APPLICATIONS

Installation - Measure the length of a cable remaining on a spool or in a box prior to pulling a new run.

Trouble Calls - Identify the type of fault in a cable (short or open) and the location by measuring the distance to the fault.

Moves, Adds and Changes - Verify cable lengths are less than the maximum 100 meters allowed prior to connecting computers or network equipment.

Job Costing - Measure the actual length of cables being replaced or upgraded.

Cabling Management- Identify a wire pair on a punchdown block by locating the transmitted tone.

CABLETOOL™
MULTIFUNCTION CABLE METER
USER'S GUIDE

WARRANTY

Psiber Data Systems Inc. warrants that the product shall be free from defects in parts or workmanship for a period of 12 months from the date of purchase if used in accordance with Psiber Data Systems Inc. operating specifications.

THIS IS THE ONLY WARRANTY MADE BY Psiber Data Systems Inc. AND IS EXPRESSLY MADE IN LIEU OF ALL OTHER WARRANTIES EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO ANY IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR ANY PARTICULAR PURPOSE.

Should any parts or workmanship prove defective, Psiber Data Systems Inc. will repair or replace at Psiber Data Systems' option, at no cost to the Buyer except for shipping costs from the Buyer's location to Psiber Data Systems Inc. This is Buyer's **SOLE AND EXCLUSIVE REMEDY** under this Agreement. This warranty does not apply to products which have been subject to neglect, accident or improper use, or to units which have been altered or repaired by other than an authorized repair facility.

Return of Equipment - To return a product to Psiber Data Systems Inc., first obtain a Return Authorization number from our Customer Service by calling 619-287-9970. The RA# must be clearly marked on the shipping label, or the package will not be accepted by Psiber Data Systems Inc. See sample label below.

To: Psiber Data Sytems Inc.
7075-K Mission Gorge Road
San Diego, CA 92120
RA# XXXXXXXX

P/N 1005-0500-0000 Rev. A

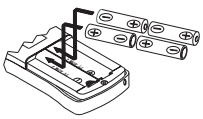
psiber

BOX CONTENTS

• CableTool Multifunction Cable Meter • Carrying Case • User Guide
• Four AA Alkaline Batteries • Two Banana Jack to Alligator Test Leads

BATTERY

The CableTool operates on four AA alkaline batteries. Remove the battery cover at the back of the unit and insert the batteries with the orientation as shown. Battery polarity is marked inside the battery well for reference.

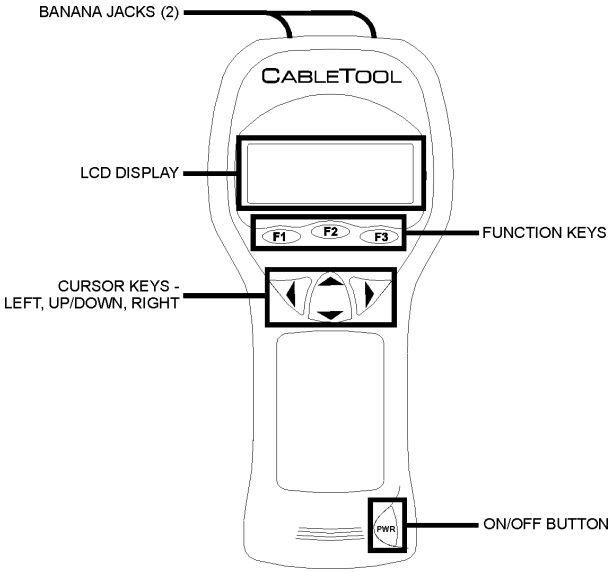


INTRODUCTION

The CableTool Multifunction Cable Meter electrically measures the length of a cable using Time Domain Reflectometry technology. The CableTool measurement begins by transmitting an electrical pulse into the connected cable. The electrical pulse travels along the cable until it hits a discontinuity (either a short or an open) and is then reflected back to the unit. The CableTool precisely measures the time between launching the pulse and recieving the reflected pulse. The time measurement is converted to distance using the cable NVP (Nominal Velocity of Propagation).

Additionally, the CableTool provides a continuous reading of any voltages present on the cable under test and features four different tone frequencies and patterns for tracing cables with a tone probe.

