

# HIOKI



## 3554 BATTERY HiTESTER

Field Measuring Instruments



### Get a Complete Diagnosis of UPS Batteries with a Single Device



- Auto-hold and Auto-data storage
- Enhanced resistance against noise
- Store up to 4800 sets of data
- PC Interface
- User-exchangeable probe tip

**WIDE  
60V RANGE**  
Ideal for UPS  
Backup Batteries



### The New Standard for Assessing Deterioration of Lead-acid Batteries

Repeated recharging of a secondary battery can lead to battery deterioration and increase its internal resistance. Problems can intensify when there is a short-circuit in the internal cell leading to voltage drop, overheating and complete battery malfunction. Worst of all, these problems can cause life-threatening fires and other accidents.



ISO 9001  
JMI-0216



ISO14001  
JQA-E-90091



<http://www.hioki.co.jp/>

HIOKI company overview, new products, environmental considerations and other information are available on our website.

# HANDS FREE Data Capture Allows You to Focus on the Testing

**Fully Automatic Data Capture**

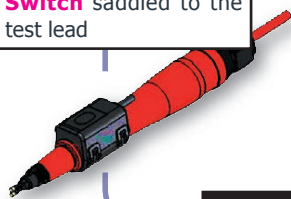
Toggle between 4 different ways to save data

## AUTO HOLD & AUTO MEMO

Automatically save data as soon as reading is stabilized

## AUTO MEMO

Instantaneously save measurement data with one touch using the **9466 Remote Control Switch** saddled to the test lead



## TEST & SAVE

Press the **HOLD** then **MEMO** keys for whenever you need to save data

Save up to **4800 Sets** of Battery Data

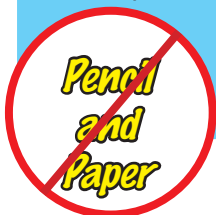
## AUTO HOLD

Check stabilized measurement value before saving with the **9466 Remote Control Switch**

## Quickly Download Data to a PC via USB Interface - Effortlessly Manage Using Bundled Software

The hassle-free measurement process is extended to data management and processing using the bundled data management software. All 4800 sets of data can be uploaded to the PC quickly and effortlessly via a USB cable, and displayed neatly in table format. Edit comparator tables and send them back to the 3554.

Store and edit up to **200** sets of comparator settings



**Not Required**



USB

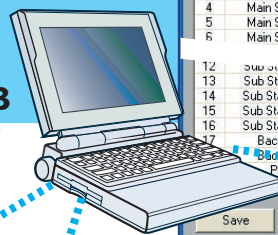


Table - [sample.csv \*]

Enter table Table No: 1

Previous table No. 1 Next table No.

Main Station 1

Range: 30mohm R-Lim1: 15.00 R-Lim2: 20.00

V-Range: 60V V-Lim: 20.00

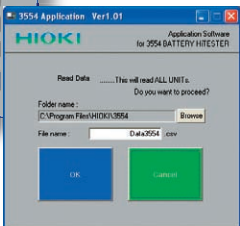
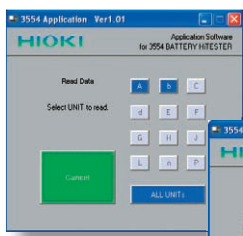
No	Name	R-Range	R-Lim1[mohm]	R-Lim2[mohm]	V-Range	V-Lim[volt]
1	Main Station 1	30m	15.00	20.00	60V	20.00
2	Main Station 2	30m	10.00	12.00	60V	20.00
3	Main Station 3	30m	15.00	20.00	60V	24.00
4	Main Station 4	30m	5.00	24.00	60V	10.00
5	Main Station 5	3m	2.00	18.00	60V	12.00
6	Main Station 6	3m	18.00	12.50	6V	2.000
12	Sub Station C-1	3m	2.000	3.000	6V	2.000
13	Sub Station C-2	3m	1.000	2.000	6V	2.000
14	Sub Station D-1	30m	15.00	20.00	60V	12.00
15	Sub Station D-2	30m	11.00	15.50	60V	12.00
16	Sub Station D-3	30m	22.00	27.50	60V	12.00
17	Backup A	3m	1.500	1.500	6V	1.500
18	Backup B	3m	1.300	1.300	6V	1.300
19	PS-1	300m	1	1	60V	20.00
20	PS-2	300m	2	2	60V	20.00

