	Clean off debris, using a clean, soft cloth dampened with isopropyl alcohol or equivalent.

Component	Frequency	Task	Description
Pallets	Monthly	Inspect	Inspect each pallet for wear. See *Inspect a Pallet* on page 170.
	Monthly, or as determined for your application	Lubricate	Add lubricant to the pallet. See *Lubricate the Pallet Lubrication Felt* on page 219.
	Monthly	Clean	• Clean the pallet body. Wipe off debris using a clean, soft, cloth. • Clean the magnet assembly. Wipe metal debris to a corner or edge of the magnet and then pull it off. • Clean the pallet encoder strip. See *Clean a Pallet Encoder Strip* on page 216.
Power supply	Monthly	Inspect	Inspect the air filter for dirt and debris. If required, replace the filter. See *Replace a Power Supply Filter* on page 217.
Table and Supporting Structure	Weekly	Clean	Clean off debris, using a clean, soft cloth.

Electrical Enclosure

Component	Frequency	Task	Description
Fan	Monthly	Inspect	Inspect for damage and loose connections. If required, repair or replace.
	As Required	Clean	Clean off debris, using a clean, soft cloth.
Filter	Monthly	Inspect	Inspect the condition of the filter. If required, vacuum, wash or replace. See *Clean a Control Panel Air Filter* on page 215.

Cleaning Procedures

This section describes SuperTrak conveyor cleaning procedures.

Clean the SuperTrak Conveyor

⚠CAUTION	After cleaning the SuperTrak conveyor frame, clean up all spills and excess water immediately. Liquid on floors causes a slip hazard.

NOTICE	Never use razor blades, scrapers, squeegees, brushes or any other abrasive tools to clean the SuperTrak conveyor frame. Use of these tools may cause damage.

Remove Dust and Dirt

1. Wipe with a soft damp cloth to remove dust and dirt.
2. Wipe with a mild detergent on a soft cloth.
3. Wipe with a damp soft cloth to remove detergent.
4. Dry with a clean soft cloth or chamois.

Remove Wet Paint, or Grease

1. Wipe with a clean soft cloth dampened with isopropyl alcohol or equivalent.
2. Dry with a clean soft cloth or chamois.

Clean a Control Panel Air Filter

Air filters are located on the side of the control panel.

1. Carefully remove the front plastic filter support.
2. Gently peel back the sponge filter.
3. Use a vacuum to carefully remove any particulate from the filter unit.
4. Replace the filter.
5. Snap the filter cover back into position over the filter.

Clean a Pallet Encoder Strip

NOTICE Never use a magnet to clean the encoder strip. Contact with magnetic material will cause permanent damage to the magnetic encoder strip.

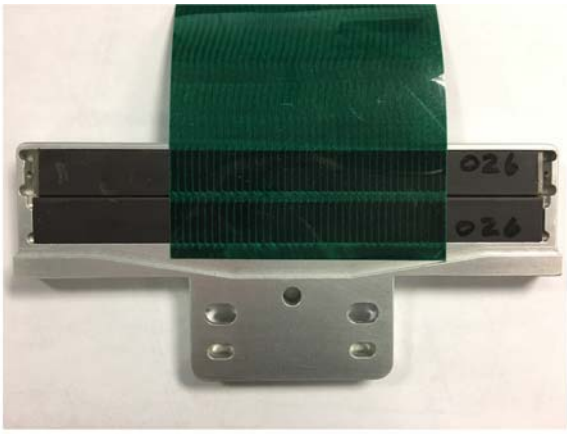
1. Gently wipe the encoder strip with a soft, dry, clean cloth.
2. Inspect the encoder strip, to make sure it is not damaged.

   See *Inspect a Pallet Encoder Strip* on page 216.

Inspect a Pallet Encoder Strip

Inspect the encoder strip with magnetic viewing film, to verify that the poles appear correctly.

Each pole should be vertical to one another. If the poles appear damaged, replace the encoder strip.



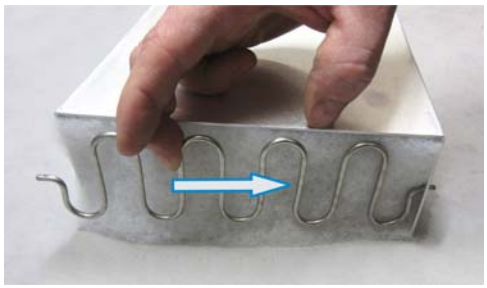
Replace a Power Supply Filter

NOTICE Be careful not to bend the power supply filter retention clip out of shape when removing it.

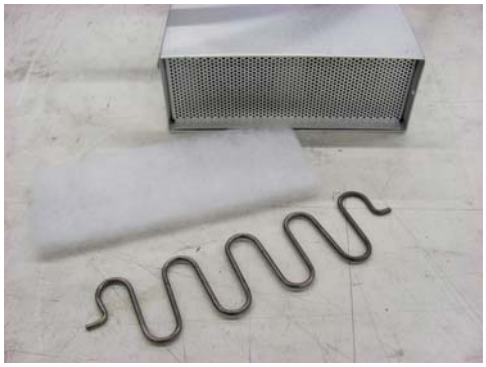
The power supply filter prevents particles from entering the power supply through the cooling fans. Particulate build-up on the power supply filter impedes air flow and may cause the power supply to overheat.

Power supply filter replacement frequency depends on the SuperTrak conveyor environment. Regularly inspect the power supply filter and replace it when it is dirty.

1. Carefully compress one end of the filter retention clip until one end releases from the power supply cabinet tab.



2. Remove the filter retention clip.
3. Remove the old filter.
4. Clean away any excess grit or dirt in and around the power supply fans.



5. Position a new filter into the base of the power supply.

   The filter is not directional, so it can be positioned with either side facing either direction.

6. Place one end of the filter retention clip into the power supply cabinet tab, and then carefully compress the filter retention clip to secure the opposite end into the cabinet tab on the opposite side.

Replace a Straight Section

Although both options are available, Automation Tooling Systems recommends that straight sections be repaired rather than replaced.

See *Appendix B: Spare Parts* on page 255.

Replace a 180 Deg. Section

Although both options are available, Automation Tooling Systems recommends that 180 deg. sections be repaired rather than replaced.

See *Appendix B: Spare Parts* on page 255.

Lubrication Procedures

This section provides lubrication procedures.

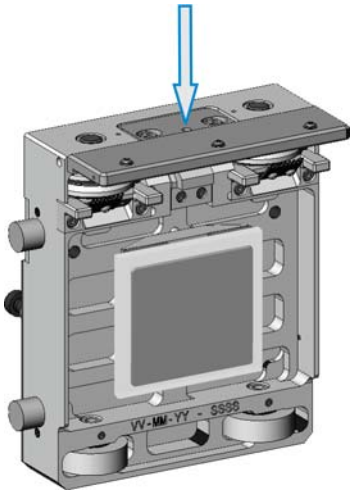
Lubricate the Pallet Lubrication Felt

NOTICE Determine and maintain a lubrication schedule for your application, to ensure that the upper v-rail and pallet lubrication felts do not run dry.

Use an oil lubricant with a viscosity similar to ISO grade 46, SAE grade 20. ATS uses a food grade NSF registered H1 machine oil for the broadest application range.

The lubrication felt lubricates the upper v-rail.

Place five (5) to ten (10) drops of lubricant into the lubrication hole at the top of the pallet.



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Troubleshooting

This section provides the following SuperTrak conveyor troubleshooting procedures for qualified technicians:

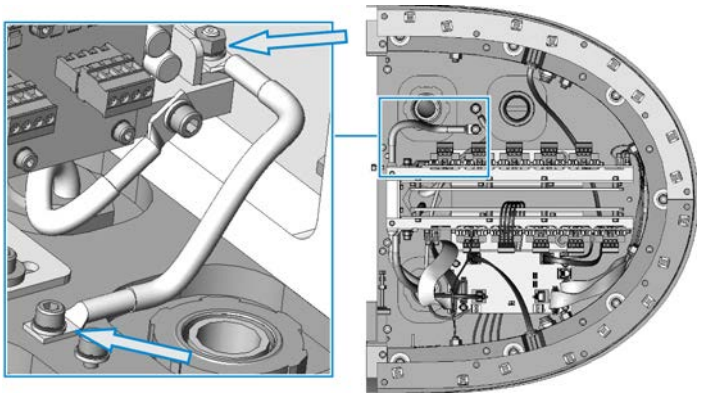
Read and understand the SuperTrak conveyor process and safety guidelines before starting any troubleshooting procedures.

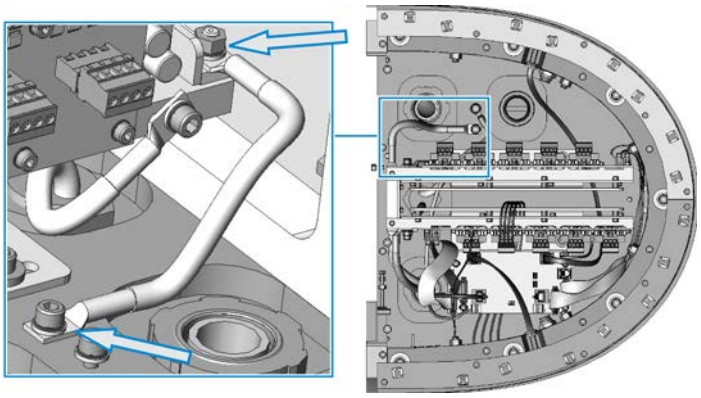
See *Safety Information* on page 5.

Communication Faults

Fault	Resolution
The configuration software is unable to connect to the controller.	• Attempt to retrieve diagnostic information using the following website: *http://controller_IP_address/sdm* The IP address of the controller is required for this procedure. • Check the controller LEDs. See *Controller Indicator Lights* on page 233.
A fault message indicates that a communication problem exists.	1. Read the fault message, and reference the TrackMaster built-in help for a resolution. See *Access the TrackMaster Built-in Help* on page 126. 2. Verify that all associated electronic components have power (for example; confirm power by looking at the component indicator lights). 3. Turn the power OFF to the controller and gateway boards (24V digital power). 4. Verify that all associated cables are correctly connected. Make sure the cable connections are correct to the components, and that the connectors are seated correctly at both ends. See *Connections* on page 104. 5. Turn the power ON.

Pre-Power ON Faults

Failure	Resolution
A short exists between the motor power connection and the common connection or ground (frame).	Determine if the short exists between a motor power connection and a common connection or between a motor power connection and ground (frame): 1. Disconnect and isolate one (1) end of the common bonding jumper located in the 180 deg. section that contains the control panel electrical interconnect.  2. Use a multimeter to measure the resistance between the motor power connection and the common connection. If the value displayed on the multimeter screen is OL, the short exists between the motor power connection and ground (frame). If the value displayed on the multimeter screen is <5Ω, the short exists between the motor power connection and the common connection.
	Isolate the short: 1. Disconnect a motor power connection at each end of the system. This divides the system in half electrically. 2. Use a multimeter to measure the resistance of each half of the system. The half of the system with a measurement of <5Ω is the half containing the short. 3. Disconnect a motor power connection in the middle of the isolated half of the system. 4. Repeat step 2. 5. Locate the connection between the motor power connection and the common connection or ground (frame).

Failure	Resolution
A short exists between the 24V digital power connection and the common connection or ground (frame).	Determine if the short exists between a 24V digital power connection and a common connection or between a 24V digital power connection and ground (frame): 1. Disconnect and isolate one (1) end of the common bonding jumper located in the 180 deg. section that contains the control panel electrical interconnect.  2. Use a multimeter to measure the resistance between the 24V digital power connection and the common connection. If the value displayed on the multimeter screen is OL, a short exists between the 24V digital power connection and the ground (frame). If the value displayed on the multimeter screen is <1000Ω, the short exists between the 24V digital power connection and the common connection.
	Isolate the short: 1. Disconnect a 24V digital power connection at each end of the system. This divides the system in half electrically. 2. Use a multimeter to measure the resistance of each half of the system. The half of the system with a measurement of <1000Ω is the half containing the short. 3. Disconnect a 24V digital power connection in the middle of the isolated half of the system. 4. Repeat step 2. 5. Locate the connection between the 24V digital power connection and common connection or ground (frame).
A short exists between the motor power connection and the 24V digital power connection.	Isolate the short: 1. Disconnect a 24V digital power connection at each end of the system. This divides the system in half electrically. 2. Use a multimeter to measure the resistance of each half of the system. The half of the system with a measurement of <10Ω is the half containing the short. 3. Disconnect a 24V digital power connection in the middle of the isolated half of the system. 4. Repeat step 2. 5. Locate the connection between the motor power connection and the 24V digital power connection.

Power Faults

Fault	Resolution
Motor supply voltage	• Make sure the motor power is ON before attempting to enable the SuperTrak conveyor. This is typically a PLC programming error. • Verify that the breakers in the SuperTrak conveyor control panel are ON. • Verify that all power supplies are functioning correctly, and that all power wiring is installed correctly and securely. • Check the 50A main motor fuse(s) and replace if necessary. See *Replace the Main Motor Fuse* on page 152.
Motor I2T	• Check for a mechanical interference with the pallet. The fault indicates the location. • Verify that pallet performance limits (such as pallet acceleration, duty cycle, or payload) are not exceeded. Reduce if required. The fault indicates the location. • Check the pallet stability. Watch the pallet during operation for abnormal oscillation. Contact maintenance to verify pallet tuning. • Replace the coil driver board, if no other solution resolves the issue. See *Replace a Coil Driver Board* on page 129.
Excessive current loop error	• Verify that the coil is correctly connected to the coil driver board (green connectors). • Test the coil resistance. It should be low (less than 1 ohm) but not a short-circuit (less than 0.3 ohm). If the resistance test fails, a problem may exist with the coil. Replace the coil. If the resistance test passes, a problem may exist with the coil driver board. Replace the coil driver board.
Coil driver(s) shut down error	• Verify that the power supplies are functioning correctly. • A problem may exist with the coil driver board. Replace the coil driver board.

Pallet Faults

Fault	Resolution
Pallet following error	• Check for mechanical or other interference with the pallet (for example, a jammed part). The fault indicates the location. • Inspect the pallet. See *Inspect a Pallet* on page 170. • Verify that a coil fuse is not blown. If a pallet travels across a coil with a blown fuse, pallet momentum is usually adequate to allow acceptable control. However, if the pallet attempts to stop in the vicinity of this coil, it will have poor control, which will trigger a following error. See *Replace a Coil Fuse* on page 153. • Check for a damaged upper v-rail, flat wear strip, or motor cover label.
Pallet lost position	• Check the encoder strip, to make sure that it is not damaged. See *Inspect a Pallet* on page 170. • Check encoder calibration. See the TrackMaster built-in help for the calibration procedure. • Verify the encoder functionality. View the TrackMaster Encoder screen, to make sure the encoders are functioning.

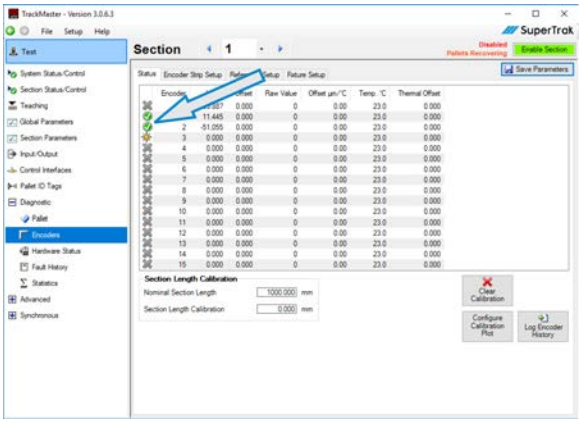
Test Straight Section or 180 Deg. Section Hardware

TrackMaster software is required for most of the straight section or 180 deg. section hardware testing procedures.

This section describes how to test the functionality of straight section or 180 deg. section hardware components.

Test Encoder Functionality

1. Open TrackMaster.
2. In the left pane, click **Diagnostic** > **Encoders**.
3. If required, click the **Status** tab.
4. At the top of the screen, click ◀ or ▶ to select the required `Section` to test.
5. By hand, slowly move a pallet across the section you selected in step 4. As you move the pallet, watch the grey Xs on the left side of the screen. The Xs, beginning with `Encoder` 0 or 15 depending on the direction the pallet is moving, should change to a yellow star and then to a green checkmark. As the pallet continues to travel across the section the green checkmark may or may not change back to a yellow star and then back to a grey X.

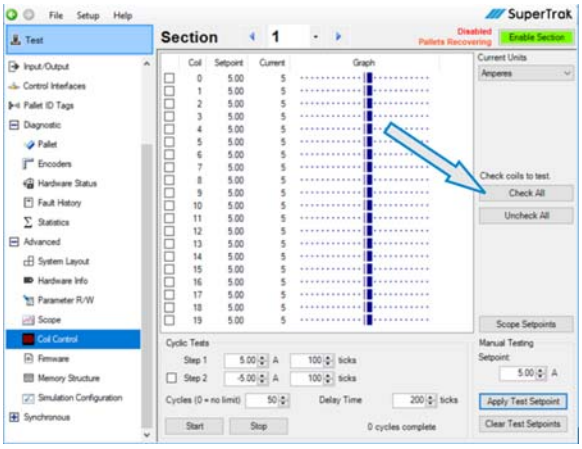


The encoders pass if all the grey Xs sequentially change to a green checkmark.

Test the Coil Functionality

1. Remove all pallets from the straight section or 180 deg. section to be tested.
2. Turn the SuperTrak power supply power ON.

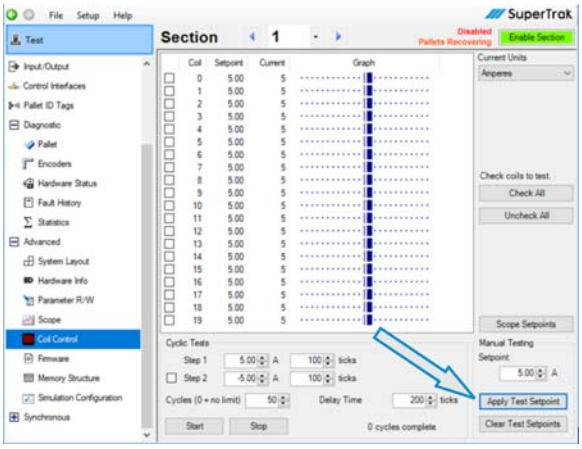
   This is generally done by turning the system power ON when the safety circuit is closed.
3. Open TrackMaster.
4. In the left pane, click **Advanced** > **Coil Control**.
5. Click **Check All**.



