

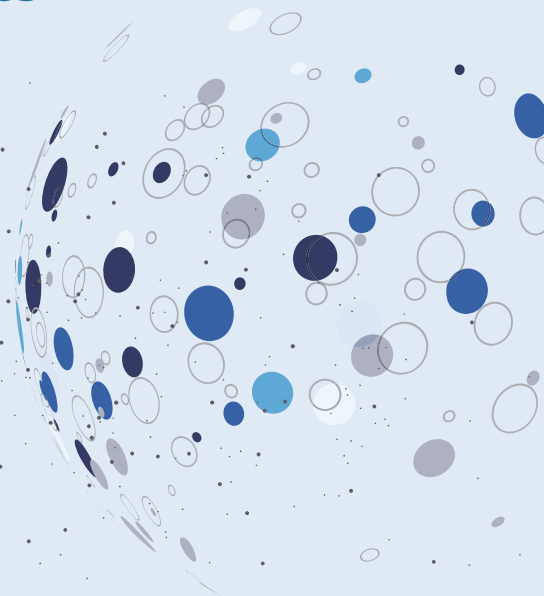


WopATech

*EChem  
Accessories*

# *Accessories Catalog 2023*

I For Electrochemical Experiments



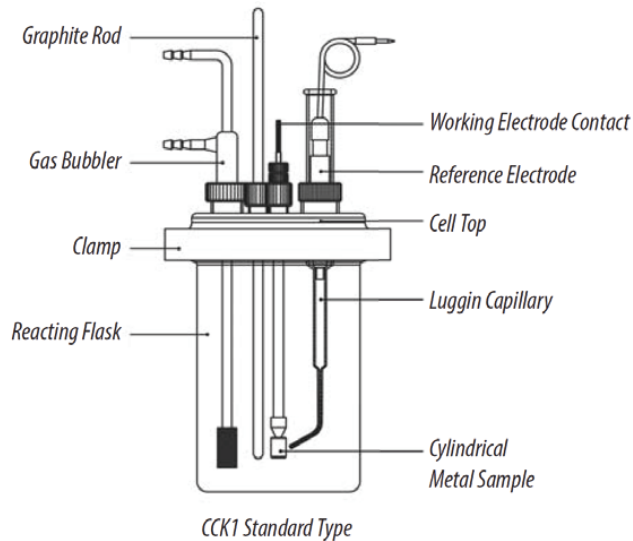
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# Corrosion Cell Kit

The CCK series corrosion cell kit is based on a standard glass reaction flask, 1 liter ~ 500ml. All wetted parts are made of chemically resistant materials such as Teflon, Pyrex and SUS 316. The standard cell configuration consists of a cylindrical metal sample working electrode, a gas bubbler, and a luggin capillary. A graphite rod as counter electrode, a reference electrode and a flat specimen holder could be ordered separately as an option. The water-jacketed type corrosion cell kit made with Teflon are also available.



CCK1, Standard Type  
With  
Optional FSH2 & Thermometer



WCCK1, Water-Jacketed Type  
With  
Optional FSH2 & Thermometer

## Specifications

Vial volume (depending on model)	CCK series : 500 ml & 1 liter WCCK series : 500 ml & 1 liter
Cylindrical sample holder material	
Tube	Pyrex®, 6.35 mm dia.
Compression gasket	Teflon®
Cylindrical metal sample	Steel
Chemical compatibility	
Wetted materials	Pyrex®, Teflon®
Non-wetted materials	Above, plus stainless steel and Viton®
Reference electrode(option)	
Type	SCE or Ag/AgCl reference electrode
Size	9 mm diameter OD, 110 mm long
Counter electrode(option)	
Graphite rod	6 mm diameter, 30 cm long
Flat specimen holder(option)	
Specimen diameter	FSH2 : 15.5 mm ~ 22 mm FSH15 : 18.5 mm~25 mm dia.
Specimen thickness	0.3 ~ 5.8 mm

All specifications are subject to change without notice.

## Parts Included For CCK1 & WCCK1

Cell vial	Pyrex®, 1L
Cylindrical metal sample & tube	Steel / Pyrex®, 6.35mm dai. x 4.35mm dia.
Cell clamp	Stainless steel
Luggin capillary	Pyrex®
Gas bubbler	Pyrex®
Cell Top	Teflon®
Other miscellaneous parts such as stopper / O-ring	MC Nylon® / Viton®

Please contact us for other replacement parts.

## Ordering Guide

Description	Part No.
Standard type	
1 liter volume	CCK1
500 ml volume	CCK05
Water-jacketed type	
1 liter volume	WCCK1
500 ml volume	WCCK05

Components can vary depending on the type of cells.

## Optional Items

Description	Part No.
Flat specimen holder	
Active area : 11.28 mm dia.	FSH2
Active area : 15 mm dia.	FSH15
Counter electrode	
Graphite rod, 150mm long	GR002H
Graphite rod, 300mm long	GR002
Reference electrode	
Saturated calomel reference electrode	WA1001
Ag/AgCl reference electrode	WA1004
Mercury/Mercurous Sulfate Reference Electrode	WA1005



FSH2



GR002



WA1001

# Corrosion Cell Kit

## Replacement Parts

Description	Part No.
Cylindrical specimen rod For CCK1, WCCK1, CCK5, WCCK5	CSH2
Luggin Capillary For CCK1, WCCK1, CCK5, WCCK5	LGCK1
Glass vial For CCK1	GVCK1
For WCCK1	GVWCK1
For CCK05	GVCK05
For WCCK05	GVWCK05
Gas bubbler For CCK1, WCCK1	GBCK1
For CCK05	GBCK05
Clamp For CCK1, WCCK1	CLCK1
For CCK05, WCCK05	CLCK05

Teflon cell top 1 For CCK1, WCCK1	CTCCK1
For CCK05, WCCK05	CTCCK05
Teflon cell top 2 For CCK1, WCCK1	CTCCK1-2
For CCK05, WCCK05	CTCCK05-2
Flat specimen holder head For FSH2	FSH2H
For FSH15	FSH15H



CSH



GBCK1

# Flat Cell Kit

The flat cell kit was designed to evaluate plate material such as metal(coupons), semi-conducting plate, etc. A sample plate will be placed one sample holder by fixing knob and maximum 300ml sample volume is acceptable. A water jacketed version is also available. A graphite plate which is placed in one side of the cell is supplied with a cell and can be used as a counter electrode. A Luggin capillary is also included while a reference electrode should be purchased separately. Instead of graphite plate, a platinum wire can be also used as counter electrode by putting through either of the ports on the cell body. You can select PTC1 or PTC2 plate test cell kit for small solution volume, which is explained on next page.



FCK2 Standard Type



WFCK2 Water-Jacketed Type

## Features

- Ideal for testing of flat specimen
- Easy to use
- Fast and easy disassembly
- Detachable counter electrode
- Two opening areas

## Specifications

Sample test area	
One side	1 cm <sup>2</sup>
The other side	5 cm <sup>2</sup>
Sample thickness	Up to 20 mm
Cell volume	
FCK15	up to 150 ml
FCK2&WFCK2	up to 300 ml
Material	
Cell body	Pyrex®
Cell end	Polycarbonate
O-ring	Viton®

All specifications are subject to change without notice.

