MIPCONTOUR



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1. Introduction

MiPContour is a graphical tool which is used to draw a distance relay characteristics library. This tool is used to create a characteristics library as per the relay settings, and it is also used to solve various problems such as:

- 1. Variety of relay characteristics
- 2. Vendor specific data format
- 3. Entering the details of relay characteristics which is time consuming process
- 4. Modifying relay characteristic to match particular scenario, which is not available
- 5. Allowing to develop user defined characteristics
- 6. Accurate visualization of the relay characteristics on one platform

2. Features

Following are the features of MiPContour:

- 1. Concept of layer for defining zones of operation
- 2. Facility to enter co-ordinates
- 3. Option to create separate library for phase and earth
- 4. Option to enter the characteristics on primary or secondary side of CT/CVT
- 5. Option to set the range

3. Launching MiPContour

Follow these steps to launch MiPContour:

1. In MiP- PSCT screen, click the 21 button. This displays the following screen:

In this window, by clicking the Create button you can create a new relay characteristics library or even you can open already created library.

2. Select User Defined from Characteristics field.

Distance Relay		
Details >>	 Standard User Defined 	
		5

3. By clicking the Create button, MiPContour: Relay Characteristics Development Tool window appears.

User Defined Chara	acteristic Library	
Create Base	Go to >> Earth	▼ Go to >>

4. Menu Bar

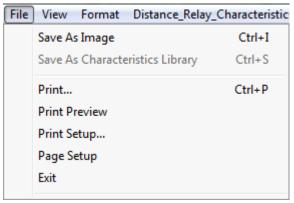
File View Format Distance_Relay_Characteristics Help

Following are the menu available in this application:

- 1. <u>File</u>
- 2. <u>View</u>
- 3. Format
- 4. Distance Relay Characteristics
- 5. <u>Help</u>

File

Following are the various options which are available under the File menu:



5.1 Save As Image

This options allows you to save the drawn relay characteristics as an image.

1. By clicking Save As Image option under File menu, Save Graph as an Image dialog box appears.

Save Graph as an Image	
Save in: Documents	- ← 🗈 📸 -
Name	Date modified
Adobe 🔒	30-07-2014 15:35
Adobe Scripts	15-10-2014 15:56
🎍 Camtasia Studio	15-10-2014 10:36
🙀 My RoboHelp Projects	20-10-2014 14:51
Outlook Files	20-10-2014 14:47 🔶
· [F.
File <u>n</u> ame:	Save
Save as type: Jpeg File(*,jpg)	Cancel

Browse and select the location for the file to be stored.

- 2. In the File name field, type the file name, and then click Save to save the file as an image.
- 3. The shortcut for this option is Ctrl+I.

5.2 Save As Characteristics Library

This options allows you to save distance relay as a characteristics library.

1. By clicking Save As Characteristics Library option under File menu, Add Characteristics Library dialog box appears.

Note: This option is enabled only when a Relay Characteristics is created.

Ado	Characteristics	Library
	 Phase C Earth 	 Primary Secondary
	Library No.	
	Library Name ABBREL100_4	
	Save	Cancel

- 2. In this dialog box, automatically the Library No. will be generated.
- 3. Phase has been selected in the tool bar, so by default Phase radio button will be marked as checked.
- 4. Primary/Secondary radio button will be selected automatically depending upon the relay manufacturer specification. For generic relays user have to select Primary/Secondary explicitly.
- 5. Click Save button, to save the distance relay as a characteristics library for phase.
- 6. Once the distance relay saved for Phase, again the Add Characteristics Library dialog box appears to save the distance relay for Earth.
- 7. Click Save button, to save the distance relay as a characteristics library for Earth.
- 8. You have successfully saved the distance relay characteristics. The shortcut for this option is Ctrl+S.

5.3 Print

This options allows you to print the relay characteristics library.

1. By clicking Print... option under File menu, Print dialog box appears.

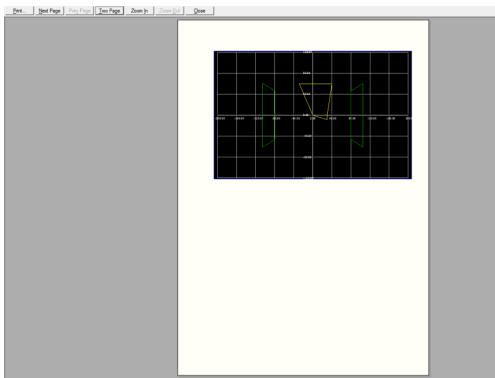
Print	
Printer-	
Name: Snaglt 9	▼ <u>P</u> roperties
Status: Ready	
Type: Snaglt 9 Printer	
Where: C:\ProgramData\TechSmith\Sn	aglt 9\PrinterPortFile
Comment:	Print to file
Print range	Copies
⊙ AI	Number of <u>c</u> opies: 1
C Pages from: 1 to:	53 53 I Collate
C Selection	123 123 Collate
	OK Cancel

- 2. In this dialog box, you can select the Printer name, Print range, and number of copies you want to print.
- 3. Once you setup the printer, click OK button. This will print the select page.
- 4. The shortcut for this option is Ctrl+P.

