



477
AC Current Pre-Amplifier

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- Six decade trans-impedance amplifier
- Up to 10^8 V/A gain
- Dual Input for use with multiple detectors
- Virtual ground input
- Fully programmable via USB interface through 417 unit

The 477 is used as a pre-amplifier for a lock-in amplifier in AC systems employing current source detectors such as photomultipliers and photodiodes (eg. Si, Ge, InGaAs, InSb) which, at low frequencies, give their best performance when connected to a virtual ground.

The virtual earth inputs of the amplifier ensure that the detector is kept in short circuit condition, whereby no voltage is generated across the detector as a result of the photocurrent it produces. This short circuit operation enhances the linearity of detectors, reduces the effect of

cable capacitance and is often a necessary condition in the determination of detector responsivity.

Used in conjunction with the 496 lock-in amplifier, the 477 allows the user to select a combination of current and voltage gain which optimises the trade-off of noise performance versus DC current sinking.

Gain range and input in use may be selected via the USB interface.

The 477 is a single-width module housed in the 417/417T base unit.

Electrical	
Channel 1 input	Current input to trans-impedance amplifier
Channel 2 input	Current input to trans-impedance amplifier
Gain Ranges	10^8 - 10^3 V/A
Maximum Current Input	10mA
Gain Accuracy	+1%
Gain Stability	200ppm/°C
Output Stability	5ppm/°C to 500ppm/°C depending on sensitivity
Linearity	< 0.025% departure from linearity from zero to full scale
Input Impedance	Virtual earth
Frequency Response 10^3 V/A Range (-3dB)	> 1MHz
Frequency Response 10^4 V/A Range (-3dB)	1MHz
Frequency Response 10^5 V/A Range (-3dB)	260kHz
Frequency Response 10^6 V/A Range (-3dB)	30kHz
Frequency Response 10^7 V/A Range (-3dB)	23kHz
Frequency Response 10^8 V/A Range (-3dB)	4kHz

Interface & Mechanical	
Interface	USB via 417/417T Unit (I ² C)
Control	Front panel/ USB
Front Panel Controlled Features	Input select, gain range select
Dimensions	Single width module, 3U high
Connector	BNC
Display	Digital display of 417 unit, channel A