

## Product Datasheet - Technical Specifications



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**Product**

IT5100 Series Battery Testers

**Features**

Resistance + Voltage simultaneously measurement and display



3 voltage ranges, 10  $\mu$ V~1000V  
Optional 7 resistance ranges



4-terminal AC measurement



Comparator function



Statistics calculation



Measurement setting configurations storage



Abnormal measurement inspection



**IT5100**

**Series Battery Testers**

**APPLICATIONS**

- Automatic battery inspection line, R&D
- Button batteries
- Electric vehicle batteries
- Alkaline batteries
- Lithium batteries
- Lead-acid batteries

*Your Power Testing Solution*



# IT5100 Series Battery Testers

IT5100 series is a series of battery internal resistance testers with high precision, high resolution and high speed. Resistance resolution is down to 0.1  $\mu\Omega$ , voltage resolution is 10  $\mu\text{V}$ . IT5100 adopts AC 4-terminal sensing, that means the tester not only can test internal resistance and voltage simultaneously with high precision, but also support long-term statistical calculations. From 3 m $\Omega$  coin size to 3000  $\Omega$  large-cell batteries, IT5100 is an ideal solution for the batteries inspection and sorting.

## Features

- Simultaneous resistance and voltage measurements
- Resistance measurement: 150  $\mu\Omega$  to 3000  $\Omega$  \*1
- Voltage measurement: 10  $\mu\text{V}$  to 1000 V \*2
- 3 voltage ranges, 7 resistance ranges automatic or manual test \*3
- Up to 125 measurements /s \*4
- 4.3 inch LCD color display
- Built-in GPIB, USB, LAN interfaces with SCPI support
- Statistics calculation and data storage function
- Comparator function
- Zero adjustment function
- 4-terminal AC measurement
- Measuring result alarm function

\*1 IT5101E: 15 m $\Omega$  to 3  $\Omega$   
 \*2 IT5101E: 10 $\mu\text{V}$  ~ 300V  
 \*3 IT5101E is 2 resistance ranges  
 \*4 In Ex\_fast mode

## Applications

The wide measuring range and multi-functions makes the IT5100 series ideal for inspection and sorting of all types of batteries. It can be used to validate various types of DUT's requiring test of internal resistance, contact resistance, Equivalent Series Resistance (ESR) etc. It is useful in both R&D, production test and other applications.

- High-voltage battery pack test e.g. electric vehicles, lithium battery etc.
- Battery module testing
- Large (low-resistance) cell testing
- High-speed mass production testing of coin batteries
- UPS inspection
- Deterioration & life assessment of alkaline batteries, lead-acid battery
- Various contact resistance test
- Equivalent Series Resistance (ESR) test

### Lithium batteries and secondary batteries



Cellphones



Digital Cameras



Unmanned Aerial Vehicles (UAV)



Electromobiles



New Energy Vehicles

Battery-powered Devices

# Your Power Testing Solution

## IT5100 Series Battery Testers

### **FAST** High Precision and Fast Measurement

#### High Accuracy

Resistance:  $\pm 0.4\% \pm 0.05\%$  FS  
Voltage:  $\pm 0.01\% \pm 0.01\%$  FS

#### High Resolution

Resistance:  $0.1 \mu\Omega^*$   
Voltage:  $10 \mu V$

\* The resolution is only for IT5101, IT5101E resolution is  $10 \mu\Omega$ .

#### High Speed

Resistance+Voltage simultaneously sampling time  $< 8$  ms  
Single sampling time (Resistance or Voltage)  $< 4$  ms

### **R+V TEST** Resistance + Voltage simultaneously measurement and display

#### 4.3 inch LCD screen

IT5100 series provides 4.3 inch LCD screen. The color screen makes the whole testing and statistics calculation process visible and simple. Support resistance & voltage simultaneous test and display, speed up to 125 measurements/s.



High speed simultaneous resistance and voltage measurement.



High voltage battery testing up to 1000 V



From  $3 \text{ m}\Omega$  coin size to  $3000 \Omega$  large-cell batteries, IT5100 is the choice.

### Wide measuring range

#### Voltage measurement

High voltage range, fitted for fast battery measurement and production line efficiency improvement.

Min.  $10 \mu V$  ~ Max.  $1000 V$

#### Resistance measurement

Select the performance and cost required for your application.