5.4 Print Preview

This options allows you to preview the page which you want to print.

1. By clicking Print Preview option under File menu, you can view the preview of the page.



Page 1

In this page, the following are the options available:

Buttons	Description
Print	This option allows you to print the selected page
Next Page	This option takes you to the next page
Prev Page	This option takes you to the previous page
Two Page	This option displays the two pages preview at a time
One Page	If you selected Two Page option, then this option will be enabled. This option displays only one page preview
Zoom In	This option allows you to zoom in the page
Zoom Out	This option allows you to zoom out the page
Close	This option will close the Print Preview page

5.5 Print Setup

This options allows you to setup the printer properties.

1. By clicking Print Setup... option under File menu, Print Setup dialog box appears.

Open the Relay	y Data File	×	Dialog	×
File Path	E.		Existing Base kV	220
	OK Cancel		OK	Cancel

- 2. In this dialog box, you can select the printer, paper size, paper source, and orientation.
- 3. Once you setup the printer, click OK button. This will save the setup.

5.6 Page Setup

This options allows you to setup the page properties.

- 1. By clicking Page Setup option under File menu, Page Setup dialog box appears.
- 2. In this dialog box, you can setup the dimension, margin, plot size, and border area of the paper.
- 3. By clicking the Default Values button, the default values will be setup for the page.

PageSetup					— ×	
Тор						
Middle						
Bottom						
Full						
For Physical Di			– Border Are	a] [
Left	0.75	inch	Left	0.75	inch	
Тор	0.75	inch	Тор	0.75	inch	
Plot Size			Right	0.75	inch	
Horizontal	7	inch	Bottom	0.75		
Vertical	4	inch	Bottom	0.75	inch	
ОК		Defau	lt Values		Cancel]

5.7 Exit

Click File> Exit ,to close the MiPContour application. A confirmation dialog box is displayed.

On Click of 'Yes' button application is closed.

MiPContour	
	Quit MiPContour? rogress will be lost!
Yes	No

View

Following are the options available in the View menu:

View	w Format Distance_Relation
\checkmark	Toolbar
<	Status Bar
	Layers Control

6.1 Toolbar

Use View > Toolbar to show or hide the tool bar. This option will be either be ON/OFF. If the option is ON, the tool bar is displayed, else the tool bar is hidden.

Following are the options available in Toolbar:

Options	Description
	Save As Characteristics Library : This option allows you to save distance relay as a characteristics library.
5	Print : This option allows user to print the distance relay characteristics which is displayed on the current screen .
LC	Layers Control : This option allows you to show/hide the zones.
•	Range : This option allows you to set the range of the axis.
▲	Selection : By enabling this option you can select a particular zone in the drawing.
	CLEAR : This option will clear the screen.
CLEAR	EDIT : This option allows you to edit the drawn distance relay characteristics library.
EDIT	

PHASE	PHASE : By selecting this option you can see the phase drawing of a distance relay characteristics.
EARTH	EARTH : By selecting this option you can see the earth drawing of a distance relay characteristics.
Delete	DELETE : This option will delete the current characteristics.
	First : This option will take you to the first library.
	Previous : This option will take you to the previous library .
	Next : This option will take you to the next library.
	Last : This option will take you to the last library.
R	Rectangle : This option is used to draw rectangle shape.
S	Square : This option is used to draw square shape.
С	Circle :This option is used to draw circle shape.
L	Line at an angle : This option is used to draw line at an angle.
PG	Polygon : This option is used to draw polygon.
PA	Polyarc : This option is used to draw polyarc.

6.2 Status Bar

Use View > Status Bar to show or hide the status bar. This option will be either be ON/OFF. If the option is ON, the status bar is shown, else the status bar is hidden.

The ranges of X and Y axis are shown in the Status Bar.

MiPContour

X: 14.878 Y: -59.778

6.3 Layers Control

This option allows you to show/hide the zones.