6. Verify that the section is disabled and that there are no active faults or warnings.

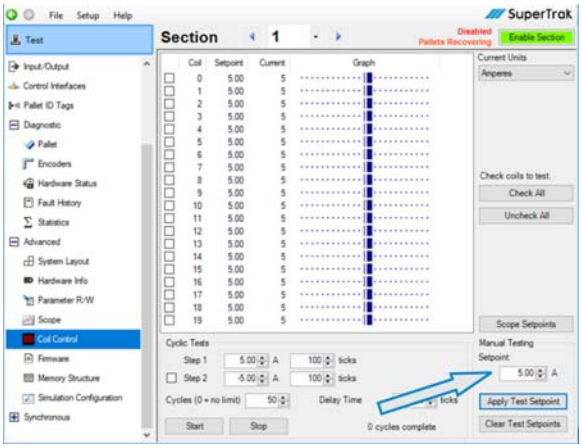
   The top right of the screen displays **Disabled** when faults or warnings exist. If required, open the Section Status/Control screen to clear any faults or warnings.
7. Verify that the **Setpoint** is set to 5.00 A.
8. Click **Apply Test Setpoint**.

   To pass, each **Coil** should display a **Current** of 5.00 ±0.5.



9. Click **Clear Test Setpoints**.

10. Enter a value of -5.00 into the **Setpoint** field.



11. Click **Apply Test Setpoint**.

    To pass, each **Coil** should display a **Current** of -5.00 ±0.5. This verifies that the current control works in both directions.

12. Click **Clear Test Setpoints**.

Test for a Reversed Polarity Coil

If a coil is connected backward it will have reversed polarity. There are two (2) methods to test for reversed polarity in a coil:

- *Test with the PLC in MANUAL Mode* on page 228

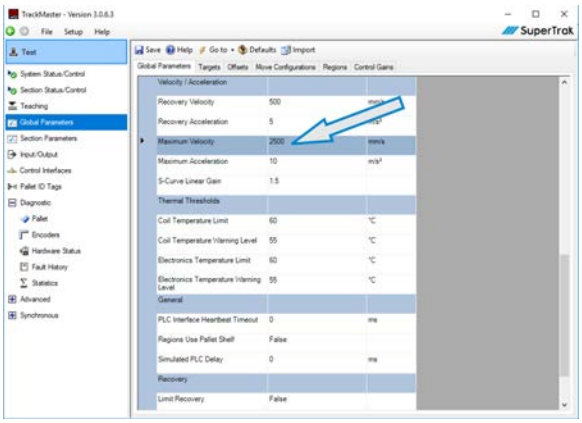
  If this option is available, it is easier and quicker to use this test.

- *Test Manually with TrackMaster* on page 229

Test with the PLC in MANUAL Mode

Use this test if you can place the PLC in MANUAL mode and step the system through process steps; otherwise, see *Test Manually with TrackMaster* on page 229.

1. Open the Global Parameters window in TrackMaster
2. Note the value of the **Maximum Velocity** parameter, so that you can change the value back to this after the test.



3. Set the **Maximum Velocity** parameter to 50 mm/s.
4. Manually step the PLC until a pallet fully-travels the length of the straight section or 180 deg. section to be tested.

   The hardware passes if the pallet fully-travels the section without producing an **Excessive pallet following error** fault.
5. Set the **Maximum Velocity** parameter back to the value that was noted in step 2.

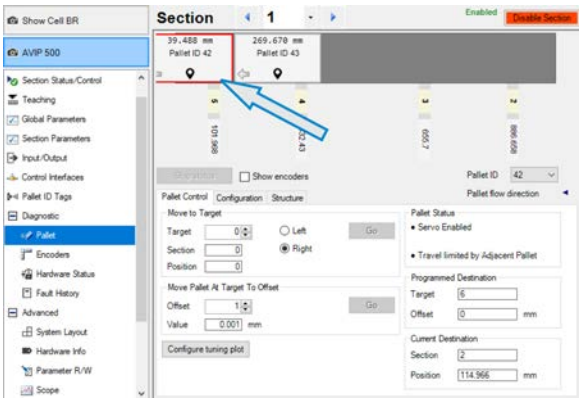
Test Manually with TrackMaster

NOTICE Before starting this test, manually block any system tooling that could interfere with pallet motion. Failure to do so, could result in system damage.

During this test, a pallet is manually commanded across the straight section or 180 deg. section being tested and across the sections on either side of the straight section or 180 deg. section being tested.

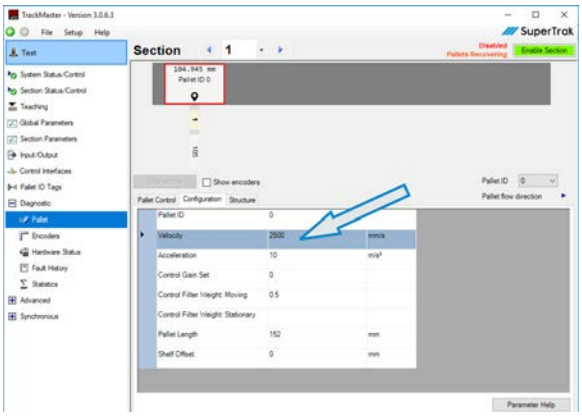
1. Prepare the system and SuperTrak pallets:
   a. Verify that no system tooling can interfere with pallet motion. If required, block the system tooling out of the way.
   b. Remove all pallets from the straight section or 180 deg. section to be tested and the sections on each side of it.
   c. Position a pallet directly on the right or left side of the section to be tested.
2. Open TrackMaster.
3. In the left pane, click **Diagnostic** > **Pallet**.
4. At the top of the screen, click ◀ or ▶ to select the **Section** that contains the pallet to use for the test.

   The selected pallet graphic has a red outline.

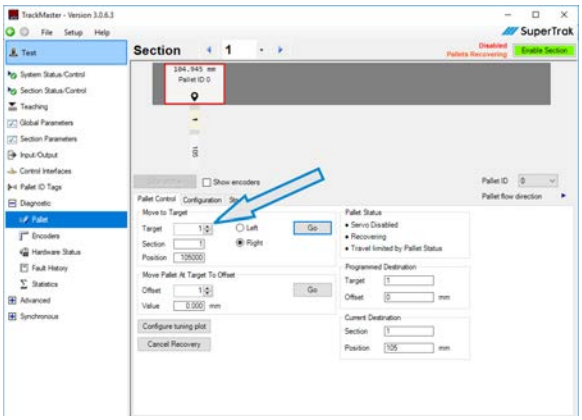


5. Click the **Configuration** tab.

6. Note the value of the **Velocity** parameter, so that you can change the value back to this after the test.



7. Set the **Velocity** parameter to 50 mm/s.
8. Click the **Pallet Control** tab.
9. Under **Move to Target**, select a **Target** that is past the section to be tested and in the direction that will cause the pallet to travel over the section to be tested.



10. Select the correct pallet direction (**Left** or **Right**), and then click **Go**.
11. With the SuperTrak power supply power ON, click **Diagnostic** > **Pallet**, and then click **Enable Section** for the section being tested and the sections on each side of it.

    Do not enable power to any other sections because this may cause all the SuperTrak pallets to move around the system.

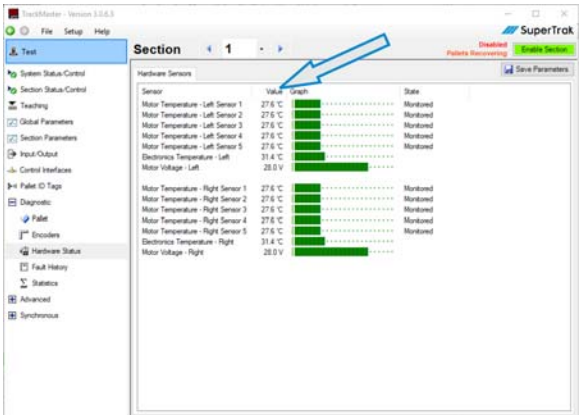
12. In the left pane, click **System Status/Control**, and then click **Disable Zone**.

    The section passes if the pallet fully travels over the section without producing an **Excessive Follow Error** fault.

13. Click the **Configuration** tab.
14. Set the **Velocity** parameter value to the value noted in step 6.

Test the Status of the Hardware

1. Open TrackMaster.
2. In the left pane, click **Diagnostic** > **Hardware Status**.
3. Verify that the **State** of all motor temperature sensors is set to **Monitored**.
4. Verify that the **Value** for:



   - Motor temperature sensors are reasonable. This value varies depending on the state of the system.

     Note that each straight section and 180 deg. section has two (2) coil driver boards, and each coil driver board has five (5) thermistor connections. A straight section has ten (10) thermistors, so it uses all the connections on the coil driver boards. A 180 deg. section has six (6) thermistors, so it only uses three (3) connections. It is normal for thermistors 2 and 4 to be ignored for 180 deg. sections because the software sets these to *Ignored* by default.
   - Electronics temperatures are within a reasonable range (25-50°C [77-122°F]).
   - Motor voltages are representative of the current SuperTrak power supply power state (ON or OFF), and are within a reasonable range (27-29V).

Test the Rail System

1. Inspect both the flat and upper v-rail for any damage or debris build-up.
2. Inspect the flat rail, to verify that the wear strip is correctly seated in the groove of the track structure.
3. Slowly, manually move a pallet fully across a straight section or 180 deg. section. As you move the pallet, feel for any resistance in pallet motion.
4. Verify that the alignment of the upper v-rail is correct between every straight section and between the straight sections and 180 deg. sections.
5. Verify that the alignment of the flat rail is correct between every straight section and between the straight sections and 180 deg. sections.

Test a Magnetic Shunt

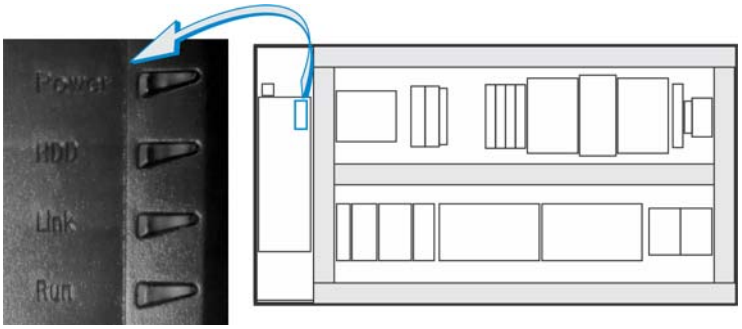
1. Manually move a pallet over straight section and 180 deg. section joints. Feel for an excessive amount of resistance (magnetic bump).
2. If necessary repeat this in several locations to obtain a baseline of what the magnetic bump should feel like.

Diagnostic Lights

This section provides information about the indicator lights on the SuperTrak conveyor hardware.

Controller Indicator Lights

The controller has four (4) indicator lights: Power, HDD, Link, and Run.



The following table summarizes the indicator light behavior.

See the *APC910 User's Manual* for additional information.

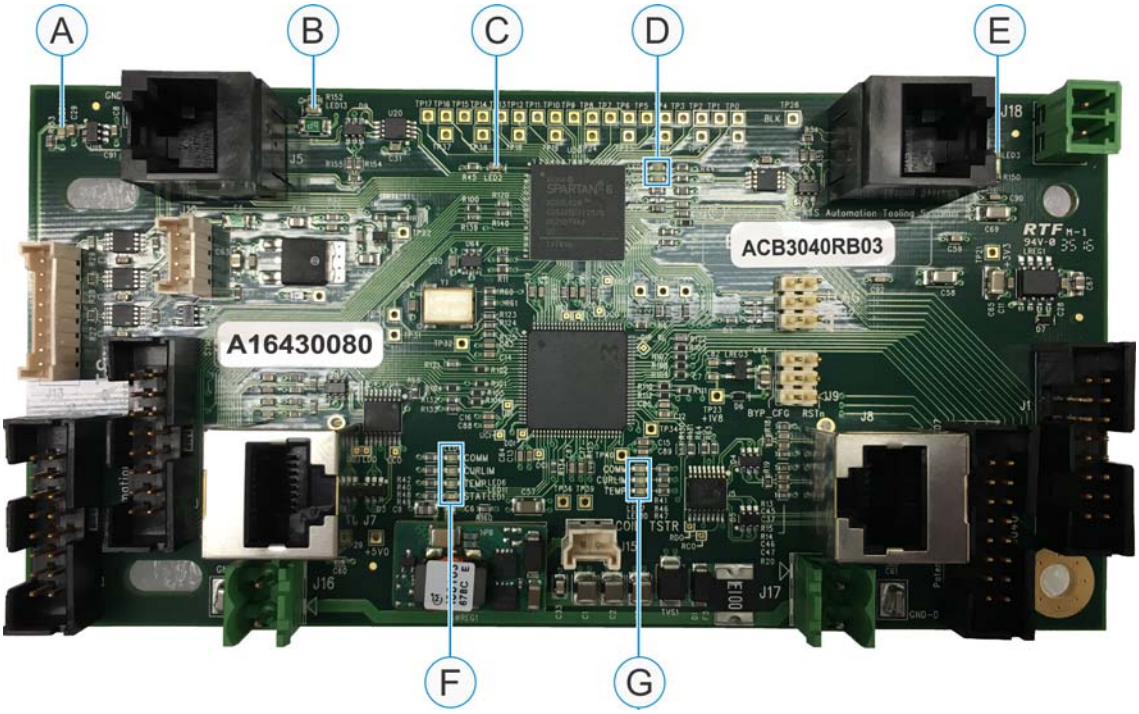
Indicator	Color	Light State	Normal	A Problem May Exist
Power	Green	Solid	✓	
		Blinking		A controller hardware problem exists. Contact your vendor for assistance.
	Red	Solid		The controller power is OFF. Press the power button to turn it ON.
		Blinking		A controller hardware problem exists. Contact your vendor for assistance.
	Red/ Green	Blinking		
HDD	Yellow	Occasional Blink	✓	
Link	Yellow	Solid	Normal when an SDL display is connected.	
		Blinking		SDL display power was interrupted. Check the cables.
		Off	Normal when an SDL display is not connected.	

Indicator	Color	Light State	Normal	A Problem May Exist
Run	Green	Solid	✓	
		Blinking	✓	The controller startup sequence is not yet complete. Wait several minutes.
	Red	Solid		A controller software problem exists. Contact your vendor for assistance.
		Blinking		

Gateway Board (ACB3040) Indicator Lights

The gateway board image may not reflect the latest version of the gateway board.

The gateway board has thirteen (13) indicator lights.



ID	LED #	Color	Light State	Normal	A Problem May Exist
A	14	Red	ON		Power to the IR reader is disabled because of excessive current draw. A short-circuit may exist in the IR reader or in the IR reader cable.
			OFF	✓	

ID	LED #	Color	Light State	Normal	A Problem May Exist
B	13	Red	ON		Power is disabled due to excessive current draw, A short-circuit exists in the encoder board or in the encoder board cable.
			OFF	✓	
C	2	Green	Any	N/A	A software diagnostic LED. This indicator is for development purposes only.
D	8	Red	Any	N/A	Software diagnostic LEDs. These indicators are for development purposes only.
D	9	Yellow			
E	3	Red	ON		Power is disabled due to excessive current draw, A short-circuit exists in the encoder board or in the encoder board cable.
			OFF	✓	
F	1 (STAT)[a]	Green	ON	✓	
			Blinking very slow		The network is not configured.
			Blinking slow		The FPGA is not configured.
			Blinking fast		The FPGA is ready but inactive.
			OFF		Power is OFF.
F and G	4 (COMM)[b] and 5 (COMM)[b]	Orange or Blue	ON		Gateway board communication does not exist with the controller.
			Blinking fast		The coil current set points are not received.
			OFF	✓	
F and G	6 (CURLIM)[c] and 7 (CURLIM)[c]	Red	Blinking fast	✓ (normal if the motor power is OFF)	The coil driver board is deactivated.
			OFF	✓	
F	11 (TEMP)[d]	Yellow	ON	✓	The gateway board is configured on the left network.
			OFF	✓	The gateway board is configured on the right network.

ID	LED #	Color	Light State	Normal	A Problem May Exist
G	10 (TEMP)[d]	Yellow	ON	✓	The gateway board is the last in the network.
			OFF	✓	The gateway board is not the last in the network.

a. STAT stands for status.
b. COMM stands for communication.
c. CURLIM stands for current limit. Note that the text does not correlate to the LED function.
d. TEMP stands for temperature. Note that the text may not correlate to the LED function. Gateway boards that were manufactured before mid-2016 and have not received a CPLD firmware update use the yellow LEDs as follows: ON=defective thermistor detected, blinking fast=the operating temperature limit is exceeded, OFF=the motor temperature is within operating range.

Coil Driver Board (ACB3000) Indicator Lights

The coil drive board has two (2) indicator lights: one green, and one red.

Indicator Light	Light State	Normal	A Problem May Exist
Green	ON	✓ (power is ON)	
	OFF		The power is OFF.
Red	ON		The A/D CPLD is not programmed. Contact your vendor for assistance.
	OFF	✓	

Specifications

This section provides SuperTrak conveyor specifications. Information in this section is for general reference and is subject to change without notice.

Performance

The SuperTrak conveyor is designed to meet the following optimal performance[1]:

Performance Description	Value
Maximum speed	4 m/s (13.1 ft./s)
Acceleration	1g with 10 kg (22 lb) payload 4g with 1 kg (2.2 lb) payload
Payload	10+ kg (22+ lb) per pallet[a]
Stop repeatability - straight section	± 0.01 mm (0.00039 in.)
Stop repeatability - 180 deg. section	± 0.025 mm (0.001 in.)
Communication	EtherNet/IP, PROFINET, POWERLINK, and EtherCAT[b]
Number of supported pallets	As many as can physically fit on the track length
Process on curve	Yes, full control
Pallet options	Standard configuration with 2 or 3 magnet array options
Collision avoidance	Built in
Power consumption	10W/section, 150-275W/pallet[c]
Servo update rate	800 µs typical

a. Higher payloads are possible. Contact ATS with application details.
b. Other protocols are possible. Contact ATS if other protocols are required.
c. Power consumption varies depending on the aggressiveness of the application: it may be less with less demanding requirements or more with more demanding requirements.

1. Performance does not include supplied product defects, operator error, operator training, or failure of services.

Environment Conditions

State	Specification	Straight Section or 180 Deg. Section Value	Power Supply Value
Operation	Temperature (ambient)	5°C (41°F) to 55°C (131°F)	-20°C (-4°F) to 71°C (159.8°F)
	Humidity (relative)	5% to 85% non-condensing	20% to 90%
Storage	Temperature (ambient)	-25°C (-13°F) to 55°C (131°F)	-20°C (-4°F) to 75°C (167°F)
	Humidity (relative)	5% to 95% non-condensing	20% to 90%
Transport	Temperature (ambient)	-25°C (-13°F) to 70°C (158°F)	-20°C (-4°F) to 75°C (167°F)
	Humidity (relative)	Max.95% at 40°C (104°F)	20% to 90%

Environmental Limits

Specification	Power Supply Value
Mains configuration	1 phase x 200-240VAC 50/60 Hz Grounding: TN
Degree of contamination	Pollution degree 2 environments
Over-voltage capacity	II
IP protection	IP20
NEMA protection	NEMA type 1
Maximum installation altitude	2000 m (6561.6 ft.)

