

Repair and Warranty

The instrument contains static sensitive devices and is not user serviceable. If an instrument fails, or its protection has been impaired, it should not be used but sent for repair by suitably trained and qualified personnel.

New instruments are guaranteed against breakdown due to manufacturing or component defects for 12 months after the purchase date by the user.

Note: Any unauthorised prior repair or adjustment to the instrument will automatically invalidate the warranty.

Manufactured in the UK by:-

BI Communications Plc
Unit 7, Buckwins Square,
Burnt Mills Industrial Estate,
Basildon, Essex, SS13 1BJ
Tel:- +44 (0) 1268 729393
Fax:- +44 (0) 1268 727987
Email:- sales@bicommunications.com
Web:- www.bicommunications.com

The company reserves the right to change specifications or designs without prior notice.

FaultCaster™

Digital TDR Cable Length Meter & Fault Locator

Operating Instructions



Safety Warnings

This instrument meets the safety requirements of IEC61010-1:1995. It is designed for use on de-energised circuits only. Connection to mains supply voltages may result in damage to the instrument and/or present a hazard to the operator. The user must assume responsibility for ensuring his or her own safety. The instrument is protected against connection to telecom network voltages according to BS/EN61326-1.

Warning

Only use the unit with non-energised or de-energised and suitably isolated circuits. Connection to mains supply may damage the instrument and could be hazardous to the user.

If the instrument is not used in the manner specified in this manual the protection provided by this equipment may be impaired.

Symbols used on the Instrument



Caution: Refer to accompanying notes

CE

Equipment complies with current EU directives

13. Specifications

Range @ Vp=70%	2000m (6000ft)
Resolution (m)	0.1m up to 100m, then 1m
Resolution (ft)	0.1ft up to 100ft, then 1ft
Accuracy	+/- 2%*
Cable Library	39 Standard Cable Types
Velocity Factor	Adjustable from 0% to 99%
Output Pulse	5v p-p into open circuit
Output Impedance	Automatic compensation
Output Pulse	Fast Edge Step Function
Display	2 x 16 Alphanumeric LCD
Tone Generator	Oscillating 810 - 1110Hz
Voltage Warning	Operates at >10V (ac / dc)
Power Supply	6v 4 x AA cells
Auto Power Down	4 minutes
Operating Temperature	0 to 40 deg. C
Storage Temperature	-20 to 70 deg. C
Dimensions	165 x 90 x 37mm
Weight	350gms (12oz)
Safety	IEC61010-1, EN 60950
EMC	BS/EN 61326-1
Water / Dust Proof	IP54
CE compliance with current EU directives	


* Measurement accuracy of +/-2% assumes the instrument setting for velocity of propagation of the cable under test to be accurately set, and homogeneity of the velocity of propagation along the cable length.

Testing will be inhibited and the operator should immediately disconnect the FaultCaster™ from the cable.

11. Cable Library

Appletalk	Belden 8102	Belden 9933
BT2002	CAT5 STP	CAT 5 UTP
Coax Air 50	Coax Air 75	Coax A/S 50
Coax A/S 75	Coax Foam PE 50	Coax Foam PE 75
Coax Solid PE 50	Coax Solid PE 75	CW1308
Ethernet 9880	Ethernet 9901	Ethernet 9903
Ethernet 9907	IBM 1/2A/6	IBM Type 3
IBM Type 9	Mains BS6500	Multicore PVC
RG6/U	RG58 (8219)	RG58 C/U
RG59 B/U	RG62 A/U	T/Pair Jelly PE
T/Pair PE	T/Pair PTFE	T/Pair PVC
T/Pair Paper 72nF	T/Pair Paper 83nF	Twinax 78
Twinax 100	URM70 Coax	URM76 Coax

12. Measurement Units & Language Selection

To change the measurement units between feet & metres, or to select an alternative operating language, hold down the **TDR/**  key and press the ● key.

Pressing the ● key will now toggle between language and measurement units and the ▲ and ▼ keys will change the language or measurement unit

Standards

Safety: IEC61010-1:1995
 EMC: EN50081 and EN50082 Light industrial

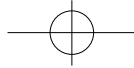
ESD	IEC1000-4-2	Cat A Pass
EM	IEC1000-4-3	Cat A Pass
Burst	IEC1000-4-4	Cat A Pass
Surge	IEC1000-4-5	Cat A Pass
Conducted RF	IEC1000-4-6	Cat A Pass

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1. Product Introduction

The FaultCaster™ is a handheld Digital TDR Cable Length Meter and Fault Locator designed to measure the length of power and communication cables, or indicate the distance to a fault on the cable, given access to one end only.



By incorporating Fast-edge Step TDR Technology, the FaultCaster™ is able to measure cable length, and indicate the distance to open or short circuit faults, to a range of 2000m (6000ft) on virtually any type of cable.


The FaultCaster™ directly indicates the cable length, or fault distance and description, on a 2x16 digit alpha-numeric LCD.

