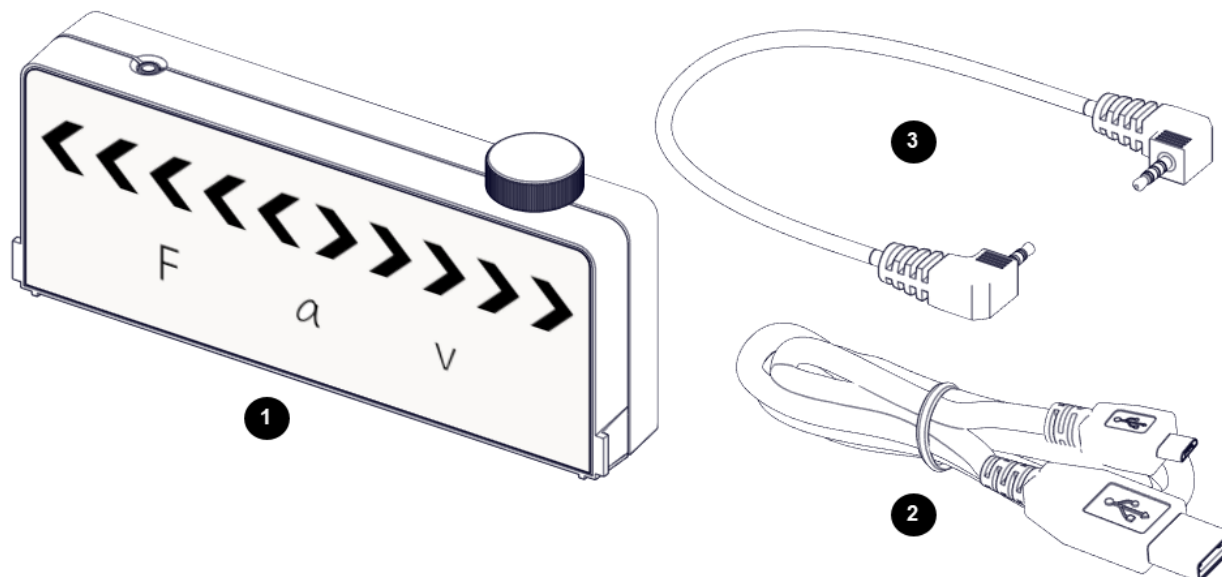


## Smart Cart Vector Display

ME-1246



### Product Summary

The Smart Cart Vector Display adds visual vectors to a Smart Cart<sup>1</sup> for force, acceleration, and velocity. Arrows light up proportional to the sensor reading showing either positive or negative direction and magnitude.

### Included Equipment

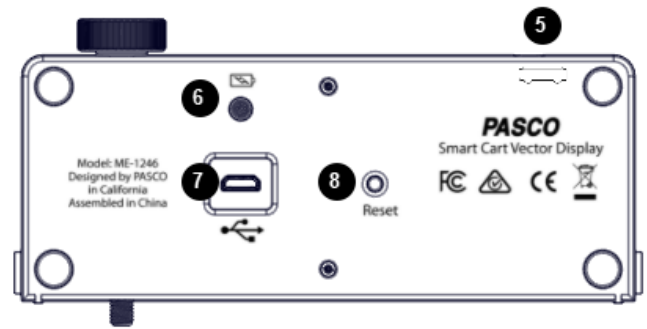
- 1 **Smart Cart Vector Display**
- 2 **Micro USB cable**  
For connecting the accessory to a USB charger.
- 3 **Smart Cart Accessory Cable**  
For connecting the accessory to a Smart Cart.

### Required Equipment

The following table lists the equipment required to perform experiments with the Smart Cart Vector Display. Only one of the options provided for each item is required.

Item	Options
Smart Cart	ME-1240 Smart Cart (Red) ME-1241 Smart Cart (Blue)
Software	PASCO Capstone SPARKvue

<sup>1</sup> U.S. Patent 10,481,173, issued 2019.



## Components

- 1 Thumbscrew**  
For securing the accessory to a Smart Cart.
- 2 Tab**  
For inserting into the slot of a Smart Cart.
- 3 Magnitude and Direction Indicator Lights**  
The illuminated arrows indicate the direction of the selected measurement. The number of illuminated arrows indicate the magnitude.
- 4 Measurement Indicator Lights**  
The illuminated variable indicates the displayed measurement.
- 5 Accessory Port**  
For connecting the accessory to a Smart Cart using the Smart Cart accessory cable.
- 6 Battery Indicator Light**  
Red blink      Low charge  
Green solid    Full charge  
Yellow solid    Charging
- 7 Micro USB port**  
For connecting the accessory to a USB charger using the USB cable.
- 8 Reset Button**  
Press and hold for one second if the accessory is malfunctioning.

## Getting Started

Before using the device with students for the first time, perform the following tasks:

1. Charge the battery.
2. Update your PASCO data collection software.
3. Update the firmware of your Smart Cart.

### Charge the battery

1. Connect the USB cable to the USB port on the accessory. Connect the other end of the cable to a USB charger or port.
2. Keep the device connected to the charger until the battery is fully charged.

**Tip:** The device can remain connected to the charger when the battery is fully charged.

### Update PASCO data collection software

1. Open the PASCO data collection software.
2. The software will display a message if an update is available. Follow the instructions on the screen. If you do not receive a message, the latest version of the software is installed.

