



# LOW VOLTAGE PRO



MODEL 30 SHOWN

**MODEL 20**

**MODEL 30**

**MODEL 30SR**

UM-LVPRO30 6/15

## **The next generation of technology and testing**

The LVPro employs the latest technology to get you the highest quality testing for your low voltage projects at the best price. The TIA 586 tests, PASS/FAIL, wiremap, timing tests (delay, skew) and impedance measurement (ohms) are standard on all Low Voltage Pros. And if you need more, you can upgrade your tester via the web.

**Add to the cable testing** powerful device tests; web downloadable test APPS to expand the capabilities of the LVPro, a connection to your PC for the easy setting of parameters, upgrading the tester, downloading reports (Model 30) and you have a tool that will be your job partner for many years.

## **Limited Warranty**

The manufacturer warrants to the original consumer that this product is in good working order for a period of one year from the date of manufacture or date of purchase. During this period the product will be repaired or replaced without charge for either parts or labor. The warranty does not cover damage caused by improper use. Repair or replacement as provided under this warranty is the exclusive remedy of the purchaser.

Low Voltage Pro User's Guide. Made in the USA.

Feet and Metric selectable. Metric setting also prints reports in metric units (Model 30).

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Patents pending.

# INTRODUCTION

**Have you ever wanted a tester that did the whole low voltage job?** A tester that has super accurate cable testing plus testing APPS for many of the low voltage devices that you work everyday? Devices such as switches, PoE, CCTV and Dolby speaker installations? If you are one of those people, then The Low Voltage Pro (LVPro) is the tester family for you.

More and more cable installers are now doing "device" installations...installing IP phones, IP cameras, CCTV equipment. They are working with devices like switches, PoE power, and surround sound speakers. Cable testing is still a major part of the job but only one part of the larger job.

But that's not to say we have forgotten about bread and butter quality cable testing. All models of the LVPro include the basic CABLE TEST APP that includes TIA586 tests (opens, shorts, split pairs) plus ohms. Also, included with all LVPro models is the Length-RLQ APP, a comprehensive test package that includes length and "RLQ" (Return Loss Quality).

The popularity of our many testers is because over half of all network problems are caused by faulty cables. And our testers spot those problems so they can be fixed quickly. But with the explosion in the popularity of electronic devices there are now lots of other devices to fix. So, when we designed the Low Voltage Pro we wanted it to be a tester that does the WHOLE JOB. And we wanted it to be able to grow as your needs grow.

**250 REPORTS:** Not everybody needs the printed reports that are available in the Model 30 but it's nice to know that you can upgrade your tester later should you need it.

**WALL JACK AND SPEAKER IDENTIFIERS:** Low voltage work also calls for wall jack identifiers...and speaker identifiers that help with Dolby speaker installations. All models of the LVPro have this capability standard (wall jack and speaker ID kits available separately).

**WORKS WITH ALL CABLE TYPES.** Many of you work with speaker cable, coax, alarm cable and Category cable (CAT5,6). The LVPro works with them all. And, if you have a unique cable, the LVPro has adjustable VOP, a technology that allows the LVPro to be tuned to your cable.

**PROTECTED CIRCUITRY.** Like any electronic device, you need to care for the LVPro like any sensitive instrument. But you will be happy to know that it is protected from voltage up to 60 volts.

**WEB UPGRADEABLE:** The Low Voltage Pro makes it easy to start small and grow as your needs grow. The list on the right shows the progression of TESTER APPS as you upgrade the unit. And, upgrading is easy, using the LVPro Manager software and USB cable that comes with every LVPro. See "LVPro Software Manager" in this manual.

## ITEMS INCLUDED

- LVPRO Main Unit
- Detachable Remote
- F Male to BNC Male
- F Male to BNC Female
- RJ45 patch cable(2)
- RJ45 to alligator clip adapter
- USB cable, case
- Batteries (4 - AA)
- 10 RJ45 remotes (M30 & 30SR only)
- 10 Coax remotes (M30 & 30SR only)
- RLQ adapters(3) (M30 & 30SR only)
- Smart Remotes (M30SR only)
- User Manual

### *Low Voltage Pro* *List of Functions by Model*

#### MODEL 20 APPS



#### CABLE TESTING PACK

Includes TIA586 cable diagram, Pass/Fail, timing (delay, skew) and impedance (ohms).



Locate multiple wall jacks for CAT5/6 and coax. Requires Remote kit(s)



#### -tone CABLE DETECTION

Place a tone on one end and detect it on the far end. Requires optional Remote Tone Probe.



#### SPEAKER POPPER

Locate speakers by audibly "popping" them. Alligator clips included with all LVPro Models.



#### SPKR 7.1 ID# MAPPER

Especially designed to properly map and label A/V speaker wires. Requires remote kit.



#### PORT BLINK CABLE DETECTION

Locate a cable connection to a switch port by blinking the switch's Link LED.



#### LENGTH-RLQ PACK

Get perfect length. Use built-in values or calibrate with your cable. Adds length readout to Cable Test App (cable length, distance to open or short). Also includes RLQ (below).



**RLQ** Included with the Length-RLQ APP, Return Loss Quality tests for load mismatches that affect the wire's power and data transfer capability. "Green" colored adapters (3 pcs) used with the RLQ test are included.

