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IPC Irwin Signal Generator & Amplifier

Part Number IPC-4885-W

User Instructions



INTRODUCTION.

The IPC Irwin Signal Generator & Amplifier has been designed for use in the study of AC circuits, Amplification and General Electronics. Its uses include driving a Loudspeaker or Vibration Generator, as well as many other electronic based experiments up to a maximum load of 4 watts. A large 4-digit auto-ranging LED display is used to indicate the set output frequency, making the instrument ideal for classroom demonstrations.

The integrated circuit design minimises the number of controls required, and the clearly labelled settings make this instrument very straightforward to use, therefore making it an invaluable instrument in the physics laboratory.

DESCRIPTION.

The instrument generates sine, square or triangular waveforms, all of which can be adjusted in amplitude from 0V to 10V (peak to peak). Output impedances of 4Ω and 600Ω are provided via white 4mm sockets, with the 4Ω output capable of delivering up to a maximum of 4 watts. The stand-alone amplifier mode has an independent input (4mm blue socket) and outputs to both the 4Ω and 600Ω sockets. Also included on the 600Ω output is an attenuation function, this can be set to a factor of x 1, x 0.1 & x 0.01, this being ideal for low signal testing. The set frequency

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is shown on the LED display and ranges from 0.1Hz to 100kHz, frequency adjustment is by a six position range switch and a continuously variable fine adjustment control. All connections are via pairs of labelled 4mm sockets with one of each pair connected to earth via the green sockets. The rear panel contains an illuminated (green) mains on/off switch and a mains input IEC socket containing an in-built protection fuse. Normally the unit is supplied with a separate UK plug to IEC plug 2.0m mains lead. The instrument itself is built into a robust metal case with a durable powder coated finish.

INSTRUCTIONS.

This instrument offers two modes of operation, one being a Signal Generator and the other being an independent Amplifier, both modes provide 4Ω and 600Ω output impedance options.

Signal Generator Mode (~ Π Λ).

When set to either of the three waveforms, sine, square or triangular, both the output amplitude and frequency can be adjusted. The amplitude is simply controlled by a single-turn rotary knob on the front panel and ranges from 0V to 10V (peak to peak). The frequency range is controlled by both a six-position rotary switch 'Range Hz' and a fine control multi-turn rotary knob 'Frequency', again on the front panel. The total frequency range is 0.1Hz to 100kHz with the set frequency shown on the LED Display, all waveforms produce an equal positive and negative pulse with respect to 0V.

The Signal Generator output is via both the 4Ω impedance and 600Ω impedance white 4mm sockets and the common green (ground/0V) 4mm socket. When using the 600Ω impedance option the output amplitude can be attenuated by a factor of x 0.1 and x 0.01.

Note: When using the 4Ω output option the maximum load connected **must not exceed 4 watts (no overload protection is provided with this instrument)**. Therefore, care should be taken when experimenting with power demanding loads such as low impedance Vibration Generators and Loudspeakers.

IPC Irwin offer a compatible Vibration Generator, part number: L1009KIT, also see the link:- <https://www.ipcirwin.com/vibration-generator>

Additional Note: Should the instrument be damaged due to overloading of the output, the warranty for repair will be void.

Amplifier Mode (▷).

This instrument can also be used as stand-alone Amplifier, with a Voltage Gain (V_a) ranging from zero to 100 (+40dB), and a frequency response of 1Hz to 100kHz (-3dB bandwidth). The Gain of the Amplifier is simply controlled by the same single-turn rotary knob used to adjust the amplitude of the waveforms when in the Signal Generator mode.

To operate the instrument in the Amplifier mode simply turn the Waveform switch to the ▷ position, confirmation of this mode will be indicated by the LED Display showing a '1' on the left-hand digit.

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The Amplifier input is via the blue (signal) and green (ground/0V) 4mm sockets and has an input impedance of $1\text{M}\Omega$ and a maximum input voltage of 200mV (peak to peak), irrespective of the Gain setting.

The Amplifier output is via both the 4Ω impedance socket and 600Ω impedance white 4mm sockets and the common green (ground/0V) 4mm socket. As with the Signal Generator modes, when using the 600Ω impedance option the output amplitude can be attenuated by a factor of $\times 0.1$ and $\times 0.01$.

Note: When in the Amplifier mode only the Amplitude/Gain control functions, all the other controls will be inactive, however if these controls are adjusted in this mode they will change the settings when returning to the Signal Generator modes.

SPECIFICATIONS.

Instrument:-

Electrical Supply	= 220-240VAC, 50-60Hz
Fuse Ratings	= IEC Socket Inlet: F1A, UK Mains Plug: 3A.
Dimensions	= 255 x 225 x 120mm overall.
Mass	= 2.7kg

Signal Generator Mode:-

Waveforms	= Sine, Square & Triangular.
Performance	= Sine-wave distortion 1%, Square-wave rise time 1 μ S approx.
Frequency Range	= 0.1Hz to 100kHz in six ranges, accuracy +/-5% on all ranges.
Voltage Output (peak)	= 0 to 10V, continuously variable for all frequencies & waveforms.

