

WireMaster XR-5 5 Cable Tester



 **TRIPLETT**

www.triplett.com

CAUTION: Read, understand and follow all Safety Rules and Operating Instructions in this instruction manual before using this product.

CONTENTS

1. Introduction
2. Safety Rules and Warnings
3. Product Features
4. Specifications
5. Front Panel
6. Operation
7. Cable Repairs
8. Maintenance
9. Accessories
10. Warranty

1: INTRODUCTION

The **Triplet WireMaster XR-5** tests 5 common LAN and Computer cables. It tests installed cables or patch cords with RJ-45, RJ-11, 1394, USB, and BNC connectors. It is intended to test cables with straight through connections..... not cables with reversed or transposed connections like some LAN crossover cables or reverse wired telephone cables.

2: SAFETY RULES & WARNINGS



This tester is not intended for use on powered circuits. Attaching this tester to a powered circuit can result in damage to the tester or injury to the user.

- 2.1 Read all instructions in this manual before using this tester. Failure to do so may result in damage to the tester or injury to the user.
- 2.2 Do not use this tester with its case open, or with parts removed. Doing so may damage the tester and/or injure the user.
- 2.3 When using this tester in schools and workshops, responsible teachers or skilled personnel must control the usage of this tester. Failure to observe this precaution may result in damage to the tester or injury to the user.
- 2.4 Follow the recommendations of any Trade Organizations or Regulatory Agencies whose scope encompasses the use of this tester. Failure to do so may result in damage to the tester or injury to the user.
- 2.5 Do not open this tester for maintenance without first disconnecting it from all external circuitry. Failure to observe this precaution may result in damage to the tester or injury to the user.
- 2.6 Repairs and maintenance must only be carried out by qualified service personnel or qualified electricians / technicians who know the dangers of, and the safety rules applicable to this type of equipment. Failure to observe this precaution may result in damage to the tester or injury to the user.
- 2.7 Do not touch the ends of the cables when making tests. An unexpected dangerous potential may be present. Failure to observe this precaution may result in damage to the tester or injury to the user.
- 2.8 Do not apply voltage or current to any of the tester's connectors. Doing so may damage the tester and/or injure the user.

- 2.9 This tester is not for use by children. Failure to observe this precaution may result in damage to the tester or injury to the user.
- 2.10 Do not use this tester to make measurements in adverse environments such as rain, snow, fog, or locations with steam, explosive gases or dusts.
- 2.11 Do not use tester in condensing atmospheres. That is, do not use tester in conditions where ambient temperature and humidity could cause condensation of water inside of the tester.
- 2.12 Do not use this tester if it is wet, either from exposure to the weather, or after cleaning the case of the tester.
- 2.13 Do not attempt immediate use of the tester when bringing it from a cold environment to a warm environment. Condensation of water, inside and outside of the tester, may produce dangerous measuring conditions. Allow the tester to warm to room temperature before using.
- 2.14 Do not modify this tester. Changing the design may make the tester unsafe and may result in injury to the user.
- 2.15 Do not use the tester if it has undergone long-term storage under unfavorable conditions.
- 2.16 Do not use the tester if it may have been damaged in transport.
- 2.17 Avoid usage near strong magnetic fields (magnets, loudspeakers, transformers, motors, coils, relays, contactors, electromagnets, etc.). The tester may display readings that are in error.
- 2.18 Avoid usage near strong electrostatic fields (high voltage power lines, televisions, computer monitors, etc.). The tester may display readings that are in error.
- 2.19 Avoid usage near strong RF fields (radio or television transmitters, walkie talkies, cellular phones, etc.). The tester may display readings that are in error.
- 2.20 Remove the battery when the tester may be left unused for longer than 1 month. Chemical leakage from the battery could damage the tester.
- 2.21 Do not use the tester if there is evidence of chemical leakage from the battery.