#### APPS ADDED WITH MODEL 30 & 30SR



#### 10/100/1000 DETECTION/DISPLAY

Plug into any active port (computer, switch, VoIP, access point) and display its capabilities.



#### POWER OVER ETHERNET / PAIRS USED

Detect PoE voltage and display its amplitude and location on the cable (midspan, endspan or both).



#### CCTV / Vpp (peak to peak voltage)

CCTV systems require a minimum of 1Vpp to DVR. Measure and display Vpp of video signal.



#### ALARM BATTERY TEST (LOADED)

Test alarm system and other backup batteries by doing a loaded battery test.



#### STORE AND PRINT UP TO 250 REPORTS

Store for later printing up to 250 tests (all cable types). All data is stored except RLQ. USB and software included.

# PUSH BUTTONS

## ARROW / OK BUTTONS

DIRECTIONAL PAD  
"D-PAD"



◀ CABLETYPE SELECTION ▶  
▲ TEST APP SELECTION ▼

1 USE ARROWS TO FIND TEST

2 PRESS OK START TEST

## LVPro SUPER SCREEN

◀ SELECT CABLETYPE ▶

SELECT TEST

TEST RESULTS

CABLE WIREMAP

VOICE RJ11 VIDEO COAX SPKR ALARM DATA RJ45

HO 1 2 HO 1 2 HO 1 2 HO 1 2

CABLE TEST CABLE TEST CABLE TEST CABLE TEST

ID TEST RLQ VOP CAL HD FD FEET METERS OHMS DELAYS SKEW VDC VPP

SUB CTR FL FR SL SR SBL SBR LOAD (ma)

CONNECTED REMOTE PAIRS USED WIREMAP 12345678S

PASS FAIL SAVE

TONE PAIR

OPEN SHORT CROSS REV SPLIT

HAMMERING  
LVPro IS WORKING

## OTHER BUTTONS

TONE LOCATOR

WALL JACK LOCATOR

CABLE ID

ON/OFF

OK

EXIT

MORE INFO (WHEN LIT)

PUSH TO QUIT APP

ON/OFF

3 PRESS EXIT STOP TEST

**60 DEGREE ANGLE (BEST VIEWING):** The LVPro LCD is designed to be brightest at a 60 degree angle.

## CABLE TESTING APPS



### CABLE TESTING PACK (ALL MODELS)

Includes TIA586 cable diagram, Pass/Fail, timing (delay, skew) and impedance (ohms).

### LENGTH-RLQ PACK



Get perfect length. Use built-in values or calibrate with your cable. Adds length readout to Cable Test APP (cable length, distance to open or short). Also includes RLQ (below).



**RLQ** Included with the Length-RLQ APP, Return Loss Quality tests for load mismatches that affect the wire's power and data transfer capability. "Green" colored adapters (3 pcs) used with the RLQ test are included.

**SAVE**

PRINT UP TO 250 REPORTS (MODEL 30 or 30SR)

Store for later printing up to 250 tests (all cable types). All data is stored except RLQ. USB and software included.

## DEVICE TESTING APPS

### DATA DEVICES



#### PORT BLINK CABLE DETECTION

Locate a cable connection to a switch port by blinking the switch's Link LED.



#### 10/100/1000 DETECTION/DISPLAY

Plug into any active port (computer, switch, VoIP, access point) and display its capabilities.



#### POWER OVER ETHERNET / PAIRS USED

Detect PoE voltage and display its amplitude and location on the cable (midspan, endspan or both).

### SPEAKER / ALARM DEVICES



#### SPEAKER POPPER

Locate speakers by audibly "popping" them. Alligator clips included with all LVPro Models.



#### SPKR 7.1 ID# MAPPER (8 PCS)

Especially designed to properly map and label A/V speaker wires. Requires remote kit.



#### ALARM BATTERY TEST (LOADED)

Test alarm system and other backup batteries by doing a loaded battery test. Adapter included.

### VIDEO DEVICES



#### CCTV / Vpp (peak to peak voltage)

CCTV systems require a minimum of 1Vpp to DVR. Measure and display Vpp of video signal.

### PHONE DEVICES



#### PHONE

Detect central office telephone connections. Display voltage and cable location (up to 4 phones).

## WALL JACK IDENTIFIERS



Locate multiple wall jacks for CAT5/6 and coax. Requires Remote kit(s)

## TONE LOCATING APPS



#### TONE CABLE DETECTION

Place a tone on one end and detect it on the far end. Requires remote tone probe.

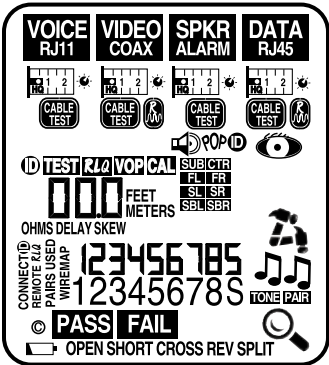
# DISPLAY SCREEN BY MODEL

## WEB UPGRADEABLE













The Low Voltage Pro gives you a choice: Buy the model you wish now or upgrade it later (using the web). Below are the LCD display screens for Models 20 & 30. Trick: While the LVPro is powering up, press the TONE and DETAILS (magnifying glass) buttons to see your display.



