Test-Um Inc.
The Intelligent Test Solutions Company

TP600
Part No.

LanRoverPRO™ Test Set
Operating Instructions

Warning!

Do not attach to energized cables. The LanRoverPRO™ may be damaged.

Caution!

Improperly crimped, damaged or un-crimped plugs can damage the jacks on the LanRoverPRO™. Inspect plugs for proper termination and crimping before inserting into the tester. Contacts should always be recessed into the plastic grooves of the plug. Do not use with 6 position plugs (RJ11) without an adapter.

FEATURES

- Auto-on and auto-off when testing cables, just plug both ends into tester!
- Two-line by 16-character full alphanumeric LCD with icons for clear results
- Cable test results displayed in wire map format with a message line for shorts and split pairs
- Tests for shorts, opens, miswires, reversals and split pairs with remote connected
- Pre-test – One-ended testing for shorts, opens and *split pairs* (no remote)

- Displays PASS icon and sounds beeper (optional) for T568A/B passing cables
- Length measurement in feet or meters using cable capacitance method
- Tone generator mode for use with tone tracers
- Auto-off in any mode and low power consumption for long battery life
- Snap-together case for easy storage of a remote and convenient patch cable testing

DESCRIPTION

The LanRoverPRO™ has an LCD display and four momentary buttons. One remote attaches to the main unit for storage or patch cable testing. The rubber end cap at the bottom is the battery compartment cover.

The LanRoverPRO™ starts in an off condition when cable testing with a remote. This yields maximum battery life and takes advantage of the fact that the auto-on feature effectively synchronizes the test cycle to the cable being connected for results in 2 seconds. The tester powers on and testing begins automatically when a connection from the main unit to the remote is sensed. The tester will automatically power off within 5 seconds of the cable being disconnected.

Upon completion of the test, the wire map display, ID and any faults are displayed. The top line of numbers on the display represents the connector pins on the main unit. The second line of pin numbers is the connector pin numbers of the remote, normally being the same as the top line for a normal data cable. If there is a miswire, the numbers on the second line will indicate the pin numbers detected. If no connection was detected for some of the pins, the second line will be blank in those pin locations. If a short is detected, the second line will have a flashing “x” in that position and the specific short condition displayed on the third line. If a split pair is detected, those pin positions on the second line will be flashing the pin numbers detected from the remote and the specific split condition displayed on the third line. If there are multiple errors

to display on the third line, the messages are displayed in sequence until all are displayed. The ID icon will have a number directly below it indicating the remote ID number.

The LanRoverPRO™ is powered on by pressing any of the four buttons. The tester will turn on in the last mode used before turning off. There are four modes of operation as described below. In any mode, pressing the MODE button causes the mode select screen to be displayed. The TURN OFF message is usually the first one displayed. Subsequent presses of the MODE button cycle through the other modes. Pressing the SEL button causes the currently displayed mode to be entered.

Test/Pre-test – If a remote is sensed, the tester reverts to the power off cable test described above (Test). If there is no remote, the LanRoverPRO™ uses the length and cable test capability to attempt to measure a cable for shorts, opens and split pairs (Pre-test). TEST and the current pair under test icons being on indicate a test in progress. The results are displayed as messages on the LCD. Because a test can take up to about 5 seconds to complete, the SEL button, which immediately starts a new test, should be pressed whenever a new cable is connected for pre-test. Partial and erroneous results will be displayed until a complete test cycle has been run on a cable.

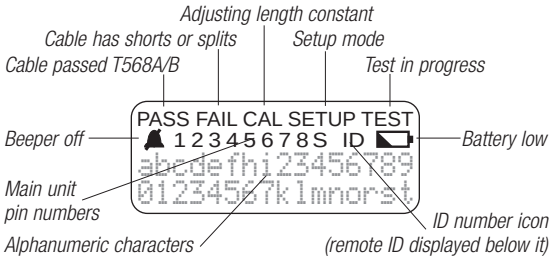
Length – The length mode measures the length of a cable by measuring its capacitance and using the capacitance per unit length (length constant) to calculate the length. The length is displayed on the LCD along with the current value of the length constant. The SEL button changes the pair being measured in a 1-2, 3-6, 4-5, 7-8 and auto-select sequence. The pair number is displayed next to the length except in auto-select mode. If a selected pair has a fault, the fault replaces the length reading on the LCD. In auto-select mode, the tester automatically selects a pair without a fault. The length constant is changed with the up and down arrows. The CAL icon is on while adjusting the constant. If network terminator patterns are found in length mode, the tester will display “T Ring Network??”, “xbase-T Network?” or “Network?” (all four lines terminated).