3: PRODUCT FEATURES

- 3.1 Tests 5 types of cables
- 3.2 Simple one button test
- 3.3 Ergonomic portable handheld design
- 3.4 Tests installed wiring or patch cables
- 3.5 Remote unit stores on Main unit
- 3.6 600 ft test distance (RJ-45 / RJ-11 / BNC)
- 3.7 Convenient battery access
- 3.8 Built in battery test
- 3.9 LEDs indicate connections and faults
- 3.10 Beeper provides audible annunciation of test results
- 3.11 Tests shielded (STP) or unshielded (UTP) LAN cables
- 3.12 Tests shields in 1394 and USB cables

4: SPECIFICATIONS

- 4.1 Cables Tested: UTP and STP LAN cables terminated in RJ-45 male connectors (EIA / TIA 568)

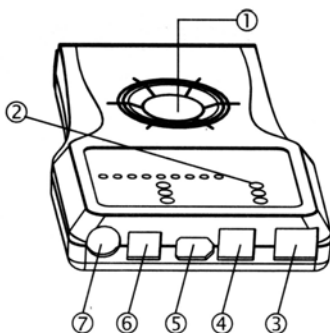
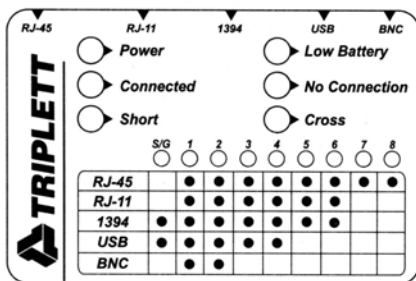
RJ-11 cables with male connectors, 2 to 6 conductors installed

1394 Cables with Type 1 plugs on both ends

USB cables with Type A "flat" plug on one end and Type B "square" plug on other end

BNC cables with male connectors
- 4.2 Faults Indicated: No Connection, Shorts, Opens, Crosses
- 4.3 Low Battery Annunciator: .. LED lights to indicate low battery
- 4.4 Case Dimensions: (w/ Remote) 7.25 x 4.0 x 1.0 inches (L x W x H)
18.4 x 10.2 x 2.5 cm, (L x W x H)
- 4.5 Weight: (without battery) 202 grams, 0.445 lbs.
- 4.6 Battery: 1 standard 9 volt alkaline battery, Triplett Part Number 37-48

5: FRONT PANEL & XR-5 DIAGRAM



- 1 Test Button
- 2 Main Display
- 3 RJ-45 Jack
- 4 RJ-11 Jack
- 5 1394 Jack
- 6 USB Jack
- 7 BNC Jack

6: OPERATION

6.1 General Information:

The WireMaster XR-5 performs its tests when the single button on its front panel is pressed and released. 6 Status LEDs indicate the condition of the cable being tested, as well as informing the user that Power is turned on, and that the battery is good (or bad). 8 additional "connection" LEDs light to indicate that specific wires in a cable are connected. A chart beneath the 8 LEDs shows the LEDs that should light for a good cable.

Note: Only one cable can be tested at a time. I.e. A BNC cable and an RJ-45 cable cannot be tested simultaneously.

6.2 The MAIN and REMOTE unit:

The WireMaster XR-5 consists of a Main unit and a Remote unit. The Remote unit stores conveniently on the bottom of the Main unit. It can be removed or replaced by sliding it from left to right or right to left respectively. *Use care when removing or replacing the Remote some of the plastic edges are a little sharp.*

The Remote is often attached to the Main unit when storing, when transporting, or when Patch cables are being tested. The Remote is removed from the Main unit when an installed (in wall, ceiling, etc.) cable is being tested.

6.3 Testing Patch cables:

"Patch" cables have both ends accessible at the same location. Usually, but not always, these cables are less than 25ft in length, and are not installed in a wall or ceiling. Since both ends are accessible, one end can be plugged into the XR5's Main unit, and one end into the Remote unit. It is not necessary to remove the Remote unit from its "docked" position on the Main unit.

6.4 Testing Installed cables:

To test cables installed in ceilings or walls, or in applications that prevent the ends from being in the same location, the Remote can be detached from the Main unit. Once detached, the Remote can be attached to one end a cable, and the Main unit attached to the other end of the cable. These ends are often in different rooms and on different floors of a building.

6.5 Performing the Test:

Once the Remote and Main unit are attached to the ends of the subject cable, as described in 6.3 and 6.4, testing may begin. Simply press and release the Test Button on the Main unit, observe the LED indicators, and note the beeping sound that comes from the Main unit.

6.6 Interpreting the Results:

6.6.1 Power LED:

The Power LED should light whenever the Test Button is pressed and released. It will stay on for a minimum of 5 seconds, or for however long the Test Button is pressed. If the Power LED does not light, replace the battery.