## Applications

- Polarization test
- Galvanic corrosion
- Electrochemical noise measurement
- EIS measurement
- Cyclic voltammetry

## Ordering Guide

Description	Part No.
Standard type	
Cell volume, 150ml	FCK15
Cell volume, 300ml	FCK2
Water-jacketed type	
Cell volume, 300ml	WFCK2

# Flat Cell Kit

## Optional Items

Description	Part No.
Reference electrode	
Saturated calomel reference electrode	WA1001
Ag/AgCl reference electrode	WA1004
Mercury/Mercurous Sulfate Reference Electrode	WA1005

## Replacement Parts

Description	Part No.
Glass vial	
For FCK15	GVFCK15
For FCK2	GVFCK2
For WFCK2	GVWFCK2
Luggin capillary for FCK15, FCK2, WFCK2	LGFCCK
Graphite plate electrode for FCK2	GR001



LGFCCK



GR001

# Plate Cell Kit

The plate test cell kit, PTC1, is designed to evaluate plate material such as metal(coupons), semi-conducting plate, etc. In evaluation, a sample plate will be placed between two cell blocks. A counter electrode (graphite rod or Pt wire type) and a reference electrode should be ordered separately.

- PTC1 has an electrode holder part, a solution block part, a bottom block part and a thickness adjustment dial knob.
- The active area, which is to be exposed to electrolyte, can be selected by O-ring's position.



PTC1



Active area will be determined by O-ring's position.

## Specifications

Sample test area	width: >15mm, thickness: 0.1~10mm
Materials	Teflon®
Active area	
Using small O-ring	1 cm <sup>2</sup>
Using large O-ring	5 cm <sup>2</sup>

All specifications are subject to change without notice.

## Ordering Guide

Description	Part No.
Plate test cell	PTC1

## Optional Items

Description	Part No.
Reference electrode	
Saturated calomel reference electrode - 9mm OD, KT glass tip	WA1001
Ag/AgCl reference electrode - 9mm OD, KT glass tip	WA1004
Counter electrode	
Graphite rod - 6mm dia. 15cm long	GR002H

# Plate Cell Kit

The plate test cell, PTC2, is a simple cell for electrochemical testing of coated samples. Also it can be a perfect choice for measuring EIS(Electrochemical Impedance Spectroscopy) of painted metal specimens. The PTC2 is very easy to assemble.

## Specifications

Sample	
Size	60x60mm or more
Thickness	>7mm
Dimensions	
Base	Approx. 132x90x10mm(WxDxH)
Cell body	
- internal diameter & length	31.5mm, 80mm long
Hole diameter	9.3mm dia. & 6.5mm dia.

All specifications are subject to change without notice.

## Parts Included

Cell body	Pyrex®
Base and cell top	Teflon®
Cell clamp	Stainless steel
O-ring	Viton®

## Ordering Guide

Description	Part No.
Plate test cell	PTC2



PTC2

## Optional Items

Description	Part No.
Reference electrode	
Saturated calomel reference electrode - 9mm OD, KT glass tip	WA1001
Ag/AgCl reference electrode - 9mm OD, KT glass tip	WA1004
Counter electrode	
Graphite rod - 6mm dia. 15cm long	GR002H

## Replacement Parts

Description	Part No.
Clamp	CLPTC2
Glass vial	GVPTC2
Teflon cell top	CTPTC2

# Permeation Cell Kit

The permeation cell kit, PMC1, is a spinoff of flat specimen cell kit, FCK2 series, and is designed for permeation test. A membrane or a permeation foil can be placed between two glass half cells.

Two graphite plates which can be used as counter electrode and two Luggin capillary are included as standard. Membrane and reference electrode should be ordered separately.

## Specifications

Sample test area	
One side	1 cm <sup>2</sup>
The other side	5 cm <sup>2</sup>
Dimensions	
Cell vial volume	150ml x 2 ea
Chemical Compatibility	
Wetted materials	Pyrex®, Polycarbonate

All specifications are subject to change without notice.

## Ordering Guide

Description	Part No.
Permeation Cell Kit - Standard type	PMC1
Permeation Cell Kit - Water-jacketed type	WPMC1



Permeation Cell Kit, Standard Type



Permeation Cell Kit, Water-Jacketed Type

# Photo Echem Cell Kit

The photoelectrochemical cell having a wide optical window is designed to characterize electrode material under lighting condition. The 2 or 3 electrode test is available. Based on a standard model, PCELL1, the attachments are interchangeable between cells according to user's applications. It is a gas tight sealed cell.



**PCELL1**  
- Standard Model

## Specifications

Materials	Cell body: PEEK Optical window: quartz glass Others: SUS 304, Viton O-ring	
Dimensions	optical window dia. 18mm cell dimensions 74.3x40x110mm(WxDxH) (PCELL1)	
Electrolyte volume	Max. 6ml (PCELL1)	
Sample size	for PCELL1&2 Width: >25mm Height: 25~62mm	for PCELL3&4 Width: <8mm Height: <22mm
Counter electrode	Coiled Pt wire (included)	
Reference electrode	6mm OD electrode available (option)	

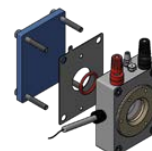
All specifications are subject to change without notice.

## Ordering Guide

### Description/Part No.

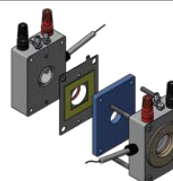
#### PCELL1 - Standard

- Standard type
- One optical window mounted in front of electrolyte chamber



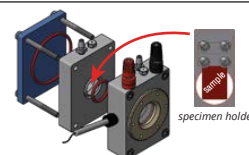
#### PCELL2

- Two optical windows arranged to face each other
- Suitable for absorbance measurement with a transparent electrode



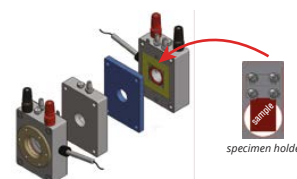
#### PCELL3

- Cell kit with a specimen holder
- Small sample can be fixed inside the electrolyte chamber



#### PCELL4

- Cell kit with a specimen holder
- Small sample can be fixed inside the electrolyte chamber



# Electrode Holder

## Universal Electrode Holder

The universal electrode holder, UEH1, is designed to hold various sizes of electrode. The UEH1 has 4 holes to hold electrodes and three of them have a screw to adjust its hole size. The hole size is available from 1.6mm to 10mm. The material of plate is Teflon®, which has high resistance to chemicals and its white color helps user to recognize a tiny change of samples during experiments.

## Specifications

Holes	Number of holes 4 Hole size 1.6mm dia. x 1ea 6.2mm dia. x 1ea 9.6mm dia. x 1ea 10mm dia. x 1ea	
Rod	Material Stainless steel Diameter 6mm diameter	
Length	Max. 150mm	

All specifications are subject to change without notice.



*Universal electrode holder, UEH1,  
with optional electrodes and glass vial*

## Ordering Guide

Description	Part No.
Universal electrode holder	UEH1

# Electrode Holder

## Flat Specimen Holder

The FSH series are sample holders to accommodate flat specimens.

- Pyrex® tube : 6.3mm dia.



### Ordering Guide

Description	Part No.
Flat Specimen Holder Active area : 11.28mm dia. Sample size : 15.5mm~22mm dia. / 0.3~5.8mm thickness	FSH2
Flat Specimen Holder Active area : 15mm dia. Sample size : 18.5mm~25mm dia. / 0.3~5.8mm thickness	FSH15

All specifications are subject to change without notice.