Dimensions and Weight

This section provides the dimensions and weight of the SuperTrak conveyor sections and components.

See *Appendix C: Data Sheets* on page 265 for additional information.

Two Straight Sections with Prolato Frame (1m Linear Module Extension)

Specification	Value
Length	1 m (3.28 ft)
Width	0.55 m (1.8 ft)
Height	1.1 m (3.6 ft)
Weight	272 kg (600 lbs)

180 Deg. Section (500 mm) with Prolato Frame

Specification	Value
Length	1 m (3.28 ft)
Width	0.55 m (1.8 ft)
Height (excluding status beacon)	1.1 m (3.6 ft)
Weight	247 kg (545 lbs)

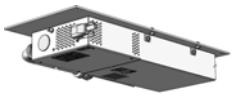
Control Panel Assembly

Specification	Value
Length	2 m (6.56 ft)
Width	0.92 m (3.02 ft)
Height (excluding status beacon)	1.1 m (3.6 ft)
Weight	588 kg (1296 lbs)

Component Weight

Specification	Value
2-Magnet pallet (without keeper plate)	2.02 kg (4.45 lbs)
3-Magnet pallet (without keeper plate)	2.4 kg (5.29 lbs)
Power supply with mounting plate	9 kg (20 lbs)
Control panel	60 kg (132 lbs)

Installation Requirements

Service	Specification	Value
Power supply (P/N: 25270337)	Input rating	1 phase x 200-240VAC 50/60 Hz
	Output rating	28VDC 47A continuous 70A peak
	Fuses/circuit breaker	10 A UL489 breaker Type CC fuses, or type J fuses
	Terminal connection cross-section	Connect as per local requirements for 10A
	Permitted mounting orientations	• Vertical with the air filter down.  • Horizontal with the access panel facing down.  • Any orientation if mounted inside a sufficient enclosure with adequate cooling.
Straight section (P/N: 1060387)	Input rating	28VDC 100A peak
	Output rating	Force of up to 150N/pallet
	Fuses/circuit breaker	50A fuses
	Terminal connection cross-section	16 mm^2 cables terminated with a wire lug
	Permitted mounting orientations	Horizontal upright, or vertical over/under
180 deg. section (500 mm) (P/N: 1060638)	Input rating	28VDC 100A peak
	Output rating	Force of up to 150N/pallet
	Fuses/circuit breaker	50A fuses
	Terminal connection cross-section	16 mm^2 cables terminated with a wire lug
	Permitted mounting orientations	Horizontal upright, or vertical over/under

Service	Specification	Value
180 deg. section (800 mm) (P/N: 25232698)	Input rating	28VDC 150A peak
	Output rating	Force of up to 150N/pallet
	Fuses/circuit breaker	50A fuses
	Terminal connection cross-section	16 mm^2 cables terminated with a wire lug
	Permitted mounting orientations	Horizontal upright

Electrical Services

Service	Specification	Value
Control panel	Line voltage	208Y120VAC+PE Or 400Y230VAC+PE
	Frequency	50/60 Hz
	Phases	3 ph, 5-wire
	Short circuit current rating	5kA
	Largest load	20A
	Control voltage	24VDC (digital power supplied from the control panel) 28VDC (motor power supplied from the power supplies)
	Full load amps	36A
UPS (located inside the control panel)	Line voltage	24VDC
	Frequency	50/60 Hz
	Current rating	15A

Electromagnetic Compatibility (EMC) Requirements for High-Frequency Emissions

The following table provides the high-frequency emissions in accordance with EN 61000-6-4:

Emission	Test Accordance	Class	Emission
Conducted emissions	IEC 55011	Class A Group 2	150 kHz - 30 MHz
Radiated emissions	IEC 55011	Class A Group 2	150 kHz - 1000 MHz

Electromagnetic Compatibility (EMC) Requirements for Immunity to Disturbances

The following table provides high-frequency disturbance limits in accordance with EN 61000-6-2:

Disturbance Type	Test Accordance	Description	Limit Requirement	PC[a]
Electrostatic discharge	EN 61000-4-2	Contact discharge to powder-coated and bare metal housing parts.	4kV	B
		Discharge through the air to plastic housing parts.	8kV	B
Electrostatic fields	EN 61000-4-3	Housing, completely wired.	10V/m, 51 MHz, 144 MHz, 222 MHz, 431 MHz, 2.4 GHz Radiated field as produced by portable radios modulation.	A
Burst	EN 61000-4-4	AC mains	±2kV, 1 min, direct coupling.	B
		I/O ports	N/A	B
Surge	EN 61000-4-5	Power connection	±2kV, CM (L-Gnd), ±1kV, DM (L-L), N/A on I/O Ports	B
High-frequency conducted disturbances	EN 61000-4-6	Power connection	0.15 - 250 MHz, 10 Vrms, 80% amplitude modulation at 1 kHz	A
		I/O ports	N/A	-

a. Performance criteria (PC) descriptions are as follows:

A - The system will continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed below a performance level specified by Automation Tooling Systems when the system is used as intended. The performance level may be replaced by a permissible loss of performance. If the minimum performance level or the permissible performance loss is not specified by Automation Tooling Systems, then either of these may be derived from the product description and documentation and by what the user may reasonably expect from the system if used as intended.
Preprogrammed move of pallets showing speeding up, sudden stop in predetermined position, short moves back-and-forth and speeding up again, are simulated to show all possible scenarios of the pallet moves. No stopping of pallets, no errors on the control screen, and no alarms are allowed during the application of the test voltage.

B - After the test, the system will continue to operate as intended without operator intervention. No degradation of performance or loss of function is allowed, after the application of the phenomena below a performance level specified by Automation Tooling Systems, when the system is used as intended. The performance level may be replaced by a permissible loss of performance. During the test, degradation of performance is allowed. However, no change of operating state or stored data is allowed to persist after the test. If the minimum performance level (of the permissible performance loss) is not specified by Automation Tooling Systems, then either of these may be derived from the product description and documentation and by what the user may reasonably expect from the system if used as intended.

Glossary

This section contains an alphabetized list of terms and acronyms that may be used in this document.

Term	Definition
ATS	Automation Tooling Systems, Inc.
Bus board	A capacitor bank that filters out spikes or ripples in the electrical supply to provide smooth DC voltage. A bus board is mounted behind each linear motor.
Cell	Two (2) or more stations that are grouped together. Typically, a cell can function independently of other cells. In some cases, cells are connected by a global emergency stop.
Component	Typically, the smallest and most detailed level of the SuperTrak conveyor. For example; a single piece of tooling, a sensor, or a cylinder.
Control interface	A protocol that provides isolated bi-directional communication from the SuperTrak conveyor controller to local cell controllers. This protocol is executed over one of the supported fieldbus network.
Cycle	The complete sequence of steps that a device performs to complete a task.
Cycle time	The time a device takes to complete a sequence of operations once.
Device	Two (2) or more components that are grouped together to complete a single function. A device can be controlled by software to move through a sequence of steps. For example; a conveyor, or lift tooling.
Disable	Prevent a device from operating through software or by removing power.
Disconnect	To interrupt or terminate a connection.
Enable	Allow a device to operate through software or by connecting power.
Encoder	A position sensor that continuously monitors pallet positions.
E-turn	References a 180 deg. section (500 mm).
Gateway network	An ATS proprietary network, implemented using standard Ethernet cables; however, it is not Ethernet and should not be connected to Ethernet devices. It connects an array of gateway boards to the controller.
GEN3	Third generation.
Guarding	A protective barrier surrounding automated equipment to prevent access to moving devices and to guard users from potentially hazardous conditions.

Term	Definition
ISO	International Organization for Standardization ISO is an international organization composed of national standards bodies from over 75 countries.
Lockout	The placement of a locking device (such as a padlock) on an energy isolating device, in accordance with an established procedure, to make sure that the energy isolating device and the equipment being controlled cannot be operated until the locking device is removed. Used in combination with tagout.
Master pallet	A SuperTrak pallet that is stored in a safe place and is only installed on the SuperTrak to verify nominal settings.
Motor assembly	References the hardware that powers the SuperTrak conveyor. The motor is mounted in an extruded outer frame that protects and encloses all the working elements of a section. It assembly incorporates the magnetic laminations, coils, drive electronics and controller for a track section.
Pallet	A movable base on which parts can be placed. A pallet can be partitioned to hold more than one part.
PCB	Printed circuit board Mechanically supports and electrically connects electronic components using conductive tracks, pads and other features etched from copper sheets laminated onto a non-conductive substrate.
PLC	Programmable Logic Controller An electronic processor that contains the programmable code for controlling system operation, device operating sequences, fault recovery, and data processing.
Reference pallet	A SuperTrak pallet that is installed on the SuperTrak conveyor and is used as a reference. It can be a specific production pallet, or a few different pallets can be sampled and the pallet in the middle of the range can be used.
Station	Two (2) or more devices that work together to complete a task. For example; a pallet stop on a conveyor and all the devices responsible for working on the contents of the pallet.
System	References the automation machine that the SuperTrak conveyor is integrated with.
Tagout	The placement of a durable tag on an energy isolating device, in accordance with established procedure, to identify the person who placed a lock on the device. Equipment being controlled by the energy isolating device must not be operated until the lock and tag have been removed. Used in combination with lockout.
Target	A location on the SuperTrak conveyor that can be set as a pallet destination. A SuperTrak conveyor can have up to 255 configured targets, each located anywhere on the system.

Term	Definition
Track section	A 1 m (3.28 ft.) long piece of conveyor track that can be joined with other sections of conveyor to produce a length of SuperTrak conveyor. The sections typically share a common power supply or multiple power supplies, and communicate with each other over a high speed data network.
TrackMaster	Software that provides configuration, programming, diagnostics and control over a supervisory data network. TrackMaster communicates over Ethernet. TrackMaster is not required to operate SuperTrak conveyor; however, it is useful for troubleshooting and configuring the device.
UPS	Uninterruptible power supply or uninterruptible power source An electrical device that provides electrical power to a device when the main source of electrical power is turned OFF.
Wide e-turn	References a 180 deg section (800 mm).

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Service

This section describes how to contact ATS Service Support for customer assistance.

Contact ATS

Please contact ATS for assistance, questions or comments regarding the operation or maintenance of your equipment.

ATS Automation Tooling Systems, Inc

730 Fountain Street North

Cambridge, ON, N3H 4R7, Canada

Tel: 519-653-6500

Fax: 519-650-6538

Email: *info@atsautomation.com*

www.atsautomation.com

Regular business hours are 8:30 am to 5:00 pm EST, Monday through Friday. Emergency support hours are 5:30 pm to 8:00 am EST, weekends and holidays.

Emergency Support Tel: 519-653-3060

Return a Part to ATS for Warranty

If your spare parts inventory does not contain a replacement part for a failed SuperTrak conveyor part, you can purchase a replacement part from ATS.

1. Contact ATS Post Automation Support with the following information:
    - Project number

      See the electrical panel, or front cover of this manual for the project number.
    - Part number
    - Part description
    - A brief description of the failure.
2. ATS provides you with a service return material authorization (SRMA) number.
3. Courier your defective part to ATS. A tracking number is recommended. Make sure the SRMA number is on the outside of the package.
4. When ATS receives the defective part, one (1) of the following is done:
    - For parts manufactured by ATS, ATS directly validates the warranty by repairing or replacing the part. Proceed to step 7.
    - For purchased parts (for example; motors, or amplifiers), ATS sends the defective part to the original manufacturer. The original manufacturer validates the warranty and repairs or replaces the part at their discretion.

    Be aware that some manufacturers require a purchase order (PO) to test returned parts. If a PO is required, ATS will contact you for a PO before additional action is taken.
5. Depending on the original manufacturer response, ATS contacts you with a list of options:
    - The defective part is repaired or replaced under warranty. Freight is the responsibility of the customer.
    - The defective part is not covered under warranty, but it can be repaired with a PO. ATS provides a quote for part repair.
    - The defective part is not covered under warranty, and it can not be repaired. ATS provides a quote for part replacement and discards the defective part unless otherwise directed.
6. When ATS receives the replacement part from the manufacturer, ATS sends the replacement part back to the original sender unless otherwise directed.
7. ATS closes the SRMA.

Request Service from ATS

Contact ATS Post Automation Support if service is required on your SuperTrak conveyor. Please have the following information available when you call:

- Company name
- Contact name
- Contact number
- Project number

  See the electrical panel, or front cover of this manual for the project number.
- Technical description of the problem
- Purchase order number

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Appendix A: Hardware Torque Specifications

The following table provides the hardware torque specifications to use during the installation of the SuperTrak conveyor.

Location Description	Size	Type	Finish	Class	DIN	Qty per	Torque (Nm)
Top connection plate	M10-1.5x40	SHCS	Zinc Plated	12.9	912	8	80
Side connection plate	M10-1.5x40	SHCS	Zinc Plated	12.9	912	12	80
Straight section mount plate	M10-1.5x40	SHCS	Zinc Plated	12.9	912	4	80
180 deg. section mount plate	M10-1.5x40	SHCS	Zinc Plated	12.9	912	4	80
	M10	O/S Washer	Zinc Plated		7349	4	
Straight section stand to mount	M8-1.25x40	SHCS	Zinc Plated	12.9	912	8	40
	M8	O/S Washer	Zinc Plated		7349	8	
Straight Section Stand to Motor	M6-1.0x45	SHCS	Zinc Plated	12.9	912	8	16
	M6	O/S Washer	Zinc Plated		7349	8	
180 deg. section stand	M8-1.25x75	SHCS	Zinc Plated	12.9	912	3	40
	M8	Lock Washer	Zinc Plated		127	3	
Joint plate	M6-1.0x35	SHCS	Zinc Plated	12.9	912	8	16
	M6	Fender Washer	Zinc Plated		9021	8	
Power supply mount	M5-0.8x16	SHCS	Zinc Plated	12.9	912	4	10
	M5	Flat Washer	Zinc Plated		125	4	
	M5	Lock Washer	Zinc Plated		127	4	
180 deg. section top cover	M5-0.8x10	SHCS	Zinc Plated	12.9	912	10	10
Straight encoder	M3-0.5x8	SHCS	Zinc Plated	12.9	912	10	2
Upper v-rail	M6-1.0x14	SHCS	Zinc Plated	12.9	912	11	16

Location Description	Size	Type	Finish	Class	DIN	Qty per	Torque (Nm)
interconnect 24VDC motor and cable	M5-0.8x14	SHCS	Zinc Plated	12.9	912	2	9
	M5	Int. Tooth Washer	Zinc Plated		6797	2	
	M5	Flat Washer	Zinc Plated		125	2	
Interconnect com cable	M6-1.0x14	SHCS	Zinc Plated	12.9	912	2	11
	M6	Int. Tooth Washer	Zinc Plated		6797	2	
	M6	Flat Washer	Zinc Plated		125	2	
Interconnect to cabinet ground	M6-1.0x14	SHCS	Zinc Plated	12.9	912	2	11
	M6	Int. Tooth Washer	Zinc Plated		6797	2	
	M6	Flat Washer	Zinc Plated		125	2	
50A fuse to coil driver PCB	M5-0.8x8	SHCS	Zinc Plated	12.9	912	1	2.7
	M5	Int. Tooth Washer	Zinc Plated		6797	1	
	M5	Flat Washer	Zinc Plated		125	1	
Coil driver board to bus bar	M4-0.7x12	SHCS	Zinc Plated	12.9	912	13	2
	M4	Int. Tooth Washer	Zinc Plated		6797	13	
	M4-0.7x12	Phillips head nylon screw	None		7985	1	
Gateway board to bus bar	M4-0.7x16	SHCS	Zinc Plated	12.9	912	4	2
	M4	Int. Tooth Washer	Zinc Plated		6797	4	
Pallet - front cover	M5-0.8x8	BHSCS	Zinc Plated	10.9	7380	4	5.8

Location Description	Size	Type	Finish	Class	DIN	Qty per	Torque (Nm)
Pallet - shoulder screw	SS 8MMX10MM	Shoulder Screw - 8MM DIA, 10MM LONG, M6X1.0 Thread	Black oxide	12.9	7379	2	10
Pallet - 2-magnet	M6-1.0x20	SHCS	Zinc Plated	12.9	912	2	16
Pallet - 3-magnet	M4-0.7x20	SHCS	Zinc Plated	12.9	912	4	4.5
Pallet - anti-tip blocks	M4-0.7x10	SHCS	Zinc Plated	12.9	912	4	4.5
Pallet - encoder strip	M5-0.8x12	LSHCS	Zinc Plated	8.8	7984	2	5.4
Pallet - anti-static brush	M3-0.5x6	BHSCS	Zinc Plated	10.9	7380	4	1.3
Pallet - lubricator	M3-0.5x14	SHCS	Zinc Plated	12.9	912	2	2
Wear strip locator	M3-0.5x8	SHCS	Zinc Plated	12.9	912	1	2

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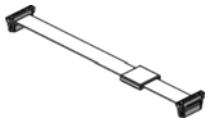
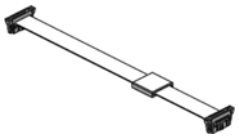
Appendix B: Spare Parts

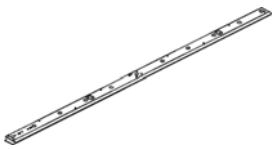
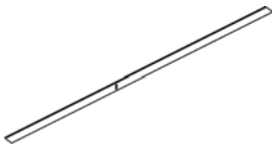
Be aware that the graphics in this section are not to scale.

This section provides the recommended spare parts information for the SuperTrak conveyor.