Save Transfer

**Edit and Send Comparator Settings**

**Automatically clear data from the 3554**

**Download Data to a Spreadsheet**



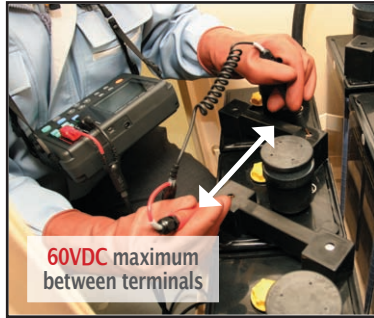
Microsoft Excel Data3554

No	R-Range	Resistance	R-Lim1[mr]	R-Lim2[mr]	V-Range	Voltage[V]	V-Lim	Judgement	Date	Time
9	1 30m	12.02	15	20	60V	12.58	12	PASS		
10	2 30m	12.01	15	20	60V	12.65	12	PASS		
11	3 30m	12.05	15	20	60V	12.59	12	WARN		
12	4 30m	20.27	15	20	60V	11.64	12	PASS		
13	5 30m	11.98	15	20	60V	12.58	12	PASS		
14	6 30m	12.46	15	20	60V	12.68	12	PASS		
15	7 30m	16.92	15	20	60V	12.01	12	WARN		
16	8 30m	11.99	15	20	60V	12.58	12	PASS		

- Download:**
- ✓ Data Memory Number
  - ✓ Range
  - ✓ Resistance value
  - ✓ Resistance limits
  - ✓ Voltage value
  - ✓ Voltage limit
  - ✓ Temperature
  - ✓ Judgement
  - ✓ Date & time

# Tough Against Noise Plus Wide 60V Range

Trying to measure UPS backup batteries while they are still being used naturally brings about noise coming from the battery's inverter or rectifying circuit. The enhanced measurement current in the 3554 plus fortified circuit design, added with the Averaging Function to handle batteries that have fluctuating measurement values no matter how steady you hold the probe makes the battery tester extra resistant against the adverse effects of noise.



- ✓ Common battery cells: 0 to 12V DC
- ✓ Fork lifts and electric vehicles: 48V DC

## Three-rank rating of battery state: Pass, Warning or Fail

Assessment is based on a 6-way combination of comparisons against upper and lower resistance limits and a voltage threshold. Immediately see the judgement result on the bright LCD and beep on your choice of PASS or WARNING/FAIL.

Resistance	Low	In Range	High
VOLTAGE			
High	Pass	Warning	Fail
Low	Warning	Warning	Fail

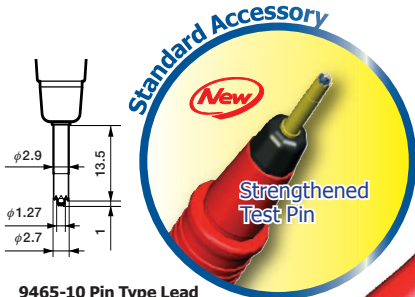
Voltage threshold value ▶  
 First resistance limit ▲      ▲ Second resistance limit

