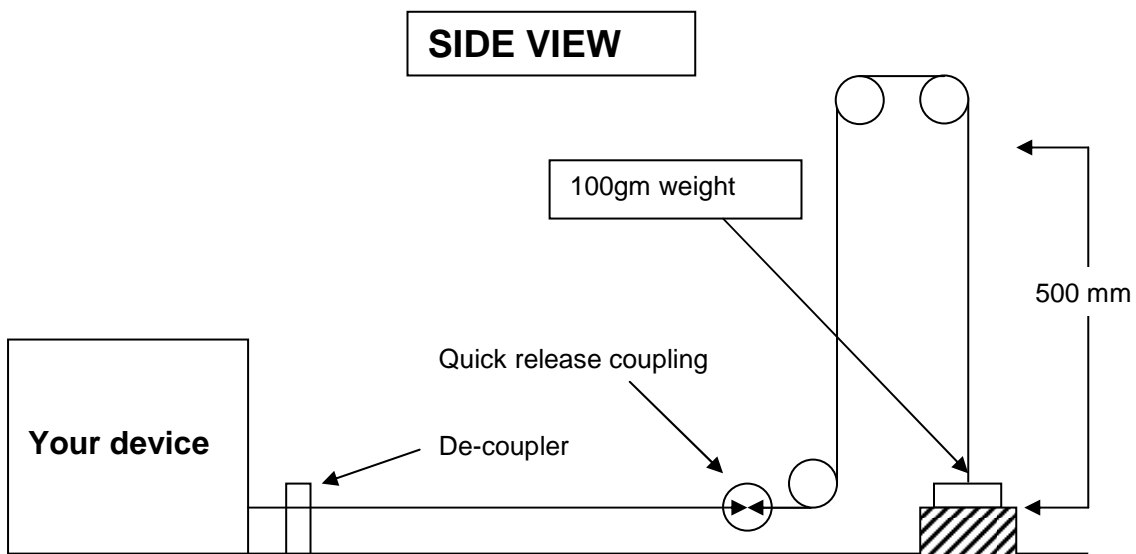


SMEELEC Rules

General Information applicable to both challenges

A special test rig has been developed for the competition. This will measure the time taken to lift the weight 500mm to the nearest microsecond.

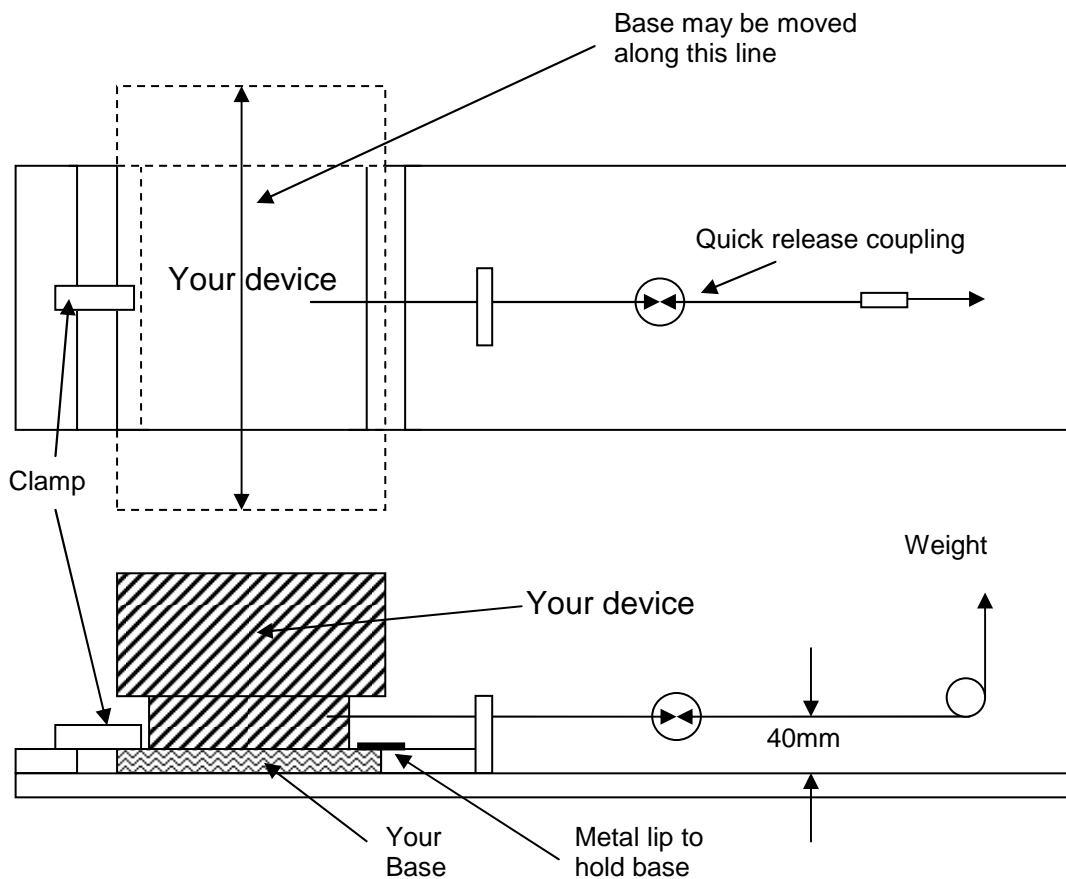
Your device will be clamped to the rig, and you will select a new power source from the supply provided. Pulling a cord horizontally lifts the weight. This is attached to your device using a quick release mechanism. A diagrammatic view is shown below.



