

# **Eckels-Bilt & Tracker**

# Overview

The Eckels-Bilt E-Tracker is a system designed to track the edge of a conveyor belt with more precision and system feedback. The key components of the system are the SmartMotor, actuator, tracking rollers and the connections box. Any of the EBI pneumatic trackers can be upgraded to the e-tracking system.

## Features

- Conveyor Belt Tracking of +/- 1/16 inch
- Feedback Control System using an Animatics SmartMotor
- Reversing functionality
- Non-Touch or Touch Sensing System
- System Indicator Outputs for Disaster Prevention
- Electrically Powered System

## Components

- Eckels-Bilt programmed servo motor and actuator for tracking force adjustments
- Analog edge sensor for accurate conveyor belt detection
- Eckels-Bilt belt tracker and rollers
- Red Lion HMI preprogrammed for Eckels-Bilt E-tracker

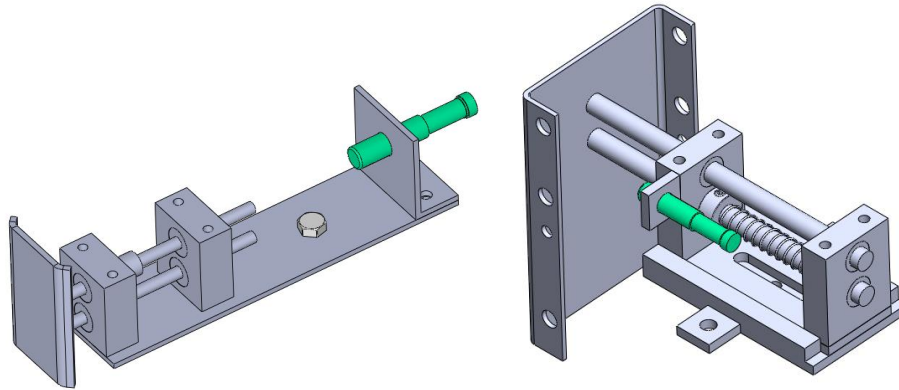
## Tracker Operation Theory

The Eckels-Bilt E-Tracker is an electrical active tracking system. An active tracking system has constant control of the belt. The E-Tracker uses a continuous feedback loop to monitor the belt and make adjustments to keep the belt edge within 1/16 of an inch to the set point of the system.

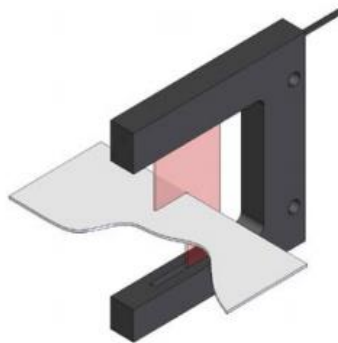
## Sensor

A single sensor is used to determine the location of the conveyor belt edge. There are two general options for sensing - touch and non-touch. A touch sensor is a mechanical system that the edge of the belt runs against. The non-touch sensor is a light band fork sensor that the edge

of the belt runs through without contacting the sensor. Both options are used to send a measurement of the belt position back to the SmartMotor. An ultrasonic paddle design is used for thick belts in harsh environments. The analog fork sensor is for thin belts.



*Touch options (Actual mounting brackets may differ from the shown above)*



*Non-contact option*

## Tracking Rollers

The actuator shifts the tracking roller(s) back and forth in a line parallel to the belt direction. This creates an angle between the roller(s) and the conveyor belt. The wrap of the belt over the tracking rollers along with friction, belt tension, and roller angle generate tracking forces in the plane of the belt. The belt is actually “steered” by traction forces rather than edge forces or differential tension forces that cause belt edge damage and uneven stretching of the belt.

# Installation Instructions

## Belt Tracker and Rollers Installation

1. Remove the rollers from the Belt Tracker.

### 2. MOUNTING THE CYLINDER SIDE:

Clamp the cylinder side of the Belt Tracker to the conveyor frame at the proper location. Make certain it is level and squared with the frame. Mark the base plate mounting holes, drill them, and mount the cylinder side with 3/8" bolts.

### 3. MOUNTING THE STATIONARY SIDE BRACKET:

Re-measure the distance and height of the mounting holes used to mount the cylinder side. Mark an equal distance and height on the opposite side of the conveyor for the stationary side mounting holes. Drill the holes and mount the bracket with 3/8" bolts.

4. Remove the stationary side plate from the bracket. Place the cylinder side end of the rollers into the holes on the cylinder side plate. Position the stationary side plate onto the other end of the roller, and then mount the stationary side plate to the stationary side bracket with the bolts centered in the slots. Lock rollers in place with retainer bars.

