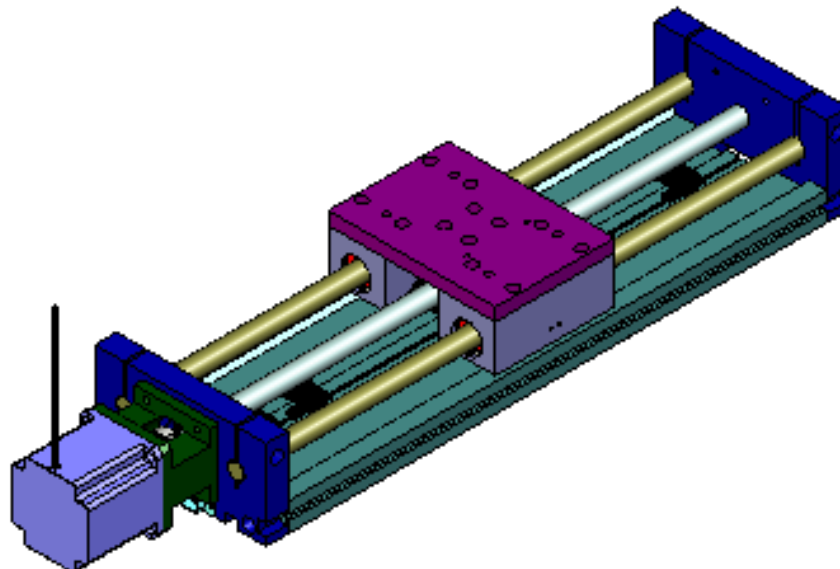


**TWINTRAC™ SERIES**

Positioning Stage System

UST SERIES

**USER'S MANUAL**



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## **USAutomation<sup>®</sup> Twintrac<sup>™</sup> User's Guide**

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## Revision Notes

1.0	Original release	
1.1	2/6/09	Added T-slot dimensions.
1.2	2/23/09	Grammatical errors – new logo

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## Using This Manual

The Twintrac is a dual round rail, screw driven positioning stage system. While the catalog UST80 includes friction type linear bushings, an anti-backlash leadscrew, and a step motor drive; it is also available with optional ball bearing bushings, ball screw, and/or servo motor drives.

This manual provides the basic information necessary to unpack, mount, and run a Twintrac. If additional information is required beyond what is presented here, please refer to the Support section of our website or contact USAutomation Applications Engineering.

## Product Returns

All returns for warranty or out-of-warranty repairs must first receive an RMA (Return Material Authorization) number. Please contact USAutomation Customer Service Department with information about the return and an RMA number will be issued if warranted.

Products returned to the factory will be examined and tested for failure mode and cause. USAutomation Customer Service will contact the customer with the repair cost if the required repair is out of warranty.

