

## TECHNICAL DATA

# Fluke 500 Series Battery Analyzers



Intelligent test probe with integrated LCD display

BTL20ANG Angled Measurement Probes

### KEY MEASUREMENTS

Internal battery resistance, dc and ac voltage, dc and ac current, ripple voltage, frequency and temperature.

### SEQUENCE MEASUREMENT MODE

Automatic or manual sequence testing of battery strings with automatic measurement storage including voltage, resistance and temperature (with BTL21 intelligent test probe), eliminating the need to press a button each time a measurement needs to be saved.

### COMPREHENSIVE LOGGING

All measured values are automatically captured during testing and can be reviewed on the instrument before downloading for on-the-go analysis

**Reduced testing complexity, a simplified workflow and an intuitive user interface provide a new level of ease-of-use in battery testing.**

The Fluke 500 Series Battery Analyzer is ideal test tool for maintenance, troubleshooting and performance testing of individual stationary batteries and battery banks used in critical battery back-up applications. The intuitive user interface, compact design and rugged construction ensure optimum performance, test results and reliability. Fluke 500 Series Battery Analyzers cover a broad range of battery test functions ranging from DC voltage and resistance tests to full condition testing using an automated string function testing and the test probe integrated infra-red temperature measurement system. 500 Series Battery Analyzers are designed for measurements on stationary batteries of all types.

- **Optimized user interface:** Quick, guided setup ensures you're capturing the right data every time, and the combined visual and audio feedback cues reduce the risk of measurement confusion.
- **Threshold comparison:** Configure multiple reference values and thresholds for resistance and voltage. Comparison result feedback after each measurement via visual and verbal cues.
- **Ergonomic test leads:** Rugged coaxial two pole kelvin test pins with remote SAVE button reduce test time and increase efficiency.
- **Intercell strap resistance test and data management:** Measures the resistance of the intercell connection between batteries in a string.
- **Test probe extenders:** Long reach, straight and angled probes for double stacked cells.
- **Intelligent test probe set (BT520 and BT521):** Integrated LCD display, infrared temperature measurement (BT521 only with BTL21 test probe), verbal audio feedback and captures voltage readings and temperature logging automatically or via integrated save button.
- **Enhanced data analysis:** Quickly compare trends, analyze results and create reports with included battery management software.
- **Easy reporting: Generate PDF report on the PC software with analysis graphics:** and data table or quick email format report with csv file on the mobile app.
- **Wireless communication:** For data download and remote display while measuring. Browse and email measurement data via iOS app.
- **Battery life:** 7.4 V 3000 mAh lithium-ion battery for more than eight hours continuous operation.
- **USB port:** For fast data download to supplied data analysis and report management application software.
- **Highest safety rating in the industry:** CAT III 600 V, 1000 V dc max. rated for safe measurements all around the battery power supply equipment.

## Voltage and resistance thresholds

Fluke Battery Analyzers allow you to quickly and easily define upper and lower measurement thresholds or tolerance ranges. During the testing process, measured values are automatically compared to the predefined threshold levels producing a PASS, FAIL or WARN indication after each measurement. A maximum of 10 sets of thresholds

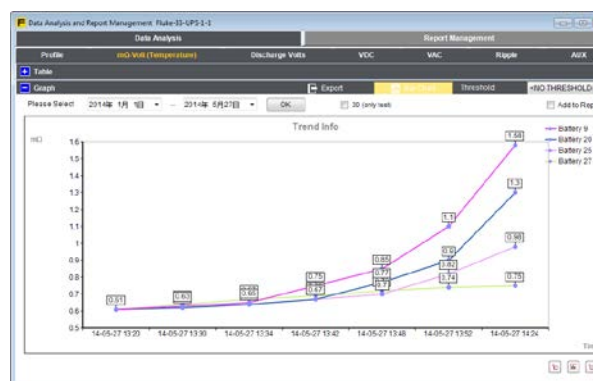
can be stored and threshold indications are determined based on the following criterion:

| Voltage        |                | Resistance |                                            |                       |
|----------------|----------------|------------|--------------------------------------------|-----------------------|
| >Voltage Lower | <Voltage Lower | <Reference | >Reference and < Reference x (1+Warning %) | >Reference x (1+Fail) |
| Pass           | Fail           | Pass       | Warning                                    | Fail                  |