There will be a TOTAL TIME allowed for the challenge. This will start as defined under each challenge, and end either at the pre-defined time, or earlier if the competitor has completed a successful run and does not want to try again within the total time. At some point during the total time, the device is required to lift the weight 500 mm, and this is the TIMED LIFT (measured to the nearest microsecond), which will be used to determine the winners.

The device must be mounted on a 16 mm thick base 300mm x 300mm to enable clamping to the test rig. Typical materials are chipboard or MDF, but it is the dimensions that are important rather than the material. Full details on the attachment to the quick release mechanism will be supplied to entrants. The quick release mechanism is to ensure that power is disconnected from the weight after it has passed the upper sensor and plays no part in the actual timing. The device itself must not overhang its base plate at any time, nor be taller than 1 metre. The front and rear edges of the base must have a 12mm strip clear to allow clamping (see diagram below). The clamp is 6mm thick, and the base can be moved backward or forward in the direction of the arrows to enable alignment with the weight cord.

Mounting Your Device onto the Test Rig



The Electric Challenge rules.

The power source for this challenge is one LR44 button cell, chosen for its worldwide availability. This type of cell is used in digital callipers, watches, cameras etc. They can be purchased at most supermarkets, camera shops etc. for less than £1. This is the easier challenge, so the energy storage time is reduced compared to the Heat Challenge.

Energy source	One LR44 button cell (1.5 v)
Weight	100 grams lifted 500 mm
Total Time	5 minutes
Maximum voltage in power circuit	30 v

Procedure

Before clamping the competitor's device to the rig, a judge must be satisfied that there is no energy stored in the device, for example storage capacitors

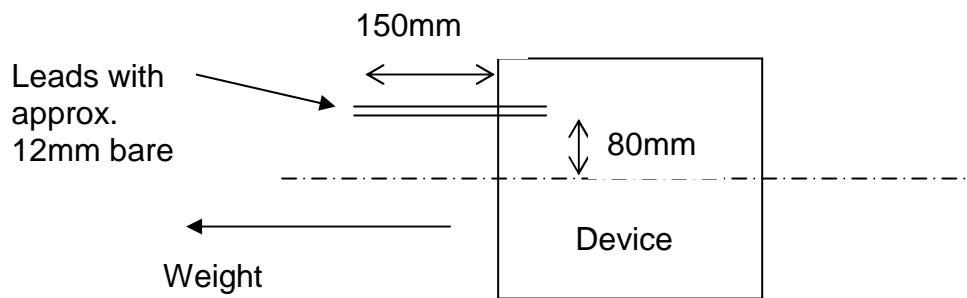
“self charge” when inactive, so to keep things fair it must be demonstrated that any such charge is dissipated before the competition run commences.

A judge will then clamp the competitor’s device to the test rig in the competitor’s presence, and connect the wires (see note on leads at end of this section) to the cell holder, and connect to the weight via the quick release coupling. The competitor will then select a cell at random from the source supplied and the judge will place it in the cell holder and operate a switch to connect the cell to the competitor’s device. This will also start the countdown timer to show remaining total time.

At some point during the total time, the competitor will initiate a timed lift, which must be completed within the total time. Failure to do so will result in disqualification.

Flying Leads

Maximum diameter of flying lead conductor is 1mm. The leads need to extend at least 150mm as shown below to enable connection to the cell.



The Heat Challenge rules.

Here the energy source is one candle flame, of the nightlight (also known as tea light) variety. To ensure a level playing field, these will be provided by the organisers on competition day, and must not be modified in any way. More energy storage time is allowed compared to the electrical challenge.

Energy source	One nightlight (tea light) candle
Weight	100 grams lifted 500 mm
Total Time	10 minutes

Procedure

It is acceptable to run a device up immediately prior to its being clamped onto the test rig. This must be done with a nightlight supplied by the organisers. During this time the competitor will select a new candle at random from the source supplied. Once the device is running, it will be clamped to the test rig and the heat source removed until it runs to a standstill witnessed by a judge. At this point the new candle will be lit and put into position. The countdown

timer to show remaining total time will start when the candle is in position as decided by the judge.

At some point during the total time, the competitor will initiate a timed lift, which must be completed within the total time. Failure to do so will result in disqualification.