### 10 Hours of Continuous Operation

Save time and money with an uninterrupted workflow

## Wide Selection of Tough and Versatile Test Probes

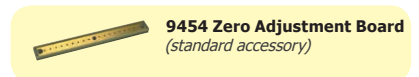
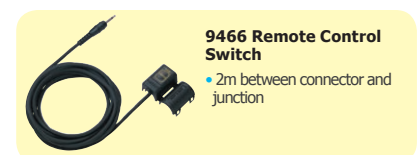
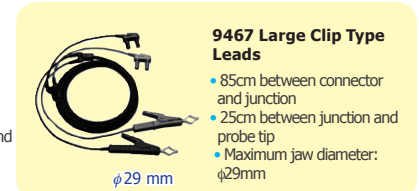
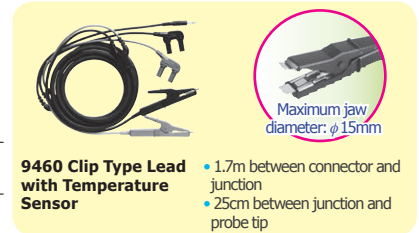
The standard 9465-10 Pin Type Leads with the single test pin on each lead has been fortified to withstand even the toughest use, while a new dual-axis mechanism incorporated in the new 9772 Pin Type Lead allows the TWO pins in each test lead to move independently. Just in case of breakage, the pins on both the 9465-10 and the 9772 can be replaced easily on site.



- 9465-10 Pin Type Lead**  
(standard accessory)
- 40cm between connector and junction
  - 25cm between junction and probe tip



- 9772 Pin Type Lead**
- 40cm between connector and junction
  - 25cm between junction and probe tip



**Diagonal probing is no longer a problem.**

### The Advantages of 4-Terminal Measurement

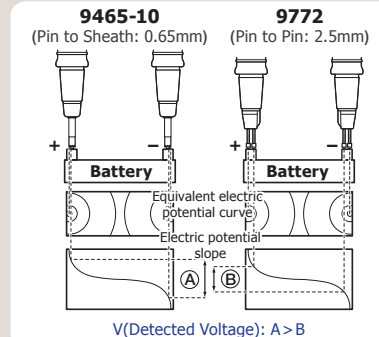
*The Quality of Your Test Lead CAN Make a Difference*

When measuring certain batteries such as lead-acid cells, the resulting measurement value may differ depending on the test leads used to conduct the measurement. This difference is due to the shape of the probe tip as well as the dimensions of the 4-terminal test leads used for measurement. However, despite a difference in value given by different test leads, it is safe to assume that each specific value reflects the correct value obtainable by the respective test leads.

Based on this principle, when diagnosing battery deterioration in a time series, it is particularly important to use test leads having the same tip shape

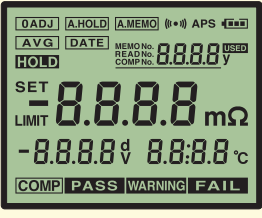
and dimensions in order to maintain measurement consistency.

The difference in the measurement values obtained by different test leads is a physical phenomenon caused by the difference in distance between the SOURCE and SENSE pins of the test leads. This is more significant when the battery terminal contains a resistance higher than the internal resistance of the battery under test. The figure on the right demonstrates how even minute physical differences between the SOURCE and SENSE pins for two types of test leads can affect the detected voltage level of the battery.



## Specifications

### Basic Specifications

<b>Measurement items</b>	: Resistance (AC four-terminal method), voltage, temperature (platinum temperature sensor, only when using 9460 leads)
<b>Display</b>	: LCD
	<i>LCD All Segments Displayed</i>
	
<b>Sampling rate</b>	: Once per second
<b>Averaging Function</b>	: OFF, 4, 8, or 16 times
<b>Input overflow</b>	: [OF] is displayed
<b>Constant current fault detection</b>	: [---] is displayed
<b>Open-circuit terminal voltage</b>	: 5 VMax
<b>Auto power off</b>	: Auto power off after 10 minutes unless during data transmission
<b>Comparator Settings</b>	: First and second resistance limits, and lower voltage limit
<b>Number of Comparator Settings</b>	: 200 Sets
<b>Comparator Output</b>	: LCD display of PASS, WARNING, or FAIL. Select beeper to sound on PASS/WARNING or FAIL.
<b>Operating temperature and humidity</b>	: 0 to 40°C (32°F to 104°F), 80% rh or less (no condensation)
<b>Absolute maximum input voltage</b>	: 60V DC, No AC input allowed
<b>Withstand voltage</b>	: Between input terminals and output terminals (including EXT. HOLD/MEMO, and USB terminals): 1.5 kV AC rms for 15 seconds
<b>Maximum rated power consumption</b>	: 2 VA
<b>Continuous operating time</b>	: 10 hours (using alkaline batteries)
<b>Power supply</b>	: AA (LR6) Alkaline Batteries x 8

The standard 3554 Package comes bundled with one 9465-10 Pin type Lead, one USB Cable, data management PC software, tough carrying case, zero-adjustment board, eight AA batteries, and one spare fuse.