## Fluke Battery Management software

Fluke Battery Management Software allows you to quickly and easily import data from the battery analyzer to a PC. The measurement data and battery profile information is stored and archived with the Management Software and can be used compare results, switch results between conductance and resistance (requires Software Management software version 1.0.69 or later) readings and perform trend analysis. All measurement data, battery profile and analysis information can be used to easily generate reports.

- Quick view saved readings
- Profile management
- Histogram of a battery string with end user defined threshold
- Historical trend data of batteries
- Multiple rounds of discharge voltage
- Quick Report Generation
- Upgrade Fluke Battery Analyzer firmware
- Switch measurement results between conductance and resistance readings



Historical trend data of batteries.

## Fluke Battery Analyze mobile app

The BT521 offers wireless communication for data download and remote display while measuring via the dedicated Fluke Battery Analyzer mobile app. Using the Fluke Battery Analyze mobile app you can:

- Browse profile
- Review sequence testing data
- E-mail sequence testing data



Histogram of a battery string with user defined threshold.

The image is a screenshot of a mobile application interface. At the top, there is a status bar with signal strength, carrier name, time (10:42 AM), and battery level. Below the status bar is a dark header bar with a back arrow on the left, the title 'Profile Data' in the center, and an envelope icon on the right. The main content area has a yellow background and displays several text labels: 'Location: Test-1', 'Device Name: UPS', 'Battery Type: General battery', 'String No: 47', 'Battery Num : 450', 'VDC Num : 20', 'VAC Num : 20', and 'Ripple Num : 20'. Below this is a dark horizontal separator. Underneath the separator is a yellow bar with a plus icon and the text 'mΩ.V'. Below this is a table with four columns: 'No', 'mΩ', 'VDC', and 'Time'. The table is currently empty. At the bottom of the screen, there is another yellow bar with a plus icon and the text 'Dis. V'.

View measurement profile.

| Profile Data |       |       |                |
|--------------|-------|-------|----------------|
| mΩ.V         |       |       |                |
| No           | mΩ    | VDC   | Time           |
| 451          | 5.71  | 12.79 | 09/19/14 10:39 |
| 452          | 5.74  | 12.99 | 09/19/14 10:39 |
| 453          | 5.84  | 12.99 | 09/19/14 10:39 |
| 454          | 5.79  | 12.99 | 09/19/14 10:39 |
| 455          | 5.69  | 12.99 | 09/19/14 10:39 |
| 456          | 5.71  | 12.99 | 09/19/14 10:39 |
| 457          | 5.71  | 12.99 | 09/19/14 10:39 |
| 458          | 25.07 | 13.04 | 09/19/14 10:39 |

View and email measurement data.