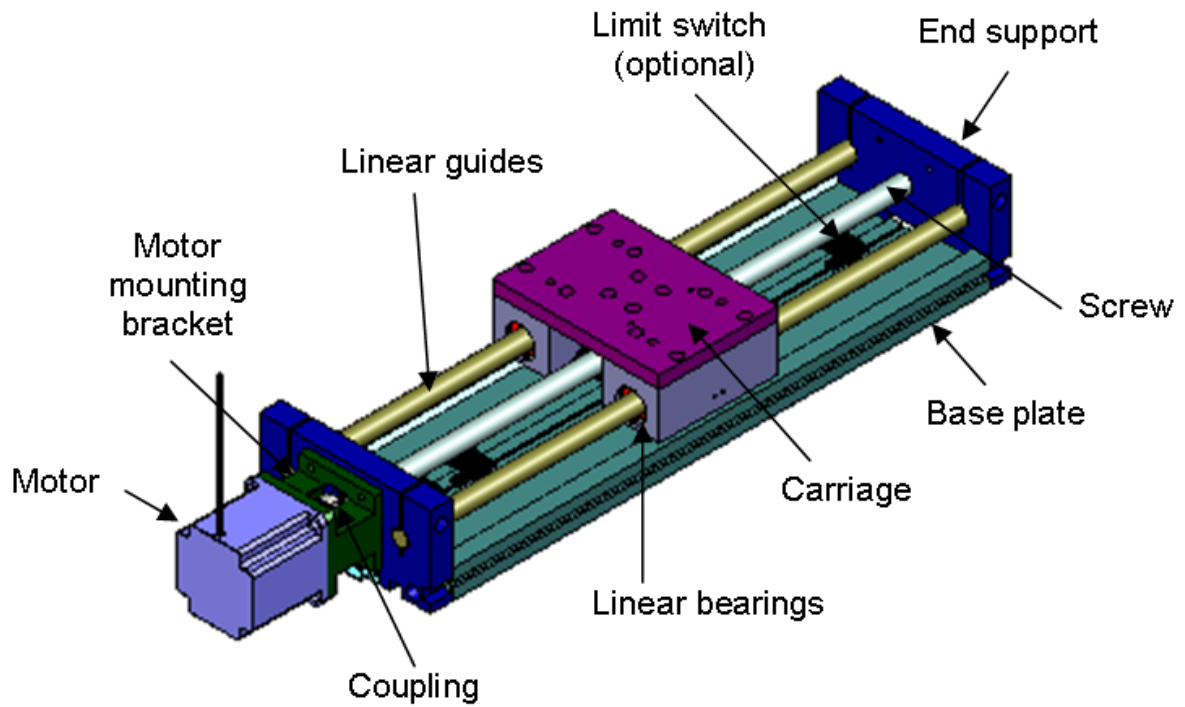
## Unpacking and Handling

Carefully remove the Twintrac from its shipping box and inspect the unit for any evidence of shipping damage. Report any damage immediately to USAutomation. Please save the shipping box for damage inspection or its use in returning product if necessary.

Please observe the following guidelines for handling and mounting:

- Do not drop the stage on any hard surface or subject it to any impact loads. Dropping the stage or other impact loads may result in bearing damage or misalignment.
- Do not drill holes into the stage. Drilling holes into the stage can generate particles and machining forces that may affect the operation of the stage. USAutomation can supply the Twintrac with modifications to your drawing. Please contact the factory for a quote.
- Do not expose the Twintrac to mist, spray or submersion in liquids.
- Do not disassemble the Twintrac.
- Unauthorized alterations or adjustments may alter the specifications and void the product warranty.