6.6.2 Low Battery LED:

The Low Battery LED should not light. If it does, replace the battery.

6.6.3 No Connection LED / Single Beep

If the Remote is not connected to the Main unit with a cable, or the cable has no intact conductors, the No Connection LED will light and the Beeper will sound once.

6.6.4 Connected LED / Lo-Hi Beep / Numbered LEDs

If the Connected LED lights and the Beeper emits a Lo-Hi beep, examine the Numbered LEDs (i.e. LEDs numbered 1 to 8, and the S/G LED).

The Numbered LEDs corresponding to the type of cable being tested must light. Examine the table below the Numbered LEDs, noting what LEDs should light. If all of these LEDs do not light, the cable has an OPEN fault.

If all of the appropriate Numbered LEDs light, the cable is OK.

Notes:

When testing an RJ-45 UTP cable, the S/G LED must not light. When testing an RJ-45 STP cable, the S/G LED must light.

The XR-5 is intended to test complete cables. It may not find faults in cables that are intentionally incomplete. For example, the standard EIA / TIA 568 RJ-45 terminated Ethernet cable is expected to contain 8 conductors. If only 4 conductors are used between the RJ-45 connectors, the XR-5 may not properly identify the faults.

RJ-11 cables may have 2 connections, 4 connections, or as many as 6 connections. For 2 connection cables, LEDs 3 and 4 must light. For 4 connection cables, LEDs 2, 3, 4, and 5 must light. For 6 connection cables, LEDs 1, 2, 3, 4, 5, and 6 must light.

The Numbered LEDs DO NOT indicate that a GOOD connection exists, only that a connection exists. If the Short or Cross LEDs are lit, there is a fault in the cable.

6.6.5 Connected LED/3 Beeps/Short LED/Numbered LEDs

If the Connected LED lights, the Beeper emits 3 beeps, and the Short LED lights, **the cable has a fault**. The Numbered LEDs indicate the location of a short.

Note:

In the Short mode, the Numbered LEDs only indicate the location of the shorts. The other connections in the cable are not indicated. If more than 3 Numbered LEDs light, there may be multiple shorts in the cable.

6.6.6 Connected LED/2 Beeps/Cross LED/Numbered LEDs

If the Connected LED lights, the Beeper emits 2 beeps, and the Cross LED lights, **the cable has a fault**.

Notes:

In the Cross mode, the Numbered LEDs indicate connections but do not indicate the location of the cross.

RJ-11 cables used for telephone connections are often crossed. Even new cables are often crossed. This seldom affects the performance of standard analog telephone lines (POTS). Digital telephone lines and old touch tone phones may be polarity sensitive, so a crossed cable may prevent them from working properly.

7: Cable Repair

7.1 General Information: The following section provides information to the user about common cable types, common failures, and repairs. It is not meant to be an exhaustive study of the topic, just some basic information that the uninitiated may find helpful.

7.2 Cable damage: When a cable tests bad, either the wire or the connectors or both may be at fault. If the cable has been installed and working, then it's likely that the wire or connectors have been abused in some way. The wire portion of the cable can be damaged by being crushed (under the leg of a desk), stretched (pulled sharply around a corner), punctured (by a nail or staple), overvoltaged (hit by lightning), burned, etc. Similar abuses will damage the connectors on the ends of the

cable. The connectors can also be damaged by excessive insertion and removal or flexing of the cable close to connector body.

While the WireMaster XR-5 can identify a bad cable, it cannot determine if the wire or the connectors are at fault. The user must examine the different parts of the cable to determine the cause of failure and take the appropriate steps to correct the problem.

