

# Installation Instructions

Original Instructions



**Allen-Bradley**

by ROCKWELL AUTOMATION

## iTRAK 5730 System Starter Kit

Catalog Numbers 2198T-SK-06-05, 2198T-SK-12-10

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The iTRAK® 5730 Starter kits provide an assembled iTRAK 5730 system and control cabinet ready to help you develop your new machine. The iTRAK 5730 Starter kit is intended for industrial use only.

Use the instructions in this publication and the iTRAK 5730 System User Manual, publication [2198T-UM003](#), to complete the installation and startup of an iTRAK 5730 System Starter kit. For a complete list of recommended publications, see [Additional Resources](#) on page 24.

The iTRAK 5730 System Starter kit was assembled in accordance with the requirements outlined in the iTRAK 5730 System User Manual, publication [2198T-UM003](#), and offers Add On Instructions (AOI) to demonstrate safe torque-off (STO) and Timed SS1 safety functions. These AOIs have been developed for reference only and are not considered as a part of the product functional safety certification. Therefore, use of any such AOIs are not considered sufficient to achieve risk reduction of hazards identified in the machine risk assessment without additional measures. For configuration and commissioning of the STO or Timed SS1 safety functions for this purpose, please see the iTRAK 5730 System User Manual, publication [2198T-UM003](#).

## Product Advisories

Read the following precautions before you begin installation of the product.

### Personal Safety



**ATTENTION:** Only qualified personnel familiar with linear motion equipment and associated machinery should plan or implement the installation, startup, and subsequent maintenance of the system. Failure to comply can result in personal injury and/or equipment damage.



**ATTENTION:** Hazardous voltages are present when power is applied to the iTRAK 5730 system. Follow all power supply requirements and complete all electrical connections as described in these instructions. Operate the equipment within the ratings specified on the iTRAK 5730 system nameplates.



**ATTENTION:** The movers use strong magnets. There is risk of health hazard for persons with heart pacemakers, metal implants, and hearing aids while in proximity of magnetic components and the magnetic field produced by components. The magnetic field that is generated can disrupt the functionality of an automatic implantable cardioverter defibrillator (AICD). People with cardiac pacemakers must not work near the iTRAK 5730 system. Maintenance personnel must avoid the use of metallic tools and secure items such as badge clips and other personnel effects that could be attracted to the strong magnetic field. Strong magnets can erase magnetic media. Never let credit cards or electronic media contact or come near the mover or iTRAK 5730 system.



**ATTENTION:** A hazard of personal injury exists. The movers, which contain application loads, can have high acceleration. Machine guards and safety enclosures must be implemented to provide protection to personnel.

### Product Safety



**ATTENTION:** Operation of an iTRAK 5730 system must be for its intended use. Instructions for safe installation and operation of the iTRAK 5730 system are in the iTRAK 5730 System User Manual, publication [2198T-UM003](#). You are responsible for the product safety of your completed machinery. An incorrectly applied or installed iTRAK 5730 system can result in component damage or a reduction in product life.



**ATTENTION:** The iTRAK 5730 system contains electrostatic discharge (ESD) sensitive parts and assemblies. Static control precautions are required when you install, test, service, or repair this assembly. Component damage can result if ESD control procedures are not followed. If you are not familiar with static control procedures, reference Guarding Against Electrostatic Damage, publication [8000-4.5.2](#) or any other applicable ESD protection handbook.



**ATTENTION:** Operation of the movers with position and motor magnets must be for their intended use. Instructions for safe installation and operation of the movers with position and motor magnets are in the user manual. You are responsible for the product safety of your completed machinery. An incorrectly applied or installed mover with position and motor magnets can result in component damage or a reduction in product life.

## Open and Inspect the iTRAK 5730 Starter Kit

Remove the Phillips head screws that secure the top and front covers to the crate and remove the covers. If you intend to reuse the shipping crate for storage, retain the covers and bolts for reuse.

Open the crate and inspect the equipment for damage or missing items. If there is evidence of damage or loss, take the following actions:

- Note on the delivery receipt that the equipment being received is damaged or parts are missing.
- Contact the carrier that made the delivery and schedule an inspection.
- Inform your local Rockwell Automation representative that the equipment is damaged or parts are missing.
- Retain all product packaging for review by the carrier.

For further assistance, contact your Rockwell Automation representative.



The crate can be reused for storage, transport, and shipping.

### Product Storage

If you must store the iTRAK 5730 Starter kit before installation, take the following precautions:

- Do not store the equipment outdoors
- Do not store the equipment in a corrosive or humid environment
- If opened, reseal and store the equipment in the shipping container
- Store the equipment in a clean and dry location

## Parts Lists

Verify the contents of your iTRAK 5730 Starter kit.

### iTRAK 5730 System Starter Kit Catalog Number 2198T-SK-06-05

This kit contains these components:

- iTRAK 5730 system - approximate weight 103 kg (227 lb):
  - 600 mm straight track
  - 5 assembled movers: 2198T-VT0304-E
  - 2 metal shipping bars
- Power and control cabinet - approximate weight 86 kg (190.0 lb)
  - Compact GuardLogix® controller: 5069-L380ERMS2
  - Safety IO: 5069-IB8S, 5069-OBV8S
  - iTRAK Power Supply: 2198T-W25-ER
  - Kinetix® 5700 DC bus supply: 2198-P031
  - Kinetix 5500 line filter: 2198-DB20-F
  - Four, 3/8 in. screws and washers
- iTRAK 5730 system power cable, 6 m (19.7 ft): 2198T-CHBFLS8-12AA06
- Ethernet cable, M12 X-code, 5 m (16.4 ft): 1585D-E8TGJM-5

### iTRAK 5730 System Starter Kit Catalog Number 2198T-SK-12-10

This kit contains these components:

- iTRAK 5730 system - approximate weight 151 kg (333 lb):
  - 1200 mm straight track
  - 10 assembled movers: 2198T-VT0304-E
  - 2 metal shipping bars
- Power and control cabinet - approximate weight 86 kg (190 lb)
  - Compact GuardLogix controller: 5069-L380ERMS2
  - Safety IO: 5069-IB8S, 5069-OBV8S
  - iTRAK Power Supply: 2198T-W25-ER
  - Kinetix 5700 DC bus supply: 2198-P031
  - Kinetix 5500 line filter: 2198-DB20-F
  - Four, 3/8 in. screws and washers
- iTRAK 5730 system power cable, 6 m (19.7 ft): 2198T-CHBFLS8-12AA06
- Ethernet cable, M12 X-code, 5 m (16.4 ft): 1585D-E8TGJM-5

## Required Tools

This table provides a list of the tools that are required to assemble and install an iTRAK 5730 Starter Kit.

Tool	Details
Flat-nose screwdriver	3 mm (0.12 in.)
Phillips bit or screwdriver	#2
Hexagonal socket	10 mm (for infield covers), 3/8 in. (if the control cabinet is mounted)

## Required System Components

These items are not included with the iTRAK 5730 Starter kits and are required for installation:

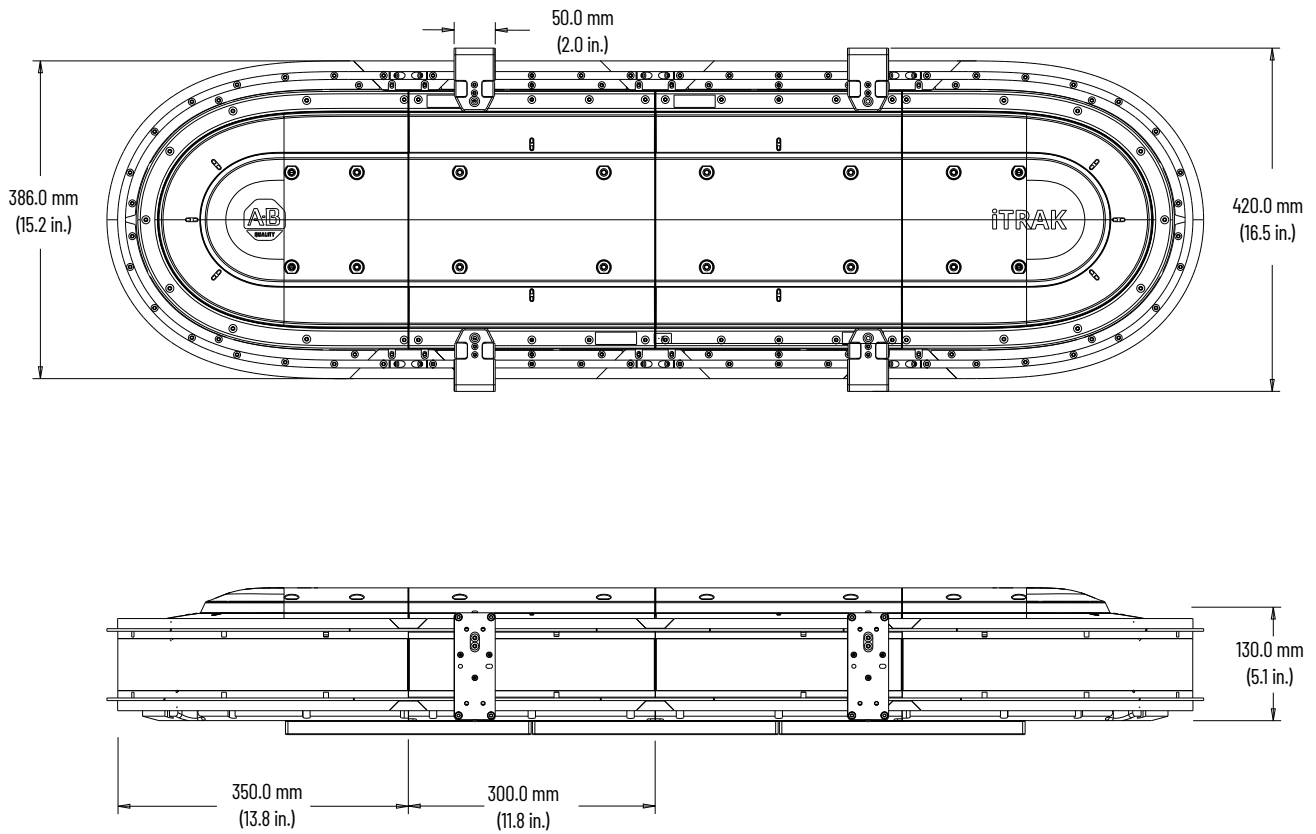
- A UL rated, 480V AC, 20 A, three-phase input power cable, 10 AWG (6.0 mm<sup>2</sup>) min.
- Cable (ring) terminals are recommended for termination of the three-phase power cable connections to the circuit breaker (CB1) in the power and control cabinet. See Wire Requirements on page 9 for cable (ring) terminal specifications.
- M6 x 16 mm lifting hardware is required to lift the iTRAK 5730 assembly into position for mounting.
- Proper lubrication is required to run the system. You can use your own lubrication system or purchase and install the lubrication kit 2198T-AL-SYS-4. See [Lubricate the Track on page 14](#) for more information.
- To program and start your iTRAK 5730 Starter Kit, use the Studio 5000 Logix Designer® application, version 33 or later. For resources that provide information on how to configure a Compact GuardLogix controller with the Studio 5000 Logix Designer application, see [Additional Resources on page 24](#).

