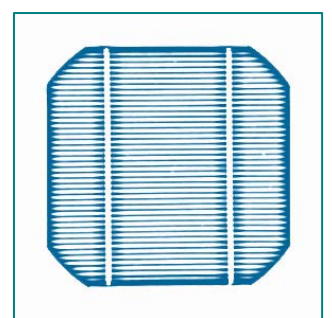


**We Adapt
So You Don't Have To!**

ZCON

Electrochemical Impedance Analyzer adapter



Feature

- For versatile AC impedance experiment using external electronic load or potentiostat/galvanostat..
- 2 signal input channel(current and voltage)/1 signal output for sinewave
- A flexible frequency generator/analyzer
- Generate various waveforms (eg. Sinusoidal etc)
- Designed for spectrum analysis in the electrochemical field
- Simulation and fitting with ZMAN™
- 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.

ZCON™ impedance analyzer is spin off model from Z# multichannel impedance monitor. This model is for single channel application only.

ZCON™ provides all tools for the application of fuel cell stack, battery pack , and general electrochemical study requiring EIS measurement using external electronic load or potentiostat/galvanostat.

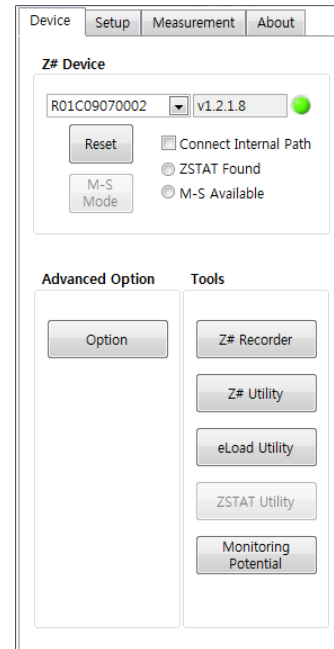
By employing electronic load, ZCON™ can be used to determine the efficiency of fuel cell and anodic/cathodic process mechanisms by calculating impedance with the measurements of I and E at given frequency.

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

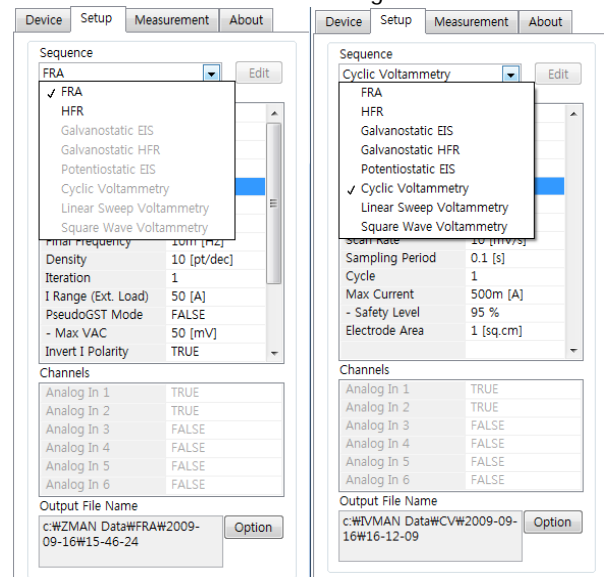
Software

- Mode
 - **With Electronic load**
 - ◆ Frequency Response Analyzer (FRA)
 - ◆ High Frequency Resistometry (HFR)
 - **With ZSTAT or 3rd parties potentiostat/galvanostat**
 - ◆ Galvanostatic Electrochemical Impedance Spectroscopy (GEIS)

