Multichannel Impedance Monitor
Z# 106

Feature

- For versatile AC impedance experiment
- 6 voltage input channel per set
- Expandability up to 60 channels
- A flexible frequency generator/analyzer
- Generate various waveforms (eg. Sinusoidal etc)
- Designed for spectrum analysis in the electrochemical field
- Simulation and fitting with ZMAN^{TM}
- High current application with external load and/or potentiostat/galvanostat
- Software controlled function
- Graphic-based user-interface
- Dual real time graph (Bode, Nyquist, etc) during measurement

Description

For the past two decades, Electrochemical Impedance Spectroscopy (EIS) has emerged as the most powerful of electrochemical techniques for defining reaction mechanisms, for investigating corrosion processes, and for the characterization of batteries and fuel cells.

Z# series provides all tools for the application of fuel cell stack, battery pack , array cells and general electrochemical study requiring multichannel EIS.

By employing electronic load, Z# can be used to determine the efficiency of fuel cell and anodic/cathodic process mechanisms by calculating impedance with the measurements of I and E at given frequency.

The complete system is software-controlled and all functions such as ranging, calibration, and measurements can be automated.
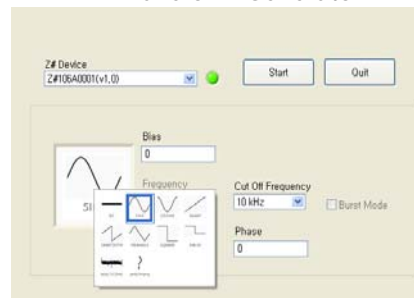
Software

- Mode
  - Galvanostatic EIS
  - Potentiostatic EIS
- Channel enable/disable
- Power spectrum display
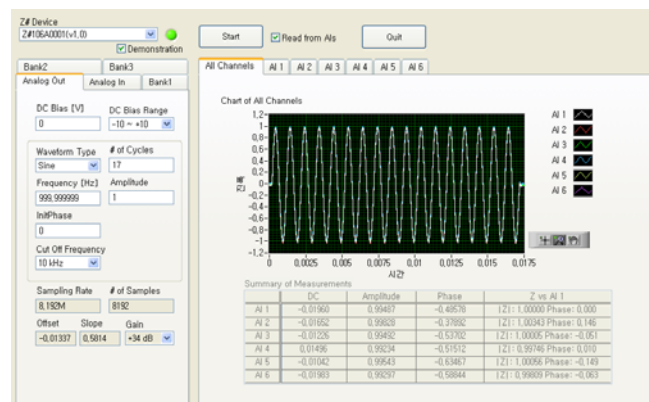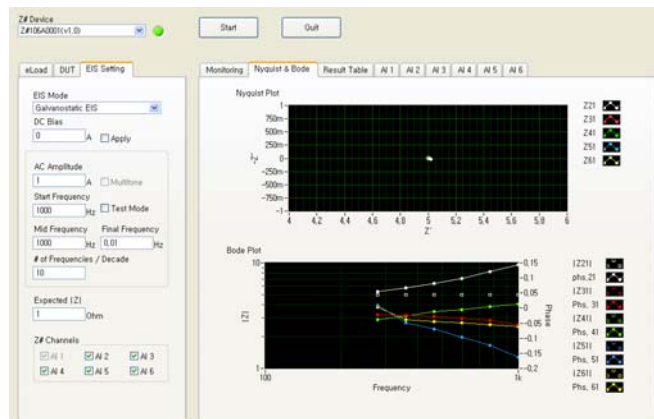- Waveform Generation
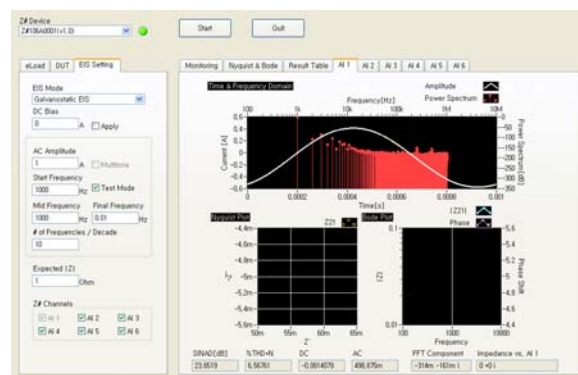
channel monitor

- Waveform Generator

Waveforms;
DC/Sine/Cosine/Ramp/Sawtooth/Square/Triangular/Pulse/
Multi-tone/ Arbitrary

channel running information

Nyquist & Bode plot for 5 channels(Real time)

EIS data analysis by ZMAN software
Single PC Auth copy is supplied with free of charge for Z#. (Please refer to the separate ZMAN catalogue)

Library files for user software: Option
User can make their own software with these libraries using Labview™ etc.