**MODEL 30 & 30SR**



**MODEL 20**

Test Apps		LVPRO Model 20	LVPRO Model 30	LVPRO Model 30SR
	<b>CABLE TEST PACK (ALL TYPES)</b> - Cable diagram, Pass/Fail, Delay, Skew, Ohms	✓	✓	✓
	<b>WALL JACK ID* (Smart Remotes - included with LVPRO 30SR)</b> *Requires remote kit(s) sold separately.	✓	✓	✓
	<b>SPEAKER POPPER</b> - Locate speakers by audibly "popping" them.	✓	✓	✓
	<b>SPKR 7.1 ID# MAPPER</b> - *Map and label AV speaker wires. *Requires remote kit(s) sold separately.	✓	✓	✓
	<b>PORT BLINK CABLE DETECTION</b> - Locate a cable connection to a switch port by blinking the switch's Link LED.	✓	✓	✓
	<b>tone CABLE DETECTION*</b> - *Requires remote kit(s) sold separately.	✓	✓	✓
<b>ALERT</b>	<b>ALERT LEDS (LINKS, VOLTS)</b> - Two LEDs quickly alert you to an active switch connection or voltage on the line.	✓	✓	✓
	<b>LENGTH PACK</b> - Adds length to Cable Test App (cable length, distance to open or short)	✓	✓	✓
	<b>Return Loss Quality - RLQ</b> - Return Loss Quality tests for load mismatches	✓	✓	✓
	<b>10/100/1000 DETECTION/DISPLAY</b> - Plug into any active port and display its capabilities.	✓	✓	✓
<b>POE</b>	<b>PoE / PAIRS</b> - Detect PoE voltage and display its amplitude and location on the cable (midspan, endsparn or both).	✓	✓	✓
	<b>CCTV / Vpp (peak to peak voltage)</b> - Measure and display Vpp of video signal.	✓	✓	✓
	<b>PHONE</b> - Detect central office telephone connections. Display voltage and cable location (up to 4 phones).	✓	✓	✓
	<b>LOADED BATTERY TEST</b> - Test alarm system and other backup batteries by doing a loaded battery test.	✓	✓	✓
<b>SAVE</b>	<b>PRINT UP TO 250 REPORTS</b> - Store for later printing up to 250 tests (all cable types). USB and software included.	✓	✓	✓



## OPERATION

RJ11 TESTS	COAX TESTS	2 WIRE TESTS	CAT5/6 TESTS
<b>VOICE RJ11</b>	<b>VIDEO COAX</b>	<b>SPKR ALARM</b>	<b>DATA RJ45</b>
1 2 HQ	1 2 HQ	1 2 HQ	1 2 HQ
CABLE TEST	CABLE TEST	CABLE TEST	CABLE TEST
☎	📺	🔊 POP ID	👁
ID TEST	RLQ VOP CAL	SUB CTR	PoE
000	HD FD FEET METERS	FL FR SL SR SBL SBR	
OHMS DELAYS KEW VDC VPP	LOAD (ma)		
CONNECT ID	123456785		🎵
REMOTE RLQ AIRS USED WIREMAP	12345678S		TONE PAR
©	<b>PASS FAIL SAVE</b>		🔍
🔋	OPEN SHORT CROSS REV SPLIT		

CABLE SELECTION  
(LEFT / RIGHT ARROWS)



DIRECTIONAL PAD  
"D-PAD"

TEST APP SELECTION  
(UP / DOWN ARROWS)

### ADJUST BACKLIGHT DISPLAY

**1** HOLD THE EXIT BUTTON DOWN

**2** PRESS UP ARROW TO CYCLE THROUGH THE 2 BACKLIGHT SETTINGS

- 1** Use the LEFT / RIGHT arrows to select the cable or cabled device that you are working with.
- 2** Use the UP / DOWN arrows to select the specific test or the specific device to be tested

**PRESS OK** and the hammer goes to work letting you know the TEST APP is active. The EXIT button stops the TEST APP.

**FAQ :WHAT MODEL NUMBER DO I HAVE:** 1) Compare the APPS on your LCD to those shown on page 6. To latch the display ON: Hold the TONE and DETAILS (magnifying glass) buttons down together immediately after power. 2) Connect the LVPro to your PC and run the LVPro Manager software. It will display the list of APPS installed (see USING LVPRO MANAGER SOFTWARE (in this manual).

Note: Because LVPros are web upgradeable, the labels might not properly show the model number (why: a label was left unchanged after a web upgrade).

## OPERATION - Cont.

**TEST APPS for both Cable and Devices.** There are APPS for both the testing cable and APPS for testing devices associated with those cable types. Your LVPro Model number (20, 30, & 30SR) and possible prior upgrades determines which of the following APPS you have loaded on your tester. If there is an APP you do not have and think you would find useful, you can use the web to add it (see USING LVPRO MANAGER SOFTWARE (in this manual).



Details available

Save Results

### CABLE TESTING PACK (MODELS 20, 30 & 30SR)

1. Connect cable to *Main unit* and *4xRemote*.
2. Select and start **Test APP** (D-PAD button).
3. **Hammering** says it's active. **EXIT** returns to menu.

**RESULTS (vary with cable type):**

**All models:** Pass/Fail, Wire map, Opens, Shorts, Split Pairs, Delay, Skew, Ohms. When lit, press Details glass (and use down arrow to show more results).

**Models 20, 30 & 30SR:** Length-RLQ APP: Length is integrated into wiremap results as is distance to open/short.

**Model 30 or 30SR:** Save test results: After test is complete, press the lit Details glass followed by the OK button to save the test. The Test # is flashed (max storage is 250 tests).