## Product Dimensions

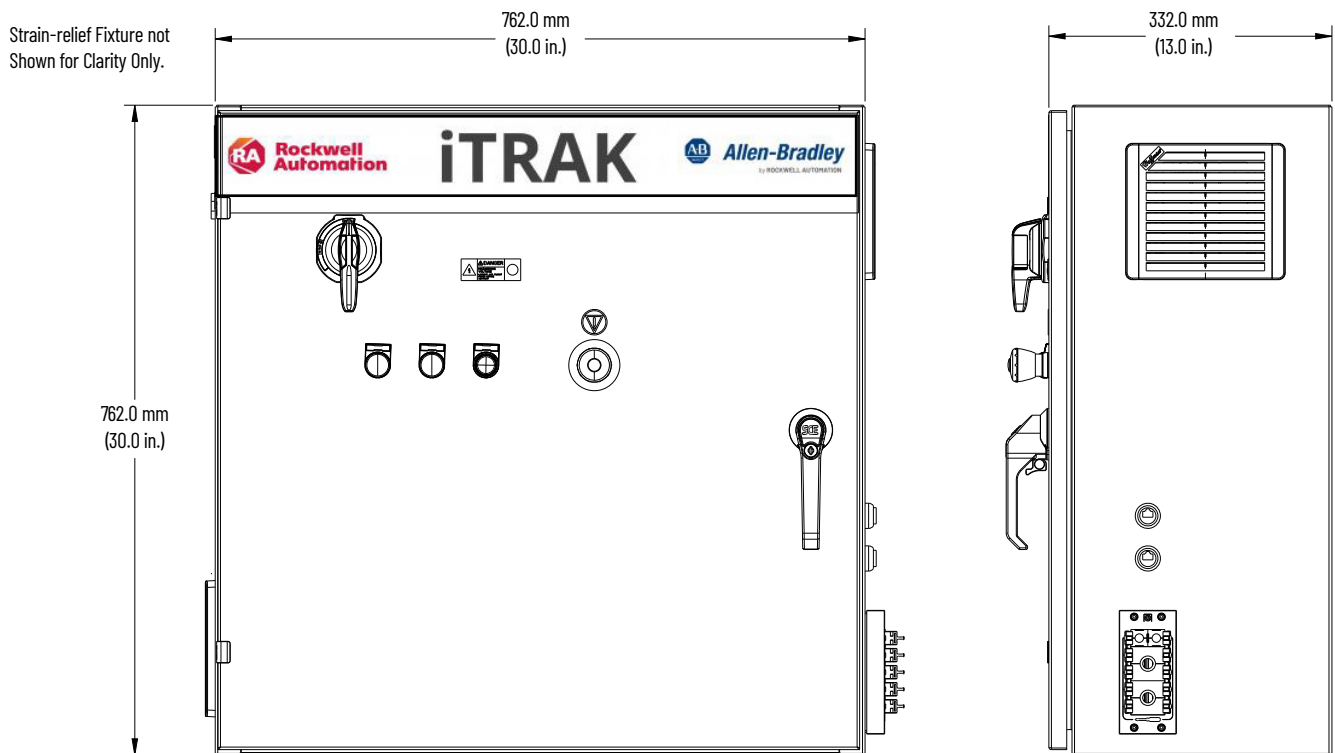
This section provides approximate dimensions for both of the iTRAK 5730 Starter kits.

**Figure 1 - iTRAK 5730 Starter Kit Track with Movers Approximate Dimensions**

2198T-SK-06-05 iTRAK 5730 Starter kit shown.



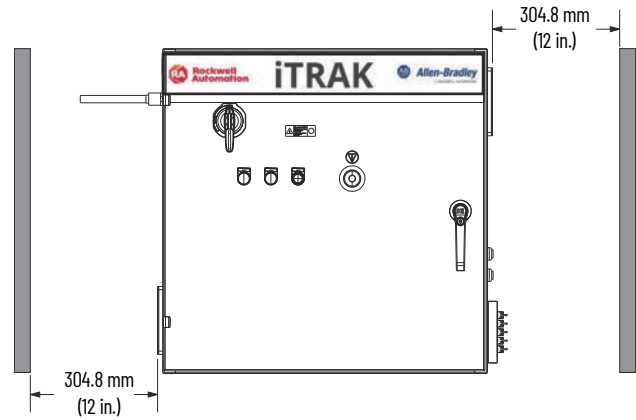
**Figure 2 - iTRAK 5730 Starter Kit Power and Control Cabinet Approximate Dimensions**



## Site Requirements

Read the Safety Information section in Chapter 1 of the iTRAK 5730 System User Manual, publication [2198T-UM003](#), for important safety and installation guidance information, such as machine guarding and protection against magnetic and electromagnetic fields. Choose the location for the iTRAK 5730 Starter kit components installation following the safety information in the user manual and these considerations:

- Overall finished assembly dimensions
- Operator access to the control panel and E-stop
- Power source location
- Cable lengths
- Objects that can restrict airflow must be a minimum of 304.8 mm (12 in.) away from the control cabinet side air vents
- Stable and vibration-free surfaces that can support the assembly weight



**ATTENTION:** Improper use or modification of system components, failure to follow the safety instructions, or disabling safety devices can result in property damage, injury, electric shock, or death.

## Prepare to Lift and Mount the iTRAK 5730 Assembly

Follow these handling and mounting hole use instructions before you attempt to lift, transport, and mount the equipment.

### General Handling Instructions

Follow these handling instructions for an iTRAK 5730 assembly:

- Use properly rated equipment and M6 x 16 mm hardware to lift and move the product.
- Qualified professionals must inspect all lifting equipment before it is used to move the product.
- All lifting cables or straps must meet or exceed the maximum weight capacity requirements.
- Wear appropriate personal protection equipment (PPE), including gloves, safety glasses, and safety shoes, when working with kit components and assembling the product.

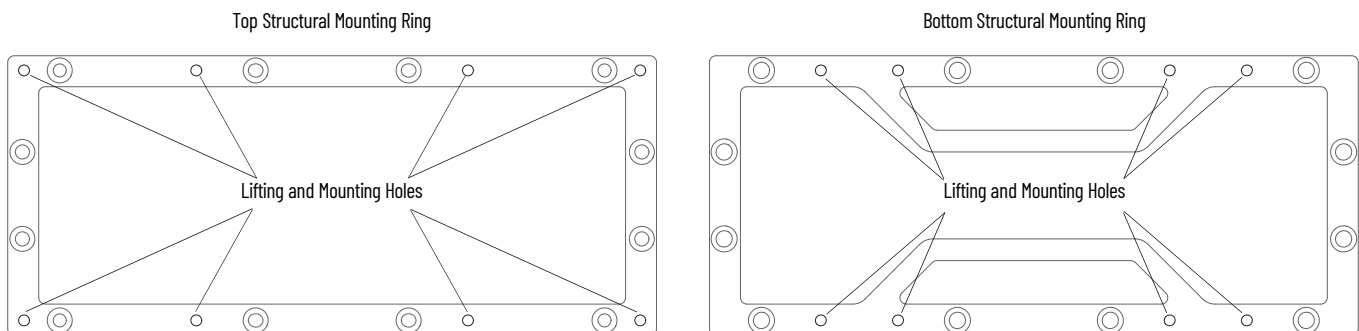


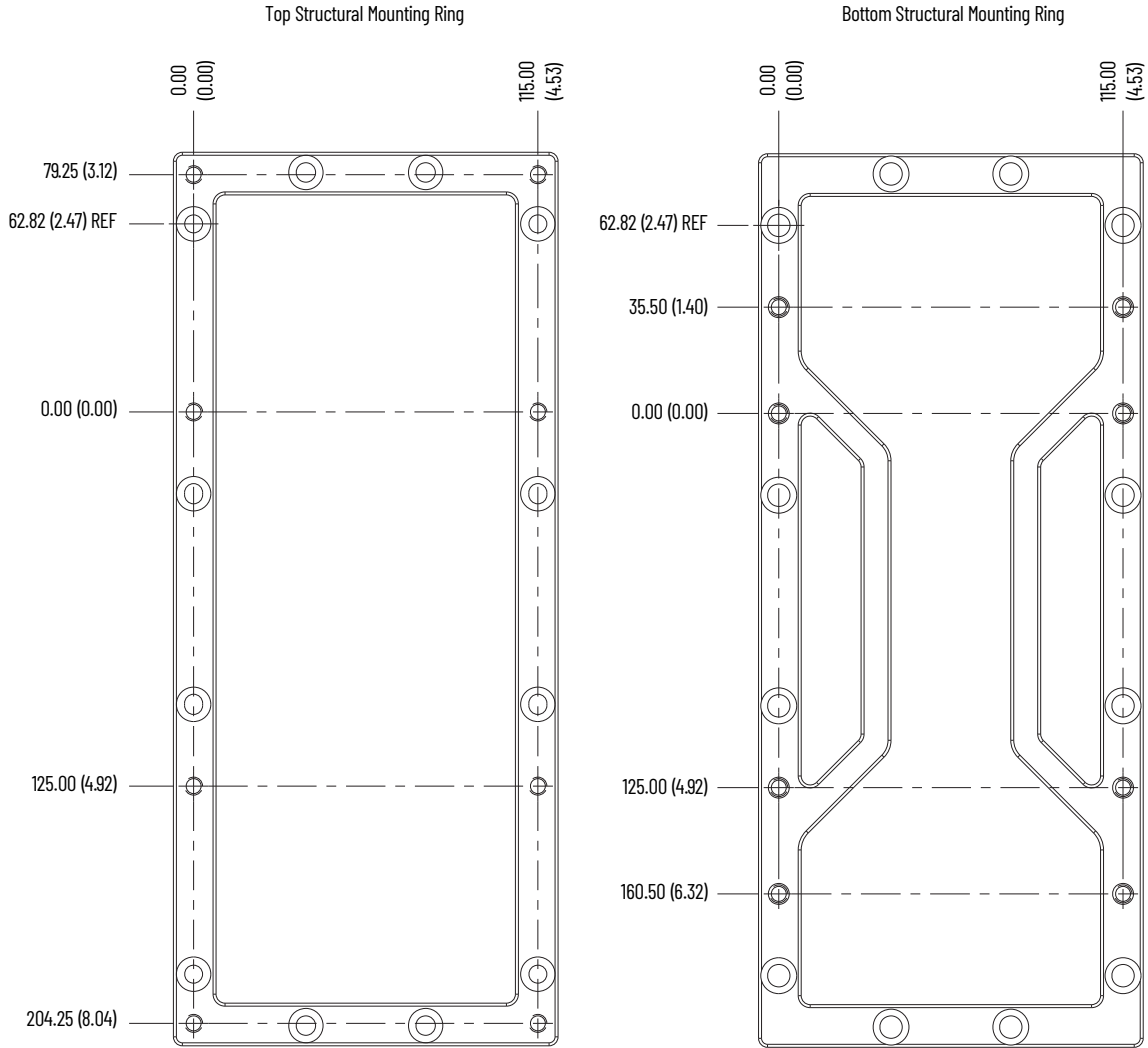
**ATTENTION:** There is a risk of injury by improper handling. You can be injured by being crushed, cut, struck, or sheared while handling and lifting iTRAK 5730 Starter kit components.

### Mounting Rings

The structural mounting rings on the iTRAK 5730 assembly contain eight holes each that accept M6 x 16 mm hardware. The mounting ring holes can be used to secure the appropriate hardware to lift the assembly. The lifting/mounting hole locations are shown in [Figure 3](#). The holes that are used for hardware to lift the assembly are also used for mounting hardware installation. See [Figure 4 on page 6](#) for the mounting ring mounting hole patterns.

**Figure 3 - Top and Bottom Mounting Ring Lifting and Mounting Holes**



**Figure 4 - Structural Ring Mounting Hole Pattern**

Dimensions are in millimeters and (inches).

