



High Current Potentiostat (Model ER467)



Description

The Potentiostat 467 features high current (1000 mA) potentiostat/galvanostat/ZRA and Hi Z operation as well as two extra general purpose channels for simultaneous recording of ancillary signals such as temperature, light intensity, pressure, or from a quartz crystal microbalance.

Potentiostat, waveform generator and data acquisition functions are all housed in the one small footprint enclosure.

Waveforms are generated by an internal DAC but there is also an input socket for connection of an external waveform generator.

Sophisticated digital signal processing ensures high resolution, low noise signals. A 'mains filter' rejects 50 or 60 Hz mains hum (often the dominant source of noise in an electrochemical experiment). Signals are transmitted by USB to your computer without the need for internal computer cards or special cables!

Applications

The Potentiostat 467 handles signals over eight orders of magnitude up to 1 amp and is ideal for most low/medium current applications such as cyclic voltammetry, anodic stripping voltammetry, small scale electrolysis and electropolymerisation, as well as photodiode, solar cell, miniature fuel cell, and electroluminescent materials research.

Computer Requirements

Windows XP or later. The computer should have a spare USB port for attachment of the Potentiostat.

- No programming required – just plug and play
- Monitors currents from sub nanoampere to 1 amp
- Portable and robust
- Two extra channels for recording ancillary signals
- Mains hum rejection
- Two, three or four electrode operation.

Software

The Potentiostat can be supplied with Chart and/or EChem software for continuous amperometry/potentiometry experiments.

Electrodes

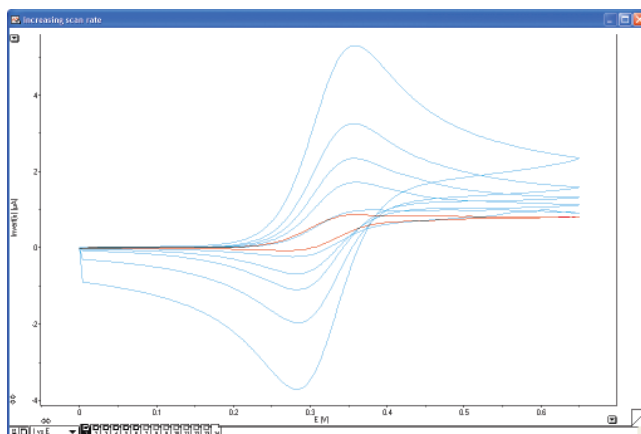
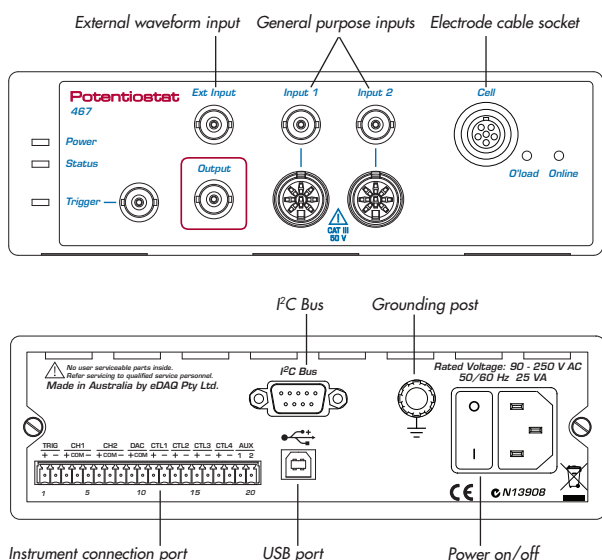
An electrode cable is supplied with miniature alligator clips and 2mm plugs that can be used with many types of electrodes. The cable has one working, one counter and two reference connections, and 2, 3 and 4 electrode configurations are supported. eDAQ also supplies a range of electrodes and accessories for cyclic voltammetry and analytical electrochemistry, including:

- glassy carbon (ET074), platinum (ET075), gold (ET076), and copper (ET079) electrodes, all of which comprise a 1 mm disk in a 3 mm diameter PEEK body,
- a variety of screen printed electrodes,
- both leakless (ET072) and refillable (ET073) Ag/AgCl reference electrodes, and
- a hydrogen reference electrode (ET070).