5. Make sure that all the rollers on your conveyor are squared with the conveyor frames. The rollers do not need to be skewed to push the belt into the sensor paddle.

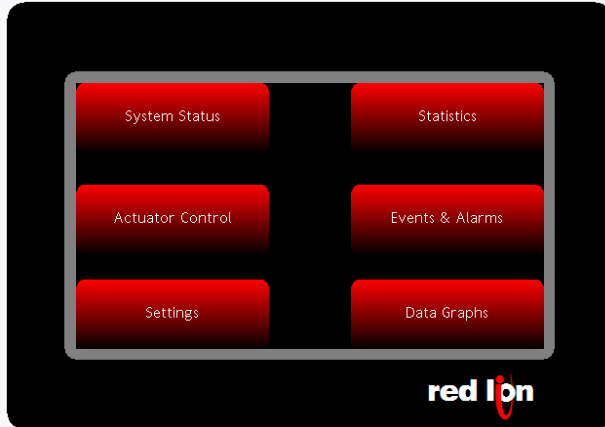
## Enclosure

- 1) Mount the connections box according to the schematics provided.
- 2) Supply 120VAC to the enclosure
- 3) Connect the "SmartMotor Power" cable to the SmartMotor
- 4) Connect the "SmartMotor I/O" cable to the SmartMotor
- 5) Connect the "Sensor" cable to the sensor
- 6) Connect RS-232 cable to enclosure

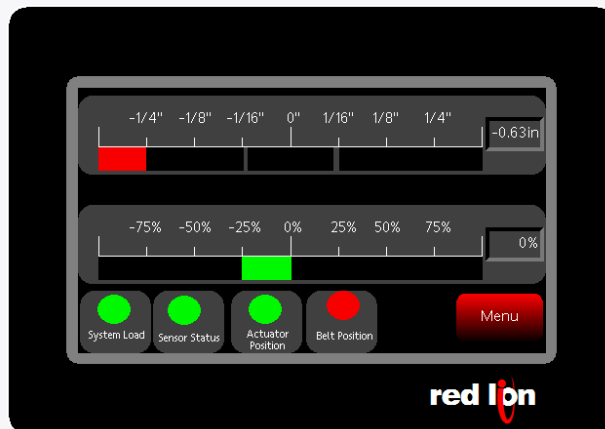
# HMI

The HMI is used to set parameters and view your system in real-time.

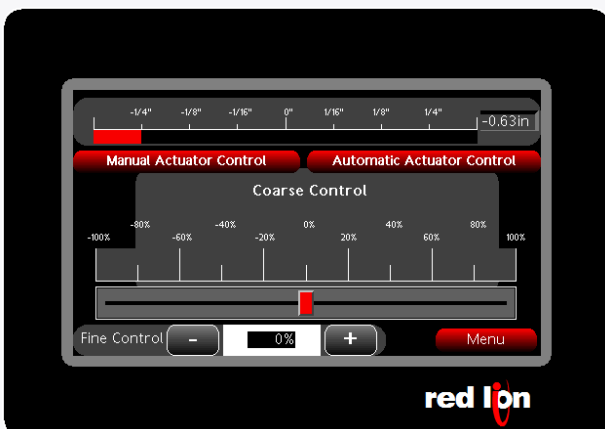
Menu screen: Use this screen to access other screens



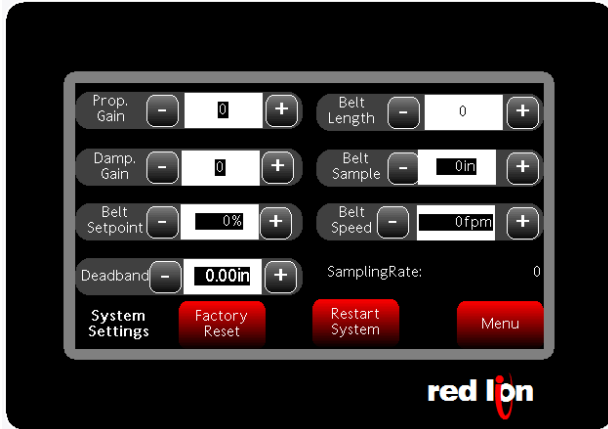
System Status: System status lets you know where you actuator and sensor are in real-time. This screen will also let you know if your system has any alarms.