## Mount the iTRAK 5730 Assembly

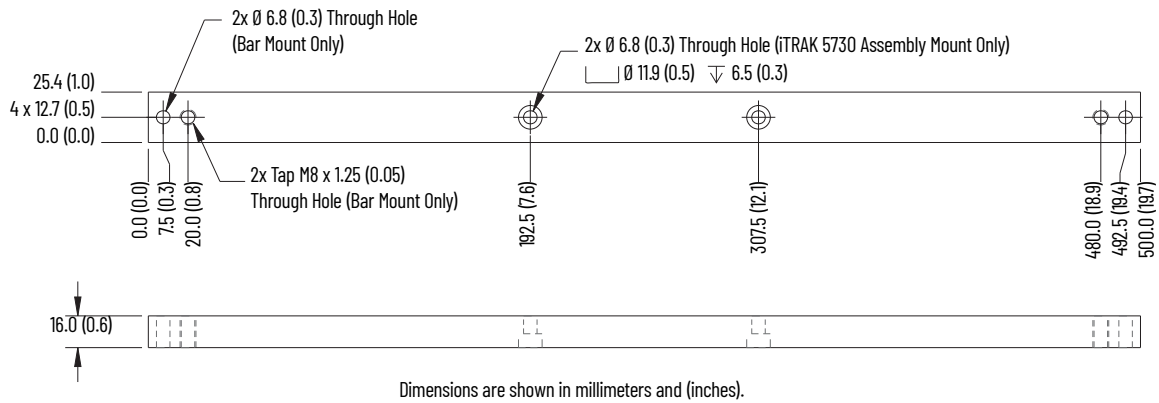
You can mount the iTRAK 5730 assembly to a fixture by using the two metal shipping bars provided in the kit, or by using a customer-sourced mounting system. See the iTRAK 5730 System User Manual, publication [2198T-UM003](#), for detailed information on how to mount the iTRAK 5730 assembly to a customer-sourced mounting system.

### Shipping Bars

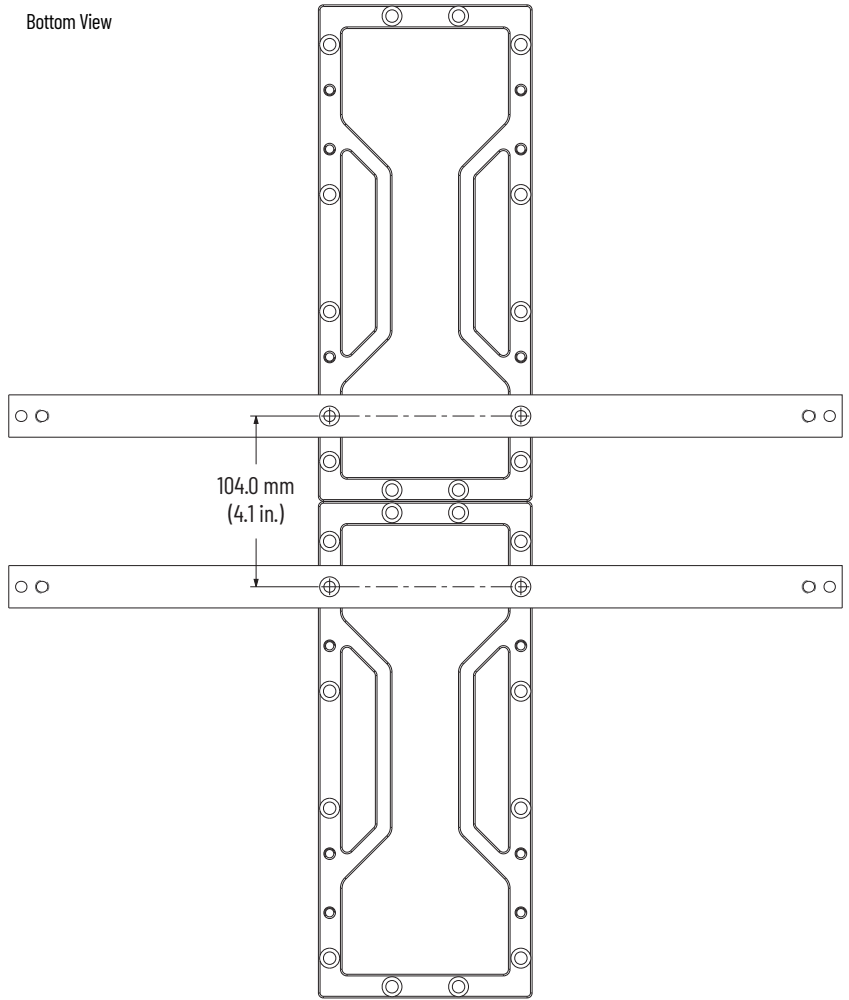
Follow these guidelines to install the shipping bars on a mounting surface and to mount the iTRAK 5730 assembly to the shipping bars:

- Secure either of the two holes (through or tapped) on both ends of the shipping bars to a fixture. See [Figure 5 on page 7](#).
- Install the shipping bars 104.0 mm (4.1 in.) apart, aligned center-to-center on the mounting holes. See [Figure 6 on page 7](#).
- Install the shipping bars with the middle counter-bored holes facing down (away from the iTRAK 5730 assembly).
- Secure the bottom mounting rings of the iTRAK 5730 assembly only to the shipping bars.
- Mount the iTRAK 5730 assembly perpendicular to the shipping bars. See [Figure 6 on page 7](#).

**Figure 5 - Shipping Bar Dimensions**



**Figure 6 - Shipping Bar Installation Dimension**



## Lift and Mount the iTRAK 5730 Assembly

This table provides the approximate weights of the iTRAK 5730 assemblies:

Kit Cat. No.	Weight [kg (lb)]
2198T-SK-06-05	103 (227)
2198T-SK-12-10	151 (333)

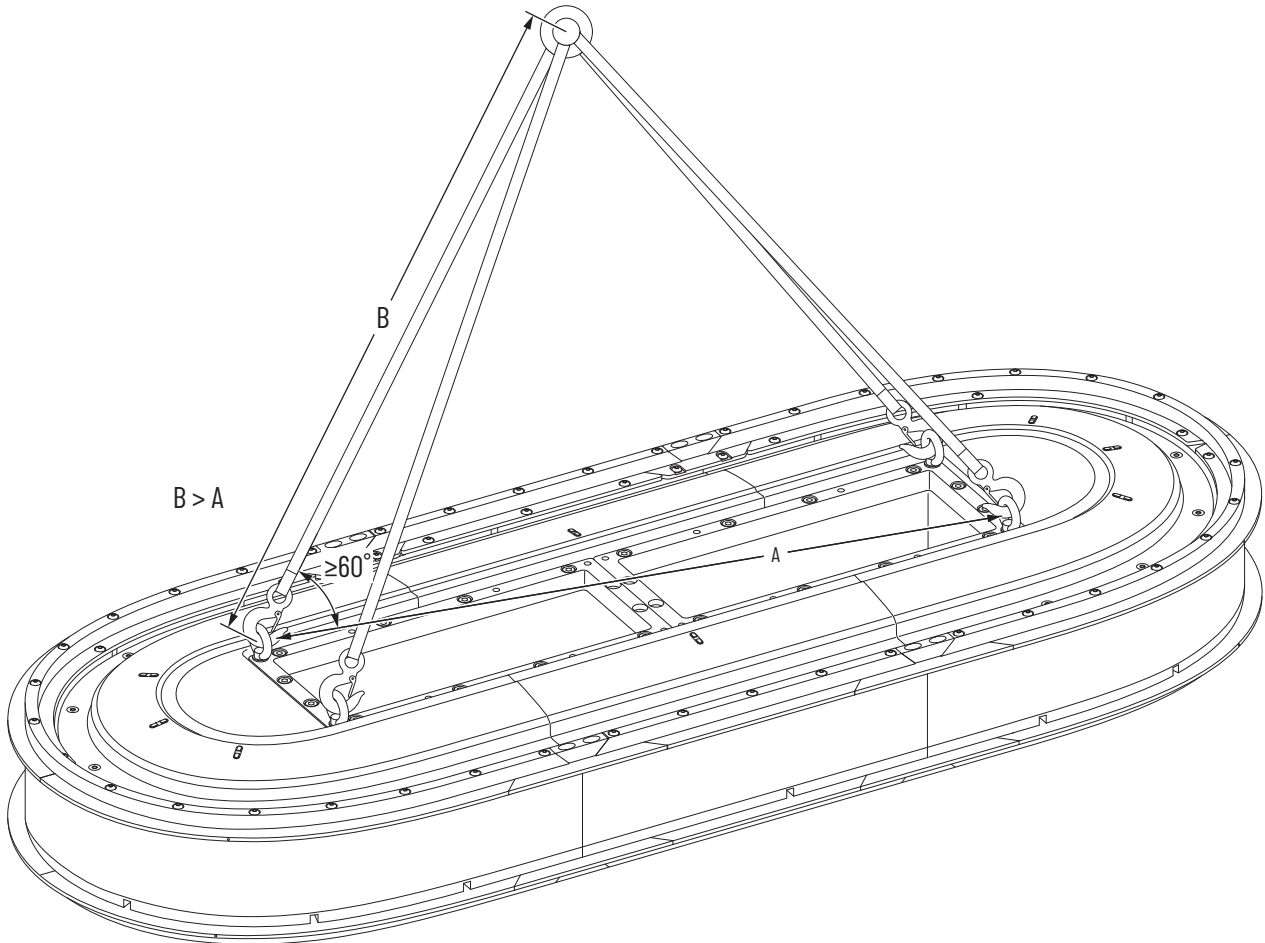
Follow these steps to lift and mount the iTRAK 5730 assembly.



**ATTENTION:** To guard against possible personal injury and/or equipment damage:

- Qualified professionals must inspect all lifting equipment before it is used to move the product.
- All lifting cables or straps must meet or exceed the maximum weight capacity requirements.
- Inspect all lifting hardware for proper attachment before lifting the equipment.
- Do not subject the equipment to high rates of acceleration or deceleration while transporting to the installation site or when lifting.
- Do not allow personnel or their limbs directly underneath the equipment when it is being lifted and mounted.

1. Remove the Phillips head screws from the top and front covers on the shipping crate and remove the covers.  
If you want to reuse the shipping crate for storage, retain the covers and hardware for reuse, if not damaged.
2. Install the appropriate lifting hardware in the mounting rings.
  - To lift kit catalog number 2198T-SK-06-05, install a minimum of four mounting-ring holes to lift the iTRAK assembly.
  - To lift kit catalog number 2198T-SK-12-10, install a minimum of six mounting-ring holes to lift the iTRAK assembly.
3. Connect the appropriate lifting straps to the hardware on the assembly.



4. Slowly lift and transport the iTRAK 5730 assembly to the installation location.
5. Mount the iTRAK 5730 assembly.

See the iTRAK 5730 System User Manual, publication [2198T-UM003](#), for detailed information on how to mount the iTRAK 5730 assembly.