System Configuration

Hardware (controller), Software, Electronic Load (option)

Specification

Analog Out	as Signal Generator	
# of Channels	1	
Configuration	Single-ended	
Maximum Output	-11.0 to +11.0 V (DC + AC)	
Voltage Offset	< 0.5 mV, software corrected zero	
DC Bias	Range	Resolution
	0.0 to 5.0 V	0.076 mV
	0.0 to +10.0 V	0.153 mV
	-5.0 to +5.0 V	0.153 mV
	-10 to +10.0 V	0.305 mV
	-2.5 to +2.5 V	0.076 mV
	-2.5 to +7.5 V	0.153 mV

AC Waveform
  Predefined Type DC, Sine, Cosine, Ramp, Sawtooth, Triangle, Square, Pulse, Multi-tone
  Frequency Range 1 uHz to 100kHz Resolution: 5000 steps/decade
  Frequency Accuracy Typ. 75 ppm, Max ±200 ppm
  Frequency Stability < 2 ppm @ 1 kHz

  < 20 ppm @ 10 kHz
  < 200 ppm @ 100 kHz
  < 2000 ppm(0.2%) @ 1 MHz

Amplitude	1 mVpp to 5 Vpp
Post-Gain/Attenuation	-44 dB to +40 dB with 6 dB step, automatic gain selection
Reconstruction Filter	10 to 150 kHz 8th order low pass filter with 10kHz step or By-Pass
Gain Error	< 0.5 %

Analog In	as Frequency Analyzer
# of Channels	Total 6, usually 1 for current input and 5 for voltage input Maximum 60Ch in daisy chain configuration
Configuration	Differential
Maximum Input	±100 V
Voltage Offset	< 0.5 mV, software corrected zero
Bandwidth	550 kHz
Input Impedance	110 kOhm
Pre-Attenuation	-20dB (×0.1)
Post-Gain/Attenuation	-44 dB to +40 dB (×100) with 6 dB step or ×200, ×400, ×800, ×1600
Anti-aliasing Filter	10 to 150 kHz 8th order low pass filter with 10 kHz step or By-Pass
CMRR	> 80 dB @ 1 kHz, > 60 dB @ 10 kHz, > 40 dB @ 100 kHz (refer to the below graph)
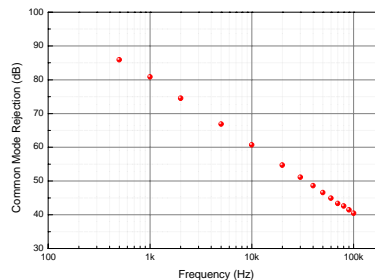
Expansion Ports
I2C In & Out	Reserved for future

General
Interface	USB 2.0 high speed
Power	External 50W AC-DC Adapters, +5/+15/-15VDC with AC Input of 100 to 240V, 2A, 50/60 Hz
Operation Condition	0 to 50 °C, 0 to 90% humidity (non-condensing)
Warranty	1 year parts and labor on defects in materials and workmanship

Stack voltage EIS(1ch)

Cell voltage EIS(4ch)
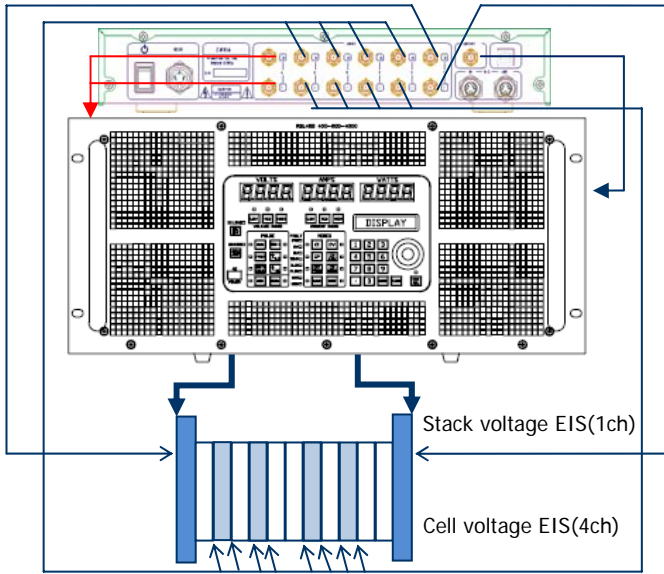
Z#106 with Dynaload RBL488 series load

For 36 channel eis measurement, 6 set of Z#106 is needed. Then you can measure eis of 36 cells or 35 cells with one total fuel cell stack(or battery pack).; One Z#106 will work as master and other 5 set of Z#106 works as slaves.

Stack voltage EIS(1ch)

Cell voltage EIS(4ch)
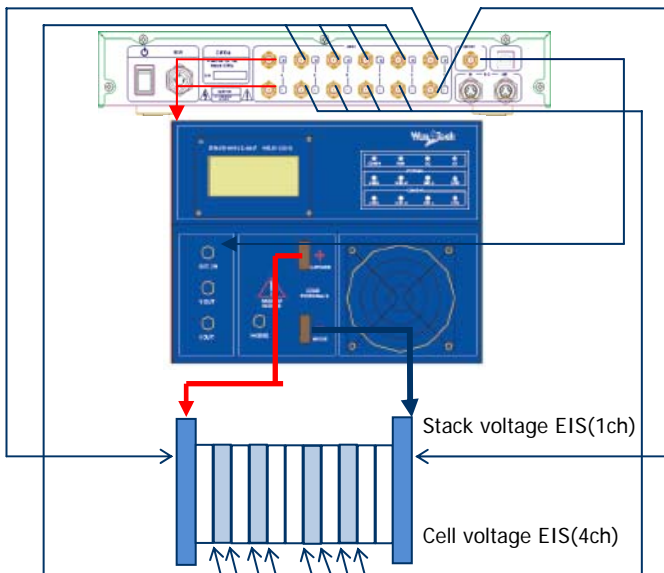
Z#106 with WonATech WEL series load

Supporting external load/Potentiostat
- TDI dynaload RBL488 series
- WonATech WLoad
- WonATech Potentiostats

Above models are fully PC controlled with Z#.

Other model might be needed to set some parameters by manually.
Please contact with your regional distributor about other 3rd parties products' availability with Z#.

36channels configuration (example)