



इ रि से ट
बाहरी दूरसंचार प्रयोगशाला
प्रयोग नं: एल पी - 8

IRISET
OUTDOOR TELECOMMUNICATION
LABORATORY
EXPERIMENT NO.: LP - 8

नाम

Name : _____

अनुक्रमांक

Roll No : _____

पाठ्यक्रम

Course : _____

दिनांक

Date : _____

प्राप्त अंक

Marks Awarded : _____

अनुदेशक का अधाक्षर

Instructor Initial : _____

Objective: To trace the Cable Faults by using Andig Digital Cable Fault Locator (Model 5289 M)

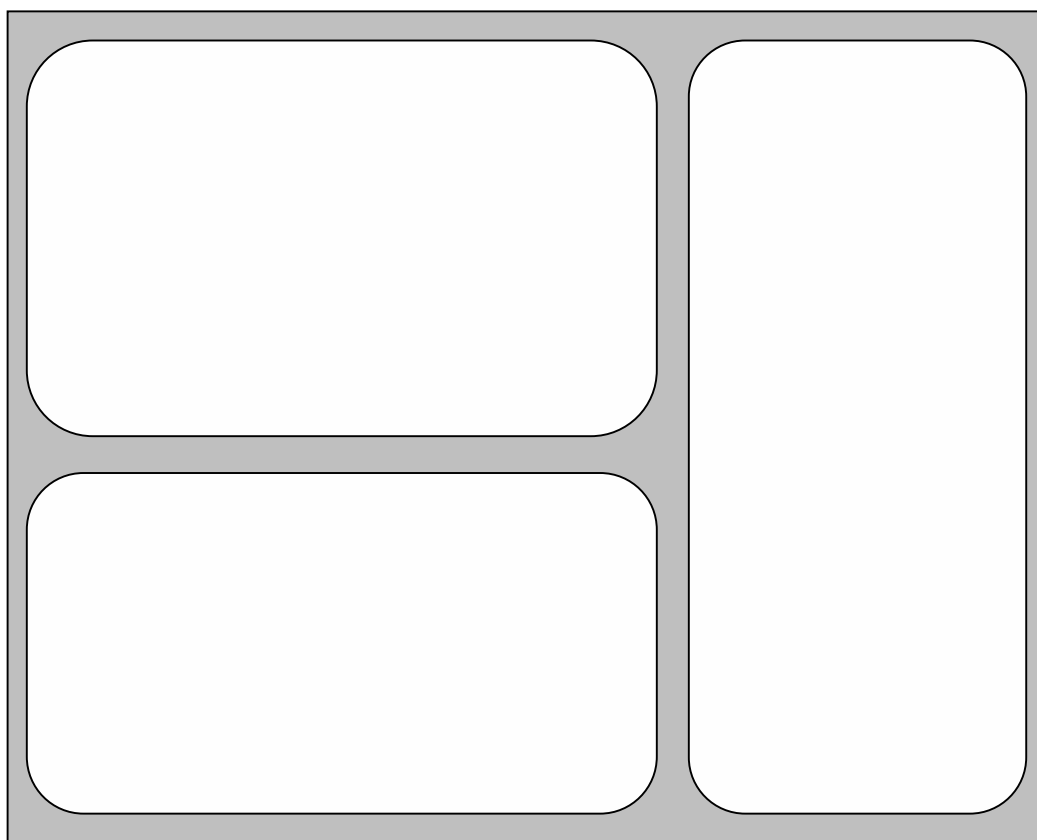
Introduction:

The main purpose of **DCFL** is to locate low insulation and contact faults in underground cables. It also digitally displays the distance to fault of all types there by facilitates the installation, maintenance and repairs in the field

It has four modes to check different faults in cables. They are

- 1. Pulse echo reflection:** This mode is used for checking the open/short faults in U/G telecom cables
- 2. Low insulation faults:** This mode is used for checking low insulation faults in U/G telecom cables
- 3. Insulation resistance faults:** This mode is used for checking insulation resistance of U/G cables
- 4. Foreign potential:** To measure foreign potential induced in the U/G telecom cables

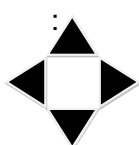
A) Draw the panel diagram of the instrument



B) Function of each key

SELECT: when pressed, selects highlighted menu

MENU: when pressed main menu is displayed



Moves up & down the highlighted menu

Moves left or right the selected cursor or increments/decrements function selected in multifunction box

RANGE: Displays range status. Select ► ◀ range using arrow keys

ZOOM: displays current zoom status from zoom 1 to zoom 5

CUR: selects cursor 1 or cursor 2

CAL/BACK: when pressed, goes to previous menu only in PULSE ECHO REFLECTION mode

GAIN: selects gain level and displays status in multifunction box

START: when pressed starts testing the cable pair under test

PRINT/VOP/2: In PULSE ECHO REFLECTION graph mode, when pressed VOP/2 of selected cable is displayed on screen and using ▲ ▼ arrow keys VOP/2 Can be changed for different cables online.