$150 \mu\Omega$  to  $3000 \Omega$

Model	Resistance											
	Measuring range	Resolution	Measuring range	Resolution	Measuring range	Resolution	Measuring range	Resolution	Measuring range	Resolution	Measuring range	Resolution
IT5101	$3 \text{ m}\Omega$	$0.1 \mu\Omega$	$30 \text{ m}\Omega$	$1 \mu\Omega$	$300 \text{ m}\Omega$	$10 \mu\Omega$	$3 \Omega$	$0.1 \text{ m}\Omega$	$300 \Omega$	$10 \text{ m}\Omega$	$3000 \Omega$	$0.1 \Omega$
IT5101E	-	-	-	-	$300 \text{ m}\Omega$	$10 \mu\Omega$	$3 \Omega$	$0.1 \text{ m}\Omega$	-	-	-	-
IT5101H	$3 \text{ m}\Omega$	$0.1 \mu\Omega$	$30 \text{ m}\Omega$	$1 \mu\Omega$	$300 \text{ m}\Omega$	$10 \mu\Omega$	$3 \Omega$	$0.1 \text{ m}\Omega$	$300 \Omega$	$10 \text{ m}\Omega$	$3000 \Omega$	$0.1 \Omega$
Model	Voltage											
	Measuring range				Measuring range				Measuring range			
IT5101	$-6 V \sim +6 V$				$-60 V \sim +60 V$				$-300 V \sim +300 V$			
IT5101E	$-6 V \sim +6 V$				$-60 V \sim +60 V$				$-300 V \sim +300 V$			
IT5101H	$-10V \sim +10V$				$-100V \sim +100V$				$-1000V \sim +1000V$			



# Your Power Testing Solution

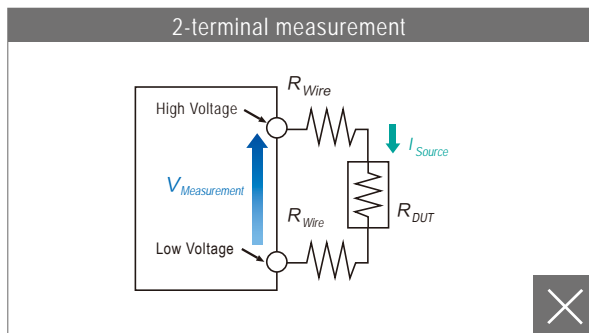
## IT5100 Series Battery Testers

### Excellent performance

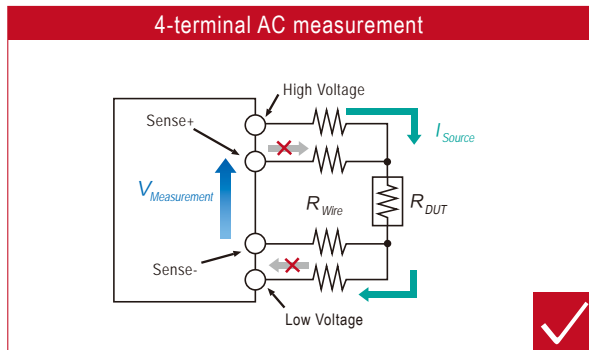


#### 4-terminal AC Measurement

To avoid the influence caused by testing wire and ensure test precision, IT5100 series adopt AC 4-terminal sensing. This means the tester can test not only internal resistance and voltage simultaneously with high precision, but also support long-term statistical calculations.



VS



#### High precision

Resistance:  $\pm 0.01\% \pm 0.01\% \text{ FS}$

Voltage:  $\pm 0.4\% \pm 0.05\% \text{ FS}$

#### High resolution

Resistance:  $0.1 \mu\Omega$  (IT5101E is  $1 \mu\Omega$ )

Voltage:  $10 \mu\text{V}$

#### High speed

Resistance + voltage

Simultaneous test < 8 ms

Single test < 4 ms

### Multifunction



#### Abnormal measurement inspection

IT5100 series provides 4.3 inch LCD screen. The color screen makes the whole testing and statistics calculation process to be visible and simple. Support simultaneous resistance and voltage test at speed up to 125 times/s.



#### Averaging function

To ensure test stability and reliability, IT5101 provides calculation functions with easy to use operation.



