

#### **RAYDON Electronics**

RA-510

Li-ion Battery Analyzer

**Quick Guide** 

V1.00



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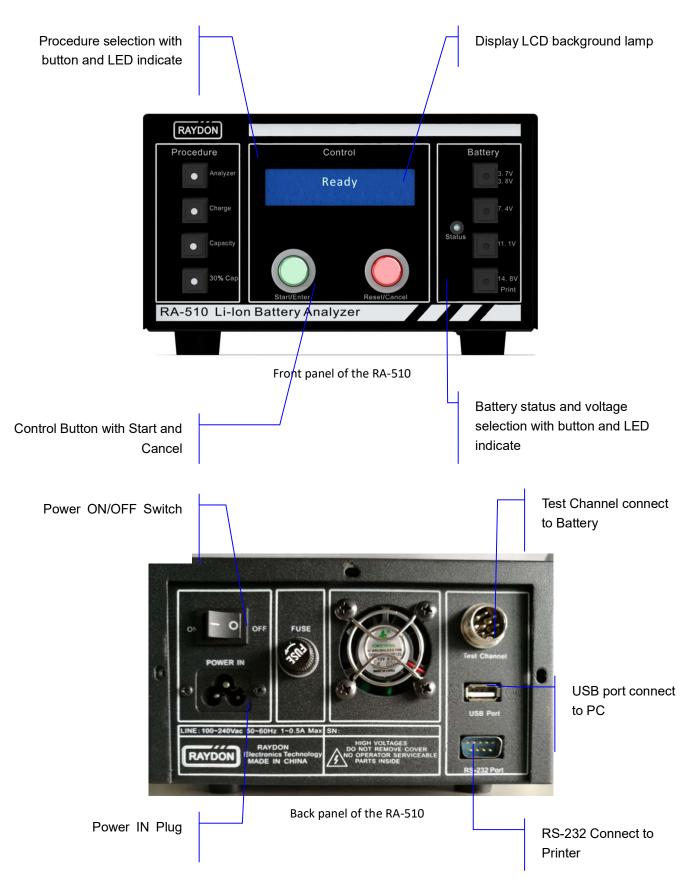
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#### **Version Control**

Version	Description	Date
V1.00		23 November,
		2017
V2.00		23 July, 2018

# Analyzer introduce

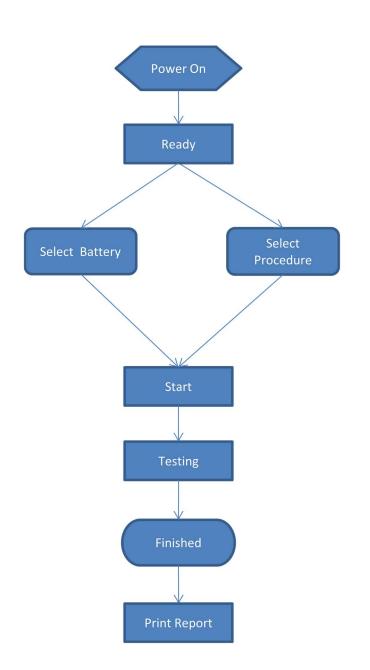




Connect battery, ready to start

# Over View

#### **Test Flow Chart**



Step No.	Item	Description	Picture
1	Power On	Boot Analyzer	HE REPART FOR A MARK
2	Ready	Ready to test status	Ready Volt: 3799mV
3	Select Battery	Battery LED ON: 1S: 3.7V/3.8V 2S: 7.4V 3S:11.1V 4S: 14.V [S]: Number of Series	Control Battery   Analyze Uolt: 3799mU   Charge Stretener   Sapachy Stretener   Sabscap Exercise   RA-510 Li-lon Battery Analyzer
4	Select Procedure	<ul><li>Procedure LED ON:</li><li>1. Analyzer</li><li>2. Charge</li><li>3. Capacity</li><li>4. 30% Capacity</li></ul>	Control Battery   Analyze Image: Capecity   Charge Image: Capecity   Solid Car Image: Capecity   Solid

5	Start	Click Start Button quick start test	RAYDON Procedure Anatyze Charge Gapacry 30% Cap RA-510 Li-Ion Battery Analyzer
6	Testing	Testing status display in LED, including procedure, battery status real time.	Analyze mV 502mA Functionality 00:00:30
7	Finish	Display test result	AnalyzeyzeG00Dace
8	Print	Print test report, and then return to Ready.	RAYDOR RA-STO REPORT Distance of the state Distance of the state Distance of the state D

# Procedure introduce

## [Analyze]

[Analyze] Test including below check points:

Initial Test: Check battery statics status

- ✓ Voltage
- ✓ Temperature\*
- ✓ Current\*
- ✓ Remaining Capacity\*
- ✓ Charge State

\* Read smart data from battery (Special design for smart data build in battery, like iPhone battery, laptop battery)

Functionality Test: Check battery physical status

- ✓ Normal charge test
- ✓ Normal discharge test

#### Usability Test:

# For iPhone battery, laptop battery and other smart data phone: read smart data from battery, and analyze the usability

- ✓ Design Capacity
- ✓ Full charge capacity
- ✓ Efficiently: compare Design capacity and Full charge capacity
- ✓ Cycle Count

# For android phone battery and other battery: check charge/discharge voltage status, and analyze the usability

- ✓ Charge dV1
- ✓ Discharge dV1
- ✓ Charge dV2
- ✓ Discharge dV2

## [Charge]

[Charge] charge battery by 2 different ways:

- ✓ Battery power less than 60%, [Charge] will charge battery to 60% (normal status).
- ✓ Battery power more than 60%, [Charge] will charge battery to 100% (fully charge status).

## [Capacity]

[Capacity] follow below steps:

- 1. Charge battery to full;
- 2. Discharge battery to empty (calculate the capacity in this step);
- 3. Charge battery to 60% normal status.

## [30% Cap]

[30% Capacity] special design for air shipment battery, according to Air Safety rule, battery must less than 30% power to ship by air:

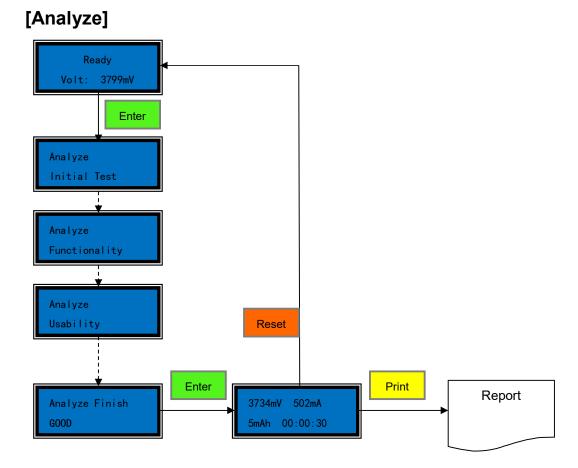
- ✓ Battery power less than 30%, charge battery to 30% (air shipment status).
- ✓ Battery power more than 30%, discharge battery to 30% (air shipment status).

#### **Analyze Result Description**

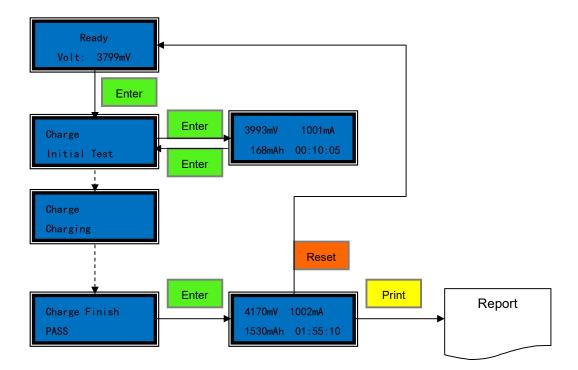
Analyze Usability Result description:

- ✓ GOOD: Battery is good.
- ✓ FAIR: Battery is not very well, but still can use.
- ✓ REPLACE: Battery age is too old, recommend replacement.

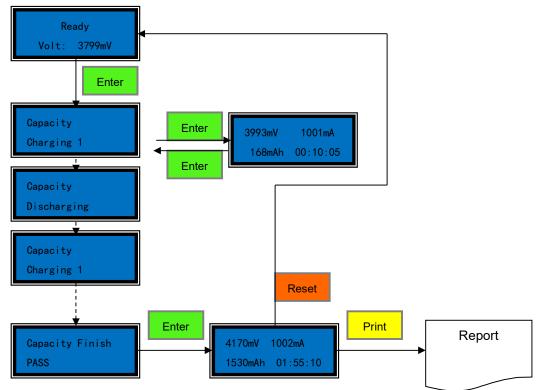
# **Procedure Flow Chart**



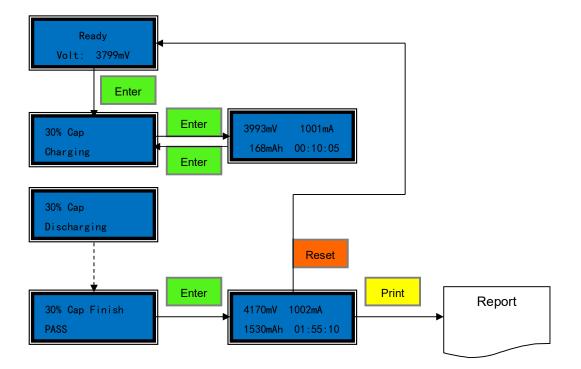
### [Charge]