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Pallet	Anti-static brush (pack of 10)		SP-25210148-PK	1+ (10-pk)	Medium	Yes
	Anti-tip block		SP-1060536	10	Low	No
	Flat wheel and bearing sub-assembly		SP-1060558	10 (individual wheels, not sets)	Medium	No
	Lubrication felt		SP-1060816	5	Medium	No
	Pallet encoder strip assembly		SP-1060543	5	Low	No
	Pallet IR tag assembly		SP-1061122	1 (if used)	Low	No
	Pallet magnet assembly - 2 magnets		SP-1060746	5 (if used)	Low	No
	Pallet magnet assembly - 3 magnets		SP-1060516	5 (if used)	Low	No

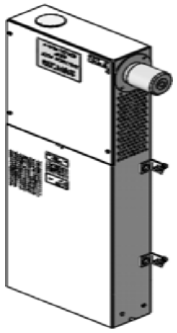
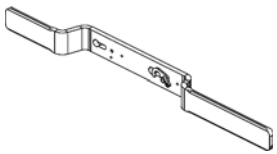
Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Pallet (continued)	V-wheel & bearing sub-assembly		SP-1060527	10 (individual wheels, not sets)	Medium	No
Cabling and wiring	Encoder cable		SP-1061547	1	Very Low	Yes
	Ethernet network cable		SP-3708400	2	Very Low	Yes
	Ribbon cable - straight LH top		SP-1060325	1	Very Low	Yes
	Ribbon cable - straight RH bottom		SP-1060322	1	Very Low	Yes
	Ribbon cable - straight RH top		SP-1060323	1	Very Low	Yes
	Ribbon cable - 180 deg. section (500 mm) LH top and bottom		SP-1060484	1	Very Low	Yes
	Ribbon cable - 180 deg. section (500 mm) RH top		SP-1060483	1	Very Low	Yes
	Ribbon cable - straight LH and 180 deg. section (500 mm) RH bottom		SP-1060324	1	Very Low	Yes

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Cabling and wiring (continued)	Ribbon cable - 180 deg. section (800 mm)		SP-125312033	1 (when applicable)	Very Low	Yes
	Ribbon cable - straight, driver (465 mm long) (Only applicable for straight sections with RME)		125422331	1	Very Low	Yes
	Ribbon cable - straight, driver (227 mm long) (Only applicable for straight sections with RME)		125422700	1	Very Low	Yes
Circuit boards	Coil driver board		SP-25211311	2+	Low	Yes
	Gateway board		SP-25211309	1+	Low	Yes
Encoder	Straight magnetic encoder assembly		SP-1060304	3	Low	Yes

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Encoder (continued)	180 deg. section (500 mm) RH encoder assembly		SP-1060408	1	Low	Yes
	180 deg. section LH encoder assembly		SP-1060415	1	Low	Yes
	180 deg. section (800 mm) LH encoder assembly		SP-25233511	1	Low	Yes
	180 deg. section (800 mm) center encoder assembly		SP-25233529	1	Low	Yes
	180 deg. section (800 mm) RH encoder assembly		SP-25234158	1	Low	Yes
	Magnetic encoder strip viewing film (pack of 5)		SP-1837179	1	Very Low	No
Rail	Straight upper v-rail - 999.5mm		SP-1060390	0	Very Low	Yes
	Wear strip - 180 deg. section transition		SP-1060640	1	Low	Yes

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Rail (continued)	Wear strip (full length)		SP-1060669	1	Low	Yes
	Wear strip locator		SP-1060389	2	Low	Yes
Misc.	Coil driver fuse (pack of 10)		SP-4234040-PK	1 (10-pk)	Very low	Yes
	Digital power cable		SP-25194786	0	Very Low	Yes
	180 deg. section motor cover (500 mm)		SP-25194872	1	Low	No
	180 deg. section motor cover (800 mm)		SP-25237933	1	Low	No
	180 deg. section motor ground cable		SP-1060627	0	Very Low	No

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Misc. (continued)	Frame ground cable - 180 deg. section		SP-1060437	0	Very Low	No
	Frame ground cable - straight		SP-1060655	0	Very Low	Yes
	Gateway board ground cable		SP-1060614	0	Very Low	No
	Interconnect tube		SP-1061529	0	Very Low	Yes
	IR reader assembly (no mount)		SP-25202314	1	Very Low	Yes
	Motor common cable		SP-1060662	0	Very Low	Yes
	Motor common cable - 180 deg. section		SP-1060439	0	Very Low	Yes
	Motor positive cable		SP-1060661	0	Very Low	Yes

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Misc. (continued)	Motor positive cable - 180 deg. section		SP-1060440	0	Very Low	Yes
	Motor power supply (no mount plate)		25270337	1+	Low	Yes
	Pallet removal tool		SP-25172729	0	Very Low	No
	Plastic hole plugs; size 15 (pack of 10)	N/A	SP-3708389-PK	0	Very Low	No
	Power supply 50a fuse (pack of 5)		SP-3708611-PK	1+ (5-pk)	Very Low	Yes
	Power supply exhaust filter (pack of 10)	N/A	SP-0405-0144-101-PK	1+ (10-pk)	High	Yes
	Standard SuperTrak conveyor controller[d]	N/A	Obsolete	N/A	N/A	N/A

Component	Description	Graphic	Part Number	Rec. Qty[a]	Replacement Frequency[b]	Critical[c]
Misc. (continued)	High performance SuperTrak conveyor controller	N/A	SP-4598804	1 (if used)	Low	Yes
	Straight motor cover		SP-25194869	2	Low	No
	Straight-to-straight electrical interconnect		SP-1060659	0	Very Low	Yes
	Thermistor		SP-1061479	0	Very Low	No

a. This is the recommended on-hand quantity for a base assembly. Increase quantities, as required, for larger SuperTrak conveyors.

b. Replacement frequency definitions:
- High - Replace at regular intervals.
- Medium - Replace occasionally.
- Low - Replace rarely.
- Very Low - Replacement is not generally required.

c. Critical to the SuperTrak conveyor function definitions:
- Yes - The SuperTrak conveyor will not run without this component.
- No - The SuperTrak conveyor will run without this component.

d. Replaced by the High performance SuperTrak conveyor controller.

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Appendix C: Data Sheets

The following table summarizes the SuperTrak products. Use the cross-references to located the data sheets for each product:

Product	Component	Size	Option 1	Option 2	Data Sheet
GEN3	Straight section[a]	1000 mm (39.37 in.) length[a]	Front-mounted electronics (FME)[a]	Tall stands (TS)[a] 345 mm (13.58 in.)	See *Straight Section with FME Data Sheet* on page 279.
			Rear-mounted electronics (RME)	Low stands (LS) 158 mm (6.23 in.)	See *Straight Section with RME Data Sheet* on page 281.
				TS 345 mm (13.58 in.)	
	90 deg. section	800 mm (31.49 in.) diameter			
	180 deg. section[a]	500 mm (19.68 in.) diameter[a] (narrow)	FME[a]	TS[a] 345 mm (13.58 in.)	See *180 Deg. Section (500 mm) with TS Data Sheet* on page 283.
			RME	LS 158 mm (6.23 in.)	See *180 Deg. Section (500 mm) with LS Data Sheet* on page 285.
		800 mm (31.49 in.) diameter (wide)			See *180 Deg. Section (800 mm)* on page 287.
	Pallet[a]	152 mm (5.98 in.) wide	2 magnets[a]		See *Pallet Data Sheet* on page 267.
			3 magnets[b]		
	Pallet setup tools				See *Pallet Setup Tools (Optional) Data Sheet* on page 297.

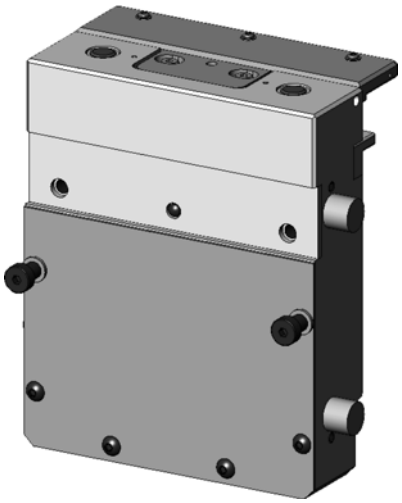
Product	Component	Size	Option 1	Option 2	Data Sheet
GEN3 (cont.)	Pallet removal tool				See *Pallet Removal Tool (Optional) Data Sheet* on page 299.
	Control panel				See *180 Deg. Section (500 mm) with LS Data Sheet* on page 285.
	Power supply				See *Power Supply Data Sheet* on page 292.
	IR reader				See *IR Reader Components (Optional) Data Sheet* on page 295.
	Prolato frame				See *Prolato Bases (Frames)* on page 300.

a. Denotes the standard deliverable.
b. The pallet pitch must be >200 mm. See the product specifications for additional information.

Pallet Data Sheet

The pallet provides low friction transport with precise product positioning.

Features



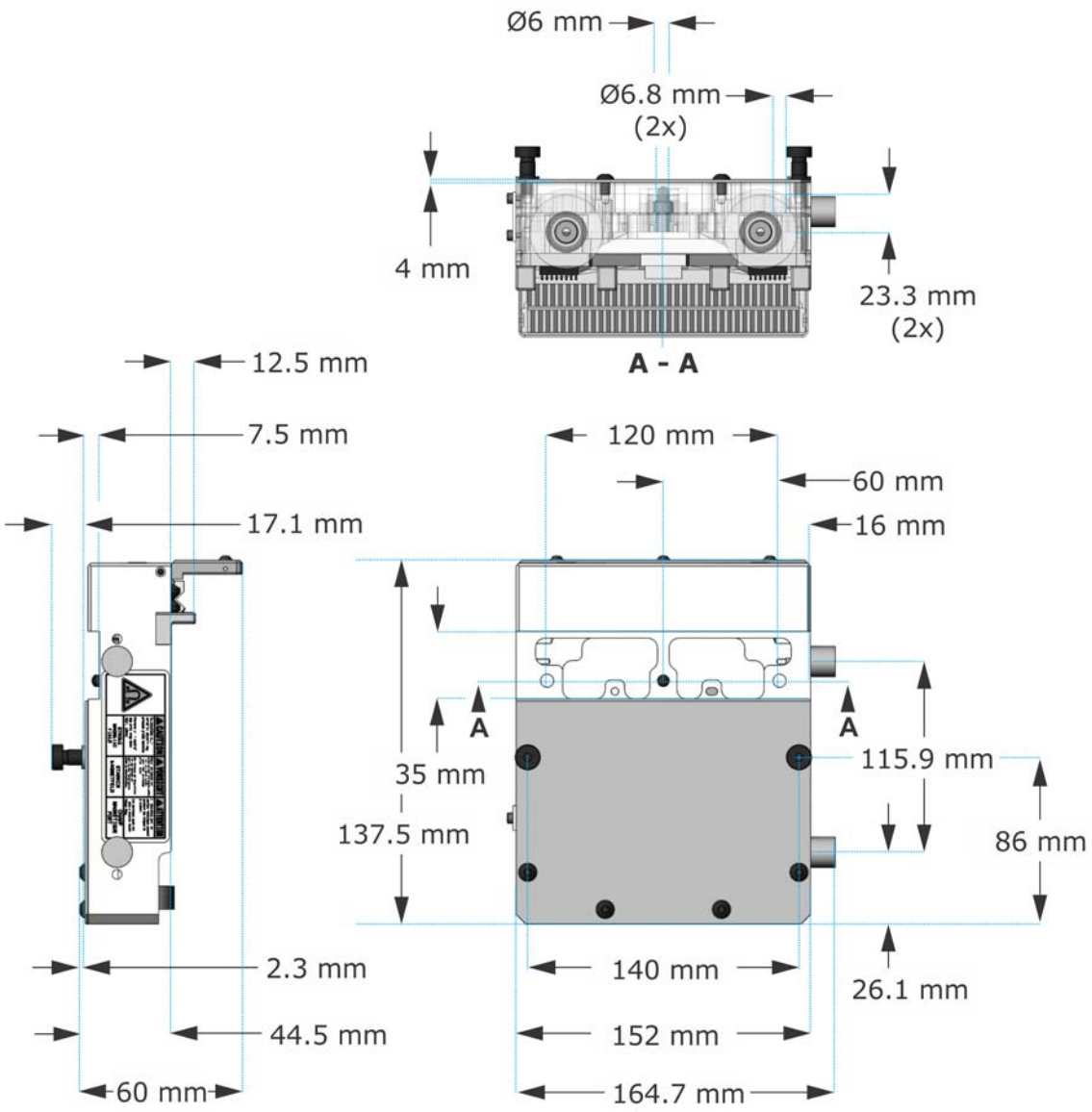
- Variable load is centered by the v-wheels.
- Available in four (4) options:
  - 2-magnet pallet with an IR tag.
  - 2-magnet pallet without an IR tag.
  - 3-magnet pallet with an IR tag.
  - 3-magnet pallet without an IR tag.

  See *Pallet Magnet Recommendations* on page 274 for magnet selection guidance.
- Includes:
  - A keeper plate assembly that, when installed, shields the magnetic field of the magnets when the pallet is not installed on the SuperTrak conveyor.
  - Holes and recesses for mounting a custom pallet shelf.
- Requires minimal maintenance (felt lubrication, monthly inspection, and cleaning).

Part Numbers

Part	Part Number
2-Magnet pallet with IR tag	25193340
2-Magnet pallet without IR tag	25193342
3-Magnet pallet with IR tag	25193341
3-Magnet pallet without IR tag	25193343
IR tag (accessory)	SP-1061122

Dimensions

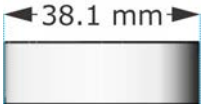

Ø6 mm
Ø6.8 mm
(2x)
4 mm
23.3 mm
(2x)
A - A
12.5 mm
7.5 mm
17.1 mm
120 mm
60 mm
16 mm
A
A
35 mm
137.5 mm
115.9 mm
86 mm
26.1 mm
2.3 mm
44.5 mm
60 mm
140 mm
152 mm
164.7 mm

Typical Pallet Wheel Lifespan

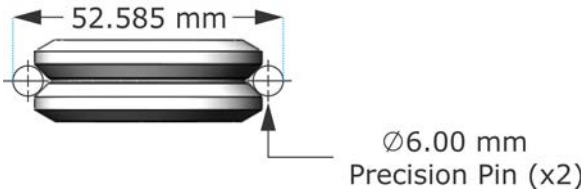
Pallet Wheel	Distance[a]	Velocity	Rating
Upper v-wheels with rail lubrication	50,000 km (31,068 mi)	Up to 4 m/sec (13.1 ft/sec)	<0.050 mm (<0.0019 in.) wear from radius See *Flat Wheel Nominal Dimensions* on page 269, and *V-Wheel Nominal Dimensions* on page 269 for additional information.
Lower flat wheels	25,000 km (15,534 mi)		

a. Assumes correct alignment. Lifespan improves when the system is correctly aligned and installed in a clean environment.

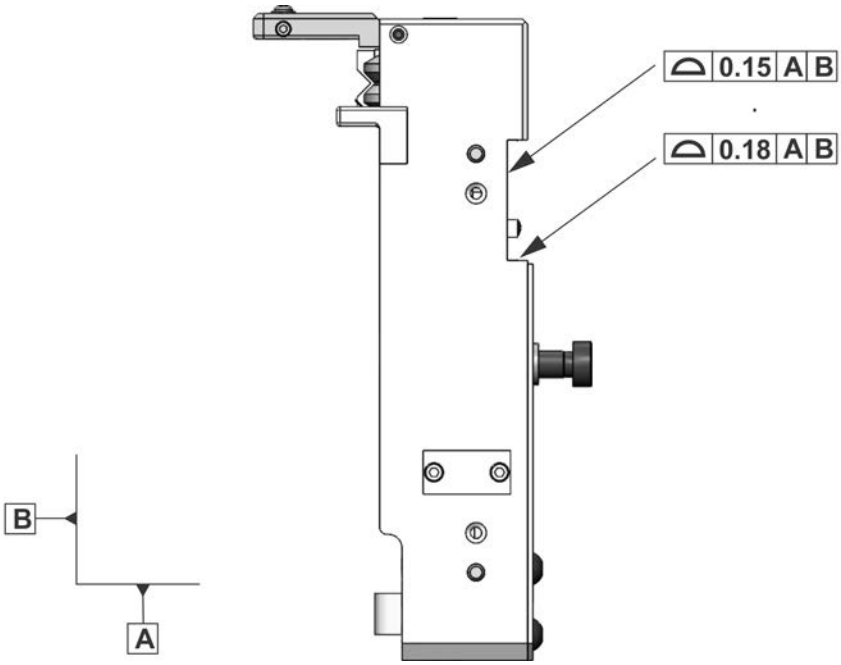
Flat Wheel Nominal Dimensions



V-Wheel Nominal Dimensions



Pallet Shelf Mounting Surface Tolerances



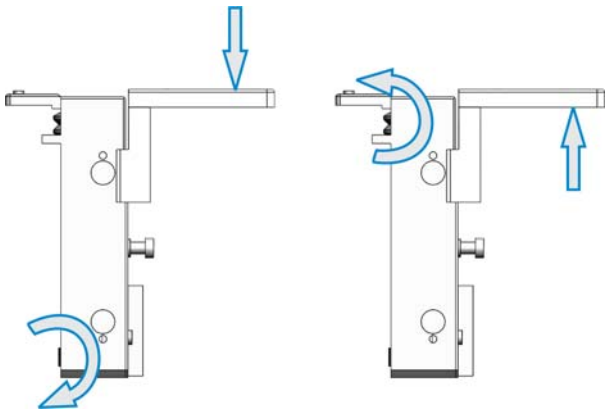
Technical Specifications

Specification	Applicable For	Value	
		2-Magnet Assembly	3-Magnet Assembly
Accelerating force of motor (max.)[a]	Straight section	120 N (26.97 lbf)	160 N (35.96 lbf)
	180 deg. section 500 mm (19.68 in.)	60 N (13.48 lbf)	80 N (17.98 lbf)
	180 deg. section 800 mm (31.49 in.)	60N (13.48 lbf)	80 N (17.98 lbf)
Acceleration (max.)[a]	1 kg (2.20lb) payload	40 m/s2 (131.2 ft./s2) See *Pallet Linear Acceleration Vs. Payload* on page 273.	
	10 kg (22.05 lb) payload	10 m/s2 (32.8 ft./s2) See *Pallet Linear Acceleration Vs. Payload* on page 273.	
Input (max.)[b]		275W	

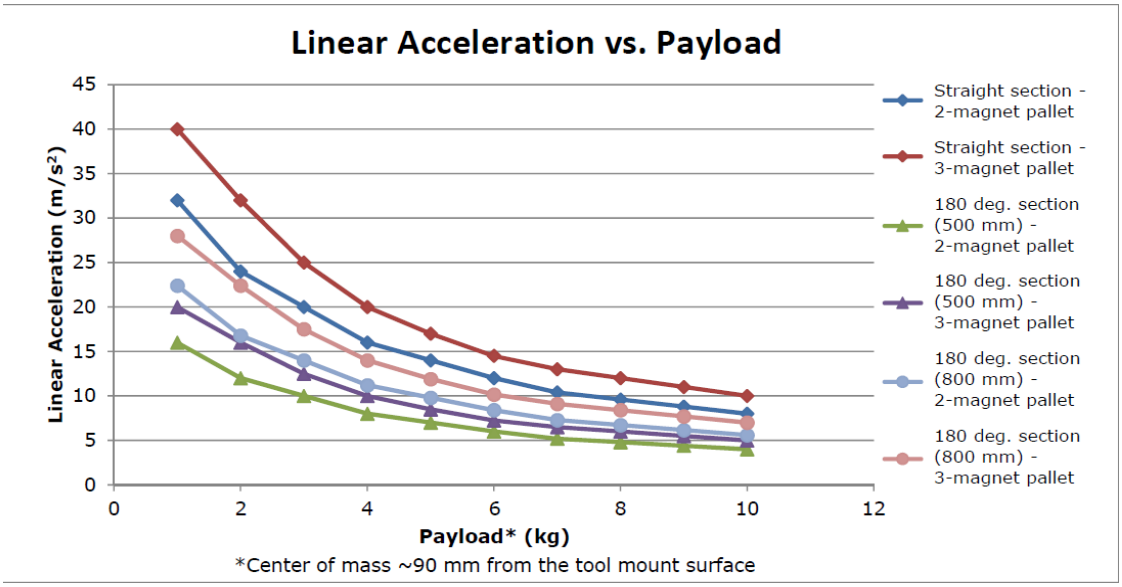
Specification	Applicable For	Value	
		2-Magnet Assembly	3-Magnet Assembly
Magnetic field strength		2.5 to 268.0 Gs See *2-Magnet Pallet Magnetic Measurement Values* on page 276, and *Pallet Magnet Recommendations* on page 274	3.0 to 1400.0 Gs See *3-Magnet Pallet Magnetic Measurement Values* on page 277, and *Pallet Magnet Recommendations* on page 274.
Magnetic force	Straight section	860 N (193.34 lbf)	1290 N (290.00 lbf)
	180 deg. section 500 mm (19.68 in.)	430 N (96.67 lbf)	645 N (145.00 lbf)
	180 deg. section 800 mm (31.49 in.)	590 N (132.64 lbf)	775 N (174.23.00 lbf)
Material		• Cover - thermoplastic film Lubricating • Lubrication felt - SAE F1 • Magnets - neodymium • Guide roller - polyoxymethylene (POM) • Bumper - chloroprene rubber (CR) • Keeper plate - polycarbonate (PC) and steel • Base plate - aluminum; anodized	
Maximum unsupported process torque perpendicular to pallet motion[c]		30 N-m (22.13 ft.-lbf)	50 N-m (36.88 ft.-lbf)
Maximum application force applied to a single pallet wheel in any direction		150 N (33.7 lbf)	
Minimum pitch from center-to-center of two (2) pallets	Straight section (with bumpers)	167 mm (6.57 in.)	200 mm (7.87 in.)
	Straight section (without bumpers)	154 mm (6.06 in.)	200 mm (7.87 in.)
	180 deg. section	200 mm (7.87 in.)	
Payload		See *Pallet Linear Acceleration Vs. Payload* on page 273, *Pallet Linear Acceleration Vs. Payload* on page 273, and *Pallet Magnet Recommendations* on page 274.	