- 7.3 Which end is bad?** The XR-5, like many cable testers, cannot find the location of the fault, or even determine which end or connector is bad. It simply "knows" that a fault exists. The user must locate the fault and take the appropriate action.
- 7.4 Cables with Molded on ends:** Many cables have molded on ends that cannot be opened up for repair. The entire cable must be replaced, or the molded on end removed and replaced with a user serviceable connector. These types of cables usually fail from Opens or Shorts. They seldom fail from a Crossed connection.
- 7.5 Cables with Crimped on RJ connectors:** Crimped on RJ connectors cannot be reused or repaired. New connectors must be installed on the cable. If the cable being tested has just been "made up" or put in service, and it tests as Open or Crossed, the RJ connectors have probably been installed incorrectly. Shorts very seldom occur as the result of a badly crimped RJ connector, so the user should suspect a problem with the wire (possibly a staple or nail through the wire, or a crushed or pinched wire) if the XR-5 indicates a Short. A visual examination of the RJ connectors may reveal the fault..... but keep in mind that whatever the cause of a connector problem (i.e., miswiring, improper stripping of the wire, bad crimp, etc.), the only solution is to replace the connector. Consequently, it is not necessary for the user to know the exact cause of the problem, simply to make sure that he installs the new connector correctly!
- 7.6 Conflicting Results:** Sometimes, the tests results of the XR-5 seem to conflict with the performance of the cable..... i.e., the cable tests bad but works OK, or vice versa. The following items list some of the reasons why.
- 7.6.1 The WireMaster XR-5 says my cable is bad, but my LAN works OK:** Installed LAN cables with RJ-45 connectors that have been in service and working OK may test as Open, Shorted, or Crossed. Here's why.....

The EIA / TIA 568 standard for LAN cables only uses 4 of the wires in the eight wire cable. The other 4 wires in the cable may have faults, but these will not affect the operation of the LAN. The XR-5 tests all of the wires in the LAN cable, and identifies the faults, even though these wires may not be being used in the LAN system.

Not all LAN cables are wired "straight through". Crossover cables used on LANs are purposely "miswired", with their Receive and Transmit wires "crossed over". The XR-5 will test this as a bad cable, but it may work just fine as a Crossover cable.

7.6.2 The WireMaster XR-5 says my cable is good, but it doesn't work on my LAN: Many cable testers like the XR-5 only perform continuity style tests (Open, Short, Crossed, etc.). Ethernet LAN cables are constructed in a special way. The 8 wires inside are grouped into 4 pairs of 2 wires each. Not only must the 8 wires connect from end to end of the cable, the pairs in the cable must connect to specific pins of the RJ-45 connectors. An installer can crimp the RJ-45 plugs onto the ends of a cable, ignoring the pairing (as described in EIA / TIA 568), and the cable will test OK. But when the cable is tried on the LAN, it doesn't work. This is because the lack of proper pairing causes excessive crosstalk in the cable, preventing the LAN from working. This type of cable fault is sometimes called a "split pair" or "double split pair". To detect this type of fault, a more sophisticated tester capable of performing a NEXT test (Near End Cross Talk) must be used. Both the Triplett PairMaster and LAN TDR can perform NEXT tests.

Note:

Crosstalk increases with the length of the cable. A LAN system will tolerate a certain amount of crosstalk. A short cable (10ft or less) that is improperly paired may work just fine. However, longer cables, paired in exactly the same way, may not work. This explains why an installer can make short jumper cables that work (although they are improperly paired), but when he installs RJ-45's in exactly the same way on a longer cable, the cable does not work.

7.6.3 The WireMaster XR-5 says my phone cable is bad, but my phone works OK.

Most single line telephones only use 2 wires in a modular cable. The modular cable, which terminates in RJ-11 connectors, could have as many as 6 wires in it. The unused wires may have faults, which the XR-5 will identify, but these faults may have no effect on the working 2 wire telephone circuit.

Many telephone cables with RJ-11 plugs / jacks are wired in reverse. The XR-5 will show that a cable like this is Crossed. A cable like this reverses the polarity of the telephone line. Most regular telephones made in the last 20 years are not polarity sensitive. So, even though the cable is wired in reverse (crossed), it may work OK.

Early touch tone telephones and answering machines were polarity sensitive. If connected in reverse polarity, the touch tone phone may not dial out (no touch tone), and the answering machine may not answer when the line rings.

7.6.4 The WireMaster XR-5 says my RJ-11 phone cable is good, but my phone doesn't work.

First, make sure the telephone line is hooked up and "live" by using a tester like the Triplet Line Bug or Line Bug 2. This simple tester will verify the presence of loop current, and will test the polarity of the line.

