

BASEWEST

Operating Manual

Model TS-421 Test Set

Escape Slide Lighting Systems

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BaseWest Inc.

4240 116th Ave N, Clearwater, FL 33762

Tel: 727 / 573-2700 • Fax: 727 / 573-4307

E-mail: info@basewest.com

www.basewest.com

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1.0 General

1.1 Introduction

The Model TS-421 test set is a rechargeable, handheld instrument designed specifically for testing airline escape slide lighting systems, light harnesses and batteries. The test set comprises a plastic enclosure with touchscreen, a removable protective cover with stand, and a universal 120/220 VAC charger. The TS-421 replaces the original TS-420 test set and duplicates the functions of that unit as well as the Astronics Model TU-14 test set.



TS-421 Test Set Shown at the Home Screen

1.2 Function

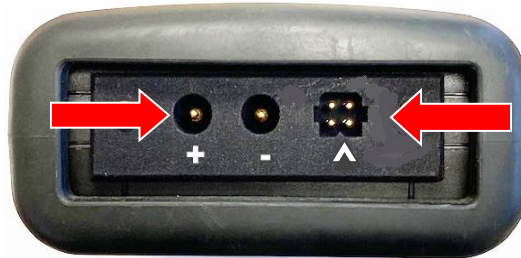
The Model TS-421 provides the following test modes:

- Voltmeter Mode with built-in load bank – The Voltmeter Mode is used to test condition of the internal cell stack of the slide lighting system battery. A touchscreen interface provides for the selection of established resistive loads as well as an open circuit (no load) test.
- Ammeter Mode with regulated power supply – The Ammeter Mode is used to verify the electrical current draw of the slide light harness when powered by the test set's internal 5 VDC power supply and to verify that all luminaires are functioning. The ammeter test has a built-in timer that allows a hands-free, walk-around inspection of luminaire operation for 30 seconds. The internal power supply is capable of providing up to 3 amperes of current.

1.3 Test Connections

Test connections are made at the connector block on the top of the instrument, shown below. These connections include a 4-contact receptacle to mate with the test lead of the battery and polarized contacts to test individual light harnesses. Marked polarity must be observed when testing individual LED-based harnesses.

Polarized Contacts
for Individual Light
Harness Connection



4-Contact Receptacle for
Battery or System Testing
through Battery Test Lead

Test Connections / Connector Block

1.4 Test Set Activation

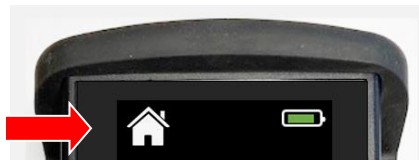
The TS-421 is OFF when the Touchscreen is dark and the RED button is not illuminated. The test set is turned ON by pressing the RED button. The HOME screen appears with Voltmeter or Ammeter test selection options, shown center, below.



If the internal battery is not sufficiently charged for test set operation, the screen to the right, above will appear for 3 seconds, indicating that recharging is required. The test set will then turn OFF.

1.5 Home Icon

The HOME screen reappears at any time the HOME icon, shown below, is pressed.



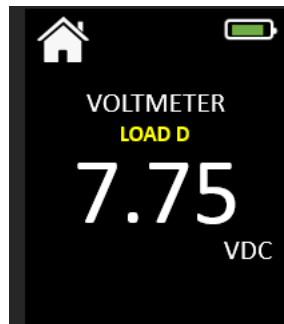
Home Icon

1.6 Internal Battery Status

The charge status of the test set's internal battery is monitored and displayed upon activation of the test set and whenever the touchscreen is active. A battery status icon is displayed in the top righthand corner of the screen indicating state of charge. When the internal battery voltage reaches a predetermined level, the icon will change from Green to Yellow indicating that the unit can be used but should be recharged before next usage.



Half Charge (Yellow)



Full Charge (Green)

1.7 Recharging

Recharging of the internal battery is accomplished with the 120/220 VAC charger provided with the unit. Chargers provided with the earlier TS-420 test set may continue to be used with the TS-421. The recharging port is located at the lower right-hand side of the test set. A recharging time of at least overnight is recommended.

1.8 Display Timing

Voltmeter and ammeter test readings remain on the screen for 30 seconds. At that point, the screen goes dark and the RED button begins to blink for 90 seconds for the Voltmeter test and 120 seconds for the Ammeter test. While the RED button is blinking, the last test reading may be recovered by pressing the RED button or pressing the Touchscreen.