An internal library of standard cable types enables accurate measurement without the necessity of entering Velocity of Propagation information, and the FaultCaster™ automatically compensates for different cable impedances.

The FaultCaster™ incorporates an oscillating tone generator, that is detectable with a standard tone probe, for use in the tracing and identification of cable pairs.

The FaultCaster™ also displays a "Voltage Detected" warning and sounds an alarm when connected to a cable carrying greater than 10V. Testing is also inhibited.

1. Getting Started


The main unit is switched on and off using the  key. When the unit is first turned on it will display the opening screen giving the software version and also the remaining battery capacity.

An auto shutdown feature turns the unit off automatically four minutes after the last key press in case the operator forgets, and in order to preserve battery life.

times per second.

This signal can be detected with a conventional inductive tone probe and enables cable tracing and identification.

The auto-shutdown facility is disabled in Tone Generator mode so that the tone may be injected into a cable for an extended period of time while tracing takes place.

To exit Tone Generator mode press the **TDR/** key again.

9. Battery Replacement

The FaultCaster™ is powered by 4 x 1.5v AA cells which are provided. Alkaline replacement cells are essential to ensure instrument performance.

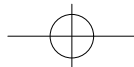
Remaining battery capacity is indicated on a "fuel gauge" display when the instrument is switched on.

To replace the battery cells first switch off the product and disconnect from any cables, then remove the battery compartment cover by loosening the 2 fixing screws.

10. Voltage Safety Warning

If the FaultCaster™ is accidentally connected to a cable carrying a voltage greater than approximately 10v a warning tone will be emitted and the instrument display will show

Voltage Detected



Short Circuit
1546m

If there is a short circuit at some point along the cable then the display will read the distance to the short.

Short Circuit
87.3m

7. Accuracy


The FaultCaster™ measures distances to faults and cable lengths to an accuracy of +/- 2%.

This measurement accuracy is based on the correct value of Vp being used for the cable under test, and homogeneity of the Vp along the cable length.

If the Vp is set incorrectly by the operator, or the Vp varies along the length of the cable, then additional errors will be incurred and the measurement accuracy will be effected.

Note:- The Vp is less well defined with unshielded multicore cable, including power cable, and is lower when a cable is tightly wound on a drum than when it is installed.

8. Tone Generator

Press the **TDR/**  key to inject a warbling tone into the cable or link under test.

The injected signal oscillates between 810Hz and 1110Hz six

2. Selecting a Library Cable or Setting Vp

After switching on the FaultCaster™, and viewing the version and battery life information, the display will show the last cable type tested and/or the last Vp setting.

T/Pair PTFE
Vp=71%

Press the **▲** and **▼** keys to move up and down through the cable library.

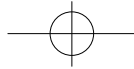
If the cable to be tested is not listed in the library, or a different Vp is required, continue pressing the **▲** key, past the top of the library, where Vp settings between 1 and 99% can then be selected.

When the FaultCaster™ is switched off it will remember the last selected cable library or Vp setting. This feature is useful in the situation where the operator is performing many tests on the same type of cable, as is generally the case.

3. Principles of Operation

The FaultCaster™ works by measuring the time taken for a signal to travel to the far end of the cable under test, or to an intermediate fault, and return.

The velocity at which the signal travels (Velocity of Propagation Vp) will depend on the characteristics of the cable.



4. Attaching a cable to the FaultCaster™

1. Ensure that no power supply or equipment is attached to the cable to be tested
2. Check that the far end of the cable is either open or shorted (not fitted with a termination)
3. Attach the FaultCaster™ to one end of the cable to be tested

The cable attachment to the FaultCaster™ is via a BNC connector located at the top of the unit. For un-terminated cables use the alligator clip attachment provided.

- | | |
|-----------------|----------------------------------------------------------------------------------------|
| Coaxial Cable | Connect the red clip to the centre wire and the black clip to the shield/screen |
| Shielded Cable | Connect the red clip to a wire adjacent to the shield and the black clip to the shield |
| Twisted Pair | Separate out one pair and connect the red and black clips to the two wires of the pair |
| Multicore cable | Connect the clips to any two wires |

5. How to determine unknown Vp settings

If the FaultCaster™ is to be used with a cable type for which the Vp is unknown, this must first be determined.

1. Take a sample of the cable at least 20m or 60ft long
2. Measure the actual length of the cable using a rule

or tape measure, or some other reliable method

3. Connect the FaultCaster™ and adjust the Vp setting such that the tester gives a correct reading of the sample length

The Vp setting can now be noted and used when measuring on unknown lengths of the same cable type.

6. Measuring Cable Length or Fault Distance

Select the cable type from the library, or alternatively select the cable Vp, and attach to the cable to be tested as previously described in this user guide.

Press the ● key.

Assuming there are no opens or shorts in the cable, then the length of the cable will be displayed.

For lengths less than 100 then the displayed value will be to one decimal place.

Open Circuit
69.2m

For lengths over 100 the decimal place is suppressed.

Open Circuit
1546m

If there is a short at the end of the cable then the display will read