Note: See Glossary for definitions.



Ruler APP



Test Active

### LENGTH-RLQ PACK (MODEL 20, 30 & 30SR)

Adds "Length" and "Distance to opens/short" to the Cable Test APP's wiremap (above). When to use the Ruler APP: 1) When you need only length 2) When you want to tune the LVPro to the specific cable you are testing (see VOP Adjustment below).

1. Connect cable to *Main unit* (*no Remote connected*).
2. Select and start **Test APP** (D-PAD button).
3. **Hammering** says it's active. **EXIT** returns to menu.

**RESULTS:**

**Models 20, 30 & 30SR:** Length of the shortest pair is displayed (pair number is indicated).



VOP Knob

**VOP ADJUSTMENT:** The LVPro Ruler APP has adjustable VOP so you can tune the tester to the cable. The default VOPs used by the LVPro are listed on the back of the tester (most people stick to the default values).

**WHAT IS MY VOP SETTING:** This is an important number



Ruler APP

because it affects the LVPro's length measurements in the Ruler APP and the Cable Test APP. To see the VOP value, cursor over to the Ruler icon. The number displayed is the current VOP value stored in the LVPro for that cable type.



VOP Knob

**ADJUSTING THE VOP IS EASY:** 1) Adjust manually ("VOP") or 2) Calibrate ("CAL") the tester from a known length of cable (*no remote connected*). Minimum length required 100' (35m).

**VOP**

Manual: Select the VOP KNOB; select VOP and use the UP/DOWN arrows. When done press OK to SAVE the VOP.

**CAL**

Calibrate: Select the VOP KNOB; select CAL and use the UP/DOWN arrows to match the cable length ("110" for 110 feet).

When done press OK to SAVE the VOP.

## OPERATION - Cont.



**RLQ** Included with the Length-RLQ APP, Return Loss Quality tests for load mismatches that affect the wire's power and data transfer capability. It is a powerful quality test that should be used if quality problems are suspected with the cable. The RLQ test works with DATA cables and VIDEO cables.



Green RLQ Remotes

ACCEPTABLE: Ratings of 1 and 2.

1. **Connect cable to Main unit and green RLQ Remote.**

2. **Select and start Test APP (D-PAD button).**

3. **Hammering** says it's active. **EXIT** returns to menu.

**RESULTS (Models 20, 30 & 30SR):** Shown as a single integer 0, 1 or 2. "0" indicates the cable measures as if it is unterminated.

"2" indicates it is perfectly terminated. Quality issues can arise in a transmission cable (Cat5/6 or coax) for a variety of reasons,

physical damage caused by crushing or bending the cable too sharply, improper termination, moisture intrusion, etc.

ACCEPTABLE: Ratings of 1 and 2.

Note: See Glossary for *RLQ* definition. If you have a Model 3 (saves test results), the RLQ rating is not saved. RLQ results are not saved.

## NETWORK DEVICE TESTING

Use these Test APPS if you are working with switches, NIC cards, PoE, IP cameras, VoIP phone and access points... any computerized device. The operation is the same for all APPS.

1. **Connect the LVP RJ45 jack to the device** (use included patch cable).

2. **Select and start Test APP (D-PAD button).**

3. **Hammering** says it's active. **EXIT** returns to menu.



Test Active

### PORT BLINK CABLE DETECTION

**Use:** Locate a cable connection to a switch port by blinking the switch's Link LED. The green link LED on the switch will slowly blink so you can locate the cable end.

**RESULT:** Port's green link LED will blink.

### 10/100/1000 DETECTION/ADVERTISED SPEED/PAIRS USED

**Use:** Plug into any active port (computer, switch, VoIP, access point) and display its capabilities (10,100,1000 HD, FD).

**RESULT:** LVPPro will display the advertised speed of the port (10,100,1000, HD, FD) and the cable pairs used to transmit.

### POWER OVER ETHERNET / PAIRS USED

**Use:** Detect PoE voltage and display its amplitude and location on the cable (midspan, endspan or both).

**RESULT:** PoE voltage is displayed (just like a voltmeter) as are the cable pairs used (1,2 3,6 or 4,5 7,8 or both).

## SPEAKER / ALARM DEVICES

Use these Test APPS if you are working with speakers, Dolby surround sound installations, or testing the quality of alarm batteries. The operation is the same for all APPS.

1. **Connect the LVP RJ45 jack to the speaker wires or alarm battery using the RJ45/alligator clips** (included).

2. **Select and start Test APP (D-PAD button).**

3. **Hammering** says it's active. **EXIT** returns to menu.

### SPEAKER POPPER

**Use:** Locate speakers by audibly "popping" them. 1) Connect the alligator clips to the loose speaker wires using the RJ45/Clips adapter included with all LVPPro Models (shown above).

**RESULT:** The speaker will make an audible popping sound.

### SPKR 7.1 ID# MAPPER (8 PCS)

**Use:** Colored and labeled to help properly map and label Dolby 5.1 and 7.1 A/V speaker wires. 1) Connect Speaker ID# Mappers to the far end of each pair of speaker wires (speakers



RJ45/Clip Adapter



Test Active



Test Active



SUB CTR  
FL FR  
SL SR  
SBL SBR

## OPERATION - Cont.



disconnected). 2) Using the RJ45/Clips adapter, connect speaker wires to the LVPro's RJ45 port.