### Update the Smart Cart firmware

The Smart Cart contains firmware that controls how the device functions and connects with accessories. The cart and accessories may not function correctly if the latest firmware is not installed.

1. Connect the Smart Cart to your software.

**Tip:** Use a USB connection for a faster update.

2. The software will display a message if a firmware update is available. Follow the instructions on the screen. If you do not receive a message, the firmware is up to date.

## Using the Equipment

### Connect the Vector Display to a Smart Cart

The Smart Cart Vector Display is required to be connected to a Smart Cart. The display can be put in the Smart Cart accessory tray upright to view from the side or flat to view from overhead.

1. Connect the Smart Cart accessory cable to the accessory port on the Vector Display. Connect the other end of the cable to the accessory port on the Smart Cart.
2. Put the display on the cart in an upright or flat position, as shown in Figure 1:

**Tip:** When the  $v$  on the Vector Display is on the front side of the cart (force sensor side) the positive direction of the cart matches the default positive direction of the display.

- Upright: Put the tabs on the Vector Display into the slots of the cart. Tighten the thumbscrew to hold the display in place.
  - Flat: Put the display flat in the Smart Cart accessory tray with the display facing up.
3. Press and hold the Smart Cart power button to power on the cart and Vector Display.

The Vector Display is configured to display the Smart Cart's accelerometer measurement at the  $5 \text{ m/s}^2$  range by default.

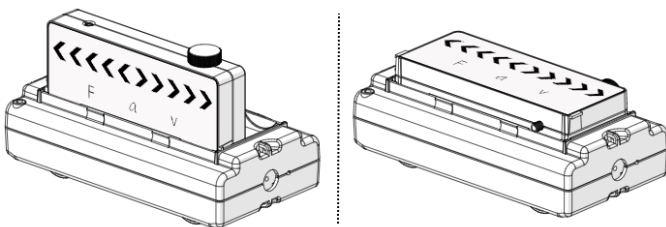


Figure 1. The Vector Display put in a Smart Cart in an upright (left) and flat (right) position.


### Change the displayed measurement

Use PASCO Capstone or SPARKvue to select a Smart Cart measurement to display. Use the software to also adjust the range and sign of the measurement.

Before performing these steps, be sure that:

- The Smart Cart is connected to the software.
- The accessory is connected to the Smart Cart.





1. In the Tools palette, go to the Vector Display tool .
2. Go to the Measurement menu then select a measurement to display.
3. Go to the Range menu then select a range to display.

**Tip:** The range corresponds to the magnitude displayed when all five arrows are illuminated on the display. For example, if the range is set to  $0.5 \text{ m/s}$ , each arrow equates to  $0.1 \text{ m/s}$ .

4. (Optional) Select the Check Sign checkbox to change the positive direction of the measurement.



1. Select  to build a new page.
2. Select the full screen layout.
3. Select the Vector Display tool .
4. Go to the Choose Device menu then select the Vector Display to configure.
5. Go to the Measurement menu then select a measurement to display.
6. Go to the Range menu then select a range to display.

**Tip:** The range corresponds to the magnitude displayed when all five arrows are illuminated on the display. For example, if the range is set to  $0.5 \text{ m/s}$ , each arrow equates to  $0.1 \text{ m/s}$ .

7. (Optional) Change the Change Sign switch to On to change the positive direction of the measurement.

## Experiments

Copy-ready experiment worksheets for classroom use are available on the PASCO website. Download the experiments for free at:

[www.pasco.com/resources/lab-experiments](http://www.pasco.com/resources/lab-experiments)

## Technical Support

For assistance with PASCO products, contact PASCO Technical Support at:

Address: PASCO scientific  
10101 Foothills Blvd.  
Roseville, CA 95747-7100  
Phone: 916-462-8384  
Web: [www.pasco.com](http://www.pasco.com)  
Email: [support@pasco.com](mailto:support@pasco.com)

## FCC Statement

This digital device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

## Product End of Life Disposal Instructions

This electronic product is subject to disposal and recycling regulations that vary by country and region. It is your responsibility to recycle your electronic equipment per your local environmental laws and regulations to ensure that it will be recycled in a manner that protects human health and the environment. To find out where you can drop off your waste equipment for recycling, please contact your local waste recycle/disposal service, or the place where you purchased the product.

The European Union WEEE (Waste Electronic and Electrical Equipment) symbol (to the right) and on the product or its packaging indicates that this product must not be disposed of in a standard waste container.



## Warranty, Copyright, and Trademarks

**Limited Warranty** For a description of the product warranty, see the PASCO catalog.

**Copyright** This document is copyrighted with all rights reserved. Permission is granted to non-profit educational institutions for reproduction of any part of this manual, providing the reproductions are used only in their laboratories and classrooms, and are not sold for profit. Reproduction under any other circumstances, without the written consent of PASCO scientific, is prohibited.

**Trademarks** PASCO and PASCO scientific are trademarks or registered trademarks of PASCO scientific, in the United States and/or in other countries. All other brands, products, or service names are or may be trademarks or service marks of, and are used to identify, products or services of, their respective owners. For more information visit [www.pasco.com/legal](http://www.pasco.com/legal).