In this week’s workshop you’ll be using a photogate to help you find the velocity of a fan cart. The photogate timer measures how long a beam of infrared light is blocked by the fan cart’s flag as it passes through the gate (see below).

Explain (briefly) how you can determine the speed of the fan cart using the photogate if you know the width of the flag that passes through the photogate.

Say you have a cart moving along a track. The cart has a 2 cm wide flag attached to it. When the flag passes through the photogate the photogate reads out $\Delta t = 0.04$ seconds. What can you say about the speed of the cart using this information?