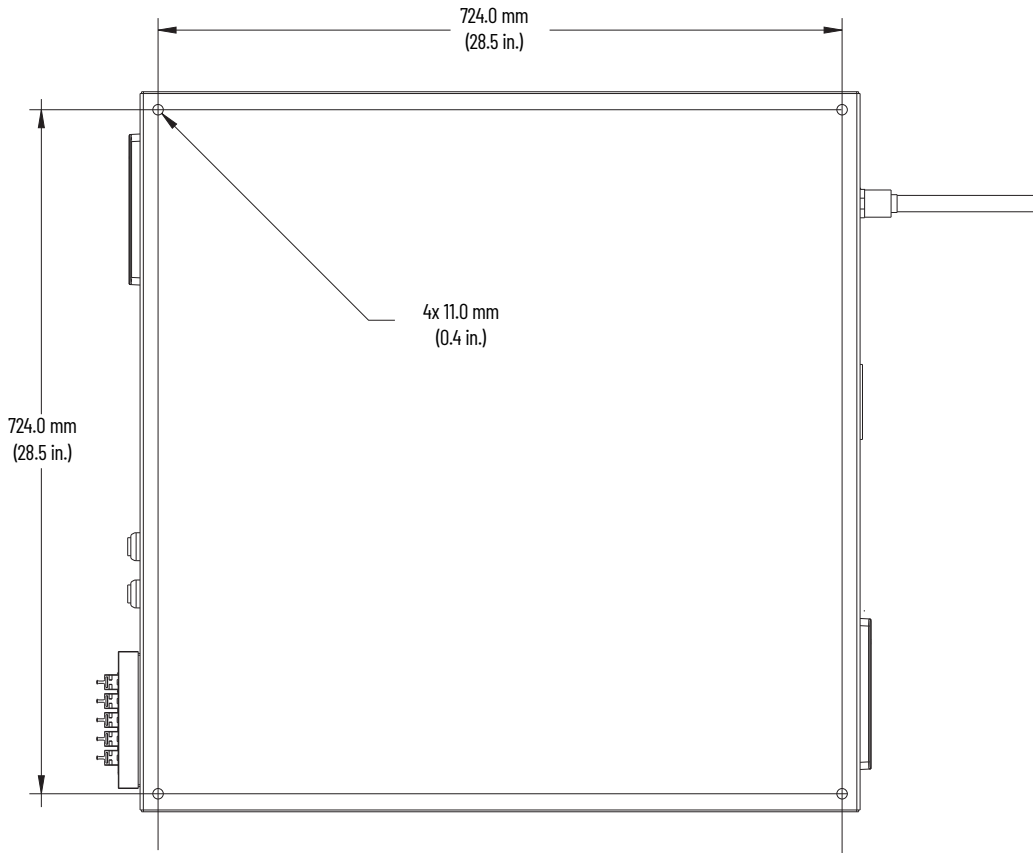


## Mount the iTRAK 5730 Starter Kit Power and Control Cabinet

The power and control cabinet can be mounted to a panel or be placed on a suitable, stable platform. Mount the power and control cabinet on a panel by using the supplied 3/8 inch hardware in each of the four mounting holes. See [Figure 7](#) for the power and control cabinet mounting hole dimensions.

**Figure 7 - iTRAK 5730 Starter Kit Power and Control Cabinet Mounting Hole Dimensions**

**Approximate Weight:**  
86 kg (190 lb)

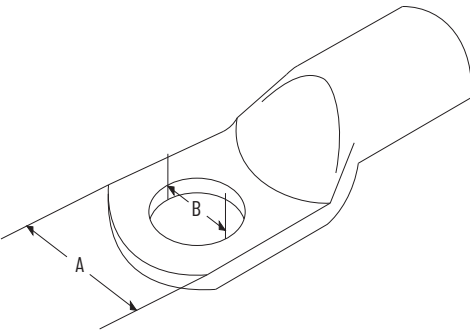


## Ground Requirements

To reduce the effects of electromagnetic interference (EMI), the iTRAK 5730 assembly and control cabinet must be grounded. The 480V AC input power cable connected to the control cabinet must be grounded at power source. See 'Grounding Requirements' in the iTRAK 5730 System User Manual, publication [2198T-UM003](#), for detailed iTRAK 5730 assembly ground information.

## Wire Requirements

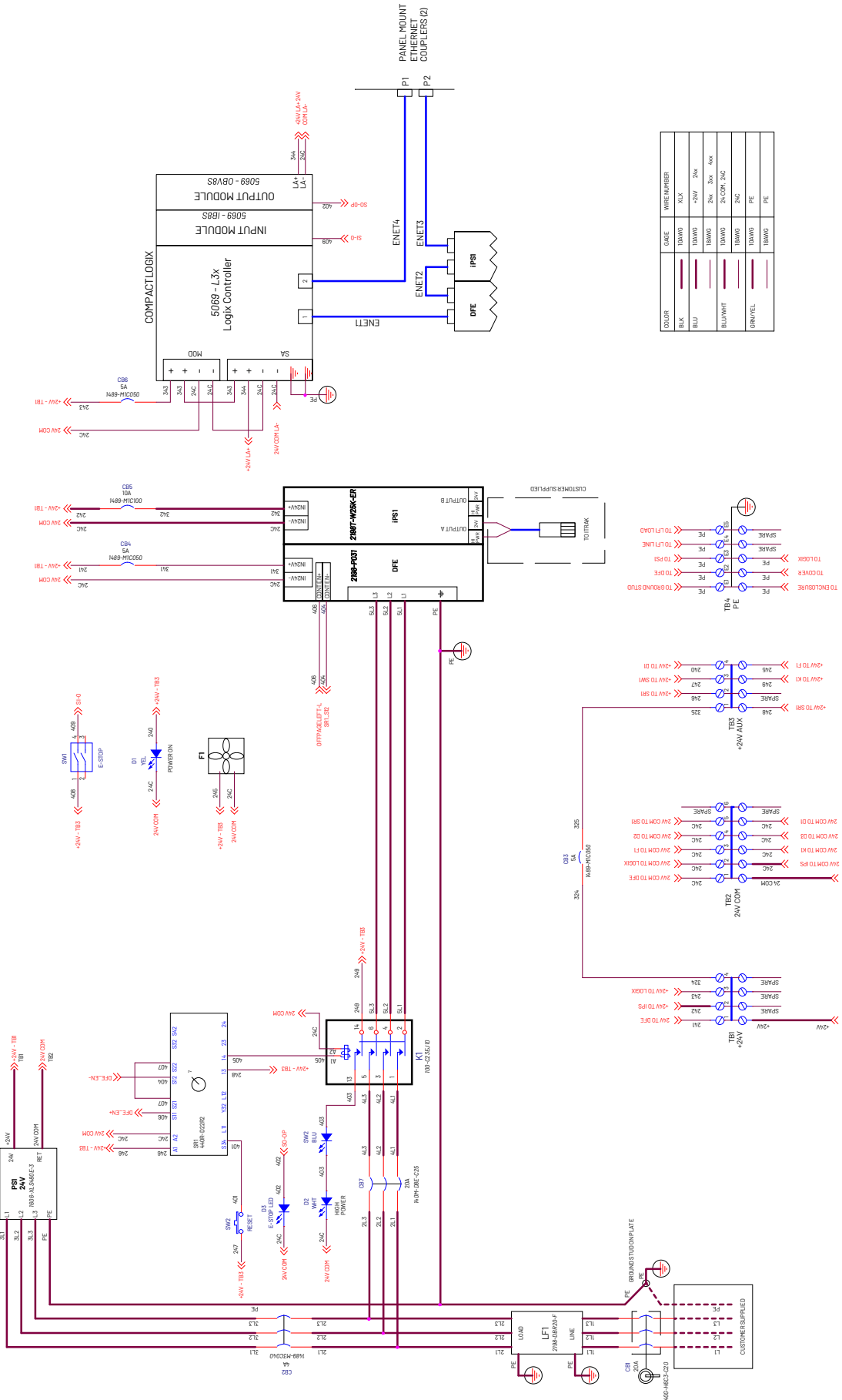
Rockwell Automation recommends installation of cable (ring) terminals on the customer-provided power cable. Cable (ring) terminals must meet these specifications:

Cable (Ring) Terminal	Cable (Ring) Terminal Dimensions		Cable (Ring) Terminal Torque	
	Width (A)	Terminal Hole Diameter (B)	[lb•in]	[N•m]
	0.787 in.	0.25 in.	53.0	6.0
	20 mm	6.5 mm		

## Wire Diagram

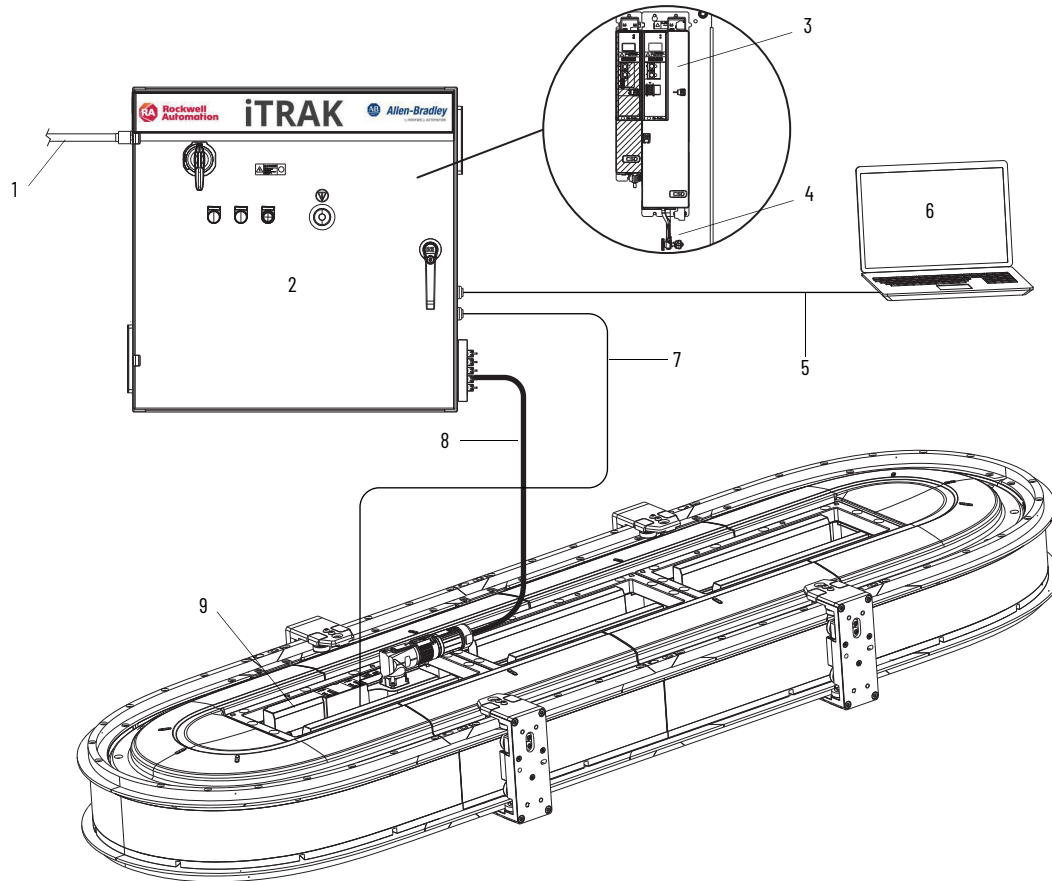
Use the wire diagram in [Figure 8 on page 10](#) for reference when you complete power, ground, and control power connections.

Figure 8 - iTRAK 5730 System Starter Kit Wiring Diagram



## Connect the iTRAK 5730 System to the Power and Control Cabinet

Use this system diagram to understand the system components and connections that are required for the iTRAK 5730 Starter kit.



Item	Description
1	Strain-relief fixture for the 480V AC input power cable <sup>(1)</sup>
2	iTRAK 5730 Starter kit power and control cabinet
3	iTRAK power supply (inside cabinet)
4	iTRAK power supply cable clamp (inside cabinet)
5	Customer-supplied Ethernet cable (RJ45 to RJ45)

Item	Description
6	Studio 5000 Logix Designer (not supplied with system)
7	Ethernet cable (RJ45 to M12)
8	Power cable (DC-bus and 24V DC)
9	iTRAK 5730 power and control input connector module

(1) In accordance with IEC 60309 series, this fixture provides adequate strain relief and a minimum earthing conductor cross-section of 2.5 mm<sup>2</sup> (14 AWG) as part of a multi-conductor power cable.