<b>Dimensions and mass</b>	: Approx.192W x 121H x 55D mm, 790 g (including batteries)
<b>Accessories</b>	: Model 9465-10 PIN TYPE LEAD x 1, USB cable x 1, Application Software CD x 1, Strap x 1, Carrying case x 1, Zero adjustment board x 1, LR6 alkaline batteries x 8, Fuse x 1



### Functions

<b>HOLD</b>	: (1) Pressing the HOLD key (2) Inputting signals to the EXT.HOLD/MEMO terminal (3) Stabilizing measured values (when the auto-hold feature is on)
<b>Data Storage</b>	: While the measured values are being held, pressing MEMO key will save them to internal memory. When the auto-memory feature is on, measured values will be saved to the instrument's internal memory when held. <b>Saved items:</b> Date, time, resistance value, voltage value, temperature, comparator setting values, and comparator judgement. <b>Maximum storable data:</b> 4800 sets. <b>Memory structure:</b> 400 data sets per unit (12 units)
<b>Reading data</b>	: Read stored data on instrument or with PC application
<b>PC Interface</b>	: USB
<b>PC Software</b>	: Windows compatible, using USB interface
<b>Application</b>	<b>PC to 3554:</b> transfer comparator tables edited on Excel, delete data from 3554, initialize the 3554, make clock settings. <b>3554 to PC:</b> transfer data stored in memory (save files on PC in CSV format)

### Measurement Accuracy (Guaranteed Accuracy Period: 1 Year)

Guaranteed Accuracy : 23°C± 5°C (73°F± 9°F), non-condensating, after zero-Conditions adjustment, warm-up time not required

#### Resistance Measurement

Temperature coefficient : ±0.01 %rdg.±0.8 dgt./°C  
Measurement current frequency : 1 kHz±30 Hz  
Measurement current reliability : ±10 %

Range	Max. display	Resolution	Measurement Current	Accuracy
3 mΩ	3.100 mΩ	1μΩ	150 mA	±1.0 %rdg.±8 dgt.
30 mΩ	31.00mΩ	10μΩ	150 mA	
300 mΩ	310.0 mΩ	100μΩ	15 mA	±0.8 %rdg.±8 dgt.
3 Ω	3.100 Ω	1 mΩ	1.5 mA	

#### Voltage Measurement

Temperature coefficient : ±0.005 %rdg.±0.5 dgt./°C

Range	Max. display	Resolution	Accuracy
6 V	±6.000 V	1 mV	±0.08 %rdg.±6 dgt.
60 V	±60.00 V	10 mV	

#### Temperature Measurement

Measurement Range	Resolution	Accuracy
-10°C to 60°C	0.1°C	±1.0°C

#### To Our Valued Customers:

The thresholds for determining the pass/fail condition of a battery depends on the specifications and standards of the battery manufacturer, battery type, capacity, etc. It is important and necessary to always conduct battery testing against the internal resistance and terminal voltage of a new or reference battery. In some cases, it may be difficult to determine the deterioration state of sealed lead acid batteries which demonstrates smaller changes in internal resistance than traditional open type (liquid) lead-acid or alkaline batteries.

## Options

*Bundled with the standard 3554*

**9465-10** Pin-type Lead  
**9454** Zero Adjustment Board

**9460** Clip-type Lead with Temperature Sensor  
**9772** Pin-type Lead  
**9466** Remote Control Switch  
**9467** Large Clip Type Lead (no CE mark)  
**9465-90** Tip Pin (to replace the tip on Model 9465-10)  
**9772-90** Tip Pin (to replace the tip on Model 9772)

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