### Replacement Parts

Description	Part No.
Flat specimen holder head For FSH2	FSH2H
Flat specimen holder head For FSH15	FSH15H

# Faraday cage

The Faraday cage, Farad2, is an essential item for electroanalytical experiments. It is well designed to block out external EMI noise and firmly enclosure all the components of electrochemical cell (electrodes, vials, etc.). The spacious interior allows you to set up electronic components or systems easily.

### Specifications

Material	
Exterior	powder-coated steel
Interior	powder-coated steel with Teflon®-coated bottom
Window	fine SUS mesh embedded in acryl plates
Access	
Number of holes	2
Size	10mm dia.
Position	right hand side and back side
Dimensions	
Overall	300 x 398 x300mm(WxHxD)
Window	100x300mm(WxH)

All specifications are subject to change without notice.



### Ordering Guide

Description	Part No.
Faraday cage	Farad2



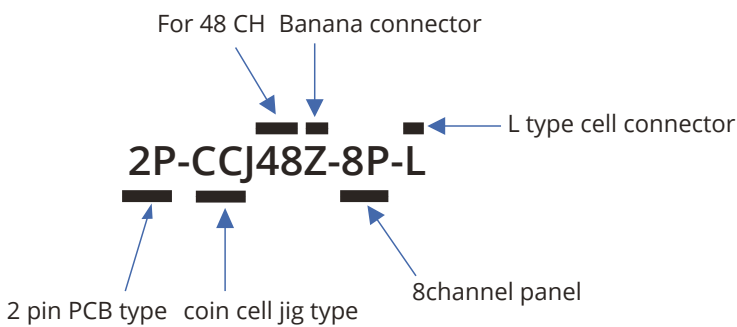
# Battery Jig

## Battery Jig

### Features

- Easy to hold cylindrical cell, coin cell, pouch cell, prismatic cell
- Wide contact point with noble coated contact area
- 4 contact point type(Kelvin probe) is available to minimize voltage drop for high current application.
- Individual channel operation is available.

ex)



### Ordering Guide

	Part No.	Description
1st	2P	2 Pin PCB type
	4PL	4 Pin Lever type
	4PK	4 Pin Knob type
2nd	CCJ	Coin cell jig
	PCJ	Pouch cell jig
	UCJM	Mid current Universal cell jig
	UCJH	High current Universal cell jig
3rd	Channel No.	Channel Quantity
	Z	Banana connector panel
4th	H	For High temperature Normal type
	4P	4ch per panel
5th	8P	8ch per panel
	16P	16ch per panel
	20P	20ch per panel
6th	S	S type cell connector
	L	L type cell connector
	M	M type cell connector

UCJ1A(1ch)



- 1 cell universal cell jig
- 4 pin probe lever type
- Kelvin type banana connectors
- Lever part is movable to fit battery size

PCJ1(1ch)



- 1 cell pouch cell jig
- 4 pin probe lever type
- Kelvin type banana connectors
- For small size pouch cell

2P-CCJ8Z-8P



- PCB type coin cell jig
- 8 channel
- 2 pin probe
- 8ch per panel
- 8 cell banana connectors option

4PL-PCJ8-4P-M



- Pouch cell jig
- 8channel
- 4 pin probe lever type
- 4ch per panel
- M type cell connector

4PL-CCJ8Z-8P



- Coin cell jig
- 8 channel
- 4 pin probe lever type
- 8ch per panel
- 8 cell banana connectors option

4PL-UCJM8Z-8P



- Mid current universal cell jig
- 8 channel
- 4 pin probe lever type
- 8ch per panel
- 8 cell banana connectors option
- Lever part is movable to fit battery size

4PK-UCJH4-4P



- High current universal cell jig
- 4 channel
- 4 pin probe knob type
- 4ch per panel

4PK-PRCJ1



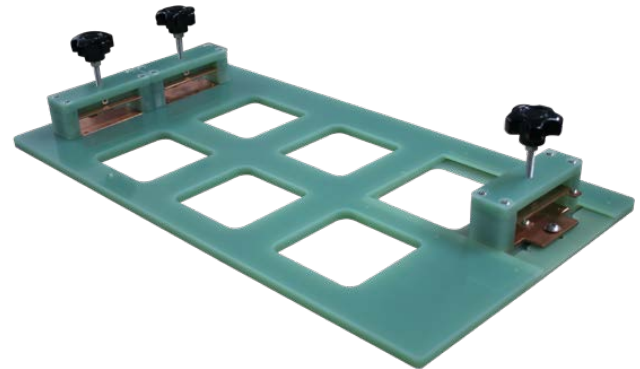
- Prismatic cell jig
- 1 channel
- 4 pin probe knob type
- For prismatic battery or pouch cell

# Battery Jig

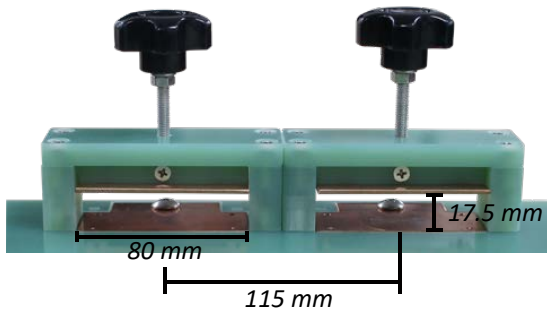
## Knob type Dual Direction Pouch Cell Jig

### Features

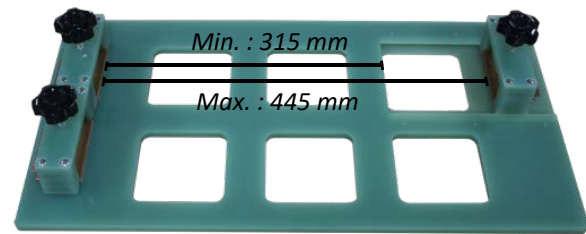
- Easy to hold pouch cell using Knob
- Kelvin probe type 4pin contact
- Bidirectional and unidirectional measurements available
- Epoxy material with excellent chemical resistance and heat resistance



Cell size - Uni direction



Cell size - Bi direction



## High current cylindrical battery jig

These battery jig is for single cell high current cylindrical battery test and having length adjustable function. For this purpose these should be designed for kelvin type 4 probe connection to minimize voltage drop by cable resistance and/or contact resistance etc. Max current is 30Amp.

There are two type of High current Cylindrical Battery Jig by battery length One is model HCCBJ65L for standard size battery up to 65mm length and the other is model HCCBJ100L for long size battery up to 100mm length.



HCCBJ65L



HCCBJ100L

### Specifications

Model	HCCBJ65L	HCCBJ100L
Maximum battery diameter		30 mm
Minimum battery contact diameter		14 mm
Maximum battery length	65mm	100mm
Current path diameter		14mm
Minimum battery length		1mm
Length × Width × Height	136 × 24 × 43mm	172 × 24 × 43mm
Cable Connectors	4ea of 4mm banana	
Weight	208g	240 g

All specifications are subject to change without notice.