1. By clicking Layers Control option under View menu, Layer Control dialog box appears.

No.	Name	Show/H	Time(Sec)
-	General	>	
1	Zone 1	•	
2	Zone 2	~	
3	Zone 3	~	
4	Reverse Zone	~	
5	Zone 1X	 	
6	Zone 2X	 	
7	Zone 4	 	
8	Zone 5	 	
9	Zone 6	 Image: A start of the start of	
10	Load Encroachment	~	
11	Load Encroachment	~	
12	Power Swing Inner	~	
13	Power Swing Inner	✓	
14	Power Swing Outer	~	
15	Power Swing Outer	~	
16	Zone 1 SOTF	✓	
17	Zone 2 SOTF	~	
18	Zone 3 SOTE	~	

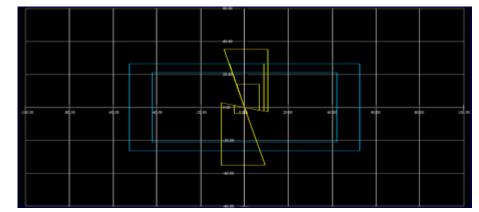
- 2. In this dialog box, you can see all the default zones.
- 3. You can select the zones by clicking the check box under Show/Hide list, and then clickOK.
- 4. By clicking Check All button, all the zones are marked as checked.
- 5. By clicking UnCheck All button, all the zones are marked as unchecked.
- 6. By clicking Cancel button, Layer Control dialog box will be closed.

Example:

1. In Layer Control dialog box, select all the zones.

No.	Name	Show/H	Time(Sec)	<u>^</u>
-	General	~		
1	Zone 1	~		
2	Zone 2	 Image: A start of the start of		
3	Zone 3	~		
4	Reverse Zone	 Image: A start of the start of		
5	Zone 1X	~		
6	Zone 2X	~		
7	Zone 4	~		
8	Zone 5	~		
9	Zone 6	✓		
10	Load Encroachment	~		
11	Load Encroachment	~		
12	Power Swing Inner	~		
13	Power Swing Inner	~		
14	Power Swing Outer	~		
15	Power Swing Outer	~		
16	Zone 1 SOTF	~		
17	Zone 2 SOTF	~		
18	Zone 3 SOTE	V		-

2. The distance relay characteristics drawing will be:



- 3. Now, in the Layer Control dialog box, click the UnCheck All button and select the zones of your choice.
- 4. Click the OK button.

No.	Name	Show/Hide	^
	General		
1	Zone 1	Image: A start of the start	
2	Zone 2		
3	Zone 3	v	
4	Reverse Zone		
5	Zone 1X		
6	Zone 2X		
7	Zone 4		=
8	Zone 5		
9	Zone 6		
10	Load Encroachment Left		
11	Load Encroachment Right		
12	Power Swing Inner Right		
13	Power Swing Inner Left		
14	Power Swing Outer Right		
15	Power Swing Outer Left		
16	Zone 1 SOTF		
17	Zone 2 SOTF		-
<			

5. Now, only the selected zones will be displayed in the distance relay characteristics drawing.

						1		
			**					
				AL HE L				
- 30 BL - 30 BC-	-60.00	-40.00	30.00	200 200	+0 0 0	ec po	8000	300 00
		_						

6.4 Data Sheet

This option opens a data sheet window in a new window.

Format

Format	Distance_Relay_Charact
Ba	ackGroundColor
A	cis
Ra	ange

Following are the various options which are available under the Format menu:

7.1 Back Ground Color

This option allows you to set the back ground color of the plotting area.

1. Click on BackGroundColor option in Format menu.

Form	Format Distance_Relay_Charact							
	BackGroundColor 1							
	Axis							
	Range							

Color dialog box appears.

- 2. Select the color of your choice.
- 3. Click OK button.

Color						
Basic colors:						
Custom colors:						
Define Custom Colors >>						
OK 3 Cancel						

This will apply the selected color to the back ground of the page.

H 🖨 IC	- K	SHIT PHASE BARD	Delete II	4 1 1					
Library No: -	MARE	MODEL:	Zreh	erred to : ***	Zone : ***				
batelion Codie :			• 0	Natance Relay Code :	[•	
				40.00					
				40.00					
1.00 .et	00 .40 00)	-35 00	0.0	20 20	40 D0	60,00	80 D 0	14
				-20-00					

7.2 Axis

This option allows you to set the axis and grid properties for R-Axis and X-Axis.

1. Click on Axis option in Format menu.



Axis & Grid Properties dialog box appears.

Axis & Grid Properties	
R-Axis	C X-Axis
Axis	Label
Allignment Origin -	Allignment Horizontal (I -
Color Thickness 1	
	Font MiFont
TickMarks	Grids
No Of Ticks 10	No Of GridLine 10
Color	Color
<u>(ОК</u>)	Cancel

- 2. In this dialog box, you can set the axis and grid properties along R-Axis and X-Axis such as:
 - Aligning, setting the color, and thickness along the Axis
 - Setting the number of ticks, and color
 - Aligning, setting the precision, and font for the Label
 - Setting the number of grid lines, and color for the Grids

7.3 Range

This option allows you to set the range.