**RESULT:** The icon that matches the speaker will light. Requires remote speaker remote kit.

## ALARM BATTERY TEST



**Use:** Test alarm system and other backup batteries by doing a loaded battery test. Better than a voltmeter test because this test places a 250mA timed interval load on the battery. Use RJ45/Alligator clips included with all LVPro Models (shown above) to connect the battery to the RJ45 port. After test starts, pressing the OK button puts a 250ma load on the battery.

**RESULT:** For the battery to be OK, the battery voltage should remain stable after the load is applied.

## VIDEO DEVICES



### CCTV / Vpp (peak to peak voltage)

**Use:** CCTV systems require approximately 1Vpp to the DVR for reliable recording. This APP measures and displays the Vpp of video signal. Perfect for quick debugging of CCTV systems.

1) Connect the CCTV camera video output to the coax connector on the LVPro. 2) Select the Camera icon and press OK.

**RESULT:** The voltage LED will light and voltage is displayed. Note: The voltage display varies with the whiteness of the camera's image.

**BNC adapters:** Various adapters are available for different connectors.

**Note:** The CCTV/Vpp APP can also be used to detect CATV (cable TV) signals. But some CATV signals may be too small for the LVPro to detect.

## PHONE DEVICES



**Use:** Detect central office telephone connections (48V).

Display voltage and cable location (up to 4 phones). 1) Connect the cable to the RJ11/RJ12 connector on the LVPro. 2) Select the Telephone APP and start the test.

**RESULT:** The LVPro scans the 6 pins and displays up to 3 pairs of central office connections; the pairs used (typically 3,4; 2,5; and 1,6); and the amplitude of voltage on each pair.

## WALL JACK IDENTIFIERS



**Use:** Large wiring jobs end up with unlabeled runs. Plugging these wall jack identifiers into each socket makes identifying the wall jack's location a snap. 1) Connect the unidentified cable into the correct LVPro jack. 2) Press the button labeled "Cabel I.D." to start the scan. Press EXIT when done.

**RESULT:** As an example, RJ45 ID#4 plugged in a RJ45 outlet will light both the "RJ45" icon and the number "4" digit on the LVPro. The same is true for coax outlets. Order:

P/N LVPro-RJ45ID (20 pcs)

P/N LVPro-CoaxID (20 pcs)

P/N LVProRJ45CoaxID (10 pcs/ea. Total of 20 pcs).

## TONE LOCATING APPS



### TONE CABLE DETECTION

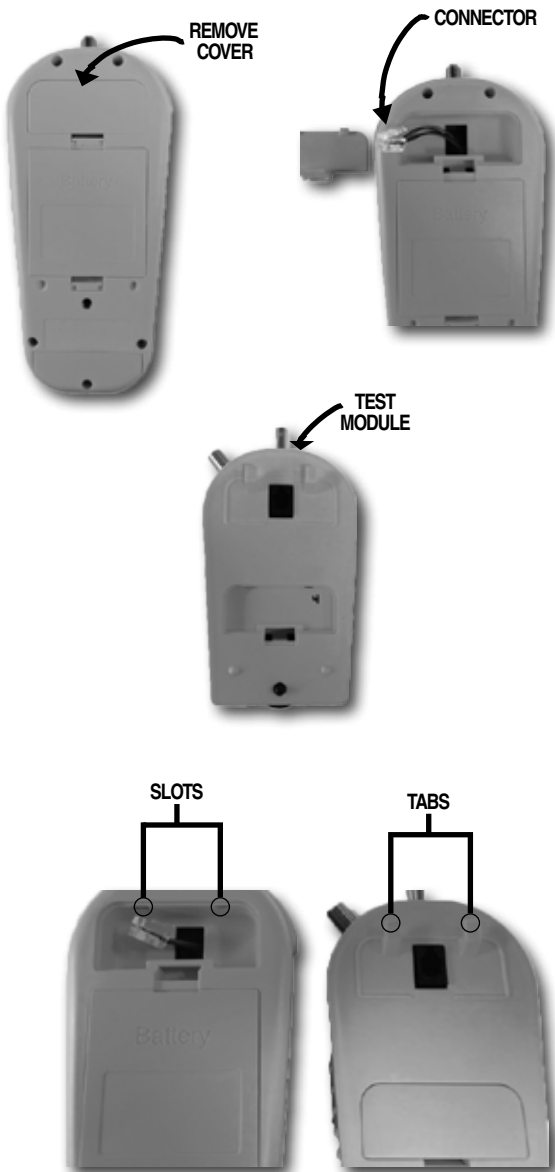
**Use:** Locating the far end of a cable. Place a tone on the near end of the cable with the LVPro and detect it on the far end with a Tone Probe (available separately). 1) Plug the cable to be "toned" into the LVPro's socket. 2) Select the proper cable type and then press the TONE button 3) Choose from 3 tones (down arrow) and/or the pairs that you wish to tone (right arrow and select "Pair" and down arrow to scroll through pairs). 4) Detect tone on the far end using a tone probe.

**RESULT:** A quick and handy way to locate cable ends. Another popular method if you are tracing data cables that are plugged into active ports: Use the Port Blink APP. **ORDER:** LVPro-Probe Lighted probe

## OPERATION - Cont.

### ATTACHMENT OF TEST MODULES

In the growing effort to expand the testing capabilities of the LVPro, the Model 20, 30 & 30SR are capable of the attachment of Test Modules to expand their testing capabilities. This section of the manual will explain how to attachment the module to the LVPro.