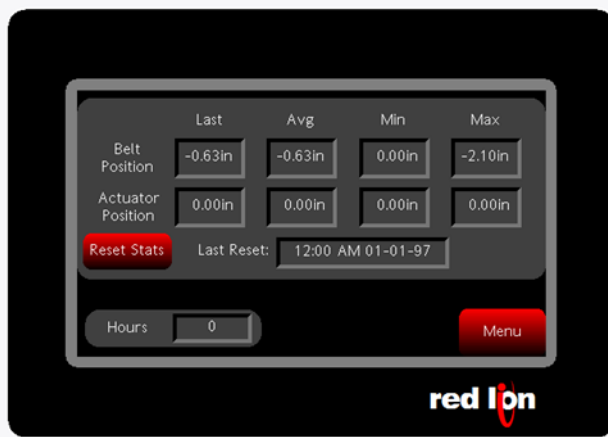
Actuator Control Screen: The actuator control menu can be used to manually move your actuator during the setup of your system.



Settings Screen: The setting screen allows you to change different parameters of your system. Before running your system set the belt length and speed. Deadband, sample size, and gains can be manipulated to change how your system responds. Belt setpoint can be changed on the fly to move the belt left or right. It is recommended that if you need to move the belt over more than 3/8", change the position of the sensor manually.



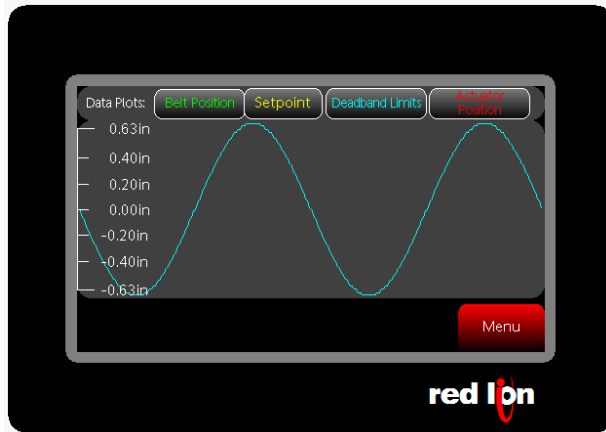
Statistics Screen: The statistics screen gives numeric data on the the acutator and belt.



Events and Alarms: This screen will keep a running tab of events and alarms the system encounters.



Trending: This screen lets you visually see the belt, actuator, set-point, and dead-band positions in real-time.



## Startup Procedure

- 1) Check for loose bolts after all components have been mounted.
- 2) Remove tools from all around the conveyor system.
- 3) Connect power to the connections box
- 4) Wait for actuator to center itself.
- 5) Turn on the conveyor system at a slow speed.
- 6) Check to see if the belt is being tracked.
- 7) If there is no response, switch the System Polarity Toggle Switch inside the connections box.

## Polarity

The e-tracker is equipped with a polarity switch.

Polarity EXAMPLE:

- a) With the belt movement through the Automatic Belt Tracker from **left to right** and the belt not in contact with the sensor,  
**THE ACTUATOR SHOULD BE EXTENDED.**
- OR
- b) With the belt movement through the Automatic Belt Tracker from **right to left** and the belt not in contact with the sensor,  
**THE ACTUATOR SHOULD BE RETRACTED.**

IF your conveyor is reversing, you can bypass this manual switch and connect to your control system.

## Stop Actuator Movement

If your system cycles with long dwell times, you can use the orange and black/white I/O inputs to stop actuator movement.

## Optional Alarms

### Belt Position

3 States: *Output 1*, *Outputs 1 and 2*, and *Output 2*

- *Output 1*: Good belt tracking. If all other lights are off, then no action is required.
- *Outputs 1 and 2*: Belt is drifting outside accepted tolerance. Check other lights for possible diagnosis of the problem



- *Output 2*: Belt is strongly mistracked. Check other lights for possible diagnosis of the problem. Conveyor shut down for maintenance may be required.

## **Actuator Position**

2 States: *Output 3*

- *Output 3*: Indicates the actuator has fully extended or retracted.
  1. Check for product build-up or conveyor interference
  2. Shut down conveyor as soon as possible to determine cause
- *OFF*: Actuator Position is acceptable. No Action is required.

## **Sensor Status**

2 States: *Output 4*

- *Output 4*: Indicates an edge sensor failure
  1. Check paddle sensor to confirm there is no obstructions to sensing the belt edge.
  2. Check the LED on the sensor
    - Red: Sensor Fault. Contact Eckels-Bilt, Inc. at 817-246-4555
    - Yellow: Sensor is good
  3. Open the Connections box and confirm the sensor cable is connected to all the appropriate junctions according to the Connections Box schematic.
- *OFF*: Sensor reading is valid. No action required.