1.9 Automatic Time-Outs

If the test set is left ON and unattended for 90 seconds, the unit will automatically turn OFF, erasing the last reading. The unit can be turned OFF by either returning to the Home screen and pressing the RED button or by pressing the RED button for 3 seconds.

2.0 **Voltmeter Mode (Battery Testing)**

2.1 Connect the 4-contact test lead of the battery under test to the mating receptacle on the connector block. Note that the connector is keyed for proper alignment.

2.2 Turn the test set ON by pressing the RED button. Press the VOLTMETER icon on the HOME screen, and the load selection screen appears per figures below.

NOTE: If the battery under test is not connected, or connected improperly, pressing the RED button creates a three-pulse vibration, and a “Check Connection” prompt appears.

- 2.3 Select the resistive load specified by the slide manufacturer’s CMM by scrolling through the loads with the left and right arrows shown in the Select Load figure, below.



Select Voltmeter Mode



Select Load

- 2.4 Once the proper load is selected, press the RED button to initiate the test. A loading icon appears momentarily until the voltage reading is presented.



Press to Test



Test In Process



Voltage Reading

- 2.5 The test reading remains visible for 30 seconds after which the screen goes dark and the RED button begins to flash for 90 seconds. The test reading can be retrieved while the RED button is flashing by either pressing the RED button or the touchscreen.

3.0 Ammeter Mode (Light Harness Testing)

3.1 Connect a light harness to the test set in one of two ways:

- If testing an individual lighting harness - Connect lighting harness directly to two polarized contact pins in the connector block. Be sure to observe polarity; in most cases the BLUE wire is positive (+) and the WHITE wire is negative (-).
- If testing a lighting harness system while connected to a battery - Connect the 4-contact test lead of the battery to the mating 4-contact receptacle on the connector block.

3.2 Turn the test set ON by pressing the RED button. Press the AMMETER icon on the HOME screen, and the ammeter screen appears.

3.3 To initiate the ammeter test, press the RED button. The RED button illuminates, and a loading icon appears for three seconds until the ammeter reading is presented.

NOTE: If the lighting harness is not connected or connected improperly, pressing the RED button creates a three-pulse vibration, and a “Check Connection” prompt appears.



Select Ammeter Mode

Press to Test

Ammeter Reading

3.4 The connected lighting harness will remain illuminated for 30 seconds, allowing the test operator to conduct a walk-around, hands free, to verify that all luminaires are operating.

3.5 After the lighting harness is turned OFF, the test reading remains visible for an additional 30 seconds. At that point the test screen goes dark and the RED button flashes for 90 seconds. The test reading can be retrieved while the RED button is flashing by either pressing the RED button or the touchscreen.

4.0 Care & Maintenance

4.1 The TS-421 test set is a sensitive electronic instrument and should be handled with appropriate care. Damage from obvious abuse cannot be covered by warranty.

- Be particularly careful to protect the touchscreen from any physical damage (damage to the touchscreen is not covered by warranty).
- The enclosure is not completely sealed; keep the test set away from rain, spills, and fluids to prevent damage to internal electronics.
- Do not apply external electrical inputs, except the AC charger provided.
- Protect from extreme temperatures and humidity; it is best to store the instrument in temperature-controlled spaces.
- It is recommended to keep the protective cover in place at all times except for battery replacement. (Note: the back of the protective cover is provided with a rotating stand that can be removed if it is not useful.)
- Avoid excessive exposure to sunlight and UV radiation.

4.2 Maintenance is limited to wiping the unit enclosure and touchscreen down lightly with a clean cloth moistened with alcohol. DO NOT use cleaners or solvents.

4.3 Field repairs except battery replacement are not authorized and will void warranty.

4.4 The P/N 6-1036 NiMH rechargeable battery is integral to the replaceable back panel of the test set. The battery has a nominal 5 to 7 year life. Battery charge retention will diminish over time and usage. The battery should be replaced when the charge retention level becomes unacceptable. Battery replacement can be accomplished at any time without affecting calibration. Replacement is accomplished as follows:

- Remove protective cover.
- Remove back panel/battery assembly of the test set; retain 4 attach screws.
- Disconnect the battery connection to the test set and discard the old back panel/battery assembly.
- Connect new the battery connection on the replacement back panel/battery assembly with same orientation.
- Secure new back panel/battery assembly with four attach screws.

5.0 Calibration

A separate BaseWest calibration manual, 25-60-46, is provided with each new unit, and is available on the BaseWest website. Calibration is recommended at one-year cycles but is dependent on user requirements and policy. Calibration can be accomplished without opening the test set enclosure. See the calibration manual for recommended accessories.