**CONNECT CONNECTOR  
TO THE TEST MODULE  
\*DO NOT PULL ON CABLE  
OR CONNECTOR.**

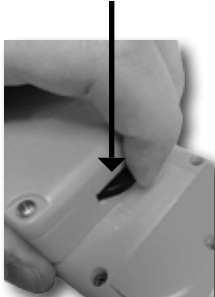
**CONNECT THE (2) TABS ON  
THE TEST MODULE TO THE (2)  
SLOTS ON THE LVPRO.**

**INSERT AT ANGLE TO  
ACHIEVE GOOD  
CONNECTION.**



**INSERT THE THREADED  
SCREW INTO THE  
THREADED HOLE. A 'CLICK'  
WILL INDICATE THAT THE  
THREADED SCREW IS IN THE  
HOLE PROPERLY.**

**SCREW THE THUMBWHEEL  
CLOCKWISE UNTIL IT  
COMES TO A STOP. THE TEST  
MODULE IS NOW FULLY  
ATTACHED AND READY TO  
BE USED.**



**FULLY ASSEMBLED LVPRO  
TEST MODULE**



# LVPro Manager Software

**WHAT DOES IT DO?** LVPro Manager link together your PC and LVPro (use the included USB cable to connect the two). It performs 3 tasks:

**1. Adds Test APPS to your LVPro:** As an example, let's say you want to move from Model 20 to Model 30. For this task, LVPro Manager will link to the Triplett website to where you can select and purchase your upgrade.

**2. Firmware Updates:** Firmware is the code buried in the LVPro that makes the LVPro perform its functions. On the rare occasion that you may need to upgrade your firmware, it's nice to know that you can stay up to date without sending the tester back to the factory.

**3. Prints and Delete Reports (LVPro Model 30 & 30SR only):** If you own a Model 30 or 30SR and are storing test results, use the LVPro Manager software to download the reports to your PC. Plus, use it to delete reports from the LVPro after they have been safely downloaded to the PC.

**4. Configure the LVPro Length APP (LVPro Model 30 & 30SR only):**

Select Tester > Configure length

VOP: Set values for each of the cable types. Reset the VOP back to factory settings.

Feet/Meters: Set the LVPro to Feet or Meters.

Note: This can also be done manually without the LVPro software.

For VOP adjustments, select the Knob icon (on the LCD).

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This icon appears on your Windows START menu after the software is installed.



LVPro Manager

# LVPro Manager Software - Cont.

## USING THE LVPro Manager Software:




## TOOLBAR MENUS



Open a saved test file (.lvp file)  
Save a test file (.lvp file)

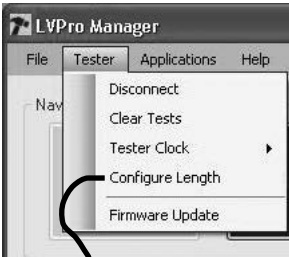
Print test reports

Exit LVPro Manager

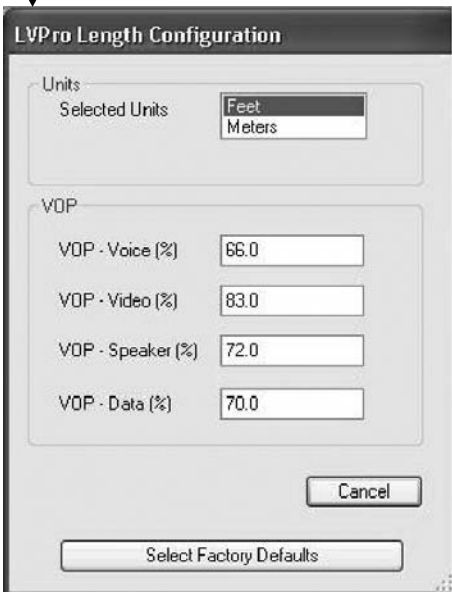
	LVPro Manager Test Report Low Voltage Pro Model 3 Sample Report Page 1
Test 1 08-Jan-2012 12:20:34 Cable: DATA VOP = 70.0 Note: Pair: 1-2 Length:58Ft Prop:81nS Skew:2nS Ohms:93 Map:1-2 Pair: 3-6 Length:57Ft Prop:79nS Skew:0nS Ohms:93 Map:3-6 Pair: 4-5 Length:57Ft Prop:79nS Skew:0nS Ohms:94 Map:4-5 Pair: 7-8 Length:60Ft Prop:83nS Skew:4nS Ohms:94 Map:7-8 PASSED	
Test 2 08-Jan-2012 12:24:59 Cable: DATA VOP = 70.0 Note: Pair: 1-2 Length:55Ft Prop:80nS Skew:2nS Ohms:92 Map:1-2 Pair: 3-6 Length:54Ft Prop:78nS Skew:0nS Ohms:92 Map:3-6	



# LVPro Manager Software - Cont.



- Disconnect from the LVPro
- Delete tests from the LVPro
- Set the LVPro's clock
- Set VOP, Feet/Meters
- Change LVPro's firmware



Click here to link to our website to view model information and upgrades available for your LVPro.