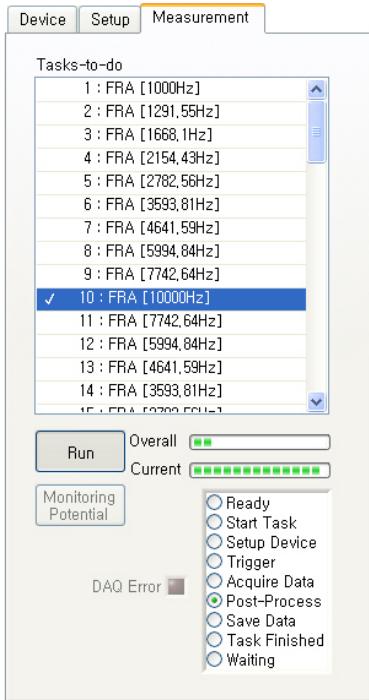
- ◆ Galvanostatic HFR (GHFR)
- ◆ Potentiostatic EIS (PEIS)
- ◆ Cyclic Voltammetry (CV)
- ◆ Linear Sweep Voltammetry (LSV)
- ◆ Square Wave Voltammetry (SWV)
- Power spectrum display
- Waveform Generation (option)



Device setting

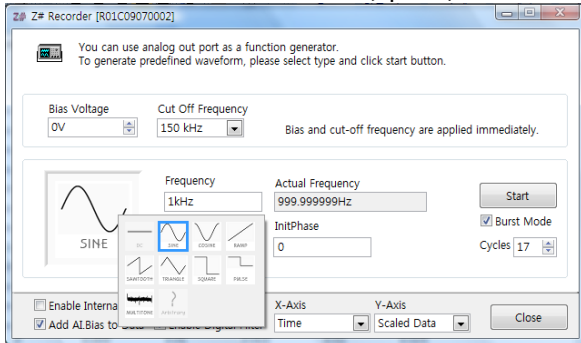


Setup menu



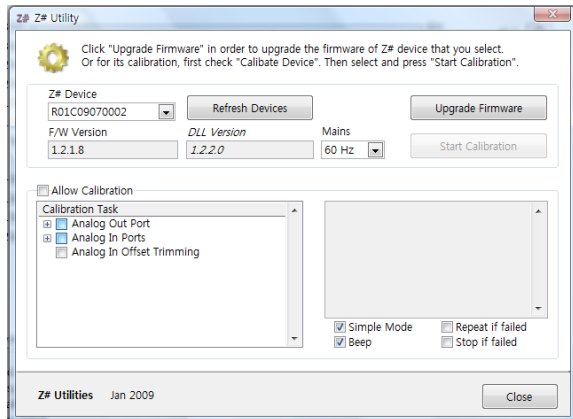
Measurement panel

● Waveform Generator (option)

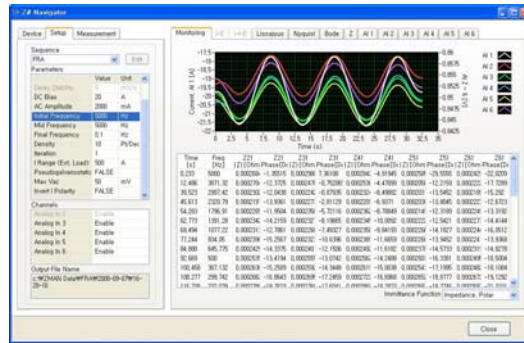


Waveforms;

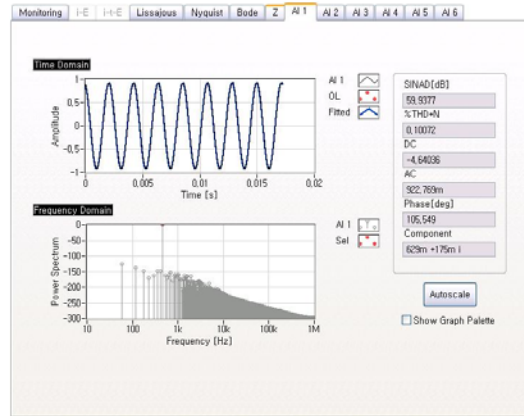
DC/Sine/Cosine/Ramp/Sawtooth/Square/Triangular/Pulse/
Multi-tone/ Arbitrary