Tone – The tone mode generates audio tones for use with tone tracers on all pairs, a selected pair or a selected pin. The signal generated on a pair has the signal on one pin and the

complement of the signal on the other pin of the pair, yielding a nominal 10 volts peak-to-peak across the pair. The SEL button selects one of the four tone sounds provided. The up and down arrows scroll through the pairs and pins that have signal on them. All pins not being driven are held at tester ground.

Setup – The setup mode is provided to set user-selectable options. The beep-on-pass can be turned on or off (default is on). The pass criteria can be set for shielded or unshielded cables (default is unshielded). The length and length constant can be set for meters or feet (default is feet). If the length units are changed, the tester converts the currently set length constant to the new units on exit of setup. The up and down arrow buttons scroll through the settable options. The SEL button changes the current setting to the other option. On exit, the mode screen first offers to return to the last mode used before entering setup.

The LanRoverPRO™ monitors for voltage being present on the RJ jack when off, in TEST/PRE-TEST mode or in LENGTH mode. The "VOLTAGE!!" message appears on the screen and the beeper sounds continuously until the voltage is removed.



LanRoverPRO™ LCD Display

INSTRUCTIONS FOR USE

LanRoverPRO™ powers off automatically after 5 minutes of continuously testing a cable when auto-on powered up the tester. Disconnecting the cable restores normal function. Most power-on modes will timeout in about 18 minutes, except for tone, which is about 2.4 hours. Be sure to install a battery if using for the first time—see battery installation.

Cable Testing

To Test a Patch Cable (see "Caution!" on page 1 about cables with bad plugs)

1) Plug one end of patch cable into main unit.
2) Plug other end of cable into remote unit.
3) The tester will power on immediately and will indicate a test in progress by displaying the TEST icon. It will be followed by map results plus a PASS icon and a beep, if it passed both the T568A/B standard and the configured shield criteria.
4) Disconnect patch cable after test. The test repeats every 5 seconds.

To Test Cable from One End

This can be done immediately after termination of one end of the cable, because no connector or remote is required at the other end of the cable. Attach a remote after the pre-test and you are ready for a full test when the other end is terminated.

1) Attach one end of supplied one-foot jumper to main unit and the other end to the wall plate or patch panel jack.
2) Turn on unit by pressing any button. If not in pre-test mode, press MODE until TEST/PRE-TEST is displayed, than press SEL button.
3) Results should appear within 5 seconds. Pressing SEL button starts a new test immediately.
4) Disconnect cable after test. The test repeats every 5 seconds.

Application Hints: The jumper cables must be short compared to the cable run for accurate open and split pair indication, either no more than 10% of the total run length or 3 feet, whichever is less. Cable being tested must be at least 4 feet long for pre-test to work properly.

To Test Installed Cable (office jack to patch panel with remote)

1) Remove remote unit from main unit by sliding remote towards top of the main unit.
2) Attach one end of supplied one-foot patch cable to the remote and other end to the wall jack.
3) Attach one end of the second supplied one-foot patch cable to the main unit and other end to the patch panel jack.

4) The tester will power on immediately and indicate a test in progress by displaying the TEST icon. It will be followed within 2 seconds by a wire map display of the results, plus a PASS icon and a beep if it passed the set shield criteria and T568A/B standard. The ID number for the remote will also be displayed.
5) Disconnect cable after test. The test repeats every 5 seconds.

Application Hints: The jumper cables must be short compared to the cable run for accurate split pair indication – no more than 10% of the total run length.

To Test Coax (tester off or in TEST/PRE-TEST mode)

1) Plug RJ45 to F coax adapters into the remote and main units.
2) Attach cable to be tested to F connectors.
3) The tester will power on if it senses the cable. If not, the cable is open. The coax adapter is connected to the 1-2 pair and will display "12" on the second line if good and flashing "xx" if shorted.
4) Length may be measured as well by setting length constant and selecting 1-2 pair.

