

Current Balance

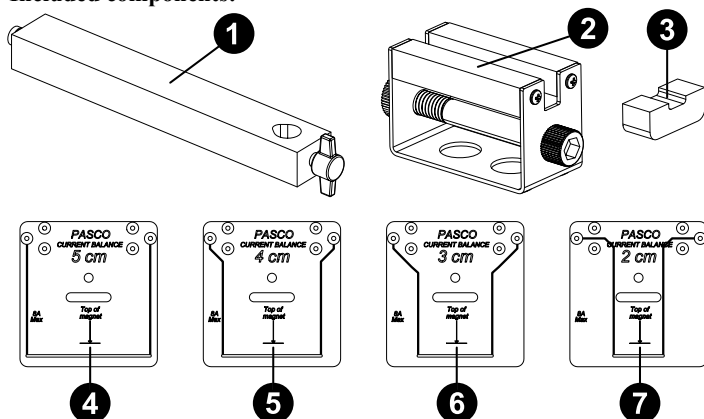
EM-8607

Introduction

The Current Balance is used to measure the force on a current-carrying wire within a magnetic field. When assembled, the apparatus consists of a wire board holder, a magnet holder, up to five magnets, and one of four wire boards. When current passes through the wire board while it is being influenced by the magnets, an upward or downward force will be exerted on the board. This force can be measured using a sufficiently precise scale.

Components

Included components:



- ❶ Wire board holder
- ❷ Magnet holder
- ❸ 5× magnets
- ❹ 5 cm wire board
- ❺ 4 cm wire board
- ❻ 3 cm wire board
- ❼ 2 cm wire board
- ❽ Storage box (not pictured)

Required equipment:

- Wireless Magnetic Field Sensor (PS-3221)
- Power supply, such as the AC/DC Power Supply (SE-9584)
- Small A-Base with Leveling Feet (ME-8989)
- Stainless Steel Rod, 45 cm (ME-8736)
- One of the following scales:
 - Ohaus Cent-O-Gram Balance (SE-8725)
 - Ohaus Scout SKX Balance 420g (SE-8756B)

Set up the equipment

1. Mount the Stainless Steel Rod on the Small A-Base.
2. Insert the Stainless Steel Rod into the hole near one end of the wire board holder. Use the large thumbscrew at the end of the holder to secure it in place on the rod at a position near the base.
3. Remove the small thumbscrew from the other side of the wire board holder, then place one of the wire boards at this end of the holder, with the banana plug ports facing towards the holder. Align the hole in the holder with the hole in the wire board, then re-insert the thumbscrew and secure the board in place, as shown in Figure 1.
4. Make sure that the desired number of magnets are inserted onto the magnet holder (see **Change the number of magnets**), then place the magnet holder onto the scale.

NOTE: The red side of each magnet should be aligned with the red beam of the magnet holder, and the blue side of each magnet should be aligned with the blue beam.

5. Position the scale in front of the wire board holder so that the lower edge of the wire board extends into the groove on the magnet holder, as shown in Figure 1. The top of the magnet holder should be aligned with the line labeled "Top of magnet" on the wire board.

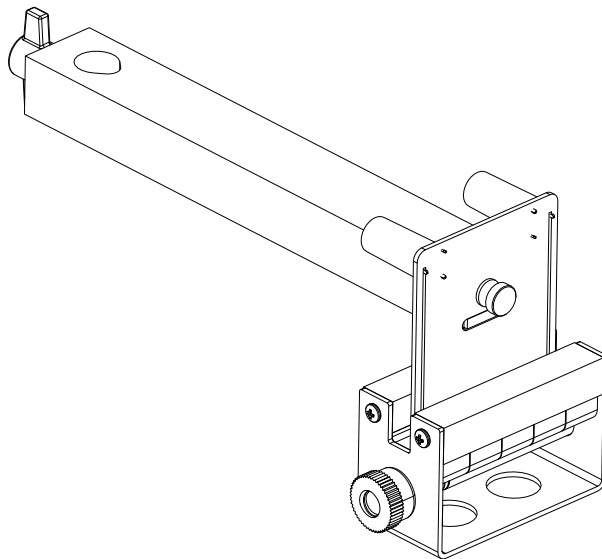


Figure 1: Setup of the magnet holder, wire board holder, and a wire board. Mounting rod, base, and scale not pictured.

6. Connect the banana plug ports on the wire board to the output ports of the power supply.
7. Tare the scale, then begin driving the board with a DC signal. The scale's readout will be proportional to the force exerted on the wire board. Use the Magnetic Field Sensor to observe the magnetic field strength.

Change the number of magnets

By default, the magnet holder is outfitted with five magnets, filling the space between the ends of the holder. However, it is possible to perform experiments with a smaller number of magnets. To remove a magnet, remove the screw from the magnet holder, then pull downwards on the magnet slightly and slide it perpendicular to the axis of the holder. Once you are done adding or removing magnets, reinsert the screw.

The magnets on the holder must *always* be evenly spaced during experiments. After changing the number of magnets on the holder, make sure to redistribute the remaining magnets so that there is equal spacing between each magnet, and between the outermost magnets and the ends of the holder.

Storage

The box in which the Current Balance is shipped contains foam with cutouts to store the individual components. As such, we recommend that you do not discard the box, as it can be used as a convenient storage solution for the apparatus.

Specifications and accessories

Visit the product page at [pasco.com/product/EM-8607](https://www.pasco.com/product/EM-8607) to view the specifications and explore accessories. You can also download experiment files and support documents from the product page.

Experiment files

Download one of several student-ready activities from the PASCO Experiment Library. Experiments include student handouts and teacher notes. Visit [pasco.com/freelabs/EM-8607](https://www.pasco.com/freelabs/EM-8607).

Technical support

Need more help? Our knowledgeable and friendly Technical Support staff is ready to answer your questions or walk you through any issues.

- Chat [pasco.com](https://www.pasco.com)
- Phone 1-800-772-8700 x1004 (USA)
+1 916 462 8384 (outside USA)
- Email support@pasco.com

Limited warranty

For a description of the product warranty, see the Warranty and Returns page at www.pasco.com/legal.

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CE statement

This device has been tested and found to comply with the essential requirements and other relevant provisions of the applicable EU Directives.