Specification	Applicable For	Value	
		2-Magnet Assembly	3-Magnet Assembly
Repeatability[a]	Straight section (X-axis)	±0.01 mm (±0.00039 in.)	
	Straight section (Y-axis)	±0.015 mm (±0.00059 in.)	
	Straight section (Z-axis)	±0.025 mm (±0.00098 in.)	
	180 deg. section (X, Y, and Z-axis)	±0.025 mm (±0.00098 in.)	
Speed (max.)[a]	Straight section	4 m/s (13.1 ft./s)	
	180 deg. section	4 m/s (13.1 ft./s)	
Weight (without keeper plate)		2.02 kg (4.45 lbs)	2.4 kg (5.29 lbs)
Weight (with keeper plate)		2.2 kg (1.85 lbs)	2.7 kg (5.95 lbs)

a. Values depend on the application.
b. Typical.
c. Includes process force, product fixture mass, and product mass. The rotation point for the moment load is calculated from the flat wheels for downward forces (left image), and from the v-wheels for upward forces (right image).



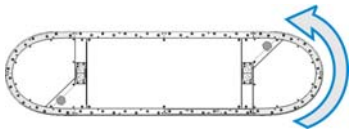
Pallet Linear Acceleration Vs. Payload

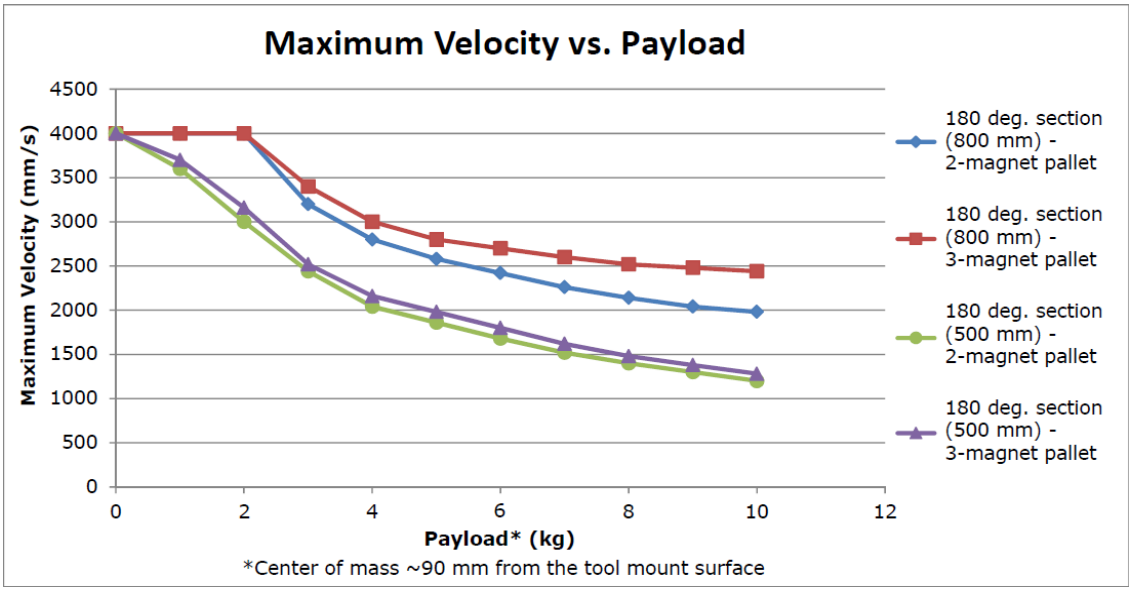


Pallet Maximum Velocity Vs. Payload on a 180 deg. Section

On a 180 deg section in a vertically mounted system (over/under configuration), the maximum velocity for a 3-magnet pallet with a 4 kg payload with CoM ~90 mm is 2.5 m/s.

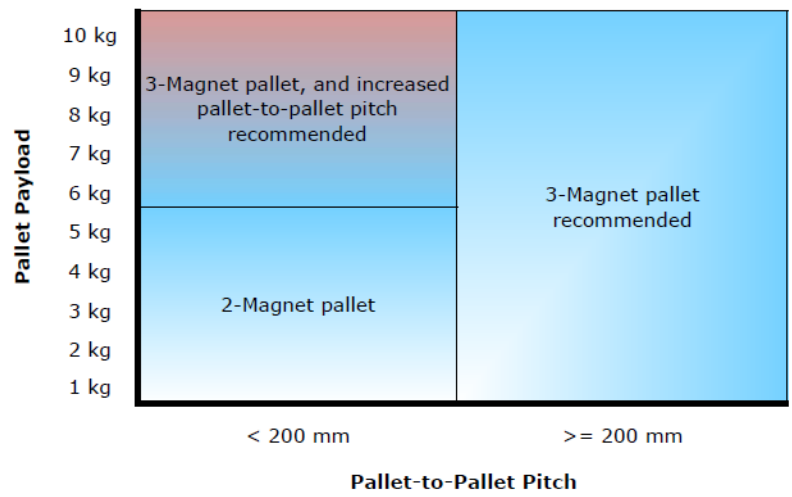
Contact Automation Tooling Systems for data related to your system specifications.





Pallet Magnet Recommendations

The maximum performance for the 180 deg. section in a vertically mounted system (over/under configuration) is 4 kg and 2 m/s.



Pallet Motion at a Constant Velocity

A 3* standard deviation for following error is provided to show the +/- positioning tolerance of the pallet 99.7% of the time.

Component[a]	Constant Velocity (mm/s)	Laser Interferometer[b] (+/- microns)	SuperTrak Encoders[b] (+/- microns)
Pallet 2-magnet	20	31	23
	50	38	28
	100	48	32
	200	40	28
	500	69	25
	1000	63	35
Pallet 3-magnet	20	31	24
	50	35	27
	100	51	35
	200	49	35
	500	75	28
	1000	58	32

a. Calculations for pallet motion predictability are based on the following test:

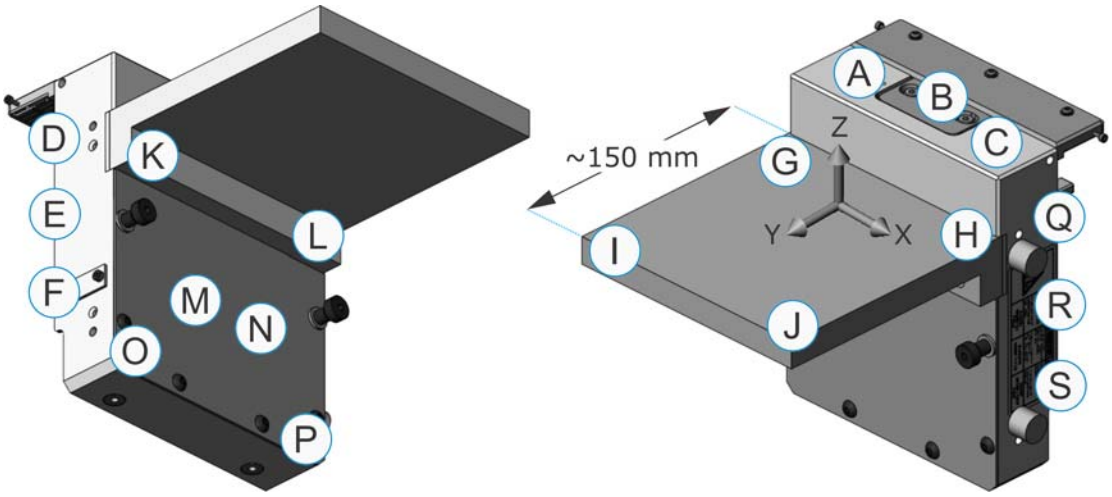
i. A pallet is programmed to travel between the two (2) targets at various constant velocities (shown as Constant Velocity in the table).

ii. The pallet motion is measured two (2) different ways: the SuperTrak encoders using the TrackMaster built-in Scope feature, and an external laser interferometer.

iii. A target is placed at the 0 mm (0 in.) and 1000 mm (39.37 in.) position on a straight section.

b. The laser interferometer and SuperTrak encoder results vary from section-to-section due to manufacturing tolerances.
The following settings and hardware versions were used during this test:
- Control gains: P=8, I=0.4, D=4, FF=5, Moving Filter=0.5, Stationary Filter=0.5
- Coil driver version: ACB3000-C02
- Controller firmware version: 3.0.10.0 using the updated March 2019 force table.

Pallet Magnetic Field Strength Measurement Locations



2-Magnet Pallet Magnetic Measurement Values

All measurements in the following table are in Gauss units.

See *Pallet Magnetic Field Strength Measurement Locations* on page 276 for the magnetic field strength measurement locations, and *Frame of Reference* on page 3 for a description of X, Y, and Z.

	2-Magnet Pallet Enabled at a Standstill			2-Magnet Pallet at Peak Force[a]		
Location	**X**	**Y**	**Z**	**X**	**Y**	**Z**
A	14	10	10	117	157	149
B	3	3.5	2.5	15	17	36
C	14	10	10	117	157	149
D	8	8	23	180	249	221
E	17	3	21	140	268	171
F	13	15	32	180	200	155
G	13	11	6	55	60	30
H	13	11	6	55	60	30
I	2.8	2.7	2.5	2.8	2.7	7
J	2.8	2.7	2.5	2.8	2.7	7
K	10	10	10	45	40	51
L	10	10	10	45	40	51

	2-Magnet Pallet Enabled at a Standstill			2-Magnet Pallet at Peak Force[a]		
Location	**X**	**Y**	**Z**	**X**	**Y**	**Z**
M	19	12	45	45	69	115
N	19	12	45	45	69	115
O	9	13	10	25	43	23
P	9	13	10	25	43	23
Q	8	8	23	180	249	221
R	17	3	21	140	268	171
S	13	15	32	180	200	155

a. Peak force measurements are captured when the coils are at maximum current. This electromagnetic field is a momentary field that could exist during acceleration at the maximum rate for a given payload.

3-Magnet Pallet Magnetic Measurement Values

All measurements in the following table are in Gauss units.

See *Pallet Magnetic Field Strength Measurement Locations* on page 276 for the magnetic field strength measurement locations, and *Frame of Reference* on page 3 for a description of X, Y, and Z.

	3-Magnet Pallet Enabled at Standstill			3-Magnet Pallet at Peak Force[a]		
Position	**X**	**Y**	**Z**	**X**	**Y**	**Z**
A	75	94	62	110	101	85
B	18	19	29	23	19	31
C	75	94	62	110	101	85
D	116	70	180	1210	270	606
E	250	38	280	1400	450	1135
F	64	65	90	260	96	100
G	40	50	19	43	53	24
H	40	50	19	43	53	24
I	5	4.5	5	5	4.5	6
J	5	4.5	5	5	4.5	6

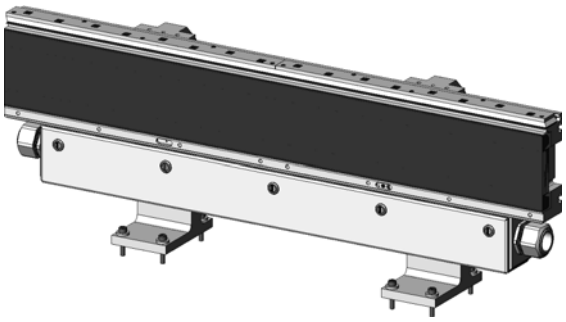
	3-Magnet Pallet Enabled at Standstill			3-Magnet Pallet at Peak Force[a]		
Position	**X**	**Y**	**Z**	**X**	**Y**	**Z**
K	90	90	128	90	112	157
L	90	90	128	90	112	157
M	124	31	120	134	31	140
N	124	31	120	134	31	140
O	22	38	3	22	39	4
P	22	38	3	22	39	4
Q	116	70	180	1210	270	606
R	250	38	280	1400	450	1135
S	64	65	90	260	96	100

a. Peak force measurements are captured when the coils are at maximum current. This electromagnetic field is a momentary field that could exist during acceleration at the maximum rate for a given payload.

Straight Section with FME Data Sheet

The straight section with front mounted electronics (FME) generates and regulates the electromagnetic field for the pallets.

Features

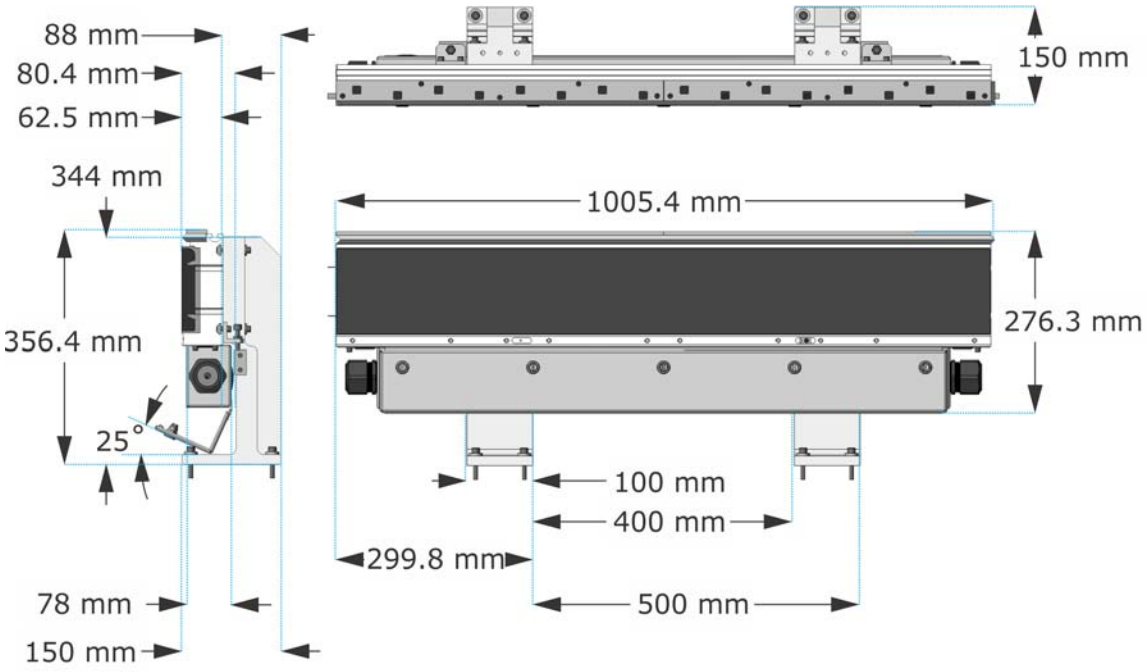


- Bevels on the upper v-rail overlap at SuperTrak conveyor section transitions to provide a smooth, low-vibration transport surface for pallets.
- Mountable in a vertical (over/under) orientation.
- Includes:
    - Encoders for contact-free position tracking of pallets.
    - Eight (8) slots for mounting brackets, cable ducts, and other tooling.
    - Two (2) stands for stable mounting on a base frame and smooth height adjustment.
    - Accessible electronics with door.
- Requires minimal maintenance (weekly cleaning of the flat wear strip).

Part Numbers

Part	Part Number
Straight section (with stands)	1060391
Straight section (without stands)	1060387-S

Dimensions



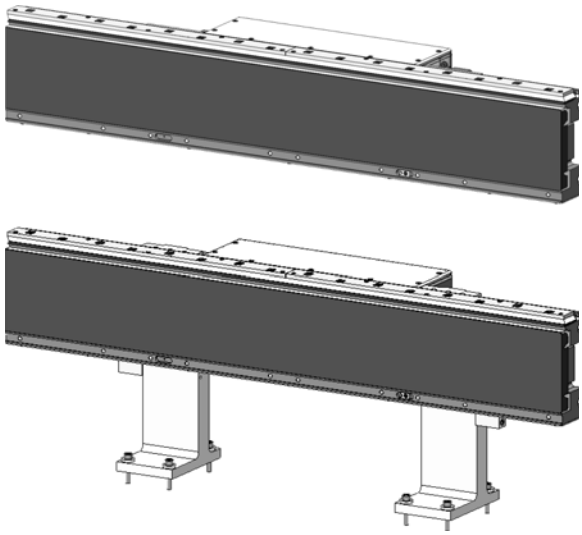
Technical Specifications

Specification	Value
24V digital bus FLA	250mA
Accelerating force (max.)	• 120 N (with 2-magnet pallets) • 160 N (with 3-magnet pallets)
Material	Aluminum anodized, stainless steel, polyamide (PA), polycarbonate (PC), epoxy resin.
Peak FLA (Amps) on 28VDC motor bus	100A
Voltage	• 28 VDC (motor) • 24 VDC (digital)
Weight	• 40.8233 kg (90 lbs) without stands • 50.8023 kg (112 lbs) with stands

Straight Section with RME Data Sheet

The straight section with rear mounted electronics (RME) generates and regulates the electromagnetic field for the pallets.