## Specifications

|                                                     | Range                                                                                                  | Resolution | Accuracy    | BT510 | BT520 | BT520ANG | BT521 | BT520ANG |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------|-------------|-------|-------|----------|-------|----------|
| Battery resistance/Strap resistance <sup>1</sup>    | 3 mΩ                                                                                                   | 0.001 mΩ   | 1 % + 8     | .     | .     |          | .     |          |
|                                                     |                                                                                                        |            | 1% +68      |       |       | .        |       | .        |
|                                                     | 30 mΩ                                                                                                  | 0.01 mΩ    | 0.8 % + 6   | .     | .     |          | .     |          |
|                                                     |                                                                                                        |            | 0.8%+12     |       |       | .        |       | .        |
|                                                     | 300 mΩ                                                                                                 | 0.1 mΩ     | 0.8 % + 6   | .     | .     | .        | .     | .        |
|                                                     | 3000 mΩ                                                                                                | 1 mΩ       | 0.8 % + 6   | .     | .     | .        | .     | .        |
| Vdc                                                 | 6 V                                                                                                    | 0.001 V    | 0.09 % + 5  | .     | .     | .        | .     | .        |
|                                                     | 60 V                                                                                                   | 0.01 V     | 0.09 % + 5  | .     | .     | .        | .     | .        |
|                                                     | 600 V                                                                                                  | 0.1 V      | 0.09 % + 5  | .     | .     | .        | .     | .        |
|                                                     | 1000 V                                                                                                 | 1 V        | 0.09 % + 5  |       |       |          | .     | .        |
| Vac (45 Hz to 500 Hz with 800 Hz filter)            | 600 V                                                                                                  | 0.1 V      | 2 % + 10    | .     | .     | .        | .     | .        |
| Frequency (displayed with Vac and Aac) <sup>2</sup> | 500 Hz                                                                                                 | 0.1 Hz     | 0.5 % + 8   | .     | .     | .        | .     | .        |
| AC voltage ripple (20 KHz Max)                      | 600 mV                                                                                                 | 0.1 mV     | 3 % + 20    | .     | .     | .        | .     | .        |
|                                                     | 6000 mV                                                                                                | 1 mV       | 3 % + 10    | .     | .     | .        | .     | .        |
| Adc/Aac (with accessory Fluke i410)                 | 400 A                                                                                                  | 1 A        | 3.5 % + 2   |       |       |          | .     | .        |
| Temperature                                         | 0 °C to 60 °C                                                                                          | 1 °C       | 2 °C (4 °F) |       |       |          | .     | .        |
| Meter mode                                          | 999 records for each measurement position with time stamp                                              |            |             |       |       |          |       |          |
| Sequence mode                                       | Up to 100 profiles and 100 profile templates (Each profile stores up to 450 batteries) with time stamp |            |             |       |       |          |       |          |

<sup>1</sup>The measurement is based on ac injection method. The injected source signal is <100 mA, 1 kHz.

<sup>2</sup>Trigger level VAC: 10 mV, Aac: 10 A

## Measurement modes

|                                                                       | BT510 | BT520 | BT520ANG | BT521 | BT521ANG |
|-----------------------------------------------------------------------|-------|-------|----------|-------|----------|
| Resistance (mΩ)                                                       | .     | .     | .        | .     | .        |
| Battery voltage                                                       | .     | .     | .        | .     | .        |
| Voltage dc                                                            | .     | .     | .        | .     | .        |
| Voltage ac and frequency (Hz)                                         | .     | .     | .        | .     | .        |
| Ripple volt                                                           | .     | .     | .        | .     | .        |
| Temperature of negative battery post<br>(Using BTL21 straight probes) |       |       |          | .     | .        |
| DC and ac current (and frequency)                                     |       |       |          | .     | .        |
| DMM mode                                                              | .     | .     | .        | .     | .        |
| Sequence mode                                                         | .     | .     | .        | .     | .        |
| Discharge measurement mode                                            | .     | .     | .        | .     | .        |
| Automatic measurement save                                            | .     | .     | .        | .     | .        |
| Wireless communication                                                |       |       |          | .     | .        |
| Memory view                                                           | .     | .     | .        | .     | .        |

## General specifications

| BT500 Instrument  |                                               |
|-------------------|-----------------------------------------------|
| Size (HxWxD)      | 22 cm x 10.3 cm x 5.8 cm (9 in x 4 in x 2 in) |
| Weight            | 850 g (1.9 lb)                                |
| Screen dimensions | 7.7 cm x 5.6 cm (3 in x 2.2 in)               |
| Interface         | USB mini                                      |