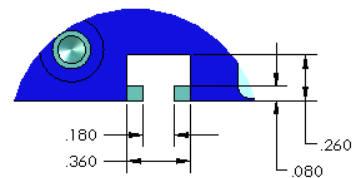
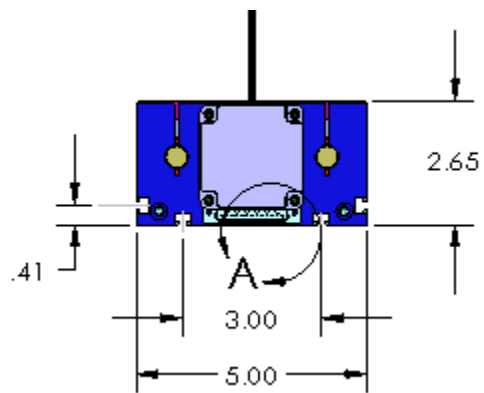
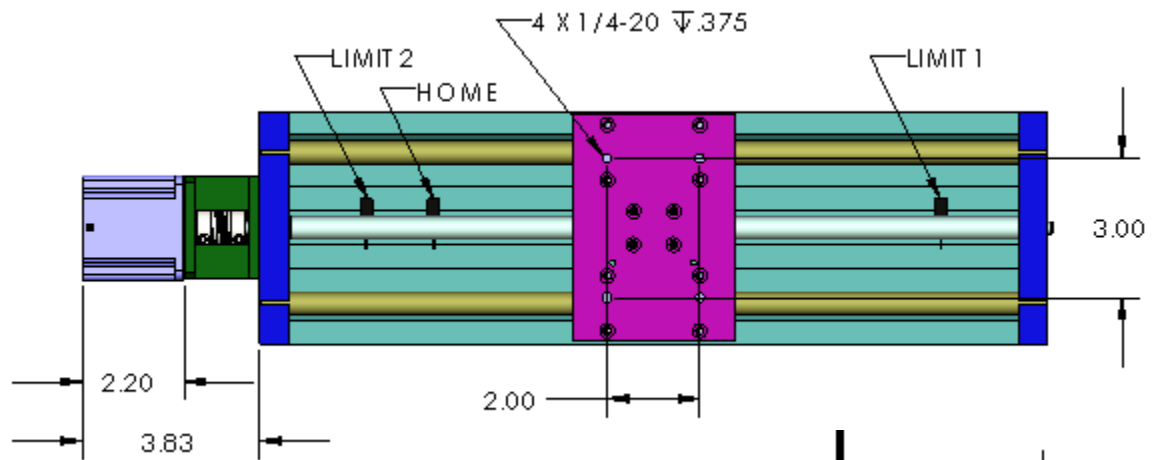
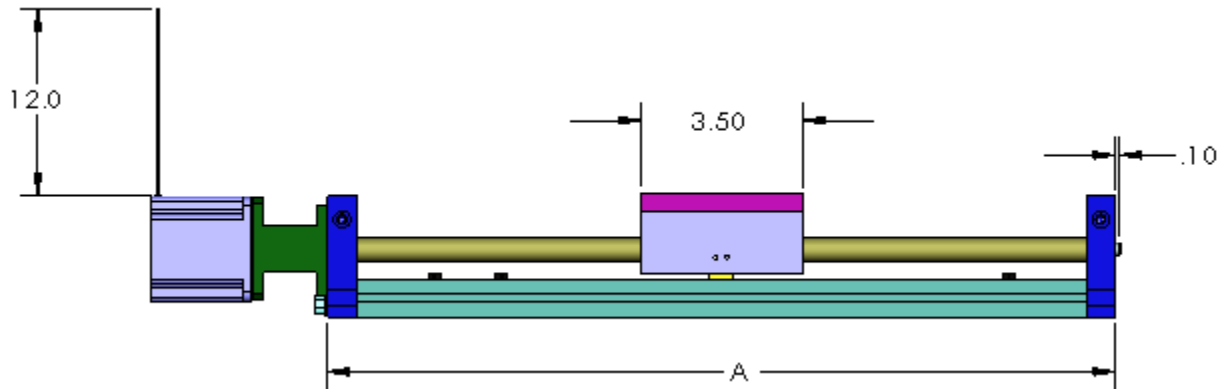
## Assembly Diagram



## Specifications

Part Number	Maximum Dynamic Load (lbs)	Lead (in)	Accuracy (in/in)	Max Linear Speed (in/sec)	Lead-screw Efficiency	Coeff of Friction (Constant)	Drag Torque (in/oz)
UST8020Z-XX-SX	200	.200	.0006	8	63	.09	2-5
UST8050Z-XX-SX	200	.500	.0006	20	79	.09	2-5

