Motion Encoder Transmitter Parts

(Order Code MECT)

The Motion Encoder Transmitter Parts kit is an add-on product to be used with an existing Vernier Dynamics Cart and Track System, or a Vernier Dynamics System. It cannot be used on its own. The parts allow you to convert a Vernier Dynamics Cart to a Motion Encoder Cart. Either a Standard Cart or Plunger Cart can be converted.

For more information about the Motion Encoder System, see www.vernier.com/dts-ec

What's Included

- Motion Encoder Transmitter Assembly
- Replacement Cart End Caps for plastic or metal carts
- Allen wrench, 3/32 inch

You will need a small Phillips or straight screwdriver to complete the assembly.

Assembly

Motion Encoder Transmitter Installation for Plastic Carts

The Motion Transmitter Parts are used to convert an existing dynamics cart to a Motion Encoder Cart. Either a Standard Cart (DTS-CART-S) or a Plunger Cart (DTS-CART-P) can be converted.

1. Remove the two end cap screws from the gray end cap using the 3/32-inch Allen wrench.
2. Remove the end cap.
3. Place the cart upside down and press the wheels down toward the body to compress the springs. Remove the pins holding the axle in place.
4. Lift out the axle and wheels.
5. Prepare the encoder transmitter assembly for insertion by removing the four silver screws from the baseplate. Discard the now-loose plastic bars; they are not needed for plastic carts.
6. Place the encoder transmitter assembly into the cart body with the power button and LED at the open end of the cart.
7. Re-insert the four silver screws into the baseplate, driving them into the screw holes of the cart body. Tighten the four bottom screws holding the encoder assembly.
8. Replace the axle and pins.
9. Take note of the LED. It will be parallel to the circuit board. The tip projects about 2–3 mm past the circuit board.
10. Install the larger end cap, being careful to allow the LED and power button to find their places in the end cap. There should be no force required at all. Discard the remaining end cap; it will not be used.
11. Replace the two screws from the original end cap into the new cap using the Allen wrench.
12. Insert two AAA batteries as indicated on the circuit board, and install the battery compartment cover.

Motion Encoder Transmitter Installation for Metal Carts (legacy)

The Motion Encoder Transmitter Parts are used to convert an existing dynamics cart to a Motion Encoder Cart. Either a Standard Cart (DTS-CART-S) or a Plunger Cart (DTS-CART-P) can be converted.

1. Remove the four end cap screws using the 3/32-inch Allen wrench.
2. Remove the end cap.
3. Place the cart upside down and press the wheels down toward the body to compress the springs. Remove the pins holding the axle in place.
4. Lift out the axle and wheels.
5. Slide the encoder transmitter assembly into the cart body, battery end first, so that the power button and LED will be at the open end of the cart.
6. Replace the axle and pins.
7. Tighten the four bottom screws holding the encoder assembly, but leave them a bit loose for now to allow it to align properly with the end cap.
8. Take note of the LED. It will be parallel to the circuit board. The tip projects about 2–3 mm past the circuit board.
9. Install the smaller end cap, being careful to allow the LED and power button to find their places in the end cap. There should be no force required at all. Discard the remaining end cap; it will not be used.
10. Replace two of the screws from the original end cap into the new cap using the Allen wrench.
11. Tighten the four bottom screws the rest of the way so everything is held tightly in place.
12. Insert two AAA batteries as indicated on the circuit board, and install the battery compartment cover.

Power

The Motion Encoder Cart requires two AAA batteries. Either NiMH rechargeable batteries or alkaline disposable batteries can be used.

Turn on the cart by pressing the clear power button on the cart endcap. It will glow blue when power is on. Press again to turn off. The cart will turn itself off after 20 minutes of inactivity. Any motion on the track will cause the timer to reset.

Battery life depends on use and the range setting. Low battery levels may cause erratic detection of the cart motion, including incorrect velocity signs. Replace the batteries if this is seen.

Range Setting of the Motion Encoder Cart

The IR transmitter on the cart has two power levels available. The default 1 m setting conserves battery power. If the cart is used on a 2.2 m track, set the cart to the higher 2 m power level. If this setting is not used, the receiver will not reliably sense the position of the cart at the far end of the track. The switch is located inside the battery compartment.

Products Related to the Vernier Dynamics Cart and Track System with Motion Encoder

Vernier Dynamics Cart and Track System (order code DTS)

Vernier Dynamics Cart and Track System is a low-friction anodized 1.2 m track and optics bench combination designed for kinematics, dynamics, and optics experiments. It includes two carts.

Vernier Dynamics Cart and Track System with Long Track (order code DTS-LONG)

The long version of the Vernier Dynamics Cart and Track System includes a 2.2 m track instead of the 1.2 standard track.

Track (order code TRACK)

The Combination 1.2 m Track/Optics Bench comes with the Encoder System Strip installed.

Bumper Launcher Kit (order code BLK)

The Bumper Launcher Kit includes accessories to integrate the Dual-Range Force Sensor with the Vernier Dynamics System or Vernier Motion Encoder System, allowing for many interesting experiments in momentum-impulse study.

Dual-Range Force Sensor (order code DFS-BTA)

The Dual-Range Force Sensor measures pushes and pulls up to 50 N.

Wireless Dynamics Sensor System (order code WDSS)

The WDSS is a wireless force sensor and accelerometer.

Replacement Parts

Motion Encoder Receiver (order code MEC-BTD)

The receiver attaches to the end of the track and connects to an interface, such as a LabQuest 2.

Motion Encoder Cart (order code DTS-CART-MEC)

This is the complete Motion Encoder Cart, with no assembly required.

Motion Encoder Track Strip - Long (order code METS-LONG)

The strip can be attached to an existing track without an encoder strip, or it can be attached as a second strip for use with two encoder systems.

Warranty

Warranty information for this product can be found on the Support tab at **www.vernier.com/gdx-acc**

General warranty information can be found at **www.vernier.com/warranty**

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