To Place Tone on a Cable

1) Turn on unit by pressing any button. If not in tone mode, press MODE until TONE is displayed, than press SEL button.
2) Press SEL until desired tone is selected. The up/down arrow keys select the pin or pair(s) to carry the tone.
3) Connect cable to be traced to main unit. For best signal, do not connect remote. Due to the shielding effect of twisted pairs, the strongest signal is obtained by having one wire of a pair carry tone. Selecting a single pin instead of a pair will do this.
4) To turn tone off, press the MODE button until TURN OFF is displayed, then the SEL button. The tone will turn off automatically after about 2.4 hours.

To Measure Length

1) Connect cable to main unit. (A remote may be at the other end).

2) Turn on unit by pressing any button. If not in length mode, press MODE until LENGTH is displayed, than press SEL button. To change length between feet and meters, use setup mode.

3) Press up and down arrows to adjust length constant. If length constant is unknown for a particular cable, a known length of cable may be used to set the constant. Fifty feet or more is suggested to minimize the resolution error (1 foot in 50 is 2% uncertainty). Connect known cable to tester and set cable constant using up and down arrows until the length reads correctly.

INTERPETING CABLE TEST RESULTS

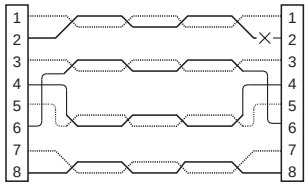
The PASS icon will be on if the cable has all pins properly connected per T568A/B. The FAIL icon will be on if there is a short or split pair. Neither icon will be on if there are opens or miswires. The wiremap should be inspected for these types of errors.

Definition of Errors – (See failure example drawings) The three classes of faults discussed below are in order of severity. The severity has to do with the ability of a more severe error to mask lower severity errors. For example, if there is a short in the cable; miswires and split pairs may not be detected for the pairs involved in the short fault.

Short – The pair has a low resistance connection from one wire of the pair to the other wire of the pair, or to any other wire in the cable or the shield. A short in the TEST mode is indicated by the FAIL icon being on and flashing Xs in the appropriate pin position of the second line of pin numbers, plus one or more error message lines listing all the pins shorted together. In the PRE-TEST mode, the error messages are displayed.

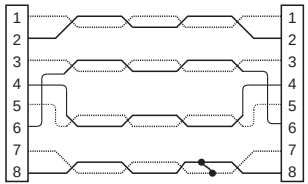
Examples of Wiring Errors (Shielded)

DARK = ON, LIGHT = FLASHING



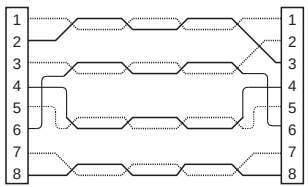
Open

```
12345678S ID
  3456788 1
```



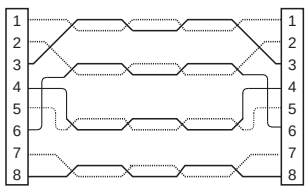
Short

```
 FAIL
12345678S ID
123456xxS 1
Short 78
```



Miswire

```
12345678S ID
132456788 1
```

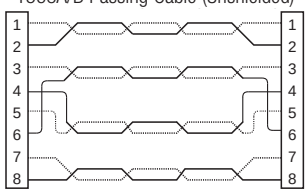


(1 not twisted with 2; 3 not twisted with 6)

Split Pair

```
 FAIL
12345678S ID
12345678S 1
Split 1236
```

T568A/B Passing Cable (Unshielded)




```
PASS
  12345678   ID
  12345678   1
```


Miswire – A wire or both wires of a pair are not connected to the correct pins at the other end of the cable. In TEST mode, the wire map shows the pin numbers *from* line 1 (main) *to* line 2 (remote). A *reverse pair* is a special case of a miswire in which the pair is wired to the correct pair of pins, or to another designated pair of pins, but the two leads are reversed. In PRE-TEST, this type of error is not detectable.