B/L (BLACK LIGHT): Switches on back light

LINE1: Socket pair for connecting faulty pair under test

LINE2: Socket pair for connecting good reference pair

RS232: connector for PC interface

PRINTER: not used

DC SOCKET: socket for ext DC & battery charging

NOTE: Following keys are used only in PULSE ECHO REFLECTION mode
When pulse (wave form) is displayed on LCD a) RANGE b) Zoom) c) GAIN d) CURSOR

MENU FLOW DIAGRAM:

	Pulse Echo reflection	Noramal Scan		
		Reference Scan		
		Settings	Cable type	paper
				Jelly
				Co-axial
				Others
			Gauge	0.5mm
				0.63mm
				0.9mm
				1.5mm
	Low Insulation Faults	Normal Scan		
		Mixed signal Scan		
		Settings	Temperature	27degree*
			Gauge	0.5mm
				0.63mm
				0.9mm
				1.5mm
		Mixed signal gauge setting	Gauge	0.5-0.63mm
			first cable length	0.5-0.9
				0.9-0.5
	Insulation Resistance	Scan		0.63-0.9
				0.9-0.63
	Foreign Potential	Normal Scan		

Exercise No.1

Aim: To locate open or short faults in the given U/G telecom cable

Procedure:

- a. Connect pair under test to LINE 1 terminals
- b. Select **pulse echo reflection**
- c. Go to settings and select the gauge and type of the cable
- d. Select normal scan
- e. Press select key

The wave forms are displayed on the screen

Press cursor key

CUR 1 and CUR 2 appears on multifunction box alternately.

Use arrow keys < > to move & align cursor 1 to starting point of incident pulse

Press cursor key again and the CUR 2 appears on the multifunction box

Use arrow keys < > to move & align cursor 2 to starting point of reflected pulse

After aligning cursors to the incident and reflected pulse distance to fault is displayed in distance box

NOTE: For better accuracy at different fault distances, select Range, Zoom, & Gain positions.

For faster cursors movements use Zoom facilities.

Observation: 1. Is the cable open circuited or short circuited if so at what distance?

Ans:

Exercise No.2

Aim: To locate insulation faults in U/G telecom cables

Requirements:

1. One good pair (preferably in the same cable in which faulty pair is to be tested)
2. Faulty pair whose insulation fault is to be measured.

Procedure:

How to find out good and faulty pairs:

1. Select **insulation resistance** menu
2. Connect limbs A & B to line1 of meter and select scan
After few seconds it displays resistance value in K ohms
3. Connect limb A & Ground to line 1 of meter & press start
After few seconds it displays resistance value in K ohms
4. Connect limb B & Ground to line 1 of meter & press start
After few seconds it displays resistance value in K ohms

In all the above cases

- if the insulation resistance is more than **5000K ohms (5M ohms)** the particular pair or limb is considered **“GOOD”**.
- If the insulation resistance is less than **2000K ohms (2M ohms)** the particular pair or limb is considered as **“FAULTY”**.
- **‘0’ k ohms** indicates short/loop fault

Set up connections as per the Fig no.1 below

Case I: limb to limb fault

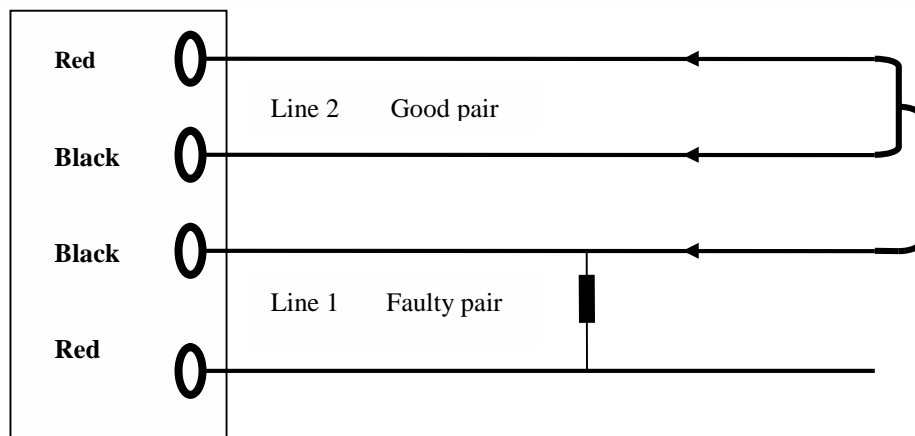


Figure no.1

1. Connect the good pair to line 2
2. Connect the faulty pair to line 1
3. Loop both the limbs of good pair at far end

4. Check the resistance between limb to limb of good pair using multimeter to ensure that it is properly looped at the far end
5. Check the resistance between any limb of good pair to faulty pair limb and it should read the same resistance as good pair
6. Loop both limbs of good pair to the faulty limb at the far end of the cable under test
7. The faulty limb which is looped to good pair should be connected to black terminal of line 1 and the second limb of faulty pair should be connected RED terminal of line 1
8. If fault is between limb to earth the red terminal should be connected to earth as per the connection Fig no.2 below