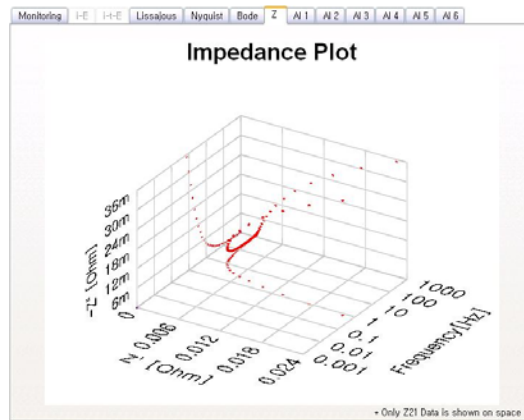
Utility



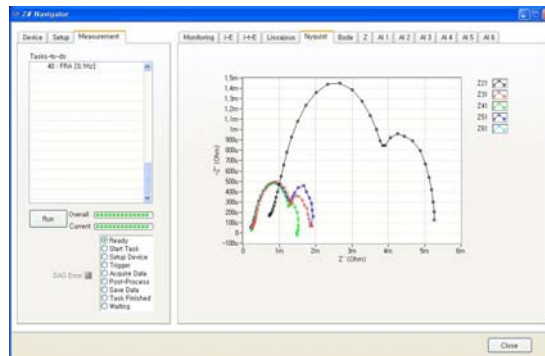
Monitoring



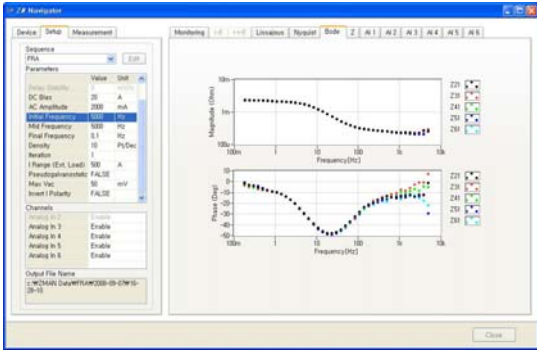
Power spectrum for each channel



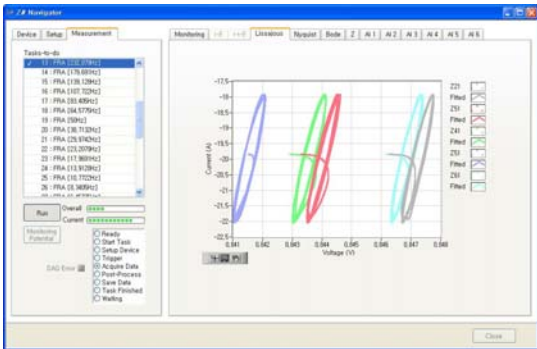
3D impedance plot(Real time)



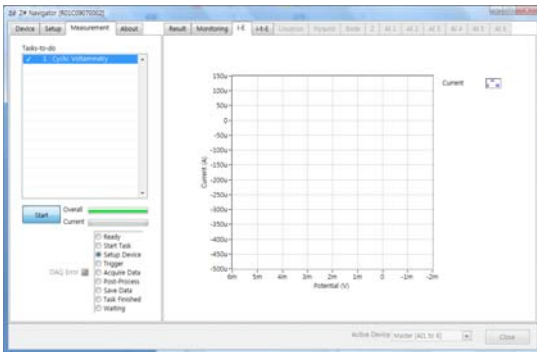
Nyquist plot (Real time)



Bode plot (Real time)



Lissajous plot



CV test with potentiostat/galvanostat

The 'Advanced Naming Option' dialog box contains the following fields and options:

- Base path for impedance data: C:\ZMAN Data
- Base path for EChem data: C:\ZVMAN Data
- Automatic file naming
- Base Path: %<Task>%<Date, %Y-%m-%d>%<W>%<Time, %H-%M-%S>

Buttons: OK, Cancel

File save option

The 'Advanced Option' dialog box, Impedance Spectroscopy tab, includes:

- Allow remote commander
- Z# Server.ini Path: C:\ProgramData\WonATech\Z#WZ# Server.ini
- Clear output immediately after end of sequence

Footnote: * Changes to this option take effect in M-S mode. ** Changes to this option take effect in single-sine FRA. *** Changes to this option take effect when you reset Z# device.