Features

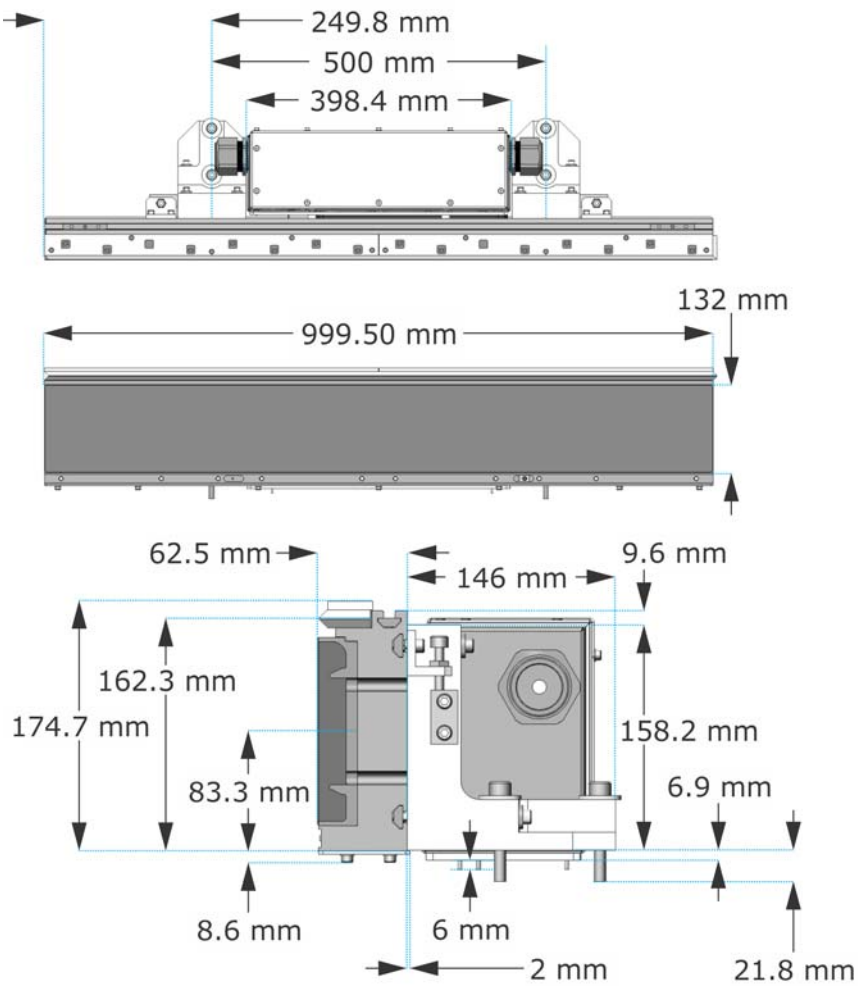


- Bevels on the upper v-rail overlap at SuperTrak conveyor section transitions to provide a smooth, low-vibration transport surface for pallets.
- Access to the electronics from the front is not required, since the electronics are mounted in the rear.
- Low stands allow for a low profile installation.
- Includes:
    - Encoders for contact-free position tracking of pallets.
    - Eight (8) slots for mounting brackets, cable ducts, and other tooling.
    - Two (2) stands for stable mounting on a base frame and smooth height adjustment.
    - Rear mounted electronics, to allow for a horizontal or vertical (also known as over/under) installation.
- Options include:
    - Tall stands (TS)
    - Low stands (LS)
- Requires minimal maintenance (weekly cleaning of the flat wear strip).

Part Numbers

Part	Part Number
Straight section (with rear mounted electronics)	125414648

Dimensions



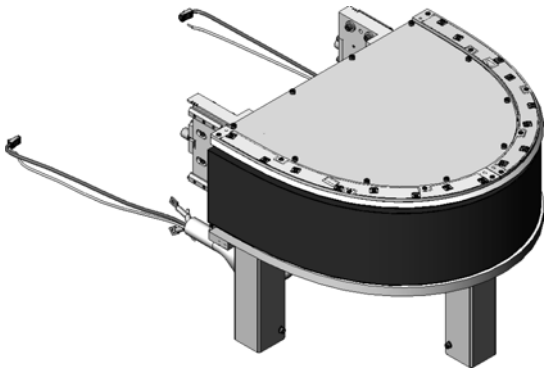
Technical Specifications

Specification	Value
24V digital bus FLA	250mA
Accelerating force (max.)	• 120 N (with 2-magnet pallets) • 160 N (with 3-magnet pallets)
Material	Aluminum anodized, stainless steel, polyamide (PA), polycarbonate (PC), epoxy resin.
Peak FLA (Amps) on 28VDC motor bus	100A
Voltage	• 28 VDC (motor) • 24 VDC (digital)
Weight	• 41 kg (90.4 lbs) without stands • 52 kg (114.6 lbs) with stands

180 Deg. Section (500 mm) with TS Data Sheet

The 180 deg. section with TS (tall stands) generates and regulates the electromagnetic field for the pallets.

Features

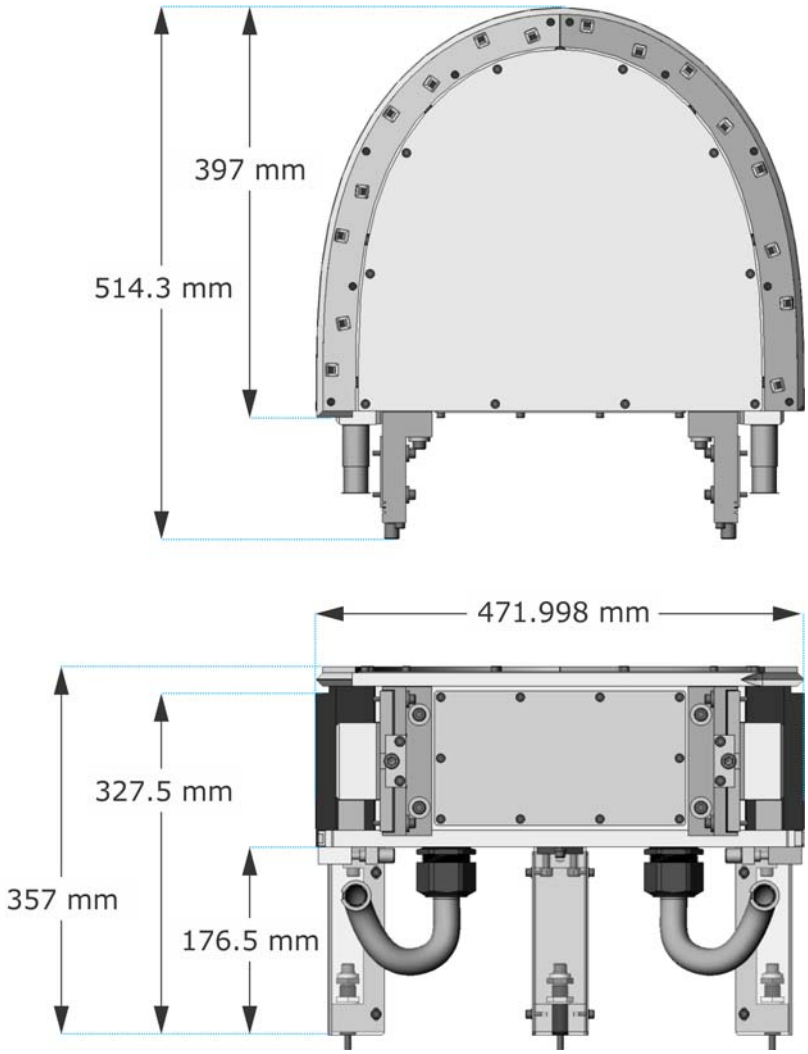


- Bevels on the upper v-rail overlap at SuperTrak conveyor section transitions to provide a smooth, low-vibration transport surface for pallets.
- Mountable in an upright, or vertical over/under orientation.
- Includes:
    - Encoders for contact-free position tracking of pallets.
    - Slot for power supply cable access.
    - Three (3) stands for stable mounting on a base frame, and smooth height adjustment.
    - Accessible electronic box by removing a cover.
- Requires minimal maintenance (weekly cleaning of the flat wear strip).

Part Numbers

Part	Part Number
180 deg. section	1060638
24V digital bus FLA	250mA
Peak FLA (Amps) on 28VDC motor bus	100A

Dimensions



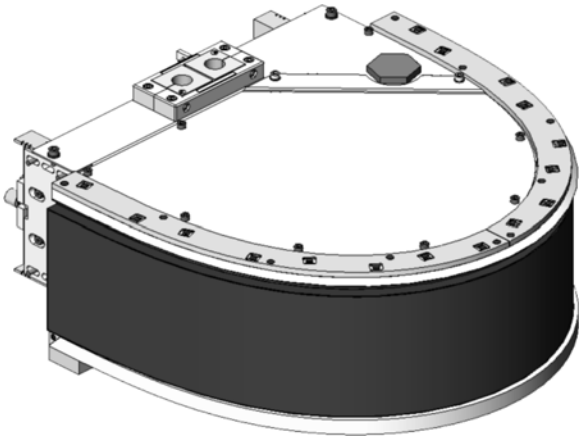
Technical Specifications

Specification	Value
Acceleration	See *Pallet Linear Acceleration Vs. Payload* on page 273.
Material	Aluminum anodized, stainless steel, polyamide (PA), polycarbonate (PC), epoxy resin.
Voltage	• 28VDC (motor) • 24VDC (digital)
Weight	65 kg (143.3 lbs)

180 Deg. Section (500 mm) with LS Data Sheet

The 180 deg. section with LS (low stands) generates and regulates the electromagnetic field for the pallets.

Features

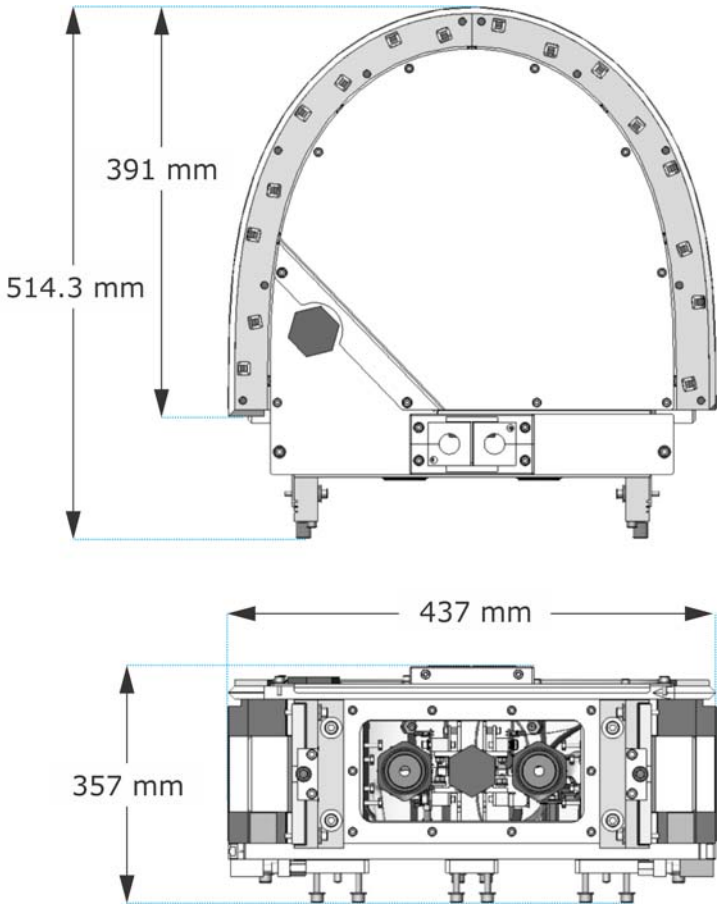


- Bevels on the upper v-rail overlap at SuperTrak conveyor section transitions to provide a smooth, low-vibration transport surface for pallets.
- Mountable in an upright, or vertical over/under orientation.
- Includes:
    - Encoders for contact-free position tracking of pallets.
    - Slot for power supply cable access.
    - Three (3) stands for stable mounting on a base frame, and smooth height adjustment.
    - Accessible electronic box by removing a cover.
- Options include:
    - Tall stands
    - Low stands
- Requires minimal maintenance (weekly cleaning of the flat wear strip).

Part Numbers

Part	Part Number
180 deg. section	125420930
24V digital bus FLA	250mA
Peak FLA (Amps) on 28VDC motor bus	100A

Dimensions



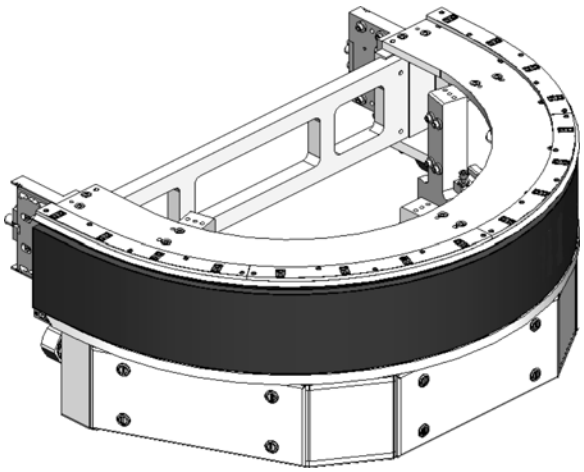
Technical Specifications

Specification	Value
Acceleration	See *Pallet Linear Acceleration Vs. Payload* on page 273.
Material	Aluminum anodized, stainless steel, polyamide (PA), polycarbonate (PC), epoxy resin.
Voltage	• 28VDC (motor) • 24VDC (digital)
Weight	64 kg (141.1 lbs)

180 Deg. Section (800 mm)

The 180 deg. section (800 mm) generates and regulates the electromagnetic field for the pallets.

Features

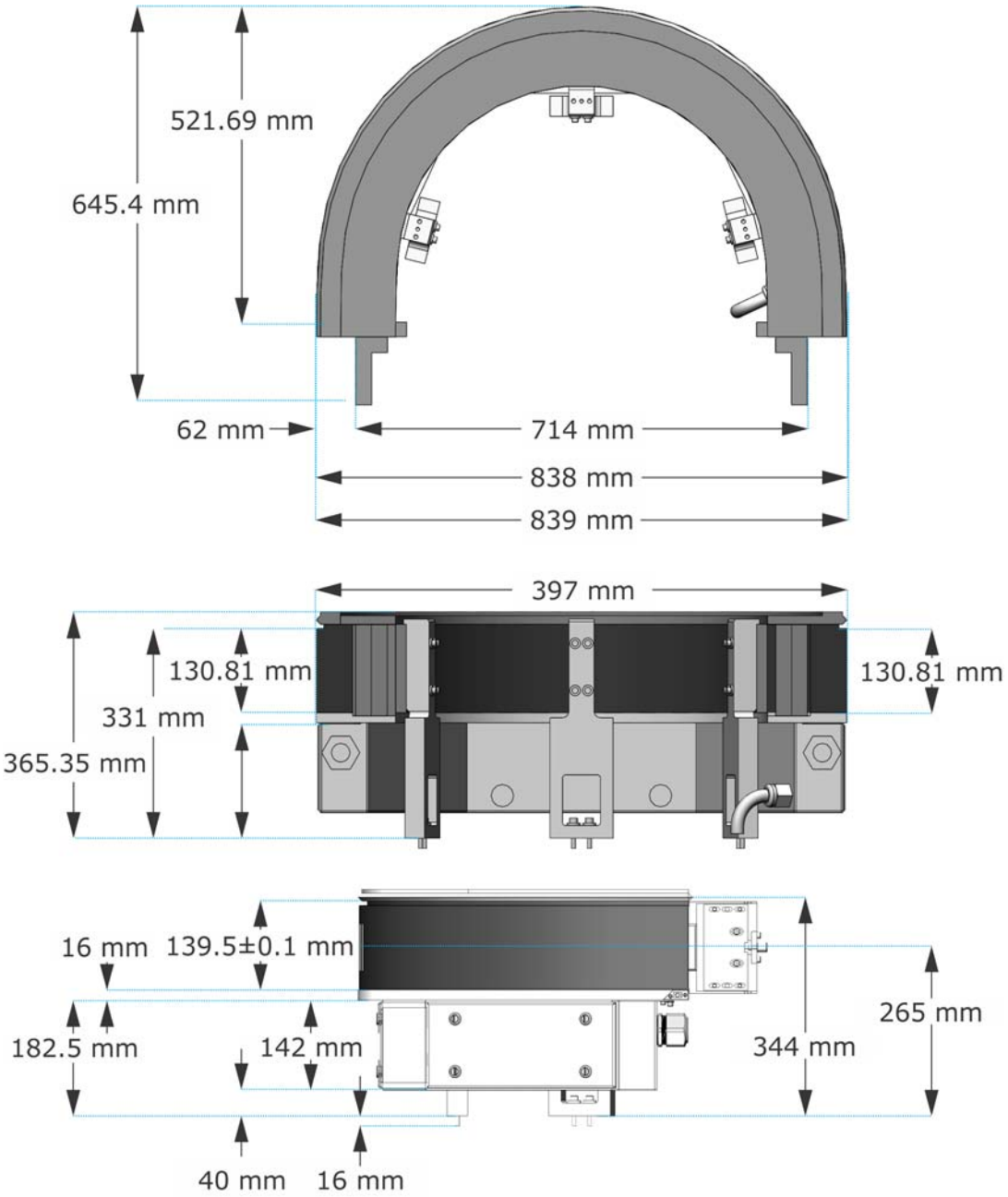


- Bevels on the upper v-rail overlap at SuperTrak conveyor section transitions to provide a smooth, low-vibration transport surface for pallets.
- Includes:
  - Encoders for contact-free position tracking of pallets.
  - Slot for power supply cable access.
  - Three (3) stands for stable mounting on a base frame, and smooth height adjustment.
  - Accessible electronic box by removing a cover.
- Requires minimal maintenance (weekly cleaning of the flat wear strip).

Part Numbers

Part	Part Number
180 deg. section	25232698
24V digital bus FLA	500mA
Peak FLA (Amps) on 28VDC motor bus	150A

Dimensions


521.69 mm
645.4 mm
62 mm
714 mm
838 mm
839 mm
397 mm
130.81 mm
331 mm
365.35 mm
130.81 mm
16 mm
139.5±0.1 mm
182.5 mm
142 mm
344 mm
265 mm
40 mm
16 mm

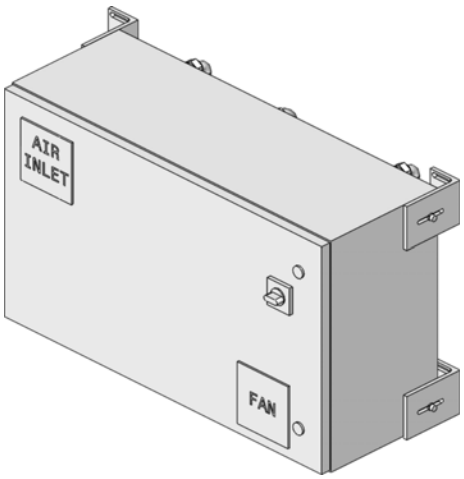
Technical Specifications

Specification	Value
Acceleration	See *Pallet Linear Acceleration Vs. Payload* on page 273.
Material	Aluminum anodized, stainless steel, polyamide (PA), polycarbonate (PC), epoxy resin.
Voltage	• 28VDC (motor) • 24VDC (digital)
Weight	109.8 kg (242 lbs)

Control Panel Data Sheet

The control panel provides controls for monitoring individual modules and pallets.