MECHANICAL FEATURES



UNDERSTANDING NVP

The CableTool makes a very precise measurement of the time it takes for an electrical signal to travel down a cable, hit a short or open and travel back to the unit. The time is converted into length based on the speed that the electrical signal travels along the cable being tested. Different cables have different electrical properties and the speed that the electrical signal travels will vary based on the NVP of the cable.

NVP (Nominal Velocity of Propagation) is the relative speed that an electrical signal will travel through a media. A vacuum is a perfect media with an NVP of 100. All cables have an NVP less than 100 and typically in the range of 50 to 80. Using the most accurate NVP available will provide the most accurate length measurements.

The NVP for electrical service cables (such as Romex, BX, UF-B) varies significantly between manufacturers and even between production lots from the same manufacturer. Data cables have special manufacturing processes that produce fairly consistent NVP values. The NVP of a cable can also be different if it is wound on a spool or laying flat (installed). Data cables have the least variation between wound and flat and some coaxial cables show significant variation. NVP is specified for many types of cable and may be printed on the cable spool or box. Contacting the manufacturer or checking their website can also be a good source of accurate NVP information. Using the Custom Cable Setup to determine the NVP of a known cable length provides accurate results. The NVP values prestored in the CableTool provide typical values for cable types from all manufacturers. Psiber Data Systems also maintains a comprehensive NVP Reference List on our website (www.psiber.com) which is updated regularly.

CABLE TYPE LIST ABBREVIATIONS

The prestored Cable Type List uses the following abbreviations:

NM - Non-Metallic (Romex)
BX - Aluminum Armored Cable with Aluminum Ground
MC - Aluminum Armored Cable with Copper Ground
HC - Aluminum Armored Cable for Health Care Applications
UF - Underground Feeder (Direct Burial Cable)
SOOW - 600V Rubber Jacketed Portable Cord
EXTEN - Outdoor Extension Cable (Typically Orange Color)
W/G - With Ground Wire
ZIP - Lamp Cord
THHN xCDT - THHN Wire in Conduit
CAT - Category
PLNM - Plenum Grade
UTP - Unshielded Twisted Pair
STP - Shielded Twisted Pair
COAX - Coaxial Cable
SPKR - Speaker Wire
TEL - Telephone Twisted Pair
PIC - Plastic Insulated Conductor (Aerial TelephoneCable)
THERM - Thermostat Wire

POWER DOWN SETUP

The CableTool will automatically turn off after the time selected in the Power Down Setup screen.

Settings available are five minutes, fifteen minutes, thirty minutes and on (must be turned off manually). Press the Save function key to store the selected setting.

POWER

Duration - The CableTool will typically provide 10-12 hours of operation from a set of four AA alkaline batteries.

Auto Power Down - The CableTool will automatically turn off after the time selected in the Power Down Setup screen or will run continuously until manually turned off when "ON" is selected for Power Down.

Low Battery - When the batteries are below the level required for the CableTool to operate properly, a "LO BATT" message appears in the upper right hand corner of the display.

SAFETY

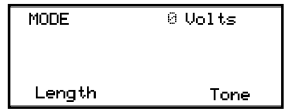
Always disconnect the test leads from any cable before opening the battery compartment cover.

OPERATION

Attach the test leads to the CableTool by inserting the safety banana plugs into the banana jacks at the top of the unit. Turn the CableTool on by pressing the "PWR" button. The startup screen is shown for a few seconds and then the Mode Screen is displayed. Clip one test lead to each of two conductors of the cable to be tested.

MODE SCREEN

When the Mode Screen is displayed, the CableTool immediately starts measuring voltage and updates the reading several times per second. If more than a 6-8 volts are present on the cable, do not conduct a Length test or apply a Tone signal until the circuit is de-energized. The CableTool can withstand continuous input voltages of up to 250Vrms.



LENGTH SCREEN

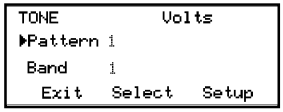
Pressing the Length function key in the Mode Screen presents the Length Screen. The CableTool automatically starts measuring the distance to the fault (open or short) using the NVP of the Default Cable (see Default Cable Setup). Using the Up/Down Cursor key, any of the eight user selected cable types, the four custom cable types or a cable type from the prestored cable list can be selected and the length is corrected for the corresponding NVP. The length measurement is continuously updated.