### Ordering Guide

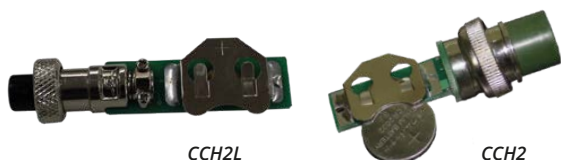
Description	Part No.
High current cylindrical battery jig - max. battery length : 65mm	HCCBJ65L
High current cylindrical battery jig - max. battery length : 100mm	HCCBJ100L

# Coin Cell Holder & Clamp Cable

## Coin Cell Holder

### For WMPG/WBCS System

- Direct connect to cell connector



CCH2L

CCH2

### Ordering Guide

Description	Part No.
For low current model - WMPG1000Ls/Le/Lx, WBCS3000Ls/Le/Lx	CCH2L
For standard current model - WPG, WMPG, WBCS3000S	CCH2

### For ZIVE System

- D-SUB connector type



### Ordering Guide

Description	Part No.
For 20mm dia. coin cell - ZIVE SP1, SP2, MP1, MP2, BP2	CCH3-20
For 24mm dia. coin cell - ZIVE SP1, SP2, MP1, MP2, BP2	CCH3-24

## Clamp Cable

### Features

- Easy to hold coin cell, pouch cell or batteries having lead line
- Clamp type battery holder

- 4 contact point type (Kelvin probe) to minimize voltage drop for high current application
- Individual channel operation is available

### Coin Cell Clamp Cables



### Ordering Guide

Description	Part No.
Max 1Amp for L type cable end - 1m cable length	CCCL
Max 5Amp for S type cable end - 1m cable length	CCCS
Max 5Amp for Banana female connector end - 30cm cable length (CCCB)	CCCB

### Pouch Cell Clamp Cables



### Ordering Guide

Description	Part No.
Max 1Amp for L type cable end - 1m cable length	PCCCL
Max 5Amp for S type cable end - 1m cable length	PCCS
Max 5Amp for Banana female connector end - 30cm cable length	PCCB

### Universal Clamp Cables



UCCB

SKAC

### Ordering Guide

Description	Part No.
Max 10Amp universal clamp cable - 30cm cable length	UCCB
Max 10Amp universal clamp cable - 1m cable length	SKAC

### For High Voltage Battery



### Ordering Guide

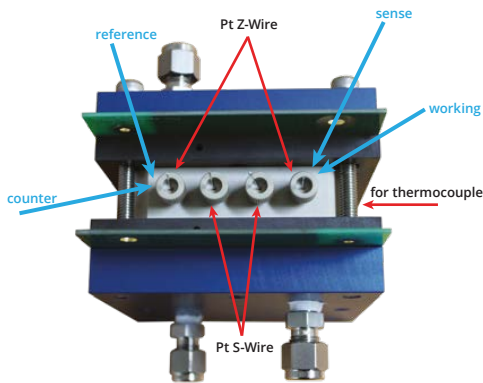
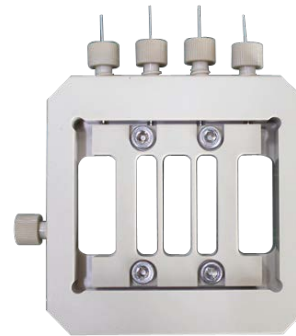
Description	Part No.
Max 10Amp 1000V battery - 1m cable length	LKAC

# Membrane Conductivity Cell

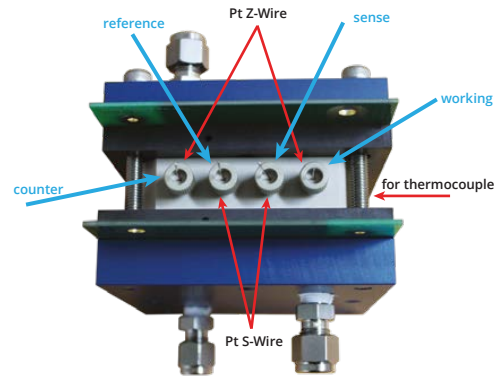
The membrane conductivity cell, MCC, is designed to measure ionic conductivity by simply loading a membrane into cell hardware. The MCC adopts a 4 point probe for measuring conductivity. By passing current through two outer electrodes and measuring the voltage through the inner electrodes, it allows the measurement of the conductivity. In the 4-electrode configuration, there is virtually no current flow at the inner voltage sensing electrodes. Therefore, polarization does not occur. The second benefit of the 4-electrode sensor is its tolerance of electrode coating. Since the 4-electrode technique measures potential drop rather than resistance, the measurement remains accurate, despite minor coating. The 2 probe measurement is also available by attaching the working and sensing electrical connections to the cathode side while attaching the counter and reference electrical connections to the anode side. Please see the configuration below.

By placing the conductivity cell between the anode and cathode conduction plate, you can simply assemble the conductivity cell into your fuel cell hardware.

- Supports 2 or 4 electrode measurement
- Material
  - Cell body : PEEK
  - Wire : platinum
- Operating temperature : to 130 °C
- Fuel cell hardware available
  - : 5, 25 cm<sup>2</sup> fuel cell test hardware (not included, provided by WonATech)
- Easy to assemble



Connecting for a 2-electrode measurement



Connecting for a 4-electrode measurement

## Specifications

<b>Material</b>	
Cell, clamp & nut	PEEK
Electrode(S-wire/Z-wire)	Platinum
<b>Dimensions</b>	
Conductivity cell	76.2x76.2x20 mm(WxHxD)
Conductivity clamp	48x50x7 mm(WxHxD)
S-wire (inner electrodes)	84 mm long x 1.0 mm dia.
Z-wire (outer electrodes)	120 mm long x 1.0 mm dia.
<b>Access</b>	
Voltage measurement (S-wire)	two, inner ports
Current measurement (Z-wire)	two, outer ports
Temperature measurement	one, side port

All specifications are subject to change without notice.

## Ordering Guide

Description	Part No.
Membrane conductivity cell	MCC

# Through-Plane Conductivity Jig

Because the conductivity of a material is directly linked with ohmic losses, the measurement of ionic conductivity is crucially important in order to evaluate the performance of a newly synthesized material such as ion exchange membrane(IEM) and proton exchange membrane(polymer electrolyte membrane, PEM).

Today ion exchange membranes are receiving considerable attention and are successfully applied for desalination of sea and brackish water and for treating industrial effluents. And proton exchange membrane(PEM) is one of the key components for various consumer related applications for fuel cells, e.g. automobiles, back-up power, portable power etc. For example, in PEMs, protons can transport in two directions, across the membrane and through the membrane. This results in two conductivities, in-plane conductivity and through-plane conductivity. For PEM fuel cells, through-plane conductivity measurement is more meaningful than in-plane because proton transfer occurs in the through-plane direction.

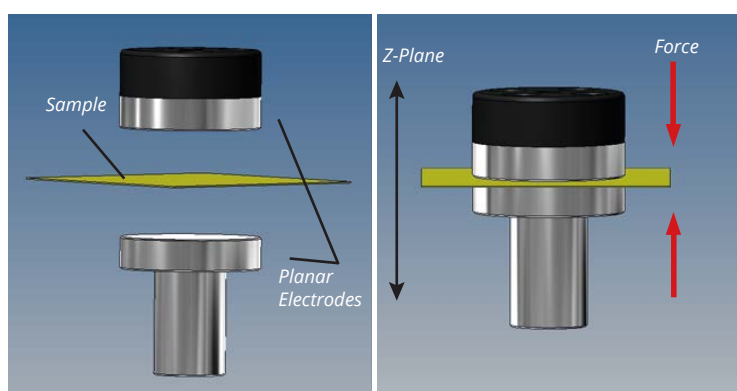
The conductivity of the membrane can be calculated based on the measured resistance by the following equation:

$$\sigma = \frac{L}{RWT}$$

where  $\sigma$  is the membrane conductivity(S/cm), L is the length between the electrodes, R is the measured resistance, W is the membrane width, and T is the membrane thickness.



