

## The need for a standard of electrical resistance



James Clerk Maxwell

In 1861 the British Association (BA) for the Advancement of Science formed a committee to establish a new standard in electrical science, by defining an internationally recognised unit of resistance. The committee comprised some leading figures in electrical science, including James Clerk Maxwell, William Thomson (later Lord Kelvin), and Henry Fleeming Jenkin. Their work in Glasgow and Edinburgh was supported by experiments conducted by Maxwell and Sir Charles Wheatstone with a team at King's College London, who tested various forms of apparatus that could be used by standards laboratories around the world to calibrate resistive devices.

The motivation for the British Association's initiative stemmed from the emerging technology of long distance submarine telegraphy cables in the 1860s, notably the transatlantic cables linking Great Britain and the United States. It was known that the signalling speed of messages in Morse code was limited by the cable resistance and capacitance so that precise knowledge of the conductor quality was important.

Maxwell's team worked for several years and, under Thomson's direction, eventually devised a method of calibration using a spinning coil immersed in a magnetic field, that was adopted in 1867 for the experimental determination of the value of the new unit of resistance, which became known as the Ohm (after the German scientist Georg Ohm).



William Thomson



Henry Fleeming Jenkin



Georg Ohm

2:00pm

Hunterian Museum balcony

## Unveiling of the IEEE Milestone Plaque

Welcome by the University of Glasgow

Professor Neal Juster

*(Senior Vice Principal and Deputy Vice Chancellor)*

The standardisation of electrical units

Professor Peter Grant

The IEEE Milestone Program

Dr Robert Dent

*(IEEE History Committee Chair)*

Unveiling of the Milestone plaque

Professor Mike Hinchey

*(IEEE UK and Ireland Section Chair)*

Professor Jose Moura

*(IEEE President 2019)*

Steph Scholten

*(Director of the Hunterian)*

3:00pm

James Watt South Building

## Technical Symposium The Standardisation of Electrical Measurement Units

The technical symposium will cover the work done to standardise the units used for electrical measurements, at a time when there were different and incompatible standards that were not internationally recognised.

Chair: Professor Mike Hinchey

*(IEEE UK and Ireland Section Chair)*

Early Resistance Standards

Professors John Thompson and Peter Grant

*(University of Edinburgh)*

Evolution of the Measurement of the Ohm over the last century

Professor Jan-Theodoor Janssen

*(Research Director, National Physical Laboratory, UK)*

Changes in International Standardisation over the last decade

Don Wright

*(Past President IEEE Standards Association and Standards Strategies, Louisville, Kentucky, USA)*

Closing remarks

Professor Charles Turner

*(IEEE Life Member Committee Chair)*