Ordering

The Potentiostat 467 system (model ER467) includes the hardware unit, power cable, USB cable, and electrode cable, and is available in three software configurations:

- ER467C with Chart software
- ER467E with EChem software
- ER467CE with both Chart and EChem software



Cyclic voltammetry of a ferrocene derivative, at increasing scan rates, using EChem software

Specifications

General Purpose Inputs			
Input channels:	Input 1, Input 2		
Input ranges:	Range	Gain	
	±10 V	1	
	±5 V	2	
	±2 V	5	
	±1 V	10	
	±0.5 V	20	
	±0.2 V	50	
	±0.1 V	100	
	±50 mV	200	
±20 mV	500		
Maximum input voltage:	±30 V (Ch 2, external detector)		
Input impedance:	~1 MΩ		
Low-pass input filter:	3000 Hz, 2nd order Bessel		
DC drift:	<1 μV/°C		
CMRR (differential):	-105 dB @ 100 /s (typical)		
Channel crosstalk:	> -140 dB		
Input noise (pp):	Range	@10 /s	@100 /s
	±10 V	3 μV	5 μV
	±1 V	1 μV	2 μV
	±100mV	0.25 μV	0.3 μV
Potentiostat			
Input channels:	Input 3 (current), Input 4 (potential)		
Current ranges:	±200, 500, 1000 mA ±1, 2, 5, 10, 20, 50, 100 mA ±1, 2, 5, 10, 20, 50, 100, 200, 500 μA ±20, 50, 100, 200, 500 nA		
Input impedance:	10 ¹³ Ω		
Compliance:	> 12 V		
Bandwidth (unity loop gain):	16 kHz (@ -90° lag) 160 Hz (high stability mode, @ -90° lag)		
Voltage offset error:	±1 mV		
Voltage gain error:	0.1%		
Gain Accuracy:	0.2% at ranges of up to 1 mA 1% at 10 – 1000 mA ranges		
Slew rate:	3 V/μs		
Applied potential ranges:	±200, 500 mV, 1, 2, 5, 10 V		
iR Compensation	0 – 10 MΩ		
Sampling			
ADC:	24 bit sigma delta convertor		
System resolution:	22 bits		
Sampling rates:	12 /min to 100 kHz (Chart Software) 100 Hz to 100 kHz (EChem software)		

Scan rate:	1 $\mu\text{V/s}$ to $>100\text{ V/s}$ (EChem software)	
Linearity error:	$<0.001\%$ of FSR	
Output Amplifier		
Output configuration:	Single-ended	
Output resolution:	16 bits	
Maximum output current:	10 mA maximum	
Output impedance:	$0.1\ \Omega$ typical	
Slew rate:	1 V/ μs	
Settling time:	20 μs (to within 0.01% of FSR)	
Output range:	Range	Resolution
	$\pm 10\text{ V}$	312.5 μV
	$\pm 5\text{ V}$	156.5 μV
	$\pm 2\text{ V}$	62.5 μV
Linearity error	± 1 LSB (from $0\text{ }^{\circ}\text{C}$ to $70\text{ }^{\circ}\text{C}$)	
Instrument Connection Port		
Type:	20 pin male connector, 3.5 mm spacing. Terminal block adaptor supplied.	
Digital Output Controls		
Outputs:	4 contact closure or TTL level. Set by software.	
Contact closures:	50 mA maximum. $\pm 24\text{ V}$ maximum. 'On' resistance $25\ \Omega$ typical, $50\ \Omega$ maximum. Close time 1.5 ms; Open time 1 ms.	
TTL level:	4 V high @ 1 mA maximum each 0.5 V low at 15 mA maximum each	
Microprocessor and Data Communication		
CPU:	FREESCALE DSP56858	
RAM:	16 MB SRAM	
EEPROM:	4 MB	
Data communication:	USB 2.0 or 1.1 compliant	
Expansion Ports		
I ² C expansion port:	Power and control bus for eDAQ Amps (maximum of 500 mA).	
Physical Configuration		
Dimensions (w x h x d):	200 x 65 x 250 mm (7.9 x 2.6 x 9.8")	
Weight:	2.1 kg (4 lb 10 oz)	
Power Requirements:	90 – 250 V AC 50/60 Hz, 25 VA	
Operating conditions:	0 to $35\text{ }^{\circ}\text{C}$ 0 to 90% humidity (non-condensing)	

eDAQ Pty Ltd reserves the right to alter these specifications at any time.