When the NVP for a cable is known to be different than the displayed NVP, the NVP can be changed by pressing the Select function key to move the arrow to the NVP field and then pressing the Up/Down cursor key to modify the NVP. The NVP can also be modified and stored in Cable List setup.

RECOMMENDATION: Before starting a job with a new spool or box of cable that has a known length, make a length measurement with the CableTool to determine if the prestored NVP for that cable type provides the correct length. This is done by selecting a cable type that matches or is similar to the type of cable to be tested, press the Select function key to move the arrow to the NVP field and press the Up/Down Cursor key until the displayed length matches the known length printed on the box or spool. The modified NVP will only be used while making this length measurement, exiting the screen or turning off the power will reset the NVP to the original value. To store the cable type with the modified NVP see "Cable List Setup". The prestored NVP is a typical value and adjusting the NVP to the actual length will provide more accurate results. See "Understanding NVP" for more information.

TONE SCREEN

Pressing the Tone function key in the Mode Screen presents the Tone Screen and the CableTool begins transmitting the user selected tone pattern and frequency (see Tone Setup).



The CableTool provides four different tone patterns which can be changed by pressing the Up/Down cursor key. The tone frequency can be changed by pressing the Select function key to move the arrow to the Band field and then pressing the Up/Down cursor key to change the frequency band.

SETUP

Pressing the Setup function key in any screen presents the Setup Screen.

The Up/Down cursor key is used to display: 1) Units Setup 2) Default Cable Setup 3) Cable List Setup 4) Custom Cable Setup 5) Toner Pattern/Band Setup and 6) Power Down Setup. Press the Select function key to enter the displayed setup screen.

UNITS SETUP

The Units Setup Screen is used to select the units used when displaying the length measurement in the Length screen.

The Up/Down cursor key is used to select Feet or Meters. Press the Save function key to store the selected units.

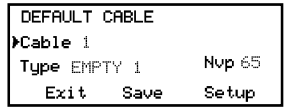
CABLE LIST SETUP

The CableTool has a prestored list of over 60 popular cable types with the typical NVP value for each cable. Cable List setup allows the user to store the most often used cable types at the top of the list for quick access and to modify the typical NVP when the actual NVP is known to be different value.

Pressing the Up/Down cursor key scrolls between the eight storage locations. Pressing the Select function key advances the arrow to the Type field where any one of the prestored cable types can be displayed by pressing the Up/Down cursor key. Pressing the Select function key again advances the arrow to the NVP field which can be modified by pressing the Up/Down cursor key. Press the Save function key to store the information.

DEFAULT CABLE SETUP

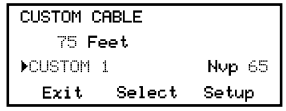
Default Cable setup allows the user to store the most often used cable type as the default for the Length measurement in the Length screen. The Default Cable is used when the Length function is selected and length measurements begin.



Pressing the Up/Down cursor key scrolls between the eight storage locations. Press the Save function key to select the displayed cable as the Default for length measurements.

CUSTOM CABLE SETUP

Custom Cable Setup is used to measure and store the NVP of a cable of a known length. Connect the CableTool to a piece of cable that is between 50 and 100 feet long and is open at the far end. Cables less than 50 feet or longer than 100 feet may not give accurate NVP results.



Press the Up/Down cursor key to select one of the four Custom Cable storage locations. Press the Select function key to advance the arrow to the length field and then use the Up/Down cursor key to adjust the displayed cable length until it matches the known length. The NVP changes as the displayed cable length is adjusted. Press the Save function key to store the information.

TONER SETUP

The CableTool has four different tone patterns and four different tone frequencies that can be used to trace a cable with a tone probe. The frequencies and patterns are compatible with tone probes from different manufacturers. The different patterns and frequencies allow multiple technicians to be working in the same area and still be able to uniquely identify the cable being traced.

Pressing the Up/Down cursor key scrolls between the four transmitted patterns. Pressing the Select function key advances the arrow to the Band field where one of four frequencies can be selected. Press the Save function key to store the displayed Pattern and Band as the Default for Toning.