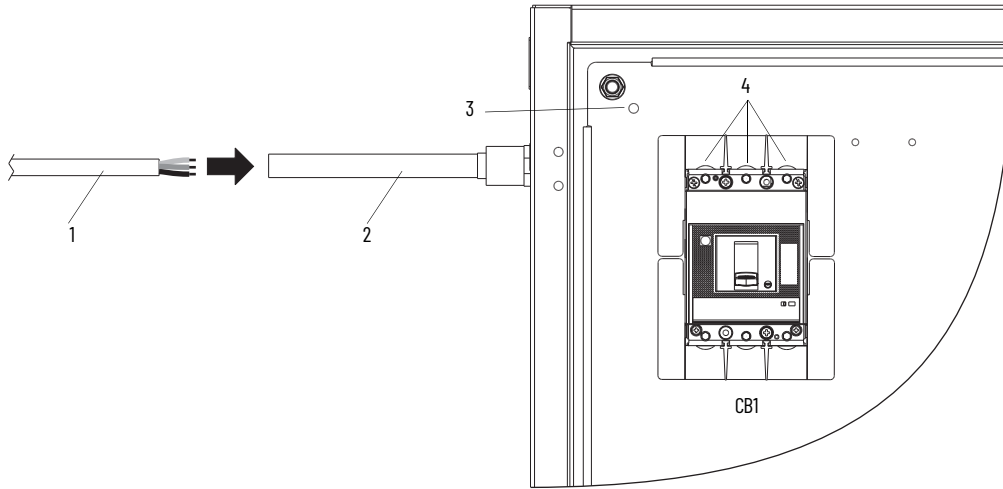
Follow these steps to connect the iTRAK 5730 Starter kit track and power and control cabinet.



**SHOCK HAZARD:** Do not make any cable connections when power is applied to any component in the iTRAK 5730 system. To avoid a shock hazard, verify that system power is not applied before you begin this procedure.

1. Verify that power is disconnected from the 480V AC, three-phase power source.
2. Complete these steps on the power and control cabinet.
  - a. Rotate the main circuit breaker handle to the OFF position.
  - b. Rotate the door handle clockwise and open the cabinet door.

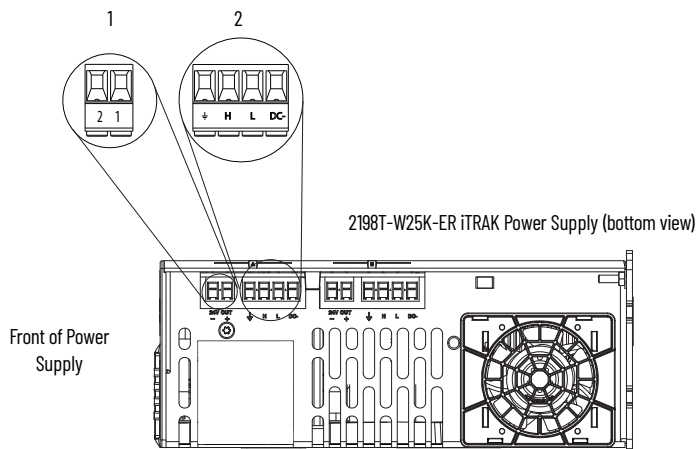
3. To connect the 480V AC three-phase power cable to the main circuit breaker (CB1), complete these steps.
  - a. Feed the power cable through the strain-relief fixture on the upper, left side of the cabinet.
  - b. Install cable (ring) terminals on the individual wires of the three-phase power cable.
  - c. Remove the Phillips head screw and cover from the top of the circuit breaker (CB1) in the control cabinet.
  - d. Secure the three-phase power wires to the input terminals (L1, L2, L3) on the circuit breaker. Apply final torque: 6 N•m (53 lb•in).
  - e. Connect and secure the power ground cable to the PE stud with the nut provided. Apply final torque: 6 N•m (53 lb•in).



Item	Description
1	Customer-provided 480V AC power cable
2	Strain-relief fixture

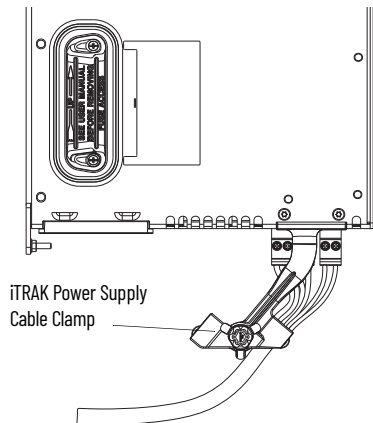
Item	Description
3	PE ground stud
4	CB1 input terminals (L1, L2, L3)

- f. Re-install the cover on the circuit breaker.
4. To connect the power and control cable to the iTRAK power supply, complete these steps.
  - a. Verify that a small portion of the cable jacket has been removed to expose the shield braid.
  - b. On the right side of the cabinet, insert the loose leads on the iTRAK power cable through the gland.
  - c. Connect the leads of the iTRAK power cable to the 24V DC (ICP) and DC-bus (IDC) connectors on the bottom of the iTRAK power supply.



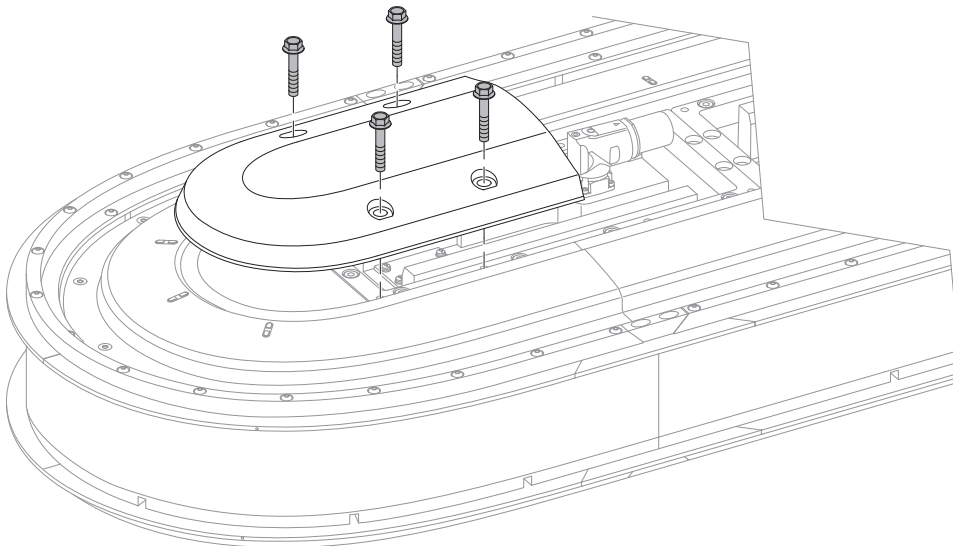
Item	Description	Connects to Terminals (Output A)		Wire Color	Wire Size mm <sup>2</sup> (AWG)	Strip Length mm (in.)	Torque Value N•m (lb•in)
		Pin	Signal				
1	24V iTRAK control power	ICP-1 ICP-2	24V+ 24V-	Red White	1.5...6 (16...10)	10.0 (0.39)	0.7...0.8 (6.1...7.0)
2	DC-bus output power	IDC-4 IDC-3 IDC-2 IDC-1	GND H L DC-	Green/Yellow Brown Black Blue	2.5...6.0 (12...10)	10.0 (0.39)	0.7...0.8 (6.1...7.0)

5. To terminate the cable shields to the ground clamp on the bottom of the iTRAK power supply, complete these steps.
  - a. Loosen the clamp knob.
  - b. Position the exposed portion of each cable braid directly in line with the clamp.
  - c. Finger-tighten the clamp knob.

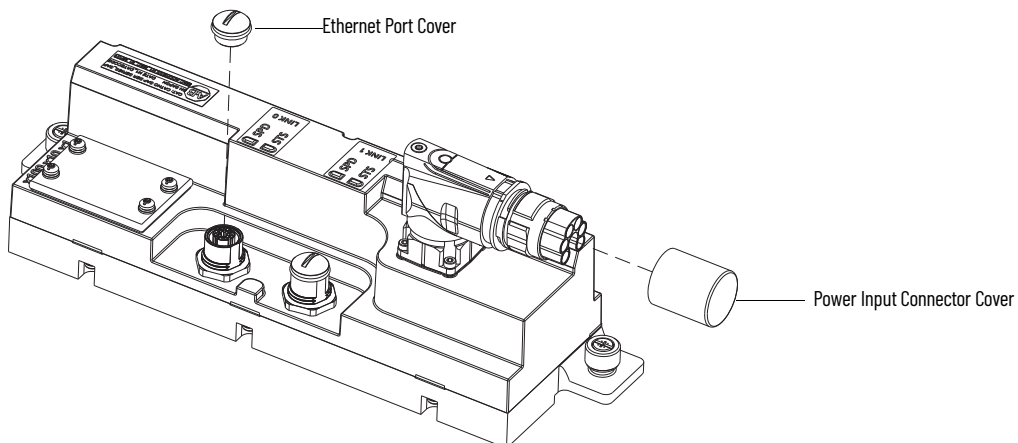


The cable must not move within the clamp under its own weight or when slight pressure is applied by hand.

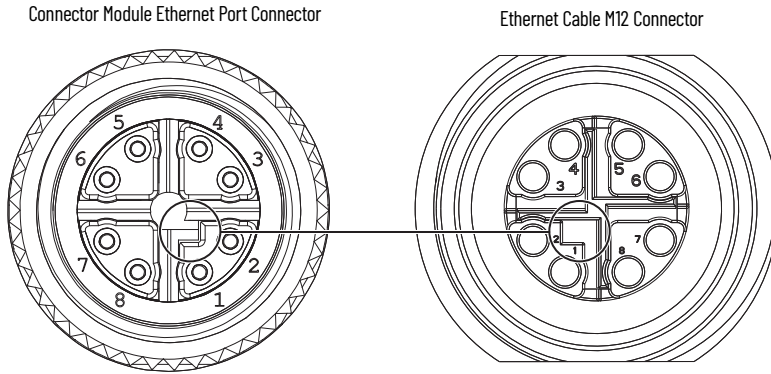
6. To connect the iTRAK power cable to the iTRAK power and control input connector module, complete these steps.
  - a. Use a 10 mm hexagonal socket bit to remove the M6 x 35 mm hex head bolts that secure the infield covers to the iTRAK assembly. Reassembly torque: 4.5 N•m (40.0 lb•in).



- b. On the iTRAK power and control input connector module, remove the protective cap from the power input connector and the Link 0 Ethernet port.



- c. Verify that the iTRAK power cable connector outer-housing is in the unlocked position.
  - d. Align the arrow on the cable connector with the arrow on the power input connector on the connector module.
  - e. Insert the cable connector into the motor power connector on the connector module until it is fully seated.
  - f. Rotate the cable connector outer housing to the locked position.
7. Connect the RJ45 Ethernet connector on the Ethernet cable to a port on the power and control cabinet.
  8. Complete these steps on the iTRAK power and control input connector module.
    - a. Verify that the connector pins are aligned and insert the Ethernet cable M12 connector into the Ethernet connector on the connector module.



- b. By turning the cable outer housing clockwise, secure the cable to the connector module mounting ring until the cable is fully seated.
9. Connect the 480V AC input power cable to the grounded power source.

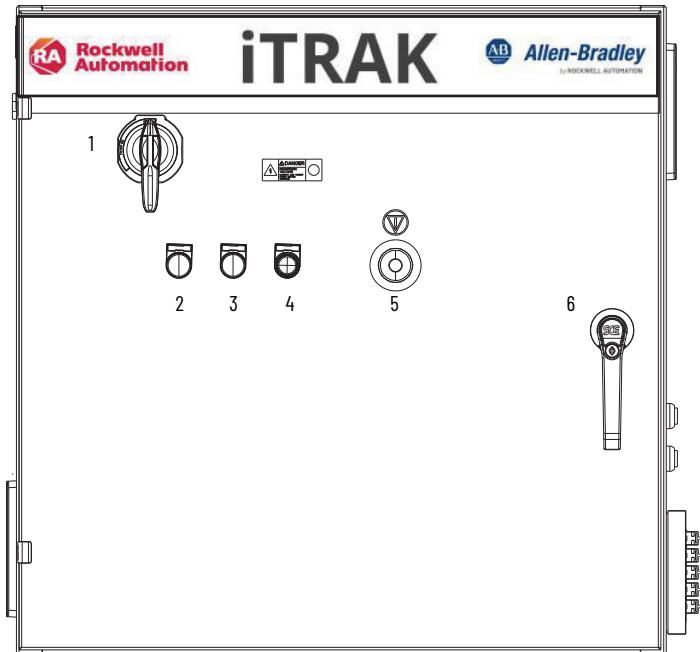
### Lubricate the Track

We recommend that you apply a lubricant (such as Kluber 4 UH1-68N) to the track system before putting the iTRAK 5730 assembly into service. You can purchase and install the iTRAK 5730 lubrication system, catalog number 2198T-AL-SYS-4 for automated track lubrication. The lubrication system requires a 24V DC power source and can be connected to the 24V I/O port on the Logix controller in the power and control cabinet. See the iTRAK 5730 System User Manual, publication [2198T-UM003](#), for details.