MCJ1 (Through-Plane Conductivity Test Jig)



The MCJ1 Through-plane conductivity test jig helps user to setup a 2-probe electrochemical cell consisting of 2 stainless steel probes that sandwiches the membrane to measure through-plane conductivity of membranes. The MCJ1 is designed to hold a membrane by pulling a lever.

Normally, a number of galvanostatic alternating current(AC) electrochemical impedance spectroscopic (EIS) techniques or DC techniques are used to estimate the membrane conductivity. User can set up a perfect system with one of ZIVE series Electrochemical Workstation with MCJ1 conductivity test jig for through-plane conductivity measurements.

## ⦿ Specifications

Sample size	>30mm diameter
Sample thickness	max. 40mm
Sample contact material	304 stainless steel
Overall dimensions	70 x 135 x 133.7mm(WxDxH)
Connection	4mm banana plug







All specifications are subject to change without notice.

## ⦿ Ordering Guide

Description	Part No.
Through-plane conductivity jig	MCJ1

# Cable







## For WPG/WMPG/WBCS System

	
<i>Shield Cell Cable for WBCS3000S/WMPG1000S</i>	<i>Shield Cell Cable for WBCS3000L(Le,Lx)/WMPG1000L(Le)</i>
	
<i>Shield Cell Cable for WBCS3000M/WMPG1000M</i>	<i>Shield Cell Cable for WPG100ex</i>
	
<i>BNC to alligator cable for WPG/WMPG/WBCS series</i>	<i>Rack 8channel cell cable for rack mount</i>

### Ordering Guide

Description	Part No.
Shield Cell Cable for WBCS3000S/WMPG1000S	
1M	BC1
1.5M	BC1.5
2M	BC2
3M	BC3
Shield Cell Cable for WBCS3000L(Le,Lx)/WMPG1000L(Le)	
1M	BCL1
1.5M	BCL1.5
2M	BCL2
3M	BCL3
4M	BCL4
Shield Cell Cable for WBCS3000M/WMPG1000M	
1M	MBC1
1.5M	MBC1.5
2M	MBC2
3M	MBC3
5M	MBC5
Shield Cell Cable for WPG100ex	
1.5M	PC1.5
BNC to alligator cable for WPG/WMPG/WBCS series	
1M	BN1
1.5M	BN1.5
2M	BN2
3M	BN3
Rack 8channel cell cable (3m) for rack mount	RACK8C

## For ZIVE System

	
<i>cell cable for SP1/MP1/PP1e</i>	<i>cell cable for SP2/MP2A/BP2A/SP3/PP3</i>
	
<i>cell cable for SP5/SP5H/SP5HC/MP5/MP5H/MP5HC/SP10/MP10</i>	<i>Aux cable</i>
	
<i>ZRA cable</i>	<i>FRA cable</i>

### Ordering Guide

Description	Part No.
Cell cable (10cm) for SP1/MP1/PP1e/SP2/MP2A/BP2A/SP3/PP3	ZC10
Cell Cable for SP1/MP1/PP1e	
1M	ZC1C100
2M	ZC1C200
3M	ZC1C300
Cell Cable for SP2/MP2A/BP2A/SP3/PP3	
1M	ZC2C100
2M	ZC2C200
3M	ZC2C300
Extention Cell cable(4 meter) for SP2/MP2A/BP2A	ZC2C400E
Cell Cable for SP5/SP5H/SP5HC/MP5/MP5H/MP5HC/SP10/MP10	
1M	ZC5C100
2M	ZC5C200
3M	ZC5C300
Aux cable (1.5 meter)	ZAUXC
ZRA cable(1.5m)	ZRAC
FRA cable(1.5m)	FRAC

# Cables

## For High Power Cell Cable

### Ordering Guide For WPG/WMPG/WBCS/ZIVE

Description	Part No.
High power cell cable for 10Amp	
1.5M	H10BC1.5
3M	H10BC3
High power cell cable for 50Amp	
1.5M	H50BC1.5
3M	H50BC3
High power cell cable for 100Amp	
1.5M	H100BC1.5
3M	H100BC3
High power cell cable for 200Amp	
1.5M	H200BC1.5
3M	H200BC3

## For Booster Interface Cable

### Ordering Guide For ZIVE

Description	Part No.
Booster I/F cable (2M) including I2C for SP1,MP1	ZBIFC1
Booster I/F cable set (ZC2 to booster I/F and I2C cable for SP2,MP2,SP3,BP2F,MP3)	ZBIFC2
Booster I/F cable set (ZC5 to booster I/F and I2C cable for SP5,MP5,SP10,MP10)	ZBIFC5
ZC2 to booster Interface	ZC2BIF
ZC5 to booster Interface	ZC5BIF
Booster I2C cable (2M)	ZBI2C



Booster I/F cable including I2C for SP1,MP1



ZC2 to booster I/F cable for SP2,MP2,SP3,BP2F,MP3



ZC5 to booster I/F cable for SP5,MP5,SP10,MP10



Booster I2C cable

## For cXM

### Ordering Guide

Description	Part No.
CX voltage input cable (16ch) 3meter length	CX_V16C3
CX voltage input cable (16ch) 2meter length	CX_V16C2
CX voltage input cable (16ch)1.5meter length	CX_V16C15

## For Z#



Z# AO cable

Z# AI cable

### Ordering Guide

Description	Part No.
Z# AO cable (1.5meter)	Z#AOC
Z# AI cable (1.5meter)	Z#AIC

# BZA Cable & Option

## Cable

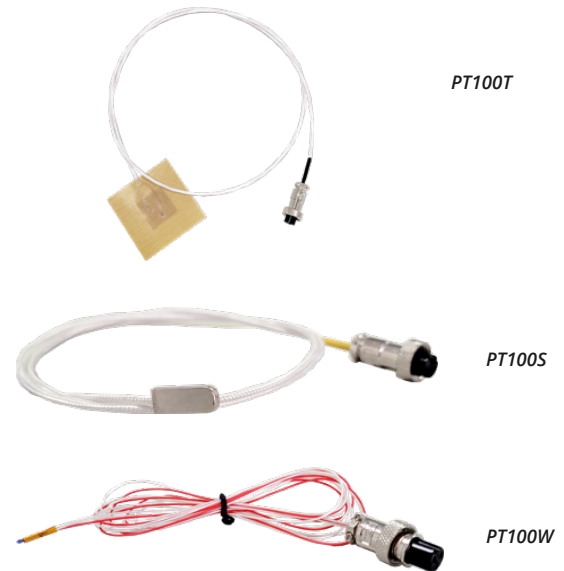
For BZA100&1000

	
<i>BZA60 cell cable</i>	<i>BZA1000 cell cable</i>
	
<i>Large alligator cable</i>	<i>Small size Kelvin alligator cable</i>
	
<i>Medium size Kelvin alligator cable</i>	<i>Large alligator clip</i>
	
<i>Mid alligator clip</i>	

### Ordering Guide

Description	Part No.
BZA100 cell cable(1M)-banana connector	BZA60C1
BZA1000 cell cable(1M)-banana connector	BZA1000C1
Large alligator cable 1M	LKAC
Small size Kelvin alligator cable 1M	SKAC
Medium size Kelvin alligator cable 1M	MKAC
Large alligator clip (CATIII1000V) 99mm	LAC
Mid alligator clip (CATIII1000V) 84.3mm	MAC

## PT100 temperature sensor For BZA



### Ordering Guide

Description	Part No.
PT100 temperature sensor	
tablet type	PT100T
sheet type	PT100S
wire type	PT100W