## CABLE TEST EXAMPLES



### CABLE TESTING PACK (ALL MODELS)

The Cable Testing Pack is standard on all LVPro Models. These following are examples of the TIA 568 test that the LVPro performs on Category cable. In addition to PASS/FAIL and wiremap that is shown here, there are also timing tests (delay, skew) and impedance measurement (ohms).

**GOOD CABLE**

WIREMAP 12345678-  
12345678S  
**PASS**

**OPEN on PAIR 1-2**

WIREMAP --345678-  
12345678S  
**FAIL**  
OPEN

**SPLIT PAIRS  
(PAIRS 1,2 AND 3,6 SPLIT)**

WIREMAP 12345678  
12345678S  
**FAIL**

SPLIT

## CABLE TEST EXAMPLES



### TECHNOLOGY FOR PERFECT CABLE TESTING

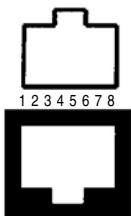
The LVPro employs the latest technology to get you the highest quality testing for your low voltage projects at the best price. The TIA 568 tests, PASS/FAIL, wiremap, timing tests (delay, skew) and impedance measurement (ohms) are standard on all Low Voltage Pros. And if you need more, you can upgrade your tester via the web.

**SHORT on PAIR 3,6**

WIREMAP  
12-45-78-  
12345678S  
**FAIL**  
SHORT

**CROSSED**

WIREMAP  
12345678-  
12345678S  
**FAIL**  
REV



RJ45 SOCKET/PLUG  
PIN DIAGRAM

## GLOSSARY

### "OHMS" Cable impedance

The high-frequency nature of 21st century CATV and data signaling requires cabling that preserves the integrity of the signal between transmitter and receiver. This requires a good impedance match along the transmission route. Standard Cat5, Cat5e and Cat6 data cables employ twisted pair transmission lines, with a specified 100-ohm characteristic impedance on each pair. Any deviation from this impedance, or impedance "mismatch", along the transmission medium causes some portion of the transmitted signal energy to be reflected back to the transmitter, and resulting in distortion at the receiver. The LVPro impedance measurement reports the near-end impedance of the attached cable - the characteristic impedance as seen by the transmitter. ACCEPTABLE: +/- 10% deviation from a cable's ohms rating.

### "RLQ"

RLQ is a measurement of the impedance match along the entire length of cable - including the receive-end termination - without regard for the specific cable impedance. That is, RLQ is a representation of the "flatness" of the impedance along the entire transmission line. A higher RLQ number indicates a good match, and a lower number indicates a poorer match. For example, a 100-ohm data cable with a good quality 100-ohm Cat5e transmission cable and a solid 100-ohm termination at the receive end will report an RLQ of 2. The same system with an unterminated cable will report an RLQ of 0. Quality issues can arise in a transmission cable (Cat5/6 or coax) for a variety of reasons, including physical damage caused by crushing or bending the cable too sharply, improper termination, moisture intrusion, etc. See "OHMS" above for the problems impedance mismatches can cause. ACCEPTABLE: Ratings of 1 and 2.

### "DELAY" Propagation Delay

Propagation delay is the travel time for a signal applied at the transmit end of a transmission line or system to arrive at the receive end. For an individual cable, propagation delay is determined mainly by the velocity of propagation (VOP), which is a characteristic value of the particular transmission medium. VOP is typically represented as a percentage of the speed of light in a vacuum (nominally  $300 \times 10^6$  m/s). E.g., a VOP of 66% indicates a propagation velocity in that transmission line of 66% of the speed of light, or  $198 \times 10^6$  m/s, or approximately 5nS per meter. ACCEPTABLE: 550ns is the maximum allowed delay.

### "SKEW"

On a multi-pair transmission line, skew is the difference in signal propagation delay between pairs. It is caused mainly by differences in the physical lengths of the cable pairs. This physical difference, in turn, results from the fact that the pairs are twisted at different twist rates (number of twists per foot of cable) to minimize crosstalk between pairs.

Skew is important because modern data transmission systems transmit symbol data coincidentally on multiple pairs, and expect to receive that data more or less coincidentally at the receiver. While data systems can accommodate some amount of skew, if the skew is too large, it results in unreliable data transfer. The Cat5e standard specifies a maximum skew of 55ns over the length of the transmission cable. This indicates that worst case difference that can be tolerated between the shortest (fastest) pair and the longest (slowest) pair.

ACCEPTABLE: 50ns is the maximum allowed skew.

# GLOSSARY

## **"VOP" Velocity of Propagation**

All cables, no matter what type, have a VOP. It is usually listed on the cable's datasheet. Or, the LVPro's Length-RLQ APP can measure it in what we call VOP "CAL" mode. The best way to describe VOP is to relate it to "Propagation delay" ... the travel time for a signal applied at the transmit end of a transmission line or system to arrive at the receive end. For an individual cable, propagation delay is determined mainly by the velocity of propagation (VOP), which is a characteristic value of the speed of a cable. VOP is typically represented as a percentage of the speed of light. As an example, a VOP of 66% means the velocity of the cable is 66% of the speed of light. The default VOP values used by the LVPro are listed on the back of the tester (most people stick to the default values).

The LVPro Models 2 and 3 include the LENGTH + RLQ APP. It includes extremely accurate length measuring using the cable's VOP as the basis for the results. Additionally, the LVPro gives you the ability to 1) adjust the VOP manually to better match a cable or 2) have the LVPro determine the VOP automatically of any cable sample: Minimum 100' (35m) required. You can tune the LVPro for any cable that you use. .