Split Pair – A split pair is an error in the twisting of the wires together within the cable. The cables generally are made up of 8 wires twisted together in 4 pairs. These 4 pairs are designated as pairs by the wiring standards and are intended to carry a signal and its return. 1 & 2, 3 & 6, 4 & 5 and 7 & 8 are the pairs designated by T568A/B for a RJ45 jack or plug. A cable can be wired with correct continuity, but not with correct pairing. This most often happens when the cable is terminated consistently at both ends, but in the wrong order. A dynamic or AC test is required to detect this type of error. *If the only error is a split pair error, the cable has correct continuity. If cross talk is not a concern, as in flat satin cable, the cable is good if the only error is the split pair error.* In TEST mode, the pin numbers on the second line of the wire map with split pairs flash, and an error message is displayed listing the pin numbers of the pairs involved in the error. In the PRE-TEST mode, the error message is displayed.

BATTERY REPLACEMENT

When the battery low icon is on, the battery should be replaced as soon as practical. The cable testing results will become unreliable when the battery reaches about 4.5 volts.

To Replace Battery

1) Remove rubber battery cap by pressing on bottom edge of the cap with the heel of the hand until the cap pops off.

2) Pull battery out of cavity and remove battery snap.

3) Connect a new Alkaline 9 volt battery to battery snaps.

4) Slide battery into cavity and snap cap in place.

When installing a new battery, ***disconnect any cables connected to the tester.*** *The length and pre-test modes will be improperly calibrated if a cable is present.*

SPECIFICATIONS

Physical Dimensions
Size: 14. 5 cm x 7.2 cm x 3 cm (5.7" x 2.85" x 1.2")
Weight: 176 grams (6.2 oz.) with battery and remote

Environmental
Operating temperature: 0 to 50°C (32 to 122°F)
Storage temperature: –10 to 60°C (14 to 140°F)
Humidity: 10% to 90%, non-condensing

Battery Life (9V Alkaline battery, typical): times are for the full capacity of the battery used continuously in one of the following modes — Standby: 2.5 years
Cable Testing: 120 hours

Cable Types: Shielded or unshielded, Cat-5E, Cat-5, Cat-4, Cat-3 and Coax

Minimum cable length for testing for split pairs: 1 meter (3 feet)

Minimum cable length for PRE-TEST: 1.25 meter (4 feet)

Length measurement range (CAT5/6): 0 to 762 meters (0 to 2500 feet)

Coax Cable: 100 ohms maximum DC resistance, center conductor plus shield

WARRANTY

Test-Um Inc. guarantees to the end-user purchaser that its products will be free of all defects in material and/or workmanship. This warranty extends for a period of 12 months for the test instrument and 3 months for the cables, from the date of manufacture or proof-of-purchase. The obligation of Test-Um Inc. under this warranty is limited to the repair or replacement (at our option) during the warranty period of any part that proves to be defective in material or workmanship under normal use, installation and service, provided the product is returned to Test Um Inc. freight prepaid. Products returned to us must be accompanied by a copy of the purchase receipt. In the absence of such a receipt, the warranty period will cease 12 months from the date of manufacture. This warranty does not extend to products that have been subjected to neglect, accidental or improper use, or to units which have been altered, repaired, or inspected by other than Test-Um Inc authorized personnel. In no event will Test-Um Inc. be liable for any incidental or consequential damages .

SERVICE

The LanRoverPRO™ is designed and manufactured to provide trouble-free service. However, if for some reason your test set should require repair, please follow these instructions.

Shipping

1. Before returning any product to Test-Um Inc., you must first request a Return Goods Authorization Number by contacting our Customer Services Dept. at 805-383-1500. No shipments will be accepted without this number, which must be clearly marked on the shipping label.
2. Ship the equipment with a copy of the sales receipt, if available.
3. Attach a description of the operational problem.
4. Include a contact name, phone number, and e-mail address (if possible).
5. Pack securely to prevent damage during shipping.
6. Ship prepaid to:
   Test-Um Inc, 808 Calle Plano, Camarillo, CA 93012

Warranty Service

All units returned for warranty repair will be repaired or replaced free of charge, at the discretion of Test-Um Inc, and will be shipped freight prepaid. In the event that a sales receipt or other dated proof-of-purchase documentation is not available, a period of not more than 12 months from date of manufacture shall apply.

Non-Warranty Service

Damaged units returned for non-warranty repairs will be inspected and an estimated repair cost forwarded by phone or mail. Once an approval of these costs is received, the unit will be repaired. Charges for service and return freight will be invoiced on a C.O.D. basis with the unit.