

The Kemo CardMaster 1 is a small compact carrier card with switchable pre filter input gain, wide range power input, and a configurable input stage. The CardMaster 1 is designed for use with the Kemo 1200 resistor set filters, or the Kemo 1600 programmable series of filters. It can be fitted into systems as a combined filter amplifier unit, to provide local amplification and filtering.

## Specification (typical values)

Dimensions	95 x 60 x 20 mm (3.7 x 2.4 x 0.8") (including filter)
Weight	100 gms (3.5 oz) (including filter).
Fixing	4 off 3.5 mm holes, 51 x 91 mm centres.(0.14 holes, 3.6 x 2.0" centres)
Power Input	9 – 30 Volts DC, 3 Watt. (typical value with 4mA IEPE current, 1208 filter module, 200 mA at 12V DC) NOTE Typical inrush current at turn on may be 5 times operating current
Operating Temperature	-10° to 45°C, non condensing.
Input Coupling	DC, AC (-3dB at 0.17Hz), IEPE.
IEPE	1-10mA (selectable), 20 V
Input Modes	Single ended, Differential (Differential AC with matched input coupling)
Input Gain	0, 20, 40, 60 dB, user set. 'On' is switch towards board edge.
Gain Bandwidth	+/- 1dB to 300 kHz
Trim Adjustments	DC Offset, Gain.
Frequency Setting	1200 Modules by resistor. 1600 Modules by DIP switches. '1' is switch towards filter.

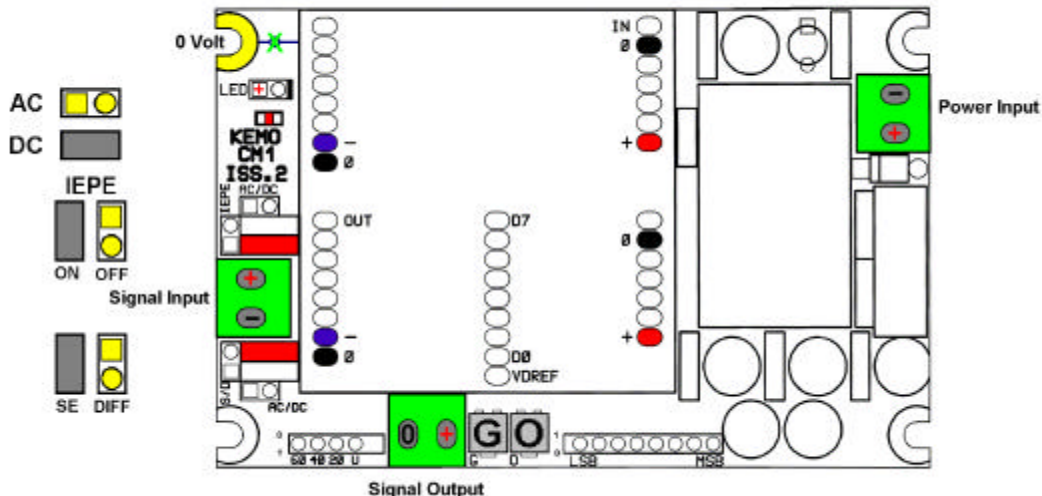


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## Power Input

A polarity protection diode is fitted for reverse polarity protection.

NOTE This unit uses a DC-DC convertor, these have a high inrush current on turn on, and this should be allowed for when specifying a power source.

## Earthing and 0 Volt

The power input negative is isolated from the signal zero volt. The unit takes zero volt as the signal output zero. It is recommended that the signal zero volt is earthed.

NOTE One mounting point provides a zero volt connection, this may be isolated by breaking the track close to the mounting point. The easiest way to do this is to use a drill to remove the small spot on **both** sides of the board.

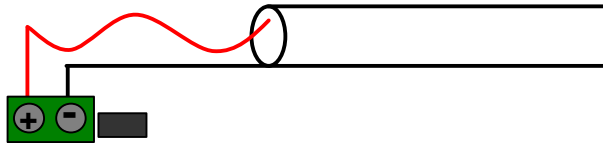
## Signal Input

DC / AC coupling. DC coupling is selected by fitting the headers to the pins marked 'AC/DC'. NOTE there are 2 headers!

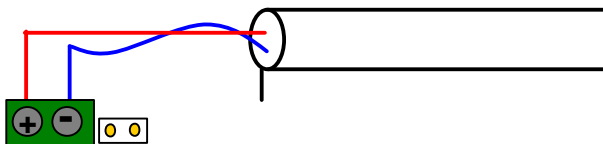
IEPE input - remove the header marked 'IEPE'. (Note on this unit a 24V 4mA source), and fit the header marked S/D. The input MUST be set to AC coupled, and single ended for IEPE to operate.

The IEPE current may be modified by changing  $R_{28}$ , on the back of the CM1.  $R_{28} = 1.2 / I_{IEPE}$

Single ended input connect the signal input to the +ve terminal and the input 0V to the -ve terminal, check the header marked S/D is fitted.



Differential input – Input signal +ve to the +ve terminal, input signal -ve to the -ve terminal.  
No header on the pins marked 'S/D'




**Gain-** Input gain is set on the bank of four DIP switches (SW3), +20dB ( x 10 ), +40dB ( x 100 ), and +60 dB ( x 1000 ). User Defined (U) is set by changing the value of  $R_{13}$ .

$R_g = 50k\Omega / (G - 1)$  Where :-  $R_g$  is the required gain resistor, G is the gain.

The gain may be trimmed by the trim pot marked 'G' between about x 0.7 and x 1.3 by adjusting the gain trim pot, this is best carried out with a suitable dynamic signal, sine wave, applied to the unit.

Gain is selected by moving ONE switch to the position marked 1, nearest the edge of the board.

NOTE –  this is opposite to the frequency setting '1' direction

**DC offset** - DC offset is trimmed by grounding the input and adjusting offset trim pot, marked 'O'

**Power Indicator LED** - A LED is fitted across both power rails (+/- 15V), in series with a 24V Zener diode and a 100  $\Omega$  resistor. There are two pin headers for an external LED, with an identical circuit to the on board LED.

## Frequency Setting

**1200 Series Modules** – the filter cut off frequency ( $f_c$ ) is set by external resistors ( $R_{fc}$ ) fitted to positions

$R_{20} R_{21} R_{22} R_{23} R_{24} R_{25} R_{26} R_{27}$ .

$$R_{fc} = 795000 \times f_b / f_c \quad \text{where } f_b \text{ is the filter module base frequency}$$

**1600 Series Modules** – the filter cut off frequency is set by the DIP switch (SW1) on the board, using an 8 bit word. Bit value '1' high is switch towards the filter module.

MSB signifies the Most Significant Bit, LSB the Least Significant Bit.

This DIP switch has no function for 1200 series modules.