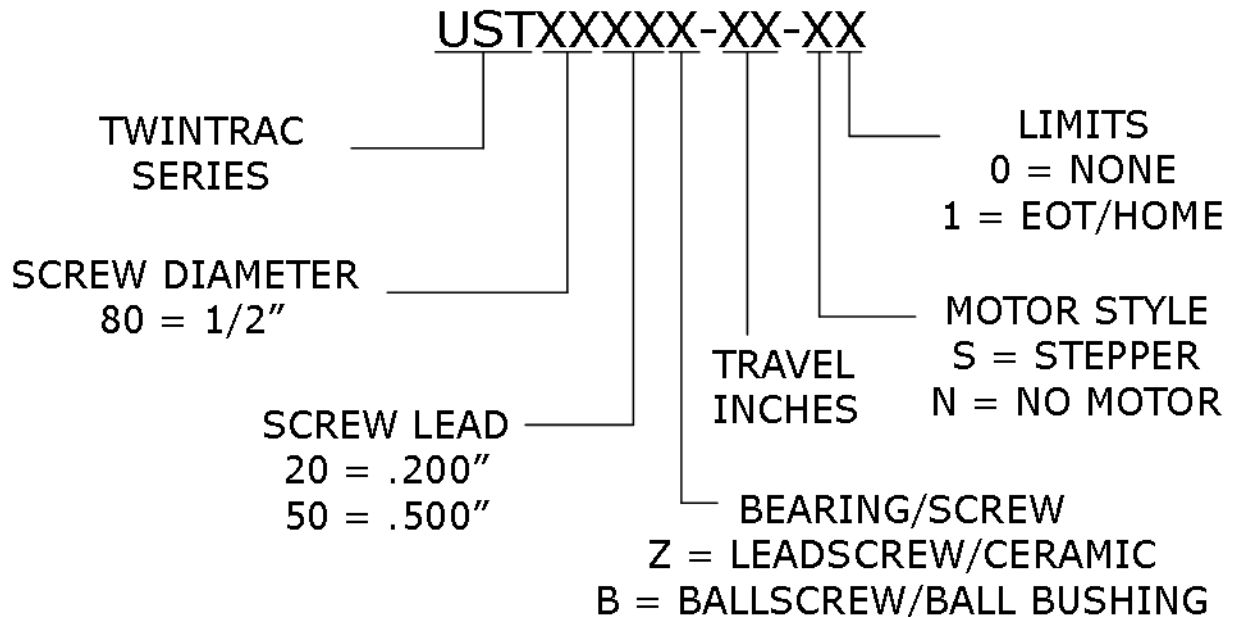
## Dimensions



Travel in (mm)	Dim A in (mm)
6 (152.4)	11.01 (279.7)
12 (304.8)	17.01 (432.1)
18 (457.2)	23.01 (584.5)
24 (609.6)	29.01 (736.9)

## Part Number Configuration

The part number configuration for the Twintrac Series is determined as follows:



## Mounting a Twintrac

The standard mounting method for the Twintrac is to use the two T-slots provided on the bottom of the base plate. These slots are sized to fit an 8-32 hex nut or hex screw head. See T-slot dimensions in Dimensions section. Assuming that the Twintrac will be mounted to a plate or other surface, holes 3" apart can be put in that plate to correspond with the distance between the two slots on the base plate. The head of an 8-32 screw can fit in the slot and protrude through the holes in the mounting surface or the screw can come up through the bottom of the mounting plate into 8-32 nuts fit into the slots. In this latter case care should be taken that the screw doesn't extend more than .250 into the slot as it may interfere with the top surface of the slot.

Countersunk mounting holes can be provided in the base plate of the Twintrac if that is a preferred mounting method. Please contact USAutomation Applications Engineering to review this and get a quote for providing those mounting holes.



## Mounting a Load to the Twintrac

Four (4) ¼-20 UNC by .375” deep threaded holes are provide on the top surface of the carriage to mount loads to the carriage of the Twintrac. See the Dimensions section for location of these holes.

## Step Motor Information

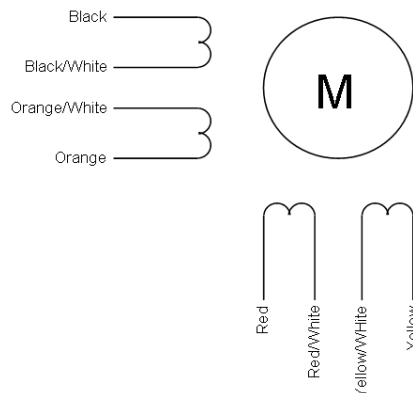
The standard motor which comes with the UST80 Twintrac is a 1.8° hybrid step motor with eight leads. This motor can be connected to any unipolar or bipolar step motor driver/controller. Full torque will be available from the motor when used with a drive that has a rated output with at least 1.4 amps per phase bipolar series or 2.0 amps per phase unipolar. Here are the ratings for the standard Twintrac step motor:

Motor	Connection	Holding Torque (oz in)	Current (A)	Inductance (mH)	Rotor Inertia (oz in sec <sup>2</sup> )	# of Leads	Weight (lbs)	Length (in)
USS23T2104-8LS	Unipolar	124	2.0	2.5	1.64	8	1.55	2.2
	Bipolar	175	1.4	10.0	1.64	8	1.55	2.2

### Electrical Rating Information

Other motors are available from USAutomation including longer stack length step motors, alternate windings, motors with built in drive/controllers, and brushless motors. Please contact the factory for more information on these optional motors.