## BZA Portable Option For BZA

### Ordering Guide

Description	Part No.
BZA Portable Option	
for BZA60	BZAP60
- including: Battery Pack (20,000mAh), Fiber Plastic Bag, Wireless Lan kit	
for BZA1000	BZAP1000
- including: Battery Pack (20,000mAh), Fiber Plastic Bag, Wireless Lan kit	

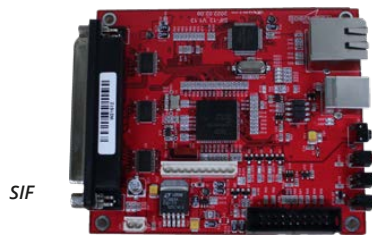


## SI Interface

For WMPG/WBCS



SIF\_EXT



SIF

### Ordering Guide

Description	Part No.
SIF external module	SIF_EXT
SIF board	SIF

## Temp Measurement

For WMPG/WBCS



8ch module for M1

### Ordering Guide

Description	Part No.
Temp Measurement	
8ch module	TEMP8
8ch module for M1 module	TEMP8/M1
8ch module for M2 module	TEMP8/M2
8ch module for high power controller	TEMP8/H

Includes K-type thermocouple(1.5m).

## Channel Extension Board

For WMPG/WBCS

### Ordering Guide

Description	Part No.
Channel Extension Board & cable per channel	
For WBCS3000S/WMPG1000S	EXT
For WBCS3000M1/WMPG1000M1	EXTM1
For WBCS3000M2/WMPG1000M2	EXTM2

## PC mounting

For Ls/Le rack model only



## Aux Voltage Measurement

For WMPG/WBCS



8ch module for M1

### Ordering Guide

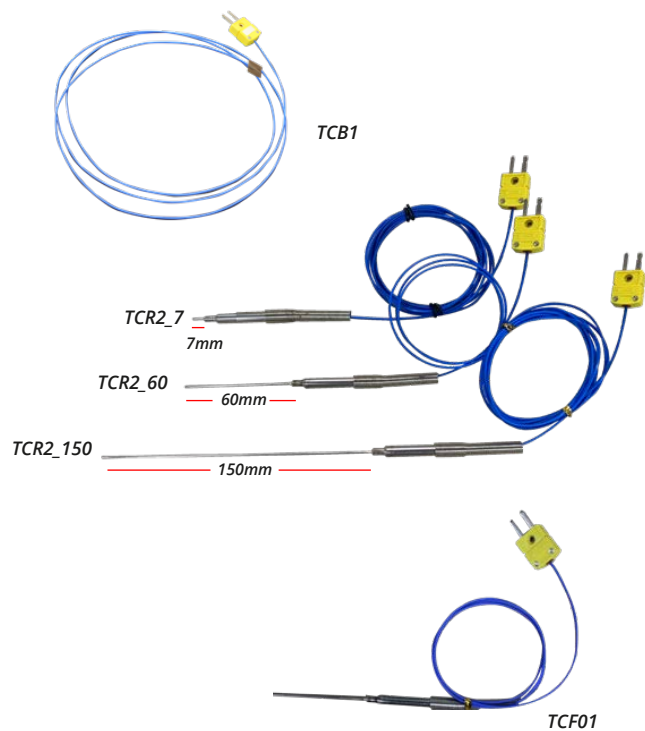
Description	Part No.
Aux Voltage Measurement	
8ch module	AUX8
8ch module for M1 module	AUX8/M1
8ch module for M2 module	AUX8/M2
8ch module for high power controller	AUX8/H

Does not include auxiliary cable(BA).

### Ordering Guide

Description	Part No.
PC mounting option without PC/Monitor	RACK_PC
Ls, Le rack model only	

## Thermocouple



### Ordering Guide

Description	Part No.
Thermocouple-Ktype bead terminal	
1M	TCB1
1.5M	TCB1.5
3M	TCB3
Thermocouple-Ktype(rod type) 2M	
7mm rod type	TCR2_7
60mm rod type	TCR2_60
150mm rod type	TCR2_150
Thermocouple-K type for fuel cell hardware fixture	TCF01

## Zero voltage booster For SMART2

### Ordering Guide

Description	Part No.
Zero voltage booster	TCB1
inside machine	ZVBi
outside machine	ZVBo