The "good" cable may result in a reversed line. The Line Bug will show reversed if this is the case. The line is not actually being reversed in the good cable.....its been reversed somewhere else along the wire. Either the reversed cable can be located and corrected, or, an often used simpler approach is to replace the good cable with a reversed cable, making the polarity come out correctly. It is also worth knowing that some female/female couplers reverse the polarity of the phone line.

Analog telephones will usually work, regardless of line polarity. Digital phones are often polarity sensitive, and may not work with reversed line polarity.

8: MAINTENANCE

Your Triplet WireMaster XR-5 is a precision test instrument and, when used as described in this manual, should not require maintenance. There are no internal adjustments. Calibration is not required.

To clean the outside of the tester, use a cloth dampened with a mild detergent solution. Do not use any abrasive cleansers, or chemical solvents that may damage the case of the tester.

TRIPLETT PRODUCT RETURN INSTRUCTIONS

In the unlikely event that you must return your Triplet equipment for repair, the following steps must be taken.

- 1) Call 1-800-TRIPLETT to obtain a Return Material Authorization (RMA) number from Customer Service.
- 2) Enclose a copy of the original sales receipt showing date of purchase.
- 3) Clearly print the RMA number on the outside of the shipping container.
- 4) Return to: Triplet Corporation
One Triplet Drive
Bluffton, OH 45817
ATTN: Repair Dept.

Be sure to include a full description of the problem, and a telephone number, street address, or email address, where you can be contacted, and a return address where the meter can be shipped to upon repair.

9: ACCESSORIES

- 9.1 The Triplet WireMaster XR-5 package contains the following items:

WireMaster XR-5 Main Unit

WireMaster XR-5 Remote (PN: 3260-R)

Female BNC Terminator (PN: 26-940)

Male / Male BNC jumper cable (5"), (PN: 26-937)

Male / Male RJ-11 jumper cable, 4 wire (PN: 26-938)

Male / Male RJ-45 STP jumper cable, EIA / TIA 568,
(PN: 26-939)

9 volt battery (PN: 37-48)

Instruction Manual (PN: 84-851)

Carrying Case (PN: 10-4250)

10: WARRANTY

Triplett One Year Limited Warranty

The Triplett Corporation warrants instruments and test equipment manufactured by it to be free from defective material or workmanship and agrees to repair or replace such products which, under normal use and service, disclose the defect to be the fault of our manufacturing, with no charge within three years (one year on calibration) of the date of original purchase for parts and labor. If we are unable to repair or replace the product, we will make a refund of the purchase price. Consult the Instruction Manual for instructions regarding the proper use and servicing of instruments and test equipment. Our obligation under this warranty is limited to repairing, replacing, or making refund on any instrument or test equipment which proves to be defective within three years from the date of original purchase.

This warranty does not apply to any of our products which have been repaired or altered by unauthorized persons in any way so as, in our sole judgment, to injure their stability or reliability, or which have been subject to misuse, abuse, misapplication, negligence, accident or which have had the serial numbers altered, defaced, or removed. Accessories, including batteries and fuses, not of our manufacture used with this product are not covered by this warranty.

To register a claim under the provisions of this warranty, contact Triplett Corporation's Customer Service Department for a Return Authorization Number (RMA) and return instructions. **No returned product will be accepted without an RMA number.** Upon our inspection of the product, we will advise you as to the disposition of your claim.

ALL WARRANTIES IMPLIED BY LAW ARE HEREBY LIMITED TO A PERIOD OF THREE YEARS (ONE YEAR ON CALIBRATION) FROM DATE OF PURCHASE, AND THE PROVISIONS OF THE WARRANTY ARE EXPRESSLY IN LIEU OF ANY OTHER WARRANTIES EXPRESSED OR IMPLIED.

The purchaser agrees to assume all liability for any damages and bodily injury which may result from the use or misuse of the product by the purchaser, his employees, or others, and the remedies provided for in this warranty are expressly in lieu of any other liability Triplett Corporation may have, including incidental or consequential damages.

Some states (USA ONLY) do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you. No representative of Triplett Corporation or any other person is authorized to extend the liability of Triplett Corporation in connection with the sale of its products beyond the terms hereof.

Triplett Corporation reserves the right to discontinue models at any time, or change specifications, price or design, without notice and without incurring any obligation.

This warranty gives you specific legal rights, and you may have other rights which vary from state to state.

Triplett Corporation

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