### Power and Control Cabinet Controls

[Figure 9](#) provides identification and descriptions of the controls and indicator lights on the power and control cabinet.

**Figure 9 - iTRAK Power and Control Cabinet Controls**



Item	Description	Item	Description
1	Main circuit breaker	4	Reset
2	24V DC power indicator light (yellow)	5	E-stop
3	480V AC power indicator light (white)	6	Mechanical, lockable handle

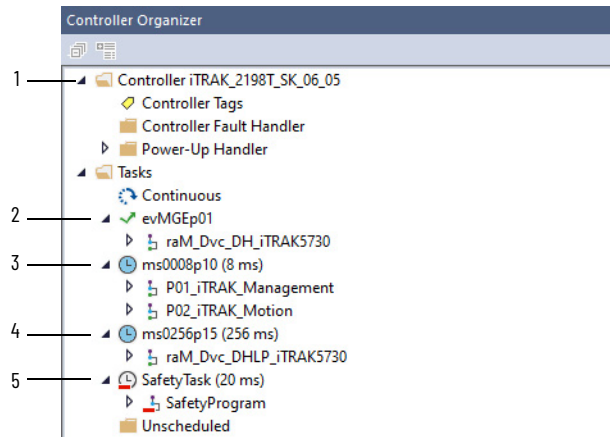
## iTRAK 5730 Starter Kit Configuration

Each iTRAK 5730 Starter kit includes two pre-configured Studio Logix Designer project (\*.acd) files, which allow you to startup of the system out-of-the-box. This section provides information about the iTRAK 5730 Starter kit project file configuration. For details on how to configure an iTRAK 5730 system, see the iTRAK 5730 System User Manual, publication [2198T-UM003](#).

To view the configuration of your iTRAK Starter kit, open the appropriate file for your track catalog number: 2198T-SK-06-05.acd or 2198T-SK-12-10.acd. The images in this section represent starter kit 2198T-SK-06-05.acd file.

### Project File Structure

The project files have the following are structure:



Item	Description
1	File name.
2	Event task. The Motion Group Execution triggers the event task, which contains the Device Handler for the iTRAK 5730. See Device Handler for iTRAK 5730 for details.
3	8 ms periodic task. The 8 ms task contains the following two programs: <ul style="list-style-type: none"> <li>P01_iTRAK_Management - This program contains routines to monitor the status of the Device Handler and the iTRAK 5730 hardware, and startup, shutdown, clear fault, and tuning sequence.</li> <li>P02_iTRAK_Motion - This program contains different motion sequences including: <ul style="list-style-type: none"> <li>Simple moves, such as jogging and homing movers</li> <li>Advanced motion, such as station programming which includes built-in collision avoidance.</li> </ul> </li> </ul>
4	256 ms periodic task. The 256 ms task contains the raM_Dvc_DHLP_iTRAK5730 program. This program is a language pack, which can be used to choose the language in which all the messages (like faults, alarms, etc.) are displayed. The starter kit code contains the English Language pack only.
5	Safety task. The Safety task contains a routine that enables the safe torque-off function on all the motor modules when an E-stop is enabled.

#### Device Handler for iTRAK 5730

The iTRAK 5730 device handler is a library set for interaction with the Rockwell Automation iTRAK 5730. The device handler provides powerful tools for device diagnostics and management. The device handler consists of a program paired with associated data structures that synchronizes the physical movers with path axes. The device handler provides:

- A basic instruction set for commissioning and enabling the iTRAK 5730.
- A set of instructions for basic operation of the iTRAK 5730, such as energize/de-energize, clear faults, etc.
- An architecture for virtual or physical operation of the iTRAK 5730.
- Enhanced management of the track as well as individual movers in the form of axes with the following features:
  - Text-based status and diagnostics
  - Faceplate
  - Error management
- Multilingual support for diagnostics messages.

## Hardware Component IP Address Assignments

This table lists the hardware components included in the kits and the assigned IP address (if applicable).

Hardware Component	Catalog Number	Qty.	IP Address
Compact GuardLogix controller	5069-L380ERMS2	1	192.160.1.100
Safety input module	5069-IB8S	1	—
Safety output module	5069-OBV8S	1	—
Kinetix 5700 DC bus supply	2198-P031	1	192.168.1.10
iTRAK power supply	2198T-W25-ER	1	192.168.1.11
Kinetix 5500 line filter	2198-DB20-F	1	—
Motor module section	iTRAK 5730 starter kit 2198T-SK-06-05	10	192.168.1.20...192.168.1.29
Motor module section	iTRAK 5730 starter kit 2198T-SK-12-10	14	192.168.1.20...192.168.1.33

## Axis and Hardware Component Configuration

Each mover and motor module section is represented as a CIP axis in the Motion Group. [Figure 10](#) is an example of the 2198T-SK-06-05 starter kit I/O configuration tree. The mover CIP axes are represented by CIPMover\_*nn* in [Figure 10](#). The motor module section CIP axes are represented by CIPSection\_*nn* in [Figure 10](#).

Each mover is also associated with a corresponding virtual axis (represented by Mover\_*nn* in [Figure 10](#)). The virtual axes are used when you need to run a simulation without the physical movers. The virtual axes are also used to command the physical movers by linking the CIP Mover axis to the virtual mover axis.

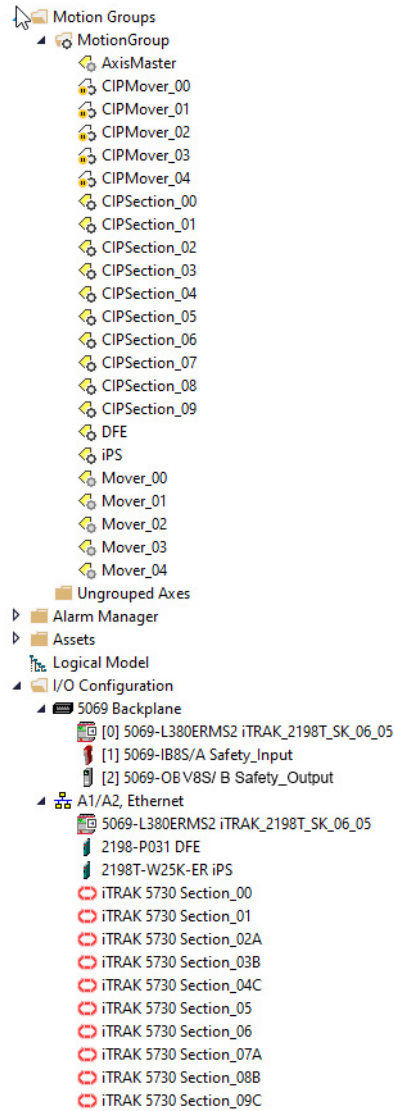
### 2198T-SK-06-05 Starter Kit

There are 10 motor module section axes in the I/O configuration tree. The 2198T-SK-06-05 starter kit is comprised of four 600 mm straight motor modules (two on each side of the track) and two curved motor modules. Each curved motor module is internally comprised of three motor sections. There are five mover axes in the I/O configuration tree.

### 2198T-SK-12-10 Starter Kit

There are 14 motor module section axes in the I/O configuration tree. The 2198T-SK-06-05 starter kit is comprised of eight 600 mm straight motor modules (four on each side of the track) and two curved motor modules. Each curved motor module is internally comprised of three motor sections. There are 10 mover axes in the I/O configuration tree.

Figure 10 - 2198T-SK-06-05 iTRAK 5730 Starter Kit I/O Configuration Tree





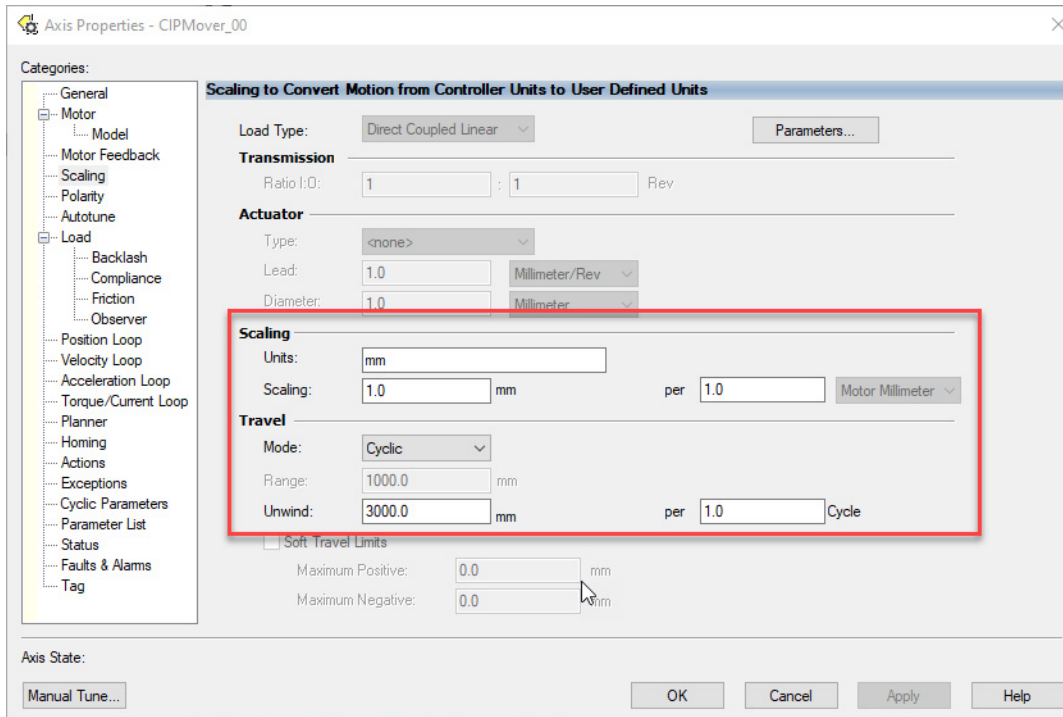
## Mover CIP Axes Configuration

This section describes how the mover CIP axes are configured.

Each straight motor module is 300 mm long and each curved module has an arc length of 900 mm (300 mm for each motor module in the curve). The Unwind value for each mover CIP axis is set to the total length of the track.

Follow these steps to view the mover CIP axes configuration.

1. In the Controller Organizer, right-click the CIPMover\_00 axis and choose Properties.  
The Properties dialog box appears.
2. Select the Scaling category.
3. The Unwind value is set to the total length of the track (in millimeters). 3000 mm in this example for starter kit 2198T-SK-06-05.
4. The Mode is set to 'Cyclic,' identifying a closed loop track.