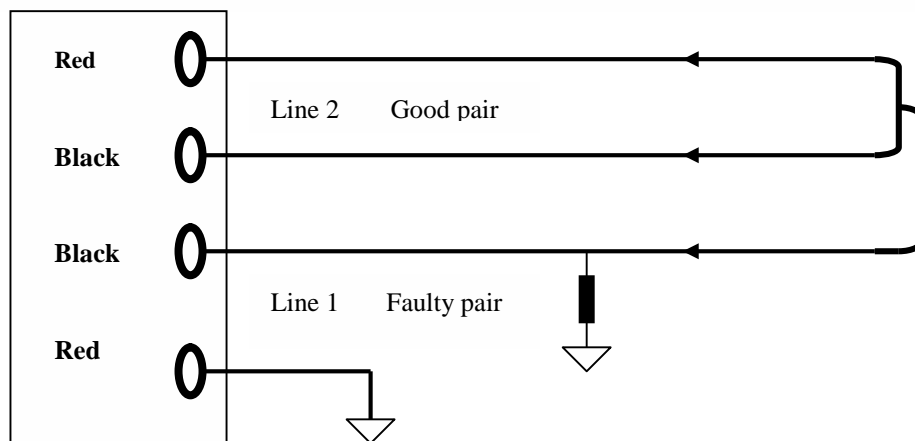


Figure no.2

9. Select **low insulation faults**
10. Select the ambient temperature and gauge
11. Press **normal scan** → final display shows after one minute.

Write down the distance in blanks.

1. Distance to loop ----- mtrs

2. Distance to fault ----- mtrs

12. To repeat test press **start**

NOTE: if loop is not extended to one limb of faulty pair, display will indicate

- A. Distance to loop 0 mtrs
- B. Distance to fault is 0 mtrs

Exercise No.3

Procedure:

Aim: To locate insulation fault using only one good limb

1. Find out the good limb by measuring insulation resistance (should be above 5000kohms)
2. Short red and black terminals of line 2 and connect to good limb (as per the figure no.3 below)

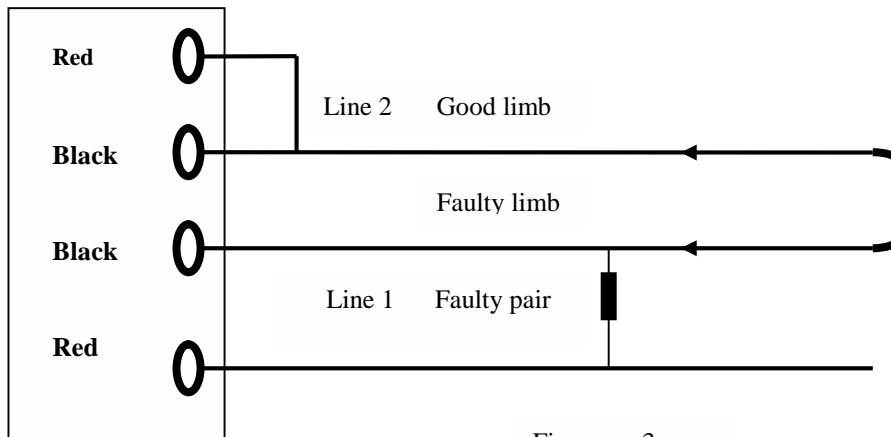


Figure no.3

3. Loop good limb to faulty limb at far end
4. Connect black terminal of line 1 to faulty limb which is looped to good limb
5. Connect red terminal of line 1 to 2nd limb of faulty pair if the fault is between limb to limb
6. Connect red terminal of line 1 to earth if faulty is between limb to earth
7. select **low insulation fault** and then select single limb scan from menu
8. If the menu for single limb scan is not available then fault distance displayed should be multiplied by 2 for actual distance to fault.

Reading:

Observation:

Exercise No.4

Procedure:

Aim: to measure insulation resistance in U/G telecom cables

1. Select “**insulation resistance**”
2. connect pair under test to line 1 terminals
3. Press start. Display will appear “insulation resistance in kohms”

Reading:

Exercise No.5

Aim: to measure foreign potential in U/G telecom cables

1. Select “ **foreign potential**”
2. connect pair under test to line 1 terminals
3. Press start. Display will appear “foreign potential in volts”

Reading:

Date:

Signature of Trainee