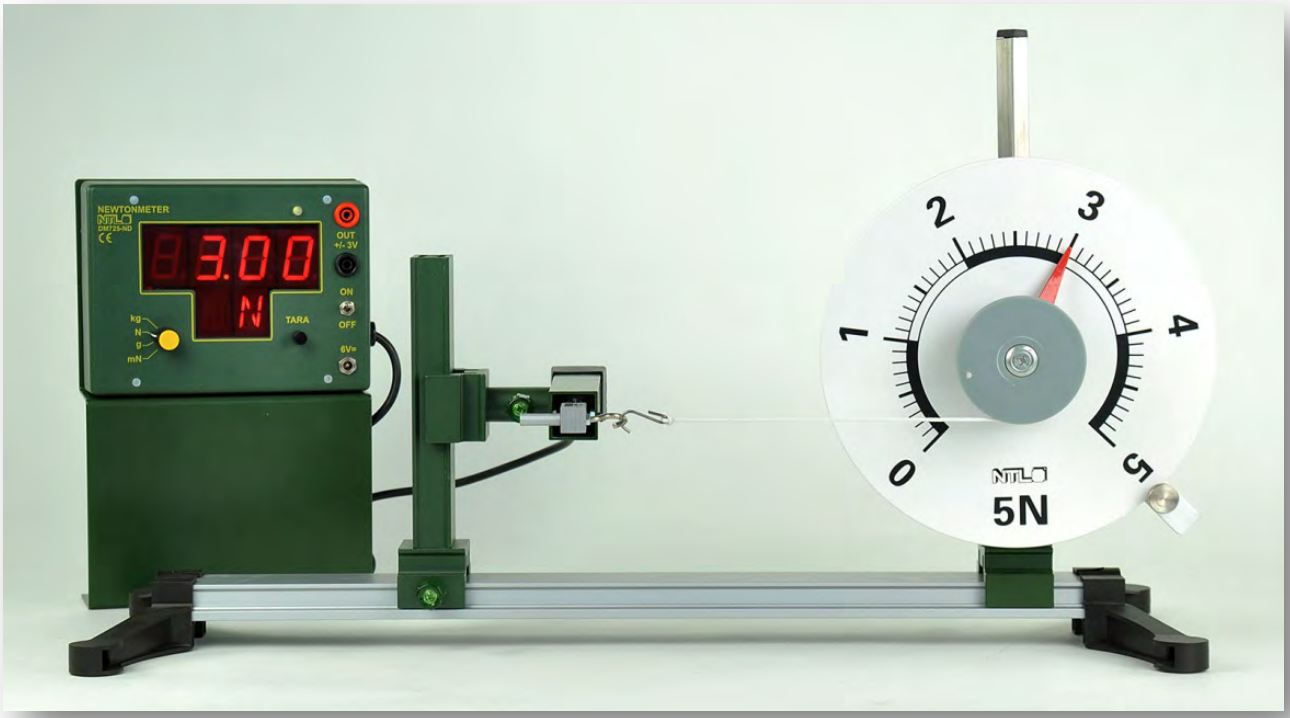
FORCE AND COUNTERFORCE (ACTIO EST REACTIO)

MED 02.06



Material:

Item-no.	Qty.	Description
DS102-50	1	Stand rail base, L=500 mm
DS112-1E	2	Rail claw, simple
DS141-1R	1	Sliding saddle with bosshead
DS300-25	1	Support rod, squared, L=250 mm, 12x12 mm
DS400-3K	1	Bosshead cross-pattern, Demo, green
DM132-1F	1	Torsion dynamometer 10 N
DS103-1G	1	Rail support "parallel", H=150 mm
DS103-3G	1	Sliding saddle, H=34 mm
DM725-ND	1	Newtonmeter "inno" 20 N / 2000 g
P3120-5B	1	S-shaped assembly platform

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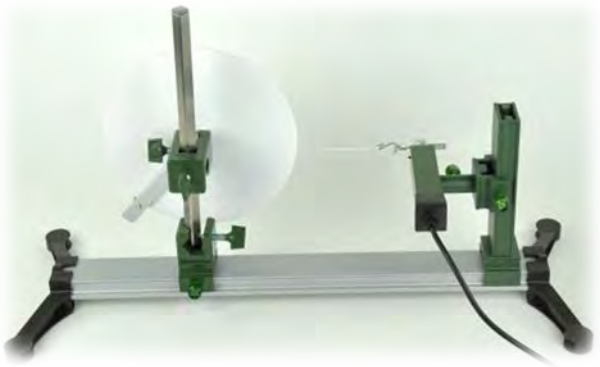
Purpose
Every force between bodies is an interaction. Forces always occur in pairs (actio and reactio). Force and counterforce are always the same size and oppositely directed.

Preparation
Attach the two rail claws to the ends of the stand rail base, then fix the sliding saddle with bosshead to one end of the stand rail base.

Insert the 25 cm rod into the bosshead; afterwards fix the cross-patterned bosshead to the centre of the support rod. Mount the Torsion dynamometer on this bosshead.

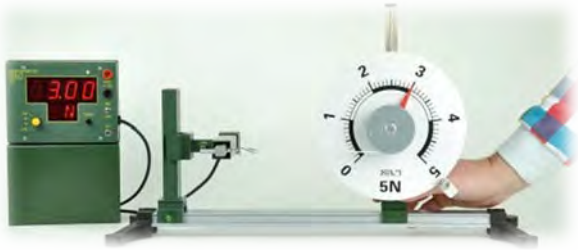
Place the rail support „parallel“ 20 cm before the sliding saddle with bosshead; afterwards attach the sliding saddle in the centre of the rail support as shown on the image.



Mount the weighing bar of the Newtonmeter in this sliding saddle. The hook of the weighing bar and the lower edge of pulley of the Torsion dynamometer have to be positioned at the same height.

Set the measuring range on the Newtonmeter to „N“ (Newton); afterwards turn it on and tare (set to 0). The scale of the Torsion dynamometer can be turned; it is also set to 0.
The hook on the cord of the torsion dynamometer is now hooked into the hook of the weighing beam.

Experiment
Loosen the screw of the sliding saddle with the Torsion dynamometer and move it slowly. Observe the values displayed on the Torsion dynamometer and on the Newtonmeter.



Move the sliding saddle back to the original position and fix it there again with the screw.

Now loosen the screw of the rail support and move it slowly.
Again observe the values displayed on the Torsion dynamometer and on the Newtonmeter.

Conclusion
A force always has the same counterforce.

Note
Due to the large resolution of the Newton meter, there may be slight deviations between the two displayed values. This is the very nature of a very accurate display.