#### [Capacity]



## [30% Cap]

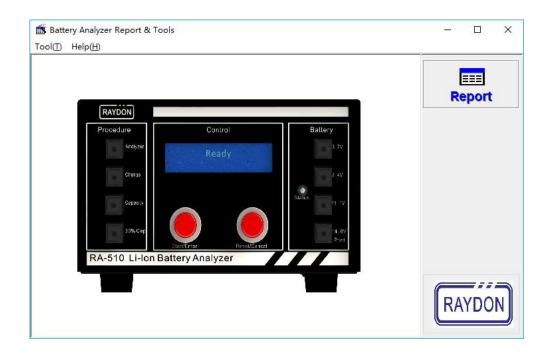


# **Report Printing**

Analyze Report Format	Charge Report Format	Capacity Report Format	30% Cap Report Format
RAYDON RA-510 REPORT	RAYDON RA-510 REPORT	RAYDON RA-510 REPORT	RAYDON RA-510 REPORT
Battery : 1S(3.7V/3.8V) Procedure: Analyze	Battery : 3S(11.1V) Procedure: Change	Battery : 3S(11.1V) Procedure: Capacity	Battery : 2S(8.4V) Procedure: 30% CAP
Voltage : 3.6 V Temperature : 20 °C Current : 00 mA Remaining Cap: 00 mAH Charge State : 50 %	Voltage : 11.5 V Temperature : 20 °C Current : 00 mA Remaining Cap: 00 mAH Charge State : 50 %	Voltage : 11.5 V Temperature : 20 °C Current : 00 mA Remaining Cap: 00 mAH Charge State : 50 %	Initial Voltage : 8.2V Charge State : 50 % Initial Test : PASS
Initial Test : PASS Charge Current : 200mA DisChg Current : 200mA Test Capacity : 500mAH Test Time : 00:00:00	Initial Test : PASS Charge Current : 000mA Test Capacity : 500mAH Test Time : 00:10:00 Functionality :FAIL	Initial Test : PASS Charge Current : 200mA DisChg Current : 200mA Test Capacity : 500mAH Test Time : 00:00:00	Charge Current : 2000mA Test Capacity : 500mAH Test Time : 00:00:00 
Functionality :PASS Design Capacity: 1500 mAH Full charge cap : 1400 mAH Efficiently : 93% Cycle Count : 10 Usability : GOOD	Design Capacity: 1500 mAH Full charge cap : 1400 mAH Efficiently : 93% Cycle Count : 10 Usability : FAIL Under Current Operator:	Functionality :PASS Design Capacity: 1500 mAH Full charge cap : 1000 mAH Efficiently : 67% Cycle Count : 100 Usability : PASS	Operator: Date :
Operator:	Date :	Operator:	
Date :		Date :	

> Blue word only available with smart data in the battery, like iPhone and laptop battery.

# Software interface



Test Information				COM Setup
Achieved Date:	21/07/2017 14:26:26			COM3
Channel:	01	Status:	Finished	
Number of Series:	15	Result:	Failed	Connect
Test Performed:	Analyze	Failed Reason:	Over Voltage	
SMBus Parameters				Read
Manufacturer Name:	LGC-LGC3.0	Full Charged Capacity:	4749mAh	
Device Name:	DELL V57XN	Design Voltage:	11100mV	
Serial Number:	424	Charging Voltage:	12600mV	Preview
Device Chemistry:	LION	Charging Current:	3000mA	
Cycle Count:	6	Relative State of Charge:	24%	
Design Capacity:	4400mAh			Print
Result Information				
Final Voltage:	10.867V	Cell 1 Voltage:	3.62V	Save as
Tested Capacity:	0mAh	Cell 2 Voltage:	3.62V	
Target Capacity Percentage:	0%	Cell 3 Voltage:	3.62V	
Test Time:	00:00:00	Cell 4 Voltage:	N/A	RAYDO

# Appendix I

# iPhone and other smart data battery connector list

Model	Connector
iPhone 4	RS001
iPhone 4S	RS002
iPhone 5	RS003
iPhone 5S/5C	RS004
iPhone 6	RS005
iPhone 6P/6S/6SP	RS006
iPhone 7/7P	RS007
iPad Mini 1/4	RS008
iPad Mini 2/3	RS009
Samsung S6/S7/S8	RS010
iPhone 8/X	RS012