## Motor Module Section CIP Axes Configuration

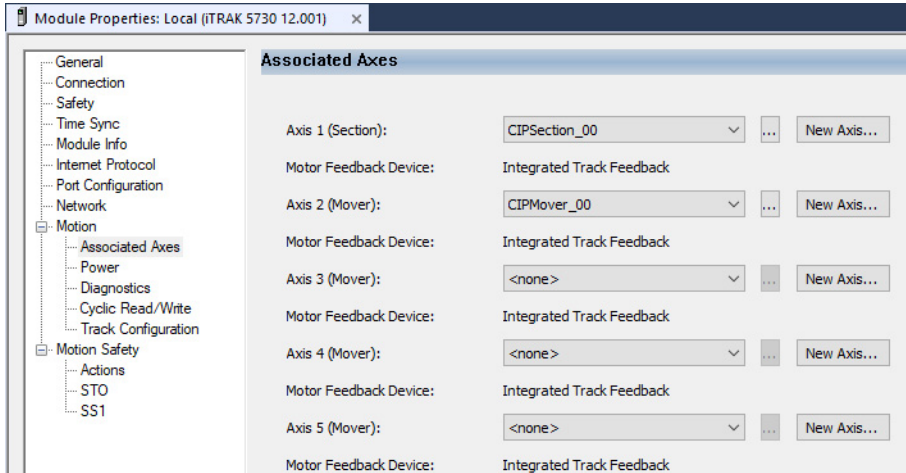
This section describes how the motor module section CIP axes are configured.

Follow these steps to configure the motor module section CIP axes.

1. In the Controller Organizer, right-click the CIPSection\_... axis and choose Properties.

The Properties dialog box appears.

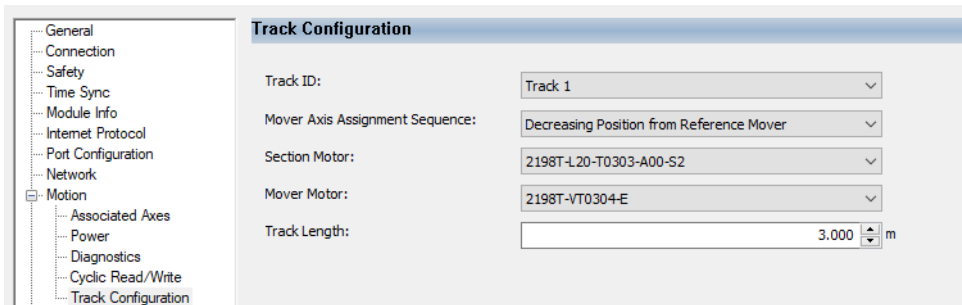
2. Expand Motion and select the Associated Axes Category.



For each iTRAK 5730 motor module, five axes are possible; one section axis and up to four mover axes.

- Axis 1 is the section axis.
- Axis 2...Axis 5 are the mover axes.

3. Select the Track Configuration category.



4. The Track ID is set to '1.'



The iTRAK 5730 Starter kits can support one track ID only. When multiple tracks are configured, choose the track ID from the Track ID pull-down menu.

5. The Mover Axis Assignment Sequence is set to 'Decreasing Position from Reference Mover.'

**IMPORTANT** All motor module section axes must be configured with the same Mover Axis Assignment Sequence.

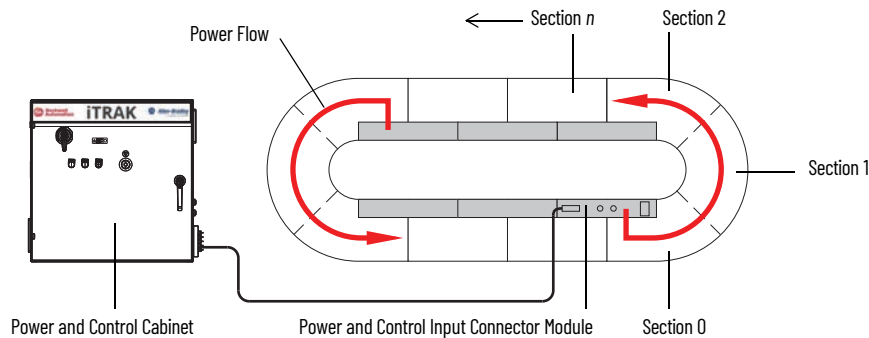
Available options include:

Mover Axis Assignment Sequence	Description
Decreasing Position	The motor module assigns movers on the track as decreasing sequential axis instances. The mover with the highest position value is the first mover, followed by movers with decreasing position values.
Increasing Position	The motor module assigns movers on the track as increasing sequential axis instances. The mover with the lowest position value is the first mover, followed by movers with increasing position values.
Decreasing Position from Reference Mover	The motor module assigns movers on the track as decreasing sequential axis instances based on the mover identified as the "Reference Mover." The "Reference Mover" is the first mover, followed by movers of decreasing position values relative to the "Reference Mover." A south pole position magnet (with the black anodized surface finish) installed on a mover electrically identifies the "Reference Mover."
Increasing Position from Reference Mover	The motor module assigns movers on the track as increasing sequential axis instances based on the mover identified as the "Reference Mover." The "Reference Mover" is the first mover, followed by movers of increasing position values relative to the "Reference Mover." A south pole position magnet (with the black anodized surface finish) installed on a mover electrically identifies the "Reference Mover."



Based on the Mover Axis Assignment Sequence, the track assigns mover IDs as follows:

- Mover 0 is the mover associated with Axis 2 (Mover) of section 0 of the track. Section 0 is the motor module section to which the power and control input connector module is connected (see illustration). Section 0 is assigned the IP address 192.168.1.20 and is associated with the CIPSection\_00 axis. Mover 0 is defined based on the Mover Axis Assignment Sequence chosen. In the starter kit code, the reference mover is Mover 0 and is associated with the CIPMover\_00 axis.

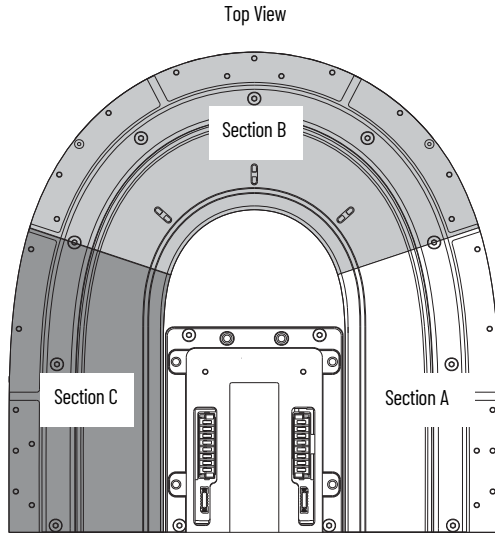


- Other movers (if any) associated with the section 0 are assigned successive mover IDs. (mover 1 is Axis 3, and so on).
- If there are no movers associated with the section axes other than Axis 2, then the mover associated with Axis 2 of section 1 is assigned mover 1, and so on. Section 1 is the section next to section 0 in the counterclockwise direction. Section 1 is assigned the IP address 192.168.1.21 and is associated with the CIPSection\_01 axis. Mover 1 is next to the reference mover, has a smaller position value, and is associated with the CIPMover\_01 axis.

6. Section Motor defines the type of motor module section assigned to the motor module section CIP axis.

**IMPORTANT** A curved motor module is comprised of three individual sections: curve section A, curve section B, and curve section C. Each of the three curve sections needs to be added as a separate motor module and configured individually.

- If your motor module is a straight section, select 2198T-L20-T0303-A00-S2
- If your motor module is a curve section A, select 2198T-L20-T0309-D18-S2-A
- If your motor module is a curve section B, select 2198T-L20-T0309-D18-S2-B
- If your motor module is a curve section C, select 2198T-L20-T0309-D18-S2-C



7. Motor Mover is set to 2198T-VT0304-E. This is the only valid option.  
 8. The Track Length field is set to the total length of the track (in meters).



The Length parameter of the CIPMover\_... axes associated with this section axis is automatically updated in the Motor Feedback section based on the Track Length parameter value for the section axis.

## Download the Program and Start the Controller

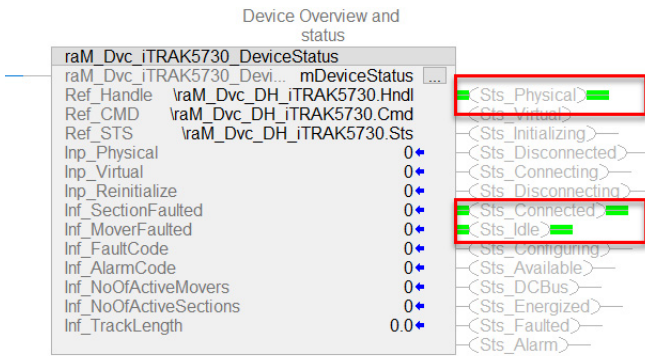
Follow these steps to download project file to the controller and start the iTRAK system.

1. Apply power to the system.
2. In Studio 5000 Logix Designer, connect to the controller and download the project file.
3. Set the controller to Remote Run mode.
4. Expand ms0008p10 (8 ms task) and P01\_iTRAK\_Management and open R01\_iTRAK\_DeviceStatus.

- Verify that the Sts\_Physical, Sts\_Connected and Sts\_Idle outputs are set.



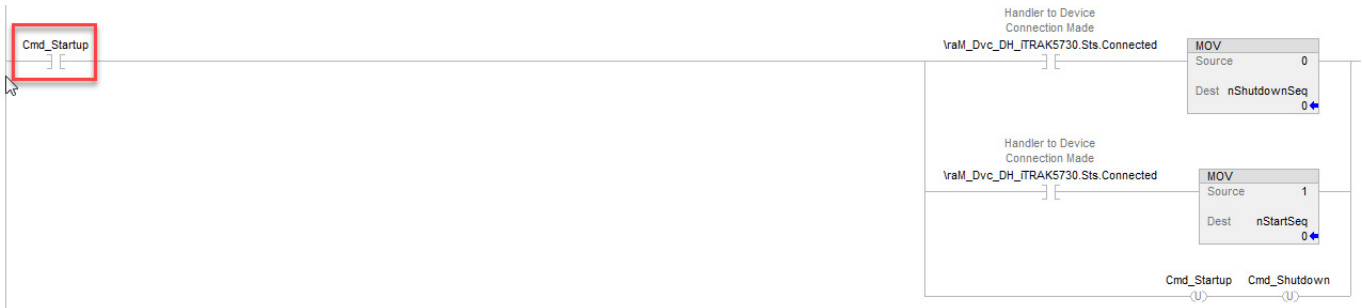
The Device Status is an Add On Instruction (AOI) to view the status of the Device Handler and the hardware.



Parameter	Description
Sts_Physical	The iTRAK is in physical operation.
Sts_Connected	All the hardware is communicating with the controller and the Motion Group is synced.
Sts_Idle	The Device Handler is connected and is waiting for the user to apply the track configuration.

- To initiate the startup sequence, access the R02\_iTRAK\_Sequence routine and enable Cmd\_Startup bit in rung 0.

The startup sequence configures the track and energizes the motor module sections and movers. A successful startup enables the track for motion.



- To check if the routine completed successfully, verify that the bStartupCompleted bit is latched and the nStartSeq tag value is set to 999.



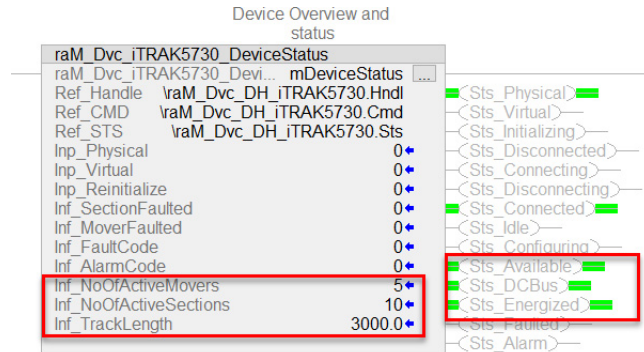
8. Expand ms0008p10 (8 ms task) and P01\_iTRAK\_Management and open R01\_iTRAK\_DeviceStatus.
9. Verify that the Sts\_Available, Sts\_DCBus and Sts\_Energized outputs are set.
10. Verify the following:

For a 2198T-SK-06-05 starter kit:

- The number of active movers (Inf\_ActiveMovers tag) is 5
- The number of active sections (Inf\_ActiveSections tag) is 10
- The track length (Inf\_TrackLength tag) is 3000 (mm)

For a 2198T-SK-12-10 starter kit:

- The number of active movers (Inf\_ActiveMovers tag) is 10
- The number of active sections (Inf\_ActiveSections tag) is 14
- The track length (Inf\_TrackLength tag) is 4200 (mm)



## Motion Profiles

There are three types of motion profiles included in the iTRAK 5730 Starter kit code.