**How to adjust the VOP for a particular cable type:** Each cable type has its own VOP. Use the VOP ADJUSTMENT KNOB icon (to the right of the RULER icon) to adjust the VOP (use the VOP icon) or let the LVPro determine the VOP of your cable by connecting a sample of the cable to the LVPro (use the CAL icon). A minimum length of 100' (35m) is recommended.

If you accidentally change the VOP of a cable type and would like to reset it to the factory value, you can do that two ways 1) Use the VOP ADJ KNOB and manually change it for each cable type (look at the label on the back of the tester for typical values) or 2) Connect the tester to the LVPro Manager Software; select TESTER; CONFIGURE LENGTH. Then select SELECT FACTORY DEFAULTS.

**What is the VOP of each of my cable types?:** Move the cursor to the Ruler icon (Length) for each of the cable types. The number displayed is the current VOP value stored in the LVPro for that cable type. If you change the VOP, it erases the factory setting and stores the new number (until it is changed again).

# SPECIFICATIONS

## **Cable Types Tested (All LVPro models)**

Shielded and unshielded twisted pair. All cable categories.  
Coax. All types.  
Telephone.  
Speaker and alarm wire.

## **Cable Tests (All LVPro models)**

Opens, shorts, reversals, split pairs, wiremap,  
propagation delay, skew, ohms. Feet and meters selectable.

## **Advanced Cable Tests (All LVPro models)**

Length and distance to fault.  
Adjustable and standard VOP settings for accurate length of all cables.  
RLQ. Return Loss Quality.

## **Locating cable ends, speaker wires and switch ports (All LVPro models)**

Wall jack identifiers (RJ45, coax and mixed kits available).  
Speaker identification. Qty 8. Available separately.  
Port Blink. LVPro lights the LED on the switch port.

## **Device tests**

Speakers: Audible popper (**All LVPro models**)  
Network Devices (**Model 30 & 30SR**)  
10/100/1000 advertised speed and cable pairs used.  
PoE Volts and cable pairs used.  
CCTV camera video signal: Measure peak to peak volts.  
CATV (cable TV) Requires min 30mVpp signal.  
Battery test (loaded) (**Model 30 & 30SR**)  
100ma loaded test (for 12V alarm and other backup batteries)

## **Printed Reports (Model 30 & 30SR)**

Stores 250 cable test reports in flash memory.

## **Upgradeable (Model 20)**

Web upgradeable. Software and USB cable included with all models.

## **Voltage protection (All LVPro models)**

DC Volts: 100  
AC Volts: 70

## **Length measurement (All LVPro models)**

Max (all wire types): 1000' (305 m)  
Min split pairs: 6' (2m)  
Min RLQ: 20' (7m)  
VOP calibration: Min cable sample 150' (50m)

## **Battery**

Type: 4 AA alkaline  
Life: Operating: 24-30 hours  
Standby (1 year)

**Timeout (battery saver):** 30 mins

**LCD viewing angle:** 60 degrees

**Backlight Display:** OFF, and 2 brightness levels

## **PART NUMBERS/CONTENTS**

### **Low Voltage Pro Model 20 - PN: LVPRO20**

Total test apps 7. Upgradeable to Model 30 (factory or web).

### **Low Voltage Pro Model 30 - PN: LVPRO30**

Total test apps 13. USB cable is used to transfer test reports.

### **Low Voltage Pro Model 30SR - PN: LVPRO30SR**

Total test apps 13. USB cable is used to transfer test reports.

Same as LVPro Model 30, but adds the Smart Remotes

### **Low Voltage Pro Lighted Probe - PN: LVPRO-P**

Lighted, tone probe with volume control for use with LVPro's tone generation capability. It is the same popular probe used with our Real World Certifier and Pro Tone Kits.

### **Low Voltage Pro Speaker ID Kit - PN: LVPRO-SPKR(7.1)ID**

Especially designed to properly map and label A/V speaker wires. Requires remote kit. Color coded and labeled per Dolby 7.1 (and 5.1) specifications. Attach the alligator clips to speaker wires and let the LVPro sort out the rest. Works with all LVPro models.

### **LVPro Wall Jack ID Kits (3 mixes available)**

Also called mappers, these are used for locating and identifying wall jacks. Available separately for CAT5/6 and coax cables. Works with all LVPro models. Includes foam holder.

**LVPro-RJ45ID** Wall Jack IDs for RJ45 (20pcs)

**LVPro-CoaxID** Wall jack IDs for coax (20pcs)

**LVProRJ45-CoaxID** Mixed kit RJ45 (10pcs) coax (10pcs) (Included with the Model 30 & 30SR)

### **Low Voltage Pro RJ45 adapter - PN: LVPRO-CLIPS**

Replacement RJ45/Alligator clip adapter.

### **Low Voltage Pro USB Cable - PN: LVPRO-USB**

Replacement USB data transfer cable.

### **Coax Adapter - PN: LVPRO-F.M/BNC.M**

(Included with the Model 30 & 30SR)

Coax F male to BNC male adapter.

### **Coax Adapter - PN: LVPRO-F.M/BNC.F**

(Included with the Model 30 & 30SR)

Coax F male to BNC female adapter.