#### Comparator function

IT5100 series provides built-in comparator function, the function can distinguish whether the test parameters are compliant with the related standard and automatically counts the pass/fail rate.



- Test resistances & voltage simultaneously
- Alternative setting method
- An alarm signal will be generated when the actual value exceeds the preset (Hi/Lo) range.
- Two setting methods are available for users, the upper and lower limit absolute value or the relative percentage of voltage and resistance. Users can choose depending on their need.
- Manual comparator

# Your Power Testing Solution

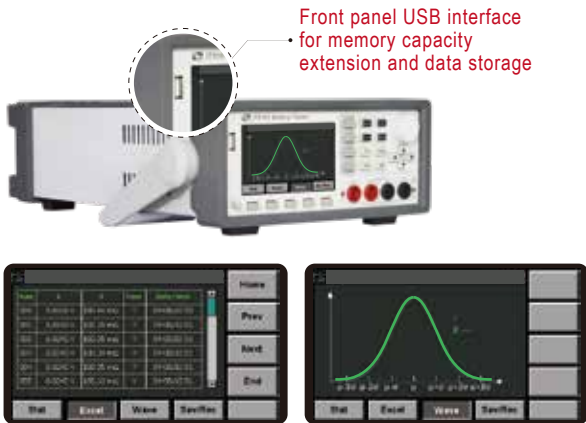
## IT5100 Series Battery Testers



### Statistics calculation & Measurement setting configurations storage

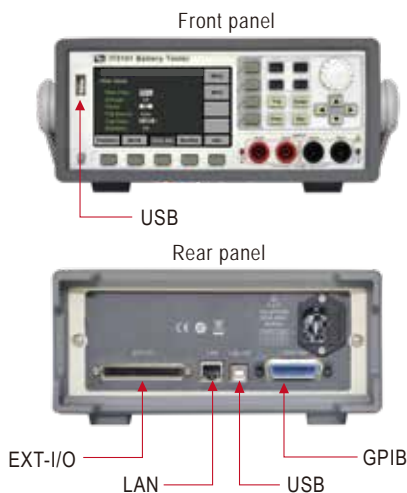
Combined with an external USB disk, IT5100 can be used for statistical calculation, which greatly simplifies the process and provides convenience to quality control.

The data storage capacity up to 1000 groups, maximum measurement setting configurations storage capacity up to 126 pcs. And the measurement data of IT5100 series can be stored as .csv file.



### Built-in multi-interface

IT5100 series supports SCPI protocol and provides built-in GPIB, USB, LAN interfaces and external control Interface. Simplifying the configuration process and adding flexibility to change interface used without adding additional cost.



Built-in GPIB, USB, LAN interfaces, supports SCPI protocol.

### EXT I/O Interface

Triggering, measuring configuration, and zero adjustment can be controlled by EXT I/O interface.

Available for outputting signals, includes comparator results, end of measurement events and measurement errors etc.

Suited for industrial PLC control or synchronization.

IT5100 Series External I/O	
Input	Output
Measurement trigger (TRIG)	End-of-Measurement (EOM)
Print	Measurement-in-Process (INDEX)
Zero adjustment (0ADJ)	Comparator results (R-Hi, R-IN, R-Lo, V-Hi, V-IN, V-Lo, PASS, FAIL)
Manual comparator (MANU)	Measurement error (ERR)
Load panel settings (7 bit) (LOAD 0 ~ LOAD 6)	General-purpose output (OUT1~OUT9)

### Advantages for automatic inspection line measurement

- Built-in LAN, GPIB, USB interface
- External control interface
- Comparator function
- Impedance & voltage simultaneously judgment
- Beep : When exceeds high/low preset measuring range
- Judgment result in time display
- External I/O output
- Manual comparison
- Used for footswitch or PLC control etc.



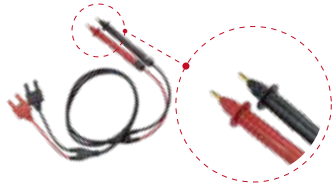
# Your Power Testing Solution

## IT5100 Series Battery Testers

### Optional accessories

ITECH provides multiple optional accessories for IT5100 series battery testers, including 4 types of testing wires with different probes and zero adjustment board.