Features



- System-specific emergency stop safety circuits can be implemented into the existing safety switching device accessories.
- Available in two (2) options:
  - 400Y230 VAC
  - 208Y120 VAC
- Includes:
  - An uninterruptible power supply (UPS).
  - Two (2) air filters.
  - An open programmable logic controller (PLC) interface (for example, PROFINET, EtherNet/IP, EtherCAT).

Part Number

The control panel part number is configurable; it consists of five parts:

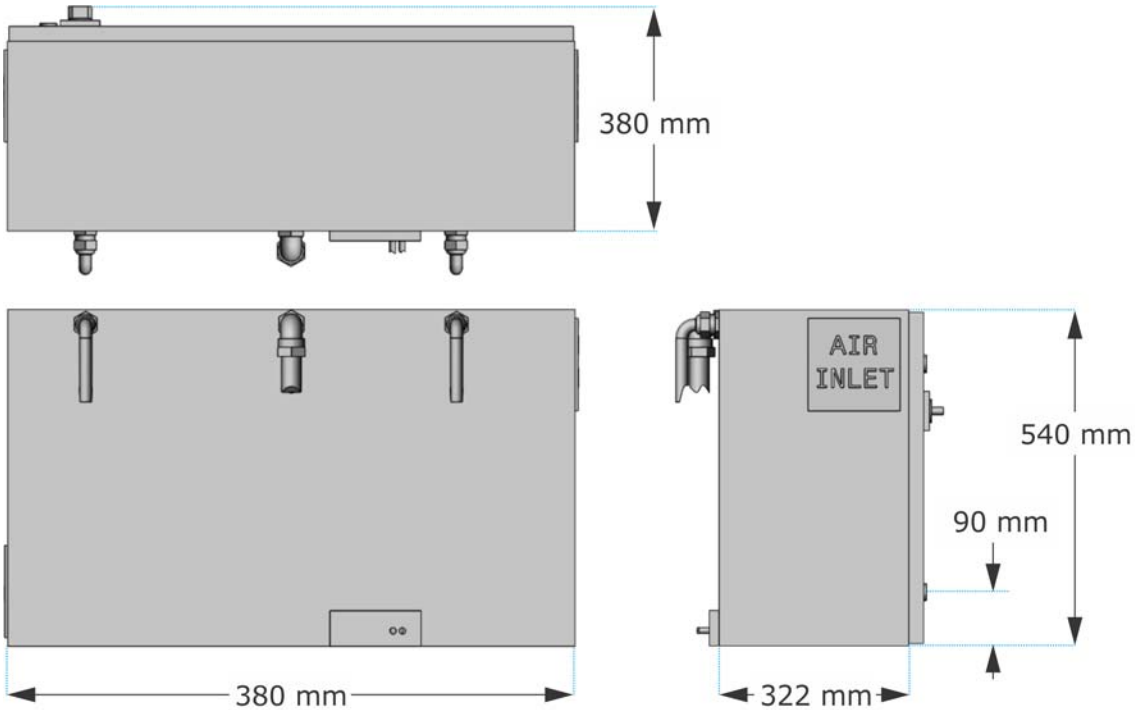
[A-Base Panel]-[B-Breaker Kit]-[C-Communication]-[D-PC]-[P5-Expansion]

The following table provides the values for each of the five parts:

Part Number Part	Description	Code
A - Base Panel	Base panel code	25202161
B - Breaker Kit	208Y120VAC	NA
	400Y230VAC	EU
C - Communication	PROFINET	PR
	EtherNet/IP	EI
	EtherCAT	EC
	PowerLink	N
D - PC	Standard celeron-based controller	C
	Upgraded I5-based controller	I5
P5 - Expansion	Expansion	E6

For example, 25202161-EU-PR-C-E6, and 25202161-NA-EI-I5-E6

Dimensions



Technical Specifications

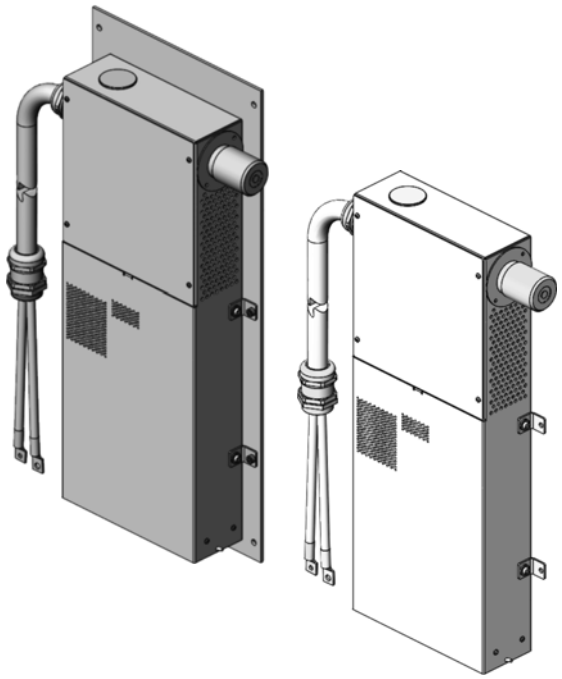
Specification	Value	
	EU	NA
Control voltage	• 24VDC (digital power supplied from the control panel) • 28VDC (motor power supplied from the power supplies)	
Frequency	50/60 Hz	
Full load amps	36A	
Largest load	20A	
Line voltage	400Y230VAC+PE	208Y120VAC+PE
Materials	Steel sheet, lacquered, RAL7024, polyamide (PA)	
Phases	3 ph, 5-wire	
Short circuit current rating	5kA	
UPS current rating	15A	
UPS frequency	50/60 Hz	
UPS line voltage	24VDC	
Weight	70 kg (154.3 lbs)	

Power Supply Data Sheet

The power supply supplies power to straight sections and 180 deg. sections.

Features

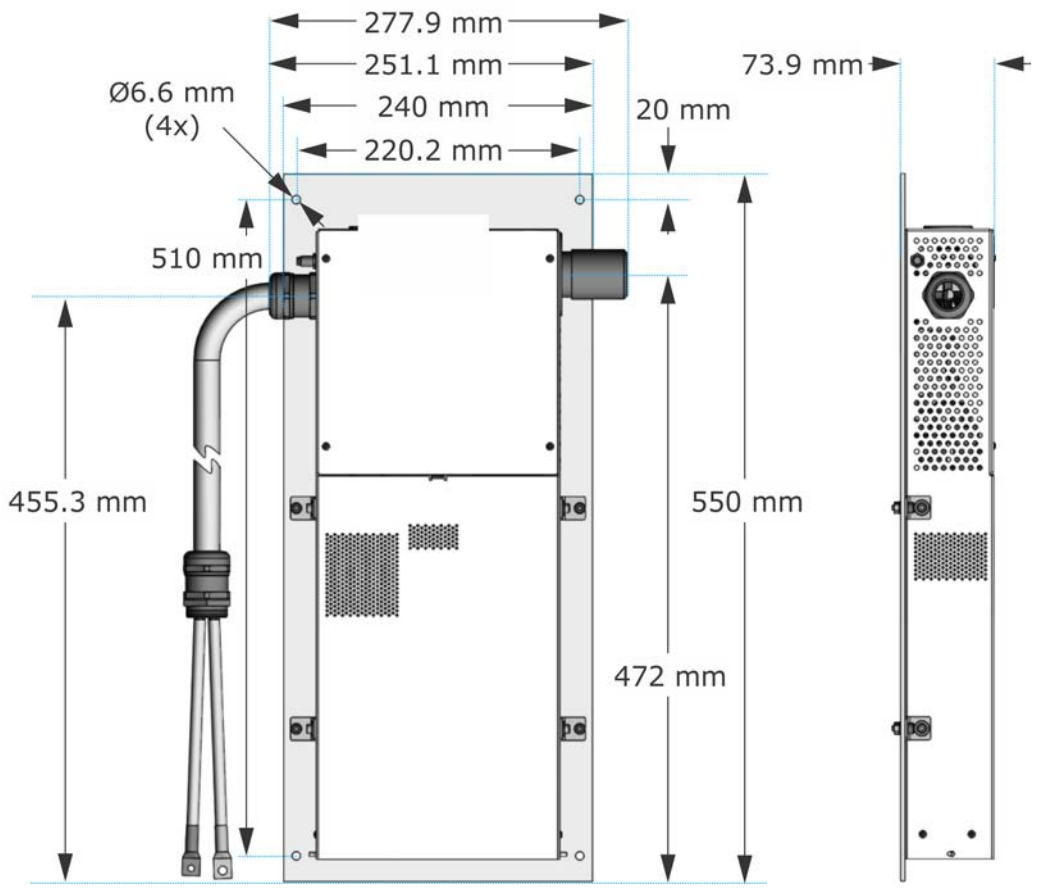
- Provides a modular power system; adjust the number of SuperTrak conveyor power supplies based on the size and requirements of the system.
- Includes:
  - A 28VDC power output cable.
  - An AC power input plug.
  - One (1) air filter.
  - Connection cable for PLC monitoring (24V).
  - One (1) mounting plate and screws.
  - Four (4) mounting brackets.



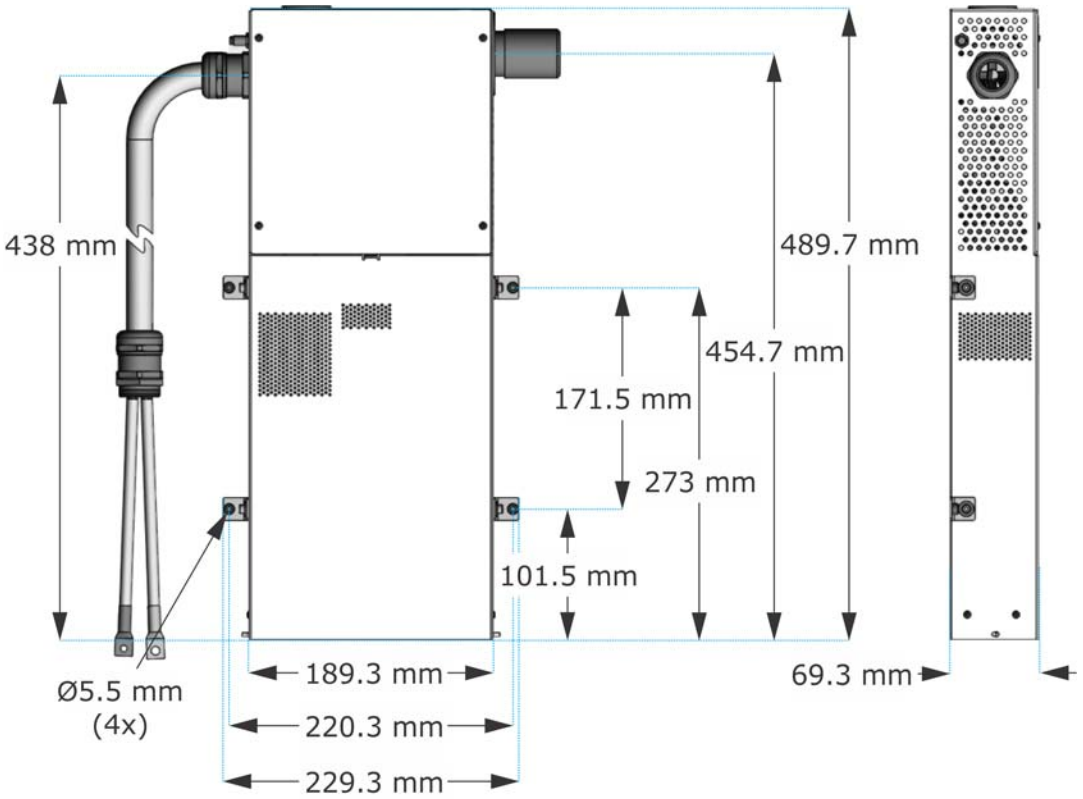
Part Numbers

Part	Part Number
Power supply (with a mounting plate)	25195828
Power supply (without a mounting plate)	25270337

Dimensions (with back plate)



Dimensions (without back plate)



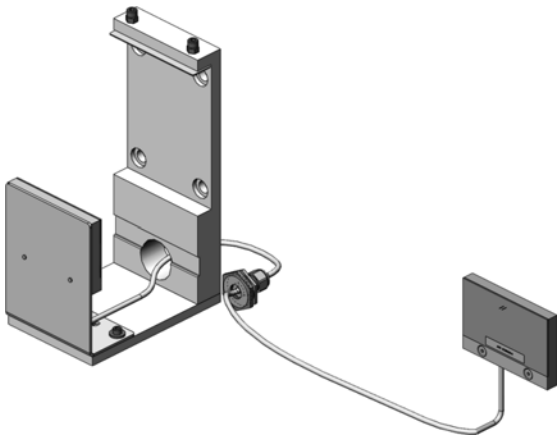
Technical Specifications

Specification	Value
Cable length	1500 mm (59.05 in.)
Class	IP20
Frequency	50/60Hz
Main voltage (input)	200-240VAC
Material	Aluminum, brass, nickel-plated, polyamide (PA), PUR
Max. number of power supplies	Application-dependent
Max. power	1500W
Power supply (output)	28VDC
Power supply with mounting plate	9 kg (20 lbs)

IR Reader Components (Optional) Data Sheet

The infrared (IR) components are optional. The IR reader mount assembly allows for easy installation of the IR reader on a SuperTrak conveyor. The IR tags assign a customized pallet ID to each pallet, and the IR reader tracks pallet positions.

Features

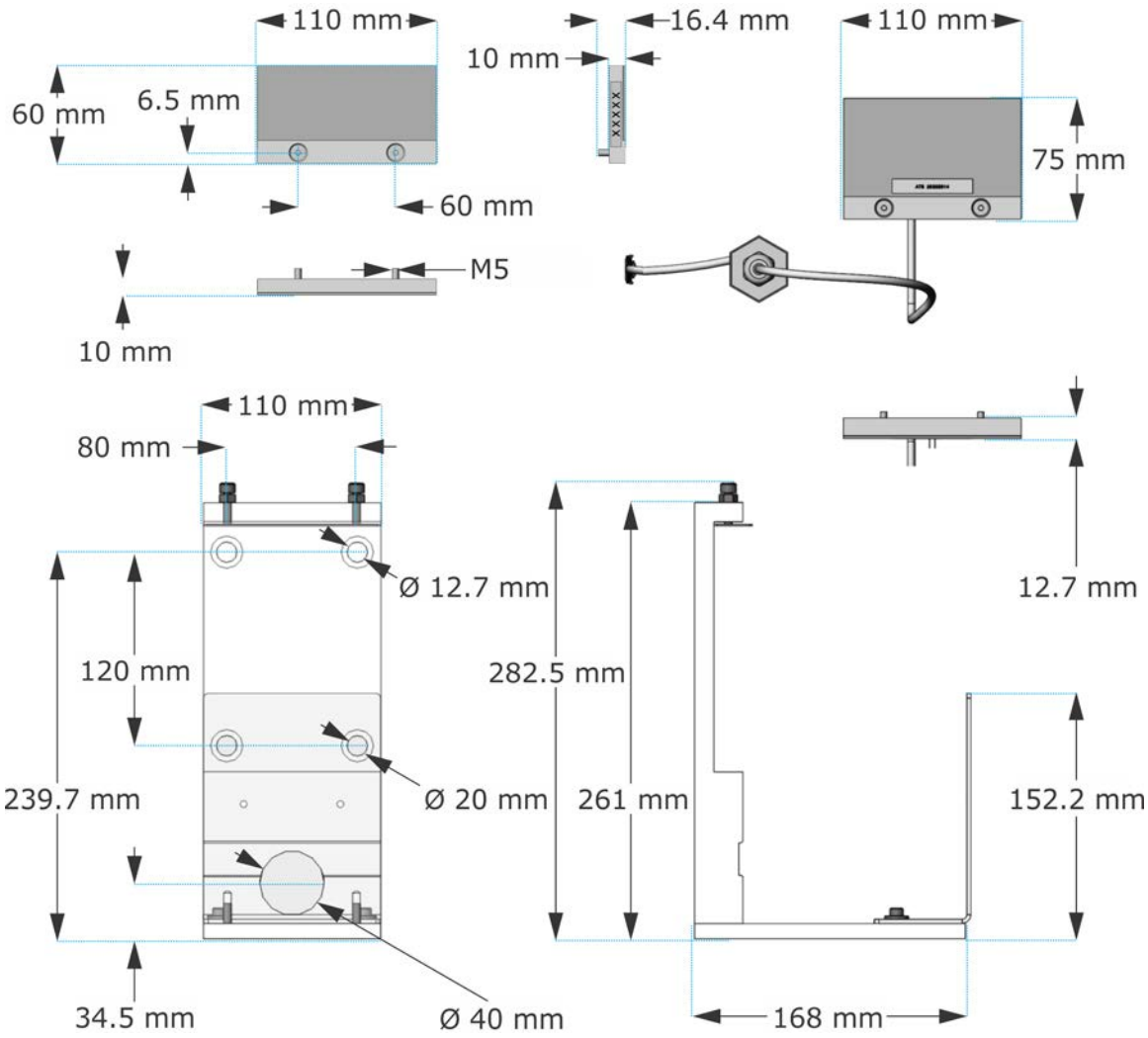


- Simplifies SuperTrak conveyor recovery after a complete cold start.
- Provides data integrity when pallets are manually removed.
- Provides tracking of individual pallets.
- Allows pallet IDs to be read “on-the-fly”: pallets do not stop at the IR reader assembly.
- Batteries are not required. The assembly induces the necessary power into the tags for reading purposes.
- External PLC programming is not required. Integration of the IR reader assembly with the SuperTrak conveyor is plug-and-play.
- Options include:
    - IR tag (read-only)
    - IR reader
    - IR reader mount assembly

Part Numbers

Part	Part Number
IR reader (no mount)	SP-25202314
IR reader mount assembly (with IR reader)	25202309
IR reader mount assembly (without IR reader)	SP-4727653
IR tag (read-only)	SP-1061122

Dimensions



Technical Specifications

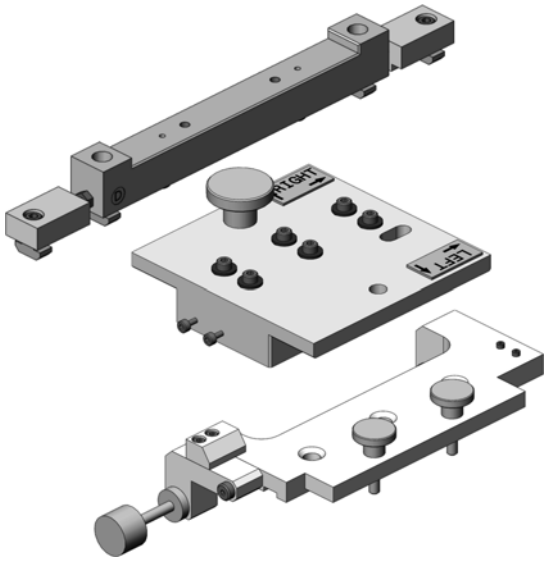
Specification	Value		
	IR Tag	IR Reader Head	Assembly Mount
Laser		Class 1	
Mass	0.1 kg (0.2 lbs)	0.3 kg (0.7 lbs)	2.4 kg (5.3 lbs)
Material	Polyoxymethylene (POM)	polyoxymethylene (POM), brass, nickel-plated, PVC	Aluminum, anodized, steel

Pallet Setup Tools (Optional) Data Sheet

The pallet setup tools are optional SuperTrak conveyor tools that allow you to align and calibrate pallet encoder strips.