Buttons: OK, Cancel

The 'Advanced Option' dialog box, Impedance Spectroscopy tab, includes:

- Apply digital notch filter
- Mains Frequency: 60 Hz
- Apply drift correction before analysis**
- Analysis Method: FFT
- Fast gain control
- Use only AI1 as current input port*
- Enable filter gain

Footnote: * Changes to this option take effect in M-S mode. ** Changes to this option take effect in single-sine FRA. *** Changes to this option take effect when you reset Z# device.

Buttons: OK, Cancel

The 'Advanced Option' dialog box, Impedance Spectroscopy tab, includes current range settings:

- Current range - High: 100 [A]
- Current range - Mid: 50 [A]
- Current range - Low: 10 [A]
- Current range - Lowest: 1 [A]

Footnote: * Changes to this option take effect in M-S mode. ** Changes to this option take effect in single-sine FRA. *** Changes to this option take effect when you reset Z# device.

Buttons: OK, Cancel

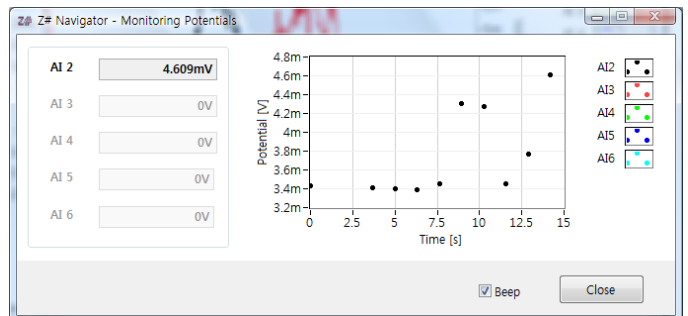
The 'Advanced Option' dialog box, Impedance Spectroscopy tab, includes ZSTAT settings:

- Max current range: 5 [A]
- Max Control Voltage: 10 [V]
- Number of ranges: 8
- Allow ZSTAT demo

Footnote: * Changes to this option take effect in M-S mode. ** Changes to this option take effect in single-sine FRA. *** Changes to this option take effect when you reset Z# device.

Buttons: OK, Cancel

Advanced Option



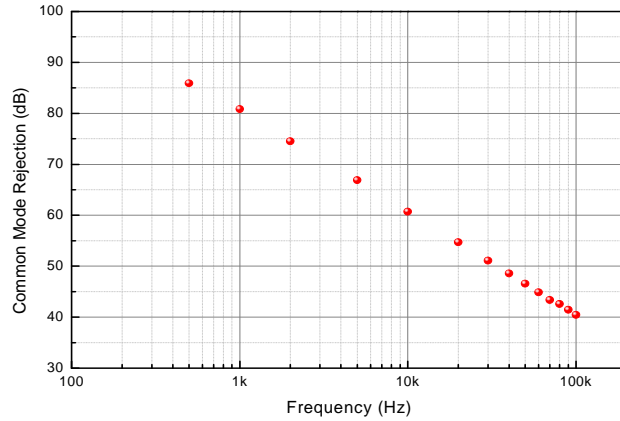
Potential Monitoring tool

System Configuration

Hardware (controller), Software, Electronic Load or Zstat (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	1 for current input and 1 for voltage input	
Configuration	Differential	
Max. Common mode voltage	±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

Power

USB 2.0 high speed
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



Front Panel



Rear panel

Supporting external load/Potentiostat

- TDI dynaload RBL488 series
- WonATech WEL Load
- ZSTAT potentiostat/galvanostat
- 3rd parties potentiostat/galvanostat

Other model might be needed to set some parameters by manually.

Please contact with your regional distributor about other 3rd parties products' availability with ZCON™.

EIS data analysis by ZMAN software

Single PC Auth copy is supplied at free of charge for Z#. (Please refer to the separate ZMAN catalogue)

Related products with Optional accessories

- Fuel cell test system



- Faradaic caged temperature oven (Farad-HT)



- Fuel cell stack jig



- Fuel cell hardware fixture



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