#### 4 types of optional testing wires (600 Vdc max.)



IT-E601 300V  
IT-E601H 1000V  
Pin type lead



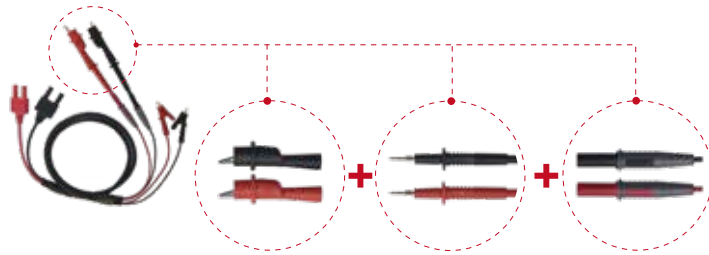
IT-E602 300V  
IT-E602H 1000V  
Large clip type lead



IT-E603 300V  
IT-E603H 1000V  
Pin type lead



IT-E605  
Zero adjustment board  
(For pin testing wire)



IT-E604 300V / IT-E604H 1000V

### PC Application Program

Measurement data can be transferred to a PC and stored as CSV files.

Num	Voltage	Resistance	Voltage State	Resistance State	Date/Time
0	4.99471	0.0546145	0	0	01-07/20:16
1	4.99505	0.5614076	0	0	01-07/20:16
2	4.99517	0.5672807	0	0	01-07/20:16
3	4.99517	0.0548138	0	0	01-07/20:16
4	4.99522	0.0213158	0	0	01-07/20:16
5	4.99519	0.0311247	0	0	01-07/20:16
6	4.99526	0.5600239	0	0	01-07/20:16
7	4.99527	0.0548351	0	0	01-07/20:16



# Your Power Testing Solution

## IT5100 Series Battery Testers

### IT5100 Specifications

Model	IT5101	IT5101E	IT5101H				
Measuring range							
Voltage value	Range	-6V~+6V	-60V~+60V	-300V~+300V	-10V~+10V	-100V~+100V	-1000V~+1000V
	Resolution	10μV	0.1mV	1mV	20uV	0.2mV	2mV
	Accuracy	±(0.01%+0.01%FS)			±(0.01%+0.01%FS)		
	Temperature drift	±(0.001%+0.001%FS)/°C			±(0.001%+0.001%FS)/°C		
Resistance value	Range/Resolution	3mΩ/0.1μΩ	/		3mΩ/0.1μΩ		
	Range/Resolution	30mΩ/1μΩ	/		30mΩ/1μΩ		
	Range/Resolution	300mΩ/10μΩ	300mΩ/10μΩ		300mΩ/10μΩ		
	Range/Resolution	3Ω/0.1mΩ	3Ω/0.1mΩ		3Ω/0.1mΩ		
	Range/Resolution	30Ω/1mΩ	/		30Ω/1mΩ		
	Range/Resolution	300Ω/10mΩ	/		300Ω/10mΩ		
	Range/Resolution	3000Ω/0.1Ω	/		3000Ω/0.1Ω		
	Accuracy	±(0.4%+0.05%FS)		±(0.4%+0.05%FS)		±(0.4%+0.05%FS)	
		±(0.4%+0.1%FS) (3mΩRange)		±(0.4%+0.1%FS) (3mΩRange)		±(0.4%+0.1%FS) (3mΩRange)	
	Temperature drift	±(0.04%+0.005%FS)		±(0.04%+0.005%FS)		±(0.04%+0.005%FS)	
	±(0.04%+0.01%FS) (3mΩRange)		±(0.04%+0.01%FS) (3mΩRange)		±(0.04%+0.01%FS) (3mΩRange)		
Specification							
Response time	10ms			(The response time is a reference when measuring pure resistance, which varies depending on the device to be measured)			
Input resistance	≥1mΩ						
Rated input	DC±300V						
Communication Interface	GPIB/USB/LAN						
Operating temperature	0°C~40°C 80%RH below (No condensation)						
Storage temperature	-10°C~50°C 80%RH below (No condensation)						
Size	384*230*105 (mm)						
weight	2.4KG						

1. Add ±0.01%FS for Med, Add ±0.02%FS for Fast, Add ±0.03%FS for Ex\_fast
2. 3mΩ range: Add ±0.1%FS for Med, Add ±0.2%FS for Fast, Add ±0.5%FS for Ex\_fast
3. Above data is applicable to > 5%FS condition

\*This information is subject to change without notice