## Power Adapter



### Ordering Guide

Description	Part No.
Power adapteppr for SP1	SP1PA
for SP2	SP2PA

## Dummy Cell

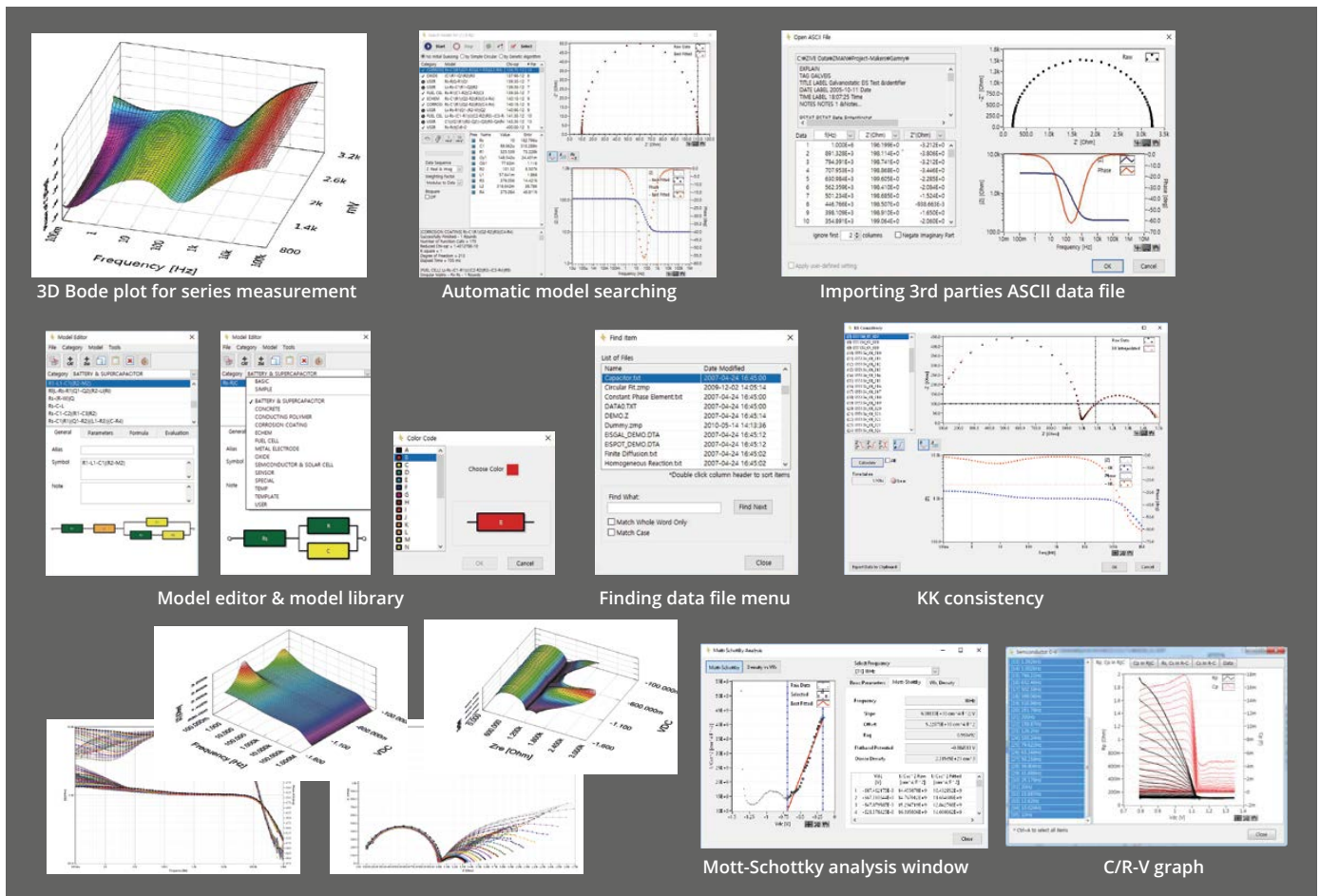


### Ordering Guide

Description	Part No.
Dummy Cell	Dummy1

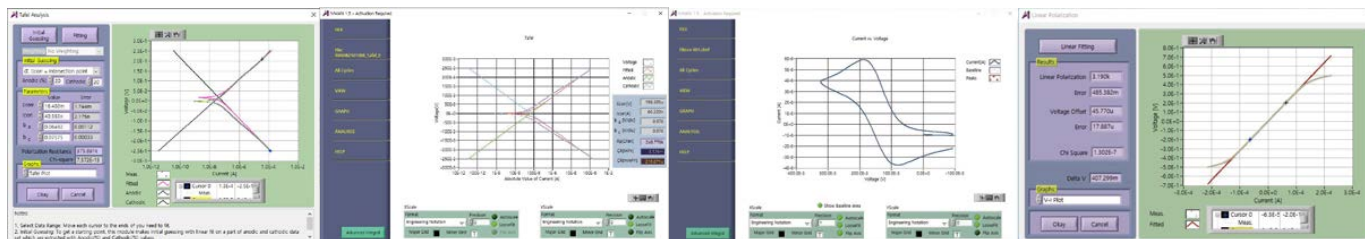
## EIS Data Analysis Software, ZMAN™

- Model simulation and fitting
- 2D- and 3D-Bode- and Nyquist plots
- Automatic equivalent circuit model search function
- Project concept to handle multiple EIS data analysis
- parameter plot from fitted elements value
- compatible with data format from Zahner, Gamry, Ametek etc. (License code is needed)
- Various weighting algorithm
- Model library and user model
- KK plot
- Batch fitting for project data
- Impedance parameter simulation
- Interpolate bad data
- Black-Nichols plot
- 3D graph setting option
- Improved model editor
- Application model library for automatic searching
- Parameter simulation of model
- Genetic algorithm option for initial guessing
- Automatic initial guessing
- Trace movie function on fitting
- Free for ZIVE's data format(\*.seo, \*.wis) analysis (no license code required)
- Circle fitting
- Data editing available (insert, delete, edit)
- Add/subtract element parameters
- Add/subtract model parameters
- Impedance, Z in polar, admittance, Y in Polar, modulus, M in polar, dielectric constant, E in polar. data display
- Empty cell capacitance calculation
- Find file function
- Data replacement by formula function
- Cursor data display
- Model finding result automatic sorting by Chi square value
- R, C R, L R, Q preview & graphic
- ZHIT function
- Mott-Schottky analysis
- Donor density vs. Vfb graph
- C vs. voltage graph



## DC Data Analysis Software, IVMAN™ Main Software

- Electrochemistry data(CV, Tafel, etc.) analysis software
- Tafel analysis function
  - Initial guessing
  - Automatic fitting
  - Corrosion rate calculation
- Linear polarization automatic fitting and analysis function
- Peak search function
- Support various graph function
- Various analysis functions as simple math, interpolation, smoothing, (semi) derivative, (semi) integral, etc.
- Report function
- 3rd party product data analysis (needs license code)
- Free for WonATech products data format analysis (no needs license code)

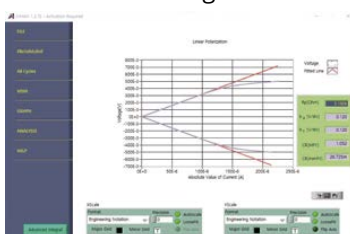


Tafel fitting

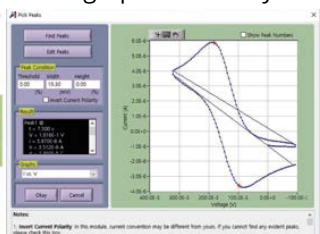
Tafel graph after analysis

CV graph

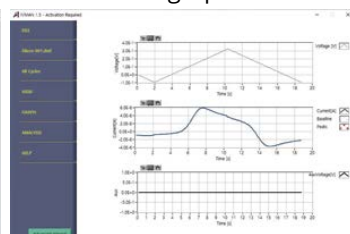
Linear polarization fitting



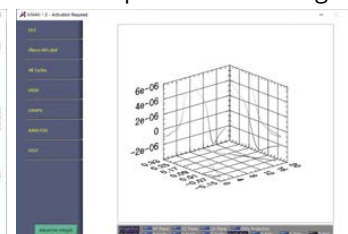
Linear polarization graph after analysis



Find peak



Voltage/Current/Temperature vs. Time graph

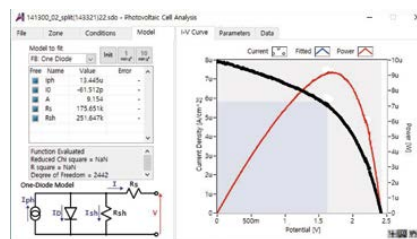


3D graph

## Optional Software for WonATech data, IVMAN™ Option Software

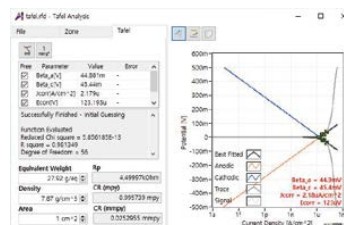
- IVMAN Optional packages are scientific software packages for WonATech data files only.
- IVMAN™ option software packages include;
  - 1) IVMAN Differential analysis software
  - 2) IVMAN Tafel analysis software
  - 3) IVMAN Photo voltaic cell analysis.
  - 4) IVMAN Peak find module
  - 5) IVMAN Extractor
- No needs license code

### 2) IVMAN™ Photovoltaic Cell Analysis



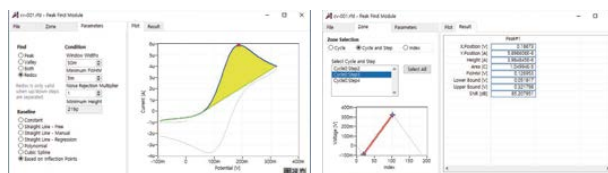
### 3) IVMAN TA™ Tafel Analysis

- Simple Tafel calculation



### 4) IVMAN PF™ Peak Find Module

- Independent peak finding software

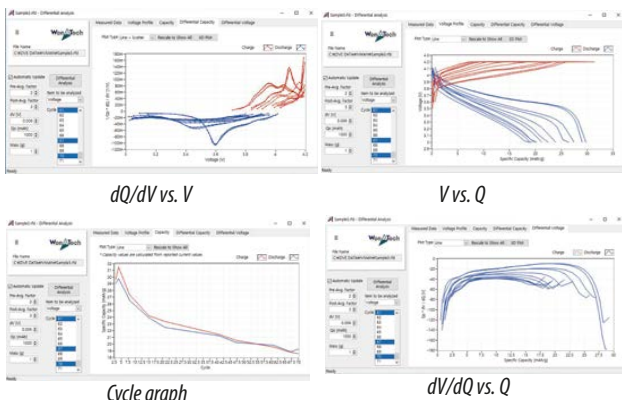


### 5) IVMAN EX™ Extractor

- Extracting data by cycle number or step
- Exporting ASCII file

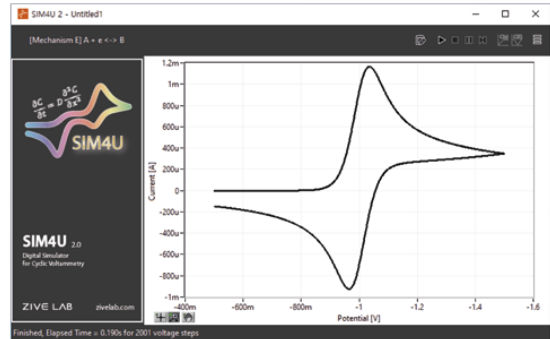
### 1) IVMAN DA™ Battery Test Data Analysis Software