Amplifier Mode:-

Voltage Gain	= 0 to 100 V_a (+40dB).
Input Voltage (max.)	= 200mV (peak to peak) - input impedance $1\text{M}\Omega$.
Frequency Response	= 1Hz to 100kHz (-3db bandwidth).

Output Performance:-

4Ω Output	= Max. Power Output of 4W over entire frequency & waveforms.
600Ω Output	= Provides attenuation settings of $\times 1$, $\times 0.1$ & $\times 0.01$

Please Note: This Equipment is for Education, Training, or research Purposes Only.

IMPORTANT- ELECTRICAL SAFETY NOTICE

Only connect the product to single phase mains electrical supply (with neutral nominally at each potential), also check that the supply voltage and frequency are within the products stated range.

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Before connecting to the mains electrical supply, examine the information on the products rating label (the value of the fuse fitted to the product is also stated), ensure that the mains plug or outlet circuit is fitted with an appropriate fuse of higher value.

WARNING: THIS PRODUCT MUST BE EARTHED

This product is designed for Electrical Safety Class 1.

If a mains lead is not fitted or supplied, connect the wires to a Standard UK, 3-pin plug as follows:-

Green/Yellow wire to the terminal marked: E (Earth) or coloured Green or Green/Yellow.

Brown wire to terminal marked: L (Live) or coloured Brown.

Blue wire to terminal marked: N (Neutral) or coloured Blue.

LIVE PARTS SHOULD NEVER BE EXPOSED UNLESS THE PRODUCT HAS BEEN SWITCHED OFF AND ISOLATED FROM THE MAINS ELECTRICITY SUPPLY.

Thank you for choosing this IPC Irwin product, which has specifically been designed for education and we know it will bring you good service long into the future. This is just one product of a wide range of UK designed and manufactured products to enhance a STEM education, please see www.ipcirwin.com website for more details on the products and service we provide to support teaching and learning in science and technology.

IPC Irwin also provide Portable Appliance Testers and a Calibration service, for more details please go to www.ipcirwin.com or call our sales and technical support line on 015395 58555.



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Declaration of Conformity (In Accordance with EN ISO 17050-1:2010).

Manufacturer: **IPC Irwin, Holker School, Cark-in-Cartmel, Grange-over-Sands, Cumbria, LA11 7PQ, United Kingdom.**

Product/Part No: **Signal Generator & Amplifier (230V AC, 50Hz main voltage)/IPC-4885-W**

This conformity certificate approves the compliance of the product with the essential safety requirements of the following UK Standards and Regulations:

- SI 2005 No.1803 **General Product Safety Regulation (implements Directive 2001/95/EC).**
- SI 2016/1101 **Electrical Equipment (Safety) Regulation (implements Directive 2014 /35/EU).**
- EN 61010-1: 2010 **Electrical Requirements for Laboratory Test & Measurement Equipment.**
- EN 61000-6-1: 2019 **EMC, Generic Standards, Immunity for Residential, Commercial and Light Industrial Environments.**
- EN 61000-6-3: 2019 **EMC, Generic Standards, Emission for Residential, Commercial and Light Industrial Environments.**
- SI 2012 No. 3032 **Restriction on Hazardous Substances (RoHS) in Electrical and Electronic Equipment Regulation, (implements Directive 2011/65/EU).**



Mark can be used only in the case of conformity assessment according to all relevant UK Standards and Regulations.

EU Declaration of Conformity (In accordance with European Parliament and Council Decision No: 768/2008/EC Annex III).

This conformity certificate approves the compliance of the product with the essential safety requirements of the following EC/EU Directives (Manufacturer, Product/Part No: as above).

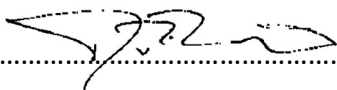
- 2001/95/EU **General Product Safety Directive.**
- 2014/35/EU **Low Voltage Directive (LVD).**
- 2014/30/EU **Electromagnetic Compatibility (EMC) Directive.**
- 2011/65/EU **Restriction on Hazardous Substances Directive (RoHS).**

European harmonised Standards used for conformity assessment and declaration:

- EN 61010-1: 2010 **Electrical Requirements for Laboratory Test & Measurement Equipment.**



Mark can be used only in the case of conformity assessment according to all relevant EC/EU Directives.

Dickon Knight (Director):  Date of Issue: 24th May 2023.

In the event of any correspondence concerning this product, please contact your supplying agent quoting the catalogue number and serial number shown on the apparatus rating label, together with the voltage and frequency of the mains electrical supply. This will help us to process your enquiry quickly. Any spare parts which may be required are supplied on the understanding that the replacement of those requiring the exposure of live electrical connections **will** be undertaken by an electrically qualified person.

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