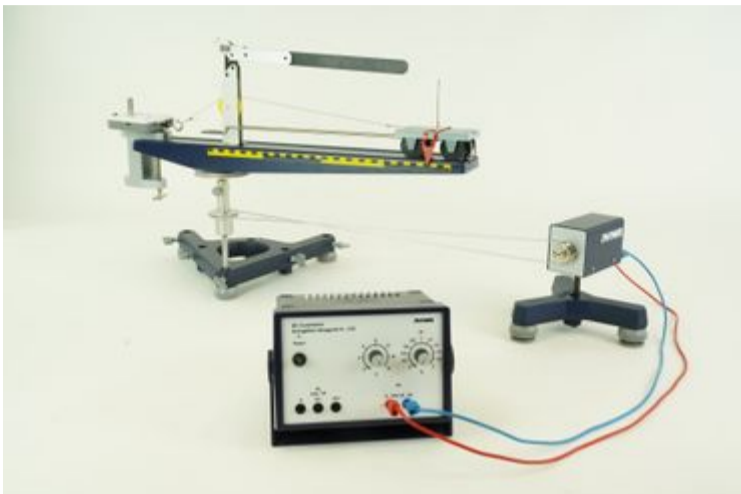


## Centripetal force/centrifugal force with Cobra SMARTsense

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### Principle

The examination of the dependencies of the centripetal force is a classic experiment of mechanics. Here and in experiments with rotational movements in general radio transmission offers many advantages. Conventional set-ups of experiments to measure the centripetal force mostly measure the force through a cord to stationary measuring units outside. If a spring scale is used to measure the values, greater speed also increases the radius of the path due to the increasing elongation of the spring. Therefore, the examination of the centripetal force with altered radii or angular speeds while setting the other quantity to a fixed value is rather complicated to perform. The Cobra SMARTsense Sensor-Unit Force with elongation measurement strips simplifies this experiment. Radio transmission additionally simplifies the set-up of this experiment, since an external fixation of the sensor is not necessary as can be seen in figure 1. So it is easy to examine the dependencies of the centripetal force on angular velocity, radius and mass.

### Learning objectives

- Determination of the relation between centripetal force and angular velocity
- Determination of the relation between centripetal force and rotating mass
- Determination of the relation between centripetal force and radius of the circular movement

### Benefits

- Wireless connection with Cobra SMARTsense Force & Acceleration
- Automatic sensor identification and loadable pre-settings with the software measureApp
- High precision allows to determine the rotational frequency
- Variable adjustment of the rotational velocity
- Set-up optionally provides the possibility to perform the classical variant of the experiment with an analogue spring balance

## Scope of delivery

Cobra SMARTsense Force & Acceleration - Sensor for measuring force and acceleration $\pm 50$ N / $\pm 16$ g (Bluetooth + USB)	12943-00	1
Fish line, l. 100m	02090-00	1
Cart for measurements and experiments	11060-00	1
Holding pin	03949-00	1
Weight, 150 g, for 11060.00	11060-01	2
Slotted weight, silver bronze, 50 g	02206-03	2
Centrifugal force apparatus	11008-00	1
Driving belt	03981-00	2
Bearing unit	02845-00	1
Motor with disk holder	11614-00	1
PHYWE Power supply, 230 V, DC: 0...12 V, 2 A / AC: 6 V, 12 V, 5 A	13506-93	1
measureLAB, multi-user license	14580-61	1
Tripod base PHYWE	02002-55	1
Support base DEMO	02007-55	1
Support rod, stainless steel, different lengths	02030-15	1
Connecting cord, 32 A, 500 mm, red	07363-01	1
Connecting cord, 32 A, 500 mm, blue	07363-04	1