## Environment specifications

|                                          |                                                                           |
|------------------------------------------|---------------------------------------------------------------------------|
| Operating temperature                    | 0 °C to 40 °C                                                             |
| Storage temperature                      | -20 °C to 50 °C                                                           |
| Lithium-ion battery charging temperature | 0 °C to 40 °C                                                             |
| Operating humidity                       | Non-condensing (10 °C)                                                    |
|                                          | <=80 % RH (at 10 °C to 30 °C)                                             |
|                                          | <=75 % RH (at 30 °C to 40 °C)                                             |
| Operating altitude                       | Sea level to 2000 meters                                                  |
| Storage altitude                         | Sea level to 12,000 meters                                                |
| IP rating                                | IP40                                                                      |
| Radio                                    | FCC Class A                                                               |
| Vibration requirements                   | MIL-PRF-28800F: Class 2                                                   |
| Drop test requirements                   | 1 meter                                                                   |
| Temperature coefficients                 | Add 0.1 x specified accuracy for each degree C above 28 °C or below 18 °C |
| Safety compliance                        | 600 V CAT III                                                             |
| EMC                                      | IEC 61326                                                                 |
| ROHS                                     | China, Europe                                                             |
| Protection Class 2                       | Pollution Degree II                                                       |
| Battery compliance                       | UN38.3                                                                    |
|                                          | UL2054                                                                    |
|                                          | IEC62133                                                                  |
|                                          | 2G per IEC68-2-26, 25G, and 29                                            |

## Items supplied with each model

| Equipment                                                                                  | Qty. | BT510 | BT520 | BT520ANG | BT521 | BT521ANG |
|--------------------------------------------------------------------------------------------|------|-------|-------|----------|-------|----------|
| Battery analyzer                                                                           | 1    | .     | .     | .        | .     | .        |
| 4-wire test pin (set)                                                                      | 1    | .     | .     | .        | .     | .        |
| BTL10 Basic Test Lead (set)                                                                | 1    | .     | .     | .        | .     | .        |
| TL175 TwistGuard™ Test Leads with adapter                                                  | 1    | .     | .     | .        | .     | .        |
| BTL20 Intelligent Test Probe Set, with extender (no temperature sensor)                    | 1    |       | .     | .        |       |          |
| BTL20ANG Intelligent Test Probe Set, with extender and angled tips (no temperature sensor) | 1    |       |       | .        |       | .        |
| BTL21 Intelligent Test Probe set, with extender and temperature sensor                     | 1    |       |       |          | .     | .        |
| i410 AC/DC Current Clamp                                                                   | 1    |       |       |          | .     | .        |
| BP500 7.4 V 3000 mAh lithium-ion battery                                                   | 1    | .     | .     | .        | .     | .        |
| BC500 18 V AC Charger                                                                      | 1    | .     | .     | .        | .     | .        |
| Standard mini-b USB cable (cable length:1 m)                                               | 1    | .     | .     | .        | .     | .        |
| Shoulder strap                                                                             | 1    | .     | .     | .        | .     | .        |
| Belt strap                                                                                 | 1    | .     | .     | .        | .     | .        |
| Magnetic hanging strap                                                                     | 1    | .     | .     | .        | .     | .        |
| Fluke Battery Management (CD) containing USB driver and manuals in all languages           | 1    | .     | .     | .        | .     | .        |
| Soft carrying case                                                                         | 1    | .     | .     | .        | .     | .        |
| Spare fuses                                                                                | 2    | .     | .     | .        | .     | .        |
| Paper battery tags                                                                         | 100  |       | .     | .        | .     | .        |

## Ordering Information

**Fluke BT510** Basic Battery Analyzer

**Fluke BT520** Battery Analyzer

**Fluke BT520ANG** Battery Analyzer, with angled test probes

**Fluke BT521** Advanced Battery Analyzer

**Fluke BT521ANG** Advanced Battery Analyzer, with angled test probes

### Accessories

**BTL10** Basic Battery Analyzer Test Leads

**BTL20** Interactive Battery Analyzer Test Probe

**BTL20ANG** Interactive Battery Analyzer Test Probe with angled tip

**BTL21** Interactive Battery Analyzer Test Probe with temperature sensor

**BTL-A** Voltage/Current Probe Adapter

**C500S** Soft carrying case (small)

**C500L** Soft carrying case (large)

**BC500** AC Power Charger

**BP500** Lithium-ion battery 3000 mAh

**TPAK80-4** Magnetic Strap

**B4WTP** 4-wire test pin

**i410** AC/DC Current Clamp

**BCR** Zero ohm calibration resistor

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