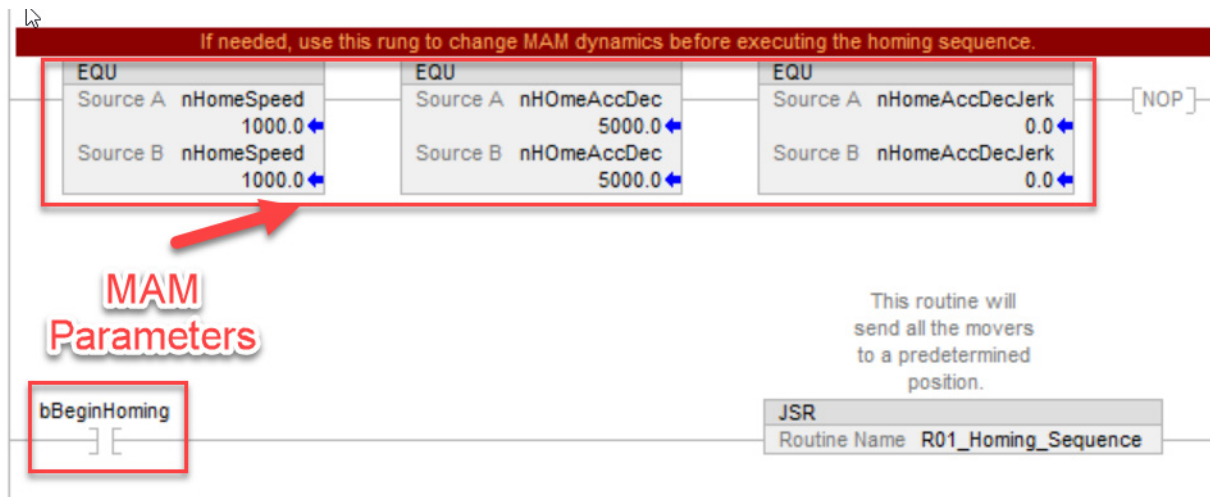
- Two of the profiles provide basic homing and jogging moves.
- A third profile uses multiple station AOIs to send vehicles to target positions that simulate process station locations. These AOIs include collision avoidance built into the algorithm that controls adjacent movers so that they do not collide when moving between stations.

The code simulates two process zones:

- The first zone is a one-up process station, where one mover stops for 400 ms and then exits the station.
- The second zone is a two-up station, where two movers stop simultaneously for 800 ms with a pitch of 200 mm.

All three move profiles can be enabled from the Main Routine (ms0008p10 > P02\_iTRAK\_Motion > R00\_Main\_Routine).

The main routine can also be used to change the move parameters for the homing and jogging sequence. To start the main routine, toggle the appropriate tag in the same rung as the JSR. For example, to start the homing sequence, toggle bBeginHoming to start the R01\_Homing\_Sequence routine.



In many cases the application involves repetitive logic for all the movers/axes. In such cases commands, checks based on positions, dynamics, and the state of each mover is implemented easily in loops. To illustrate this, the jog sequence is implemented by using both ladder logic and structured text. We encourage you to implement your application in whichever language with which you are comfortable and/or proficient. The ICT libraries work well in both Ladder Logic and Structured Text. Set the bUseST bit to run the structured text routine R03\_Jog\_Sequence\_ST and reset this bit to run the ladder logic routine R02\_Jog\_Sequence.



## Mover Interface for the iTRAK 5730 System

The Mover array is a User Defined Data Type that is used by the Device Handler to access motion instructions for the iTRAK 5730 system from one public interface. A public parameter is part of the Device Handler program (raM\_Dvc\_DH\_iTRAK5730). A public parameter can be accessed by other programs, as opposed to a local parameter which can only be accessed by routines in which the tag is defined. The public parameter is accessed by other programs using the notation \[ProgramName].TagName. For example, to access the Mover array the notation will be \.raM\_Dvc\_DH\_iTRAK.Mover5730[i] where *i* is the *i*th mover. Open the Device Handler program and explore the Mover array.

Name	Usage	Style	Data Type
▲ Mover	Public		raM_UDT_Opr_iTRAK_Movers_Motion[8]
▸ Mover[0]			raM_UDT_Opr_iTRAK_Movers_Motion
▸ Mover[1]			raM_UDT_Opr_iTRAK_Movers_Motion
▲ Mover[2]			raM_UDT_Opr_iTRAK_Movers_Motion
▸ Mover[2].MAM			raM_UDT_Opr_iTRAK_Movers_MAM
▲ Mover[2].MAJ			raM_UDT_Opr_iTRAK_Movers_MAJ
Mover[2].MAJ.Execute		Decimal	BOOL
▸ Mover[2].MAJ.MotionInstruction			MOTION_INSTRUCTION
▸ Mover[2].MAJ.MotionInstructionMerge			MOTION_INSTRUCTION
▸ Mover[2].MAJ.Direction		Decimal	SINT
Mover[2].MAJ.Speed		Float	REAL
▸ Mover[2].MAJ.Units		Decimal	SINT
Mover[2].MAJ.AccelRate		Float	REAL
Mover[2].MAJ.DecelRate		Float	REAL
Mover[2].MAJ.AccelJerk		Float	REAL
Mover[2].MAJ.DecelJerk		Float	REAL
Mover[2].MAJ.Merge		Decimal	BOOL
Mover[2].MAJ.LockPosition		Float	REAL
▸ Mover[2].MAJ.LockDirection		Decimal	SINT
Mover[2].MAJ.ContinuousExecution		Decimal	BOOL
Mover[2].MAJ.Executed		Decimal	BOOL
▸ Mover[2].MAG			raM_UDT_Opr_iTRAK_Movers_MAG
▸ Mover[2].MAPC			raM_UDT_Opr_iTRAK_Movers_MAPC
▸ Mover[2].MATC			raM_UDT_Opr_iTRAK_Movers_MATC
▸ Mover[2].MCD			raM_UDT_Opr_iTRAK_Movers_MCD
▸ Mover[2].MDAC			raM_UDT_Opr_iTRAK_Movers_MDAC
▸ Mover[2].MAS			raM_UDT_Opr_iTRAK_Movers_MAS
▸ Mover[2].MRP			raM_UDT_Opr_iTRAK_Movers_MRP
▸ Mover[2].Status			raM_UDT_Opr_iTRAK_Movers_Status
Mover[2].Configure		Decimal	BOOL

Each mover array has motion instructions like MAJ, MAG, MAPC, etc. The motion interface contains all the parameters associated with a particular motion instruction. For example, in this image the MAJ structure contains members that are present in a standard MAJ motion instruction block in Studio 5000. All axis feedback and status are consolidated in the Mover array. To jog a mover, populate the MAJ motion instruction interface for the appropriate mover and then enable the Execute bit. There is an Execute bit for each motion instruction in the Mover array. When a Device Handler is instantiated, all parameters are set to 0.

The station routines (R04\_Station\_01, R05\_Station\_02, and R06\_Station\_03) have the station AOlS which define the position of the station, station ID, and parameters, which define the move when movers exit the station. These parameters include velocity, acceleration, deceleration, jerk, and minimum pitch between movers. The routine contains logic that simulates vehicles stopping for a specific amount of time and sending them to the next station.

For information on the iTRAK device handler and the associated AOlS, see the documentation in the Independent Cart Technology libraries package available in the Product Compatibility and Download Center website, [rok.auto/pcdc](http://rok.auto/pcdc).

## Electrical Specifications

Category	Specification
Electrical rating	480V AC, 16 A, 50/60 Hz
Short circuit rating	10 kA
Electrical system	TN-C

## Environmental Specifications

Category	Specification
Environmental compliance	Rockwell Automation maintains current product environmental information on its website at: <a href="https://rok.auto/certifications">https://rok.auto/certifications</a>
IP rating	IP22, Type 1
Ambient operating temperature	5 °C (41 ° F)..40 °C (104 ° F)
Altitude	Up to 1000 m (3281 ft)
Relative humidity	Less than 50% at 40 °C (104 ° F)
Transportation and storage temperature	-25...+55 °C (-13...+131 °F)

## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
iTRAK 5730 System User Manual, publication <a href="#">2198T-UM003</a>	Provides information and instructions for how to assemble, lift, mount, connect, configure, troubleshoot, and maintain an iTRAK 5730 system.
iTRAK 5730 System Technical Data, publication <a href="#">2198T-TD002</a>	Product specifications for Rockwell Automation iTRAK 5730 system components, with performance, environmental, certifications, load force, and dimension drawings.
Kinetix® Servo Drives Specifications Technical Data, publication <a href="#">KNX-TD003</a>	Product specifications for Kinetix Integrated Motion over the EtherNet/IP™ network, Kinetix 5700 iTRAK Power Supply, Integrated Motion over sercos interface, EtherNet/ IP networking, and component servo drive families.
Kinetix 5700 iTRAK Power Supply and iTRAK Bus Conditioner Module Supply Installation Instruction, publication <a href="#">2198T-IN001</a>	Provides information for wiring and connecting the Kinetix 5700 iTRAK power supply to the iTRAK system.
Independent Cart Technology Libraries, available on the Product Compatibility and Download Center website, <a href="http://rok.auto/pcdc">rok.auto/pcdc</a>	Provides standardized object-oriented libraries for iTRAK systems.
GuardLogix 5580 and Compact GuardLogix 5380 Controller Systems Safety Reference Manual, publication <a href="#">1756-RM012</a>	Describes the GuardLogix 5580 and Compact GuardLogix 5380 controller systems, which are type-approved and certified for use in safety applications.
Compact GuardLogix 5380 Controllers User Manual, publication <a href="#">5069-UM001</a>	Provides information on how to install, configure, program, and use CompactLogix and Compact GuardLogix controllers.
EtherNet/IP Network Devices User Manual, <a href="#">ENET-UM006</a>	Describes how to configure and use EtherNet/IP devices to communicate on the EtherNet/IP network.
Ethernet Reference Manual, <a href="#">ENET-RM002</a>	Describes basic Ethernet concepts, infrastructure components, and infrastructure features.
System Security Design Guidelines Reference Manual, <a href="#">SECURE-RM001</a>	Provides guidance on how to conduct security assessments, implement Rockwell Automation products in a secure system, harden the control system, manage user access, and dispose of equipment.
Industrial Components Preventive Maintenance, Enclosures, and Contact Ratings Specifications, publication <a href="#">IC-TD002</a>	Provides a quick reference tool for Allen-Bradley industrial automation controls and assemblies.
Safety Guidelines for the Application, Installation, and Maintenance of Solid-State Control, publication <a href="#">SGI-11</a>	Designed to harmonize with NEMA Standards Publication No. ICS 1.1-1987 and provides general guidelines for the application, installation, and maintenance of solid-state control in the form of individual devices or packaged assemblies incorporating solid-state components.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://rok.auto/certifications">rok.auto/certifications</a> .	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at [rok.auto/literature](http://rok.auto/literature).



**Notes:**

## Waste Electrical and Electronic Equipment (WEEE)







At the end of life, this equipment should be collected separately from any unsorted municipal waste.

Rockwell Automation maintains current product environmental information on its website at [rok.auto/pec](http://rok.auto/pec).

Your comments help us serve your documentation needs better. If you have any suggestions on how to improve our content, complete the form at [rok.auto/docfeedback](http://rok.auto/docfeedback).  
For technical support, visit [rok.auto/support](http://rok.auto/support).

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