- Battery test data analysis
- Electrochemical voltage spectroscopy (dQ/dV vs. V)
- Voltage vs. Capacity analysis (V vs. Q)
- Cycle graph (Q vs. cycle)
- Differential voltage graph(dV/dQ vs. Q)



## Simulation Software for Cyclic Voltammetry, SIM4U Freeware

- Single or multiple charge transfer steps and first and second-order chemical steps can be used.
- Cyclic voltammetry method is used for simulation.
- 1D simulation of semi-infinite diffusion processes is used
- The pre-equilibrium can be applied before simulation.
- The effect of uncompensated resistance and double layer capacitance can be simulated.
- Measured data and simulated data can be seen together in the plot.

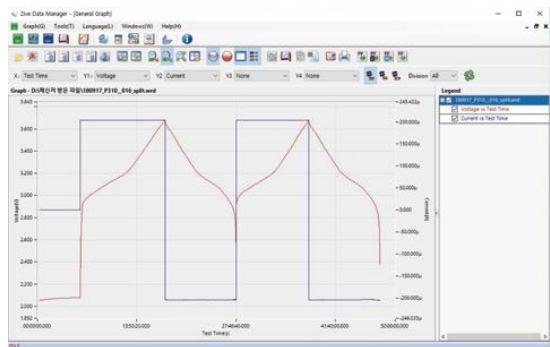


\* Downloaded for free from [www.zivelab.com](http://www.zivelab.com).

## Software for SI data & SM data set, ZIVE Data Manager Freeware

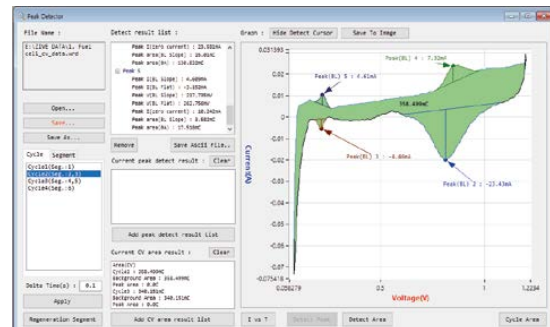
### Main functions

- Split data file by cycle or batch
- Resampling function
- Multi working electrodes data format convert
- Subtract current function between two data files
- DC graph, cycle graph, EIS graph function
- Data exporting to Excel or ASCII format
- Data overlay with SI data and SM data



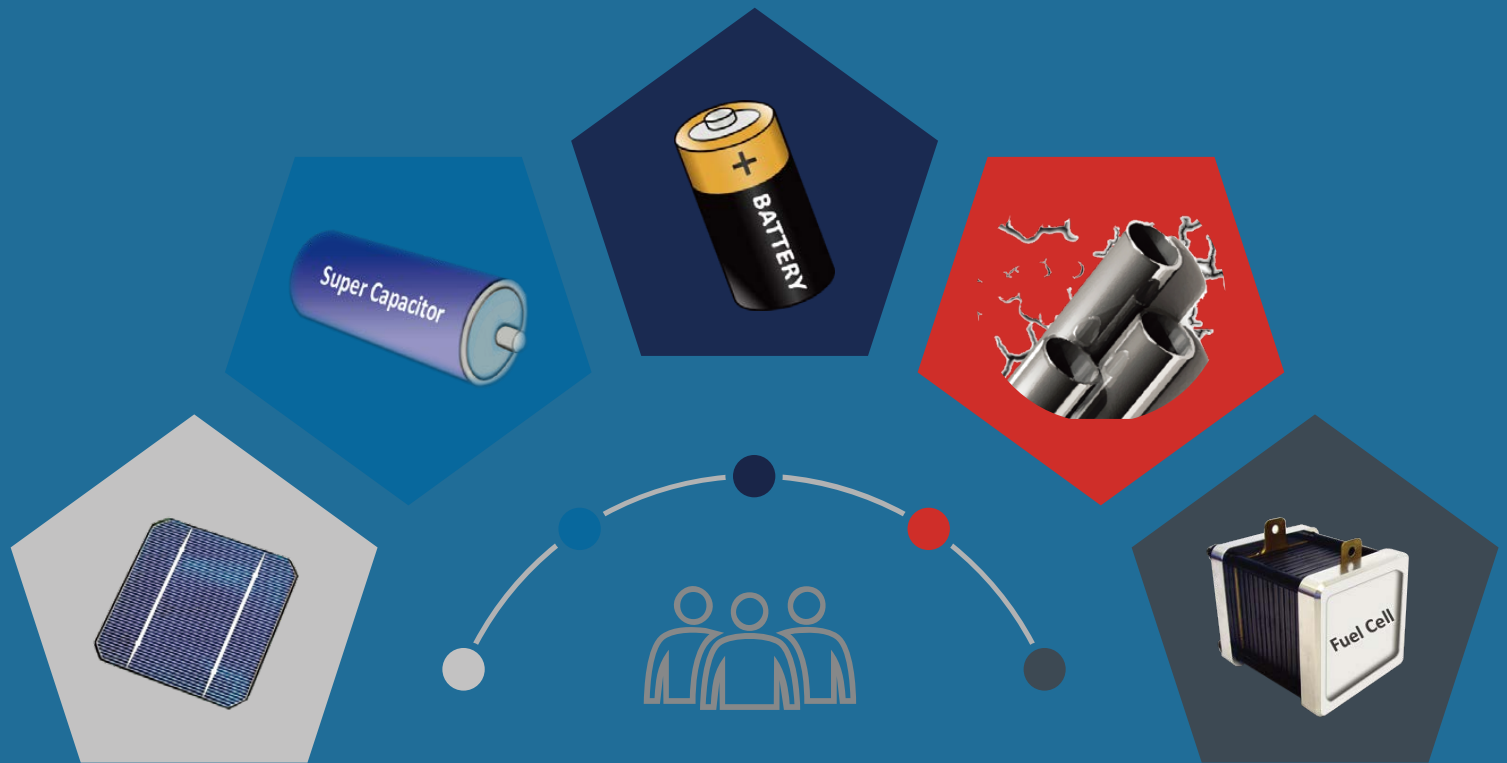
### Peak Detector (CV analysis)

- Voltammogram peak finding and analysis
- Cycle area measurement
- IV curve, It curve display



\* This software is only for WonATech data files.  
Downloaded for free from [www.zivelab.com](http://www.zivelab.com).

# Designing the Solution for Electrochemistry



## GATEWAY TO ELECTROCHEMISTRY



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