### Electrical Schematic



Switching Sequence

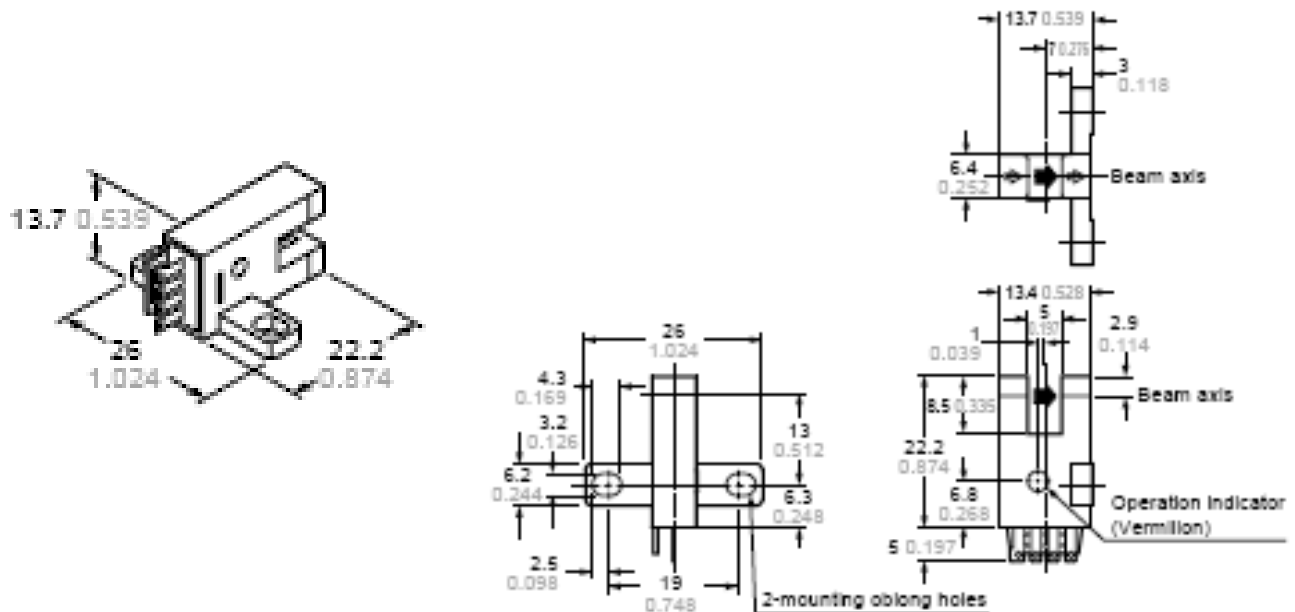
	Black	Orange	Red	Yellow
Step 1	+	-	+	-
Step 2	-	+	+	-
Step 3	-	+	-	+
Step 4	+	-	-	+

Limit Switch Information

If your Twintrac has the optional limit switches they will be mounted in the center channel of the base plate underneath the screw. Three limits are normally supplied with the two outside ones acting as end of travel limits and the inside one acting as a home switch. The limits are adjustable by loosening the two screws on each limit and sliding them to new positions before retightening. Care should be taken to secure any excess wire so that it doesn't interfere with the travel of the bearing blocks.

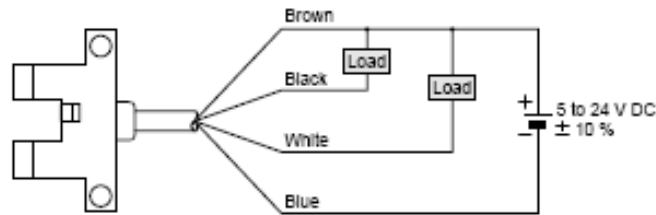
The limits are SUNX model PM-T54, an infrared U-channel switch which is interrupted by a flag mounted to the moving carriage of the Twintrac. The output of the switches is an NPN open-collector with both Light-ON and Dark-ON modes.

Dimensions



Schematic

**Wiring diagram**



**Output operation**

	Color code	Output operation
Output 1	Black	Light-ON
Output 2	White	Dark-ON

Generally, Output 2 will be used because the switch output will then go ON when the flag interrupts the switch. In addition, for safety the switch will appear triggered (shutting down travel) if there is a break in the wiring to the switch.

If more detailed information is required for the sensor, please refer to this URL: <http://www.sunx-ramco.com/SunxPDFFiles/PM.pdf> .

*Wiring*

Connection to the limit switches on the Twintrac are available on the DB25 connector underneath the motor. Here is the pinout description and pin location:

Pin	Function
1	V +
2	COM
3	Limit 1 output
4	Home output
5	Limit 3 output