Features

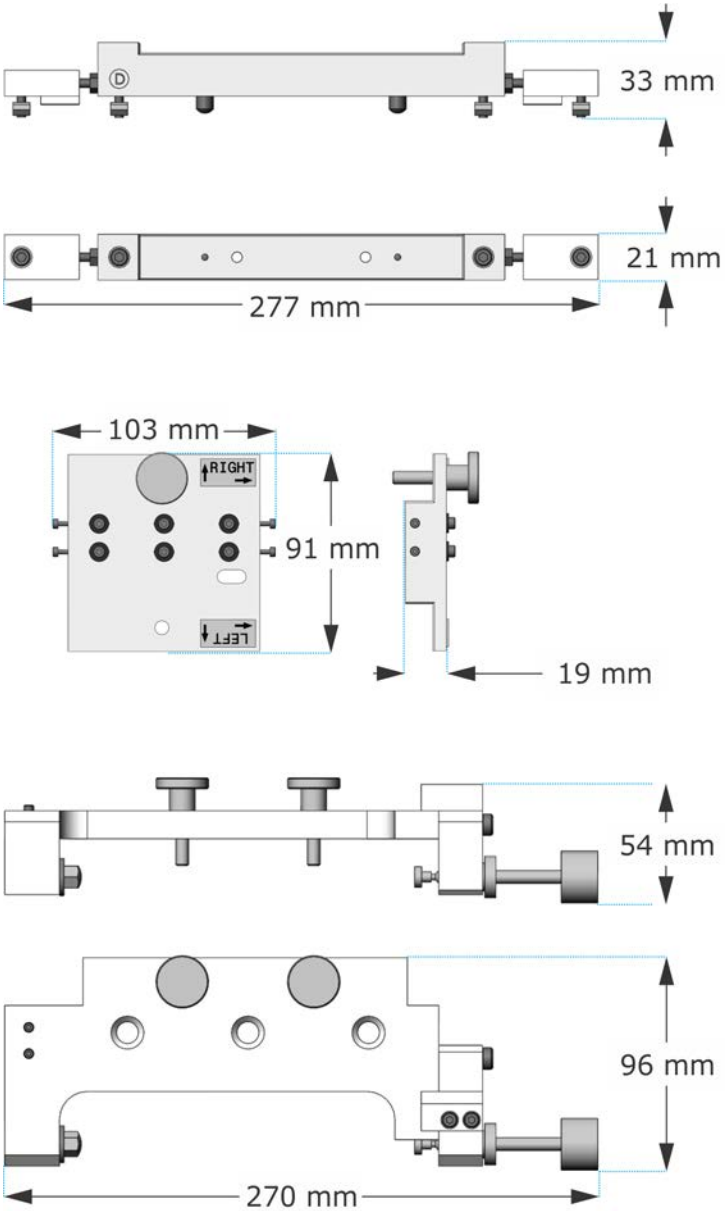
- Provides easy alignment and calibration of pallet encoder strips.
- Includes the following tools:
  - Pallet setup stationary mount, which provides a fixed mounting surface for the pallet setup tools.
  - Pallet setup adjustable chip finder, which accurately positions a pallet setup stationary mount in relation to a defined encoder.
  - Pallet setup removable locate, which allows for adjustment of the pallet encoder bracket.



Part Numbers

Part	Part Number
Pallet setup tools	4736082

Dimensions



Technical Specifications

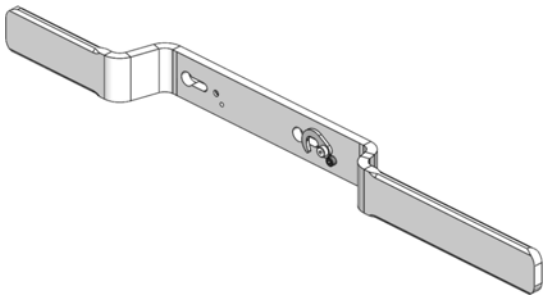
Specification	Value
Mass	2.2 kg (4.9 lbs)
Material	Aluminum, steel

Pallet Removal Tool (Optional) Data Sheet

The pallet removal tool allows for quick and easy removal of pallets from straight sections or 180 deg. sections.

Features

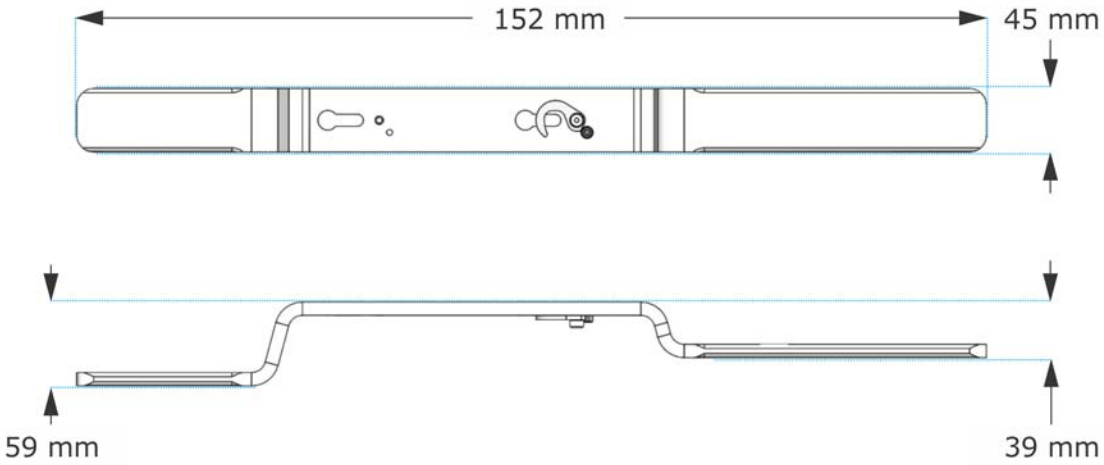
- Provides leverage to easily overcome the magnetic forces of the pallets.
- Includes a locking latch to safely secure the pallet.



Part Numbers

Part	Part Number
Pallet removal tool	25172729

Dimensions



Technical Specifications

Specification	Value
Material	Aluminum
Weight	0.8 kg (1.76 lbs)

Prolato Bases (Frames)

The prolato base provides a stable adjustable mounting base for straight sections and 180 deg. sections.

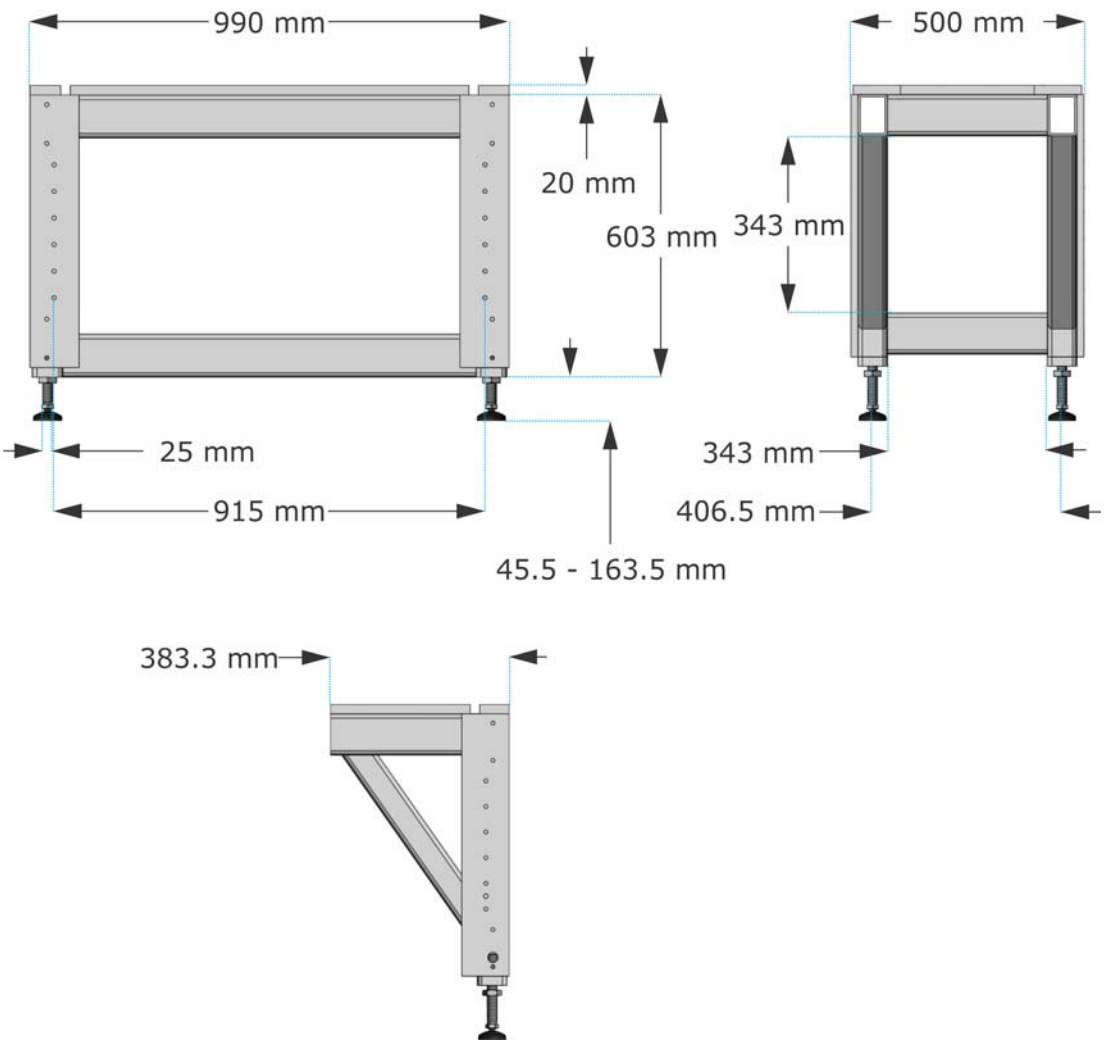
Features

- Solidly welded frame.
- Available in two (2) versions:
  - 1 m for mounting straight sections or 180 deg. sections.
  - 180 deg. mount for mounting 180 deg. sections.
- Includes:
  - Adjustable leveling feet.
  - Threaded holes for attaching 180 deg. plates, cross-braces, side connection plates, and control panels.

Part Numbers

Part	Part Number
Prolato base - 1 m	125354246
Prolato base - 180 deg. mount	125354247

Dimensions



Technical Specifications

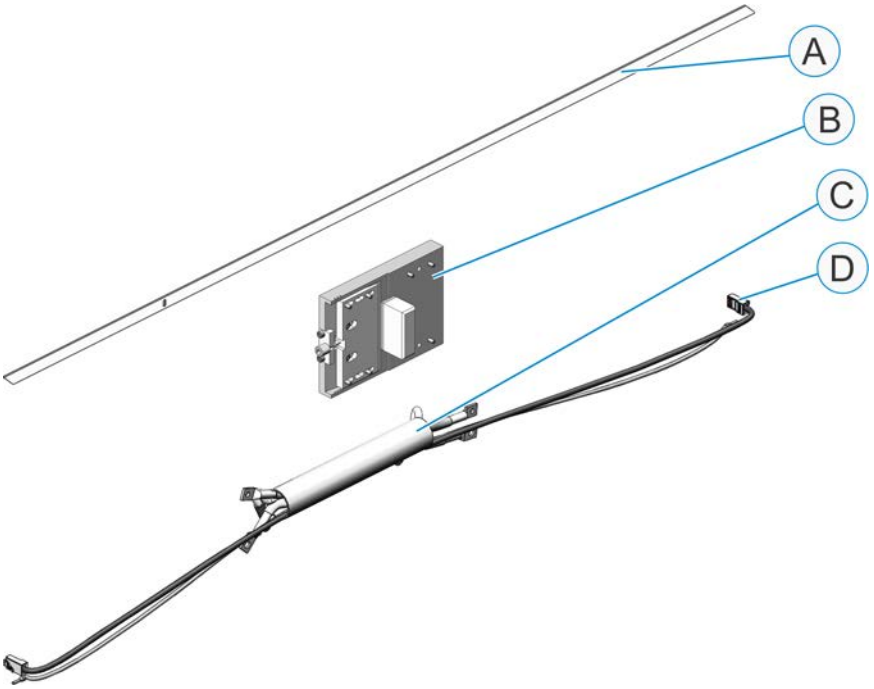
Specification	Value	
	Prolato Base - 1 m	Prolato Base - 180 Deg. Mount
Mass	135 kg (297.6 lbs)	62 kg (136.7 lbs)
Material	Steel lacquered RAL7024, zinc die casting, steel, galvanized	

Interconnect Kit (Straight Section to Straight Section)

The interconnect kit provides all the necessary hardware to physically connect two (2) adjacent straight sections with FME mechanically, electrically, and functionally.

Features

The following items are included:



A	Flat rail	**C**	Straight-to-straight electrical interconnect
B	Wedge adjust	**D**	Ethernet network cable[a]

Part Numbers

Part	Part Number
Ethernet network cable[a]	SP-3708400
Interconnect kit	4217881
Straight-to-straight electrical interconnect	SP-1060659
Wear strip	SP-1060669
Wedge adjust	SP-1060643

a. The Ethernet network cable is included with the straight-to-straight electrical interconnect, but is also offered separately because it may be damaged during assembly or maintenance.

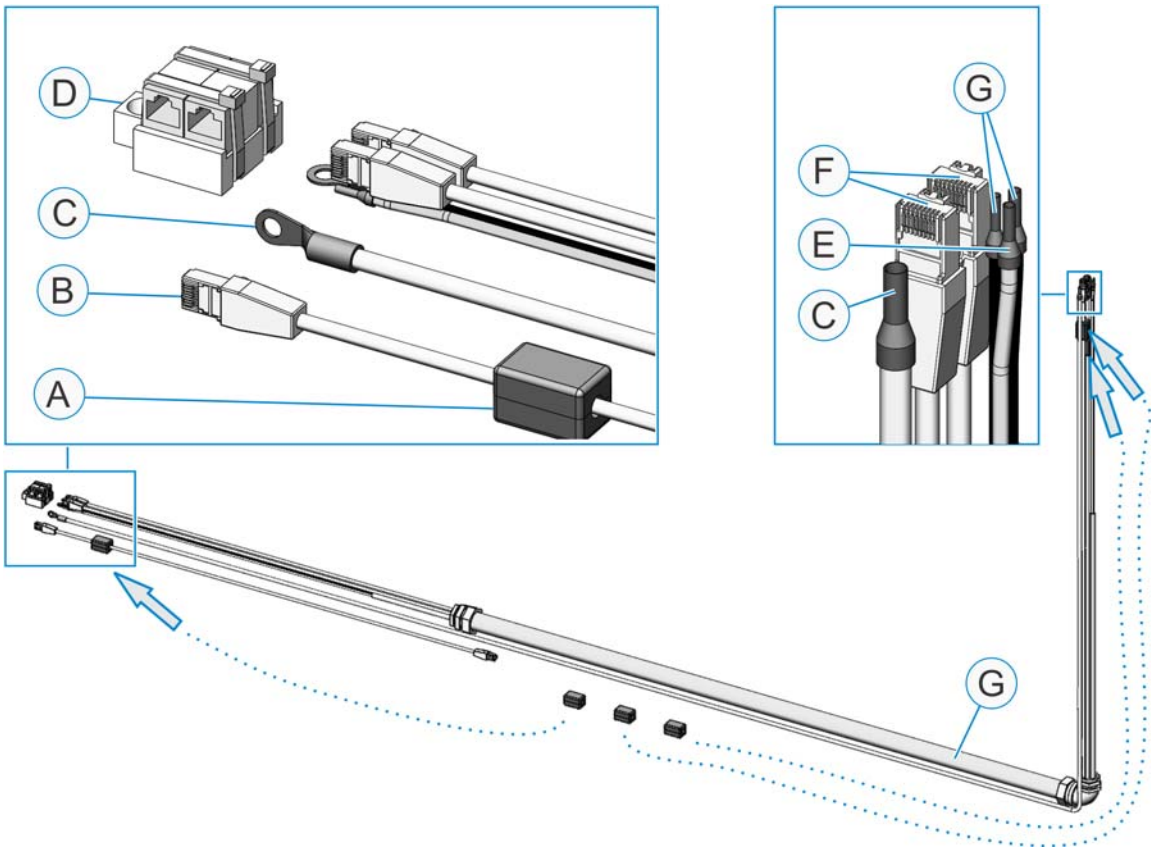
Interconnect (SuperTrak Control Panel to 180 Deg. Section)

The control panel to 180 deg. section interconnect provides the wires that are required between the 180 deg. section and the control panel.

See *Gateway Network Connections* on page 110.

Features

The following items are included:



A	Ferrite (1 of 3)	**E**	Common connection
B	Left network patch cable	**F**	Two (2) 3 m[a] Ethernet cables - left and right network cables
C	24VDC digital power	**G**	3 m[a] ground cable[b]
D	F-F coupler (1 of 2)	**H**	1.2 m[c] Conduit

a. Optional length of 7.6 m.

b. The ground wire is 16 AWG.

c. Optional lengths of 2 m, and 6.5 m.

Part Numbers

Part	Part Number
1.2 m control panel to 180 deg. section interconnect	25240470
2 m control panel to 180 deg. section interconnect	125362696
6.5 m control panel to 180 deg. section interconnect	25221246

Appendix D: Unit Conversions

To Convert	Into	Multiply By
psi	kPa	6.8948
psi	bar	0.068947
psi	inHg	2.03602
kPa	psi	0.145038
kPa	bar	0.01
kPa	inHg	0.295301
bar	psi	14.503773773
bar	KPa	100.0
bar	inHg	29.5301
inHg	psi	0.491154
inHg	kPa	3.38638816
inHg	bar	0.03386388158
Gs	mT	0.1
cm	in.	0.3937
in.	cm	2.54
m	ft	3.2808
ft	m	0.3048

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