By default the Resistance R-Axis range will be set to Min (-100), and Max (100). Similarly, the Reactance X-Axis range will

be set to Min (-60), and Max (60).

You can also define the range as per the requirement.

1. Clicking on Range option in Format menu.

Form	nat Distance_Relay_Charact
	BackGroundColor
	Axis
	Range [*]

Range of the Axis dialog box appears.

Rar	nge of th	ne Axis	2 -		x
	- R Min	-100	Max	100	
	-X Min	-60	Max	60	
	- Impeda	nce referred to-	С	Secondary	
	ſ.	OK	Default	Cancel	

2. Under R-Axis, and X-Axis, you can define the range as per your requirement, and then click OK. This will plot the graph according to the defined R and X Axis.

By clicking Default button, the default range i.e, -100 to 100 for R-Axis, and -60 to 60 for X-Axis will be set.

Help

The help menu consists of following:

Help	
	Help Topics
	About MiPContour

8.1 Help Topics

This option opens a help file of the application.

8.2 About MiPContour

This option contains the details of the application.

About MiP	Contour	×
	MiPContour Version Copyright © - 1998 - 2013 by Power Research and Development Consultants Pvt. Ltd., No. 5, 11 th Cross, 2nd Stage, West of Chord Road Bangalore 560 086, INDIA.	ОК

Distance Relay Characteristics

This feature allows you to either:

Creating a new Manufacturer Specific Distance Relay Characteristics.

Viewing & Editing Existing Distance Relay Characteristics

Creating User Defined Distance Relay Characteristics.

Viewing & Editing User Defined Distance Relay Characteristics.

9.1 Create: Manufacturer Specific Distance Relay Characteristics

Follow these steps to create a new distance relay characteristics:

1. Click the Distance Relay Characteristics on the menu bar.

File	View	Format	Distance_Relay_Characteristics	Help
				· •

Distance Relay Characteristics dialog box is displayed.

- 2. Click on radio button to select Create New.
- 3. Select the manufacturer from the MAKE list box.
- 4. Select the version from the MODEL list box.

After selecting manufacturer and version, Library No is generated automatically.

5. Click the Create button.

Distance Relay Characteristics	X
Create New 2 View & Edit	
MAKE 3 MODEL	4
Library No	
	•
Create 5	Cancel

This displays a MICOM P442 dialog box.

MICOM P442
General Zone 1 Zone 2 Zone3/4 ZoneP PSB SOTF
Library Details
No. 4
Name MicomP442_4
VNominal 0 kv INominal 0 A
Line Angle 70 Zone Status 110110
Z1p Tilt Angle 0 Series Compensation
Z1m Tilt Angle 0 © Enabled © Disabled
Z2/p/q Tilt Angle 0
OK Cancel

In this dialog box, you can set up the zones by entering the values for each zones or you can leave with the default values.

MICOM P442					×
General Zone 1 Zone 2 Zone3/4 ZoneP PSB SOTF					
Operation Mode	FORWARD			Ŧ	[
KZ1 Res Comp	1		R1-G 10)	ohm
KZ1 Angle	0		R1-ph 10)	ohm
Z1	10	ohm	TZ1 0		secs
Z1X Reactance	15				
	ОК	Cance	el		

MICOM P442	264			X
General Zone 1	Zone 2 Zone3	8/4 ZoneP PS	B SOTF	
Operation Mode	FORWARD		-	
KZ2Res Comp	1	R2-G 20	ohm	
KZ2 Angle	0	R2-Ph 20	ohm	
Z2	20	ohm TZ2 0.2	secs	
	ок	Cancel		

MICOM P442			×
General Zone 1 Zone 2 Zone3	/4 ZoneP PSB	SOTF	
Operation Mode FORWARD		-]
KZ3/4 Res Comp 1	R3 G-R4 G	30	ohm
KZ3/4 Angle 0	R3 Ph - R4 Ph	30	ohm
Z3 30	TZ3	0.6	secs
Z4 40	ohm TZ4	1	secs
NOTE: Zone 4 is taken as REVER	RSE.		
ок	Cancel		

MICOM P442	L.C.			×
General Zone 1	Zone 2 Zone	3/4 ZoneP	PSB SOTF	1
Operation Mode	INACTIVE		•	
KZP Res Comp	1	RP-G	25	ohm
KZP Angle	0	RP-ph	25	ohm
ZP	25	ohm TZP	0.4	secs
	ОК	Cancel		

MICOM P442		×
General Zone 1	Zone 2 Zone3/4	ZoneP PSB SOTF
Operating Mode	OFF	•
Delta R	0.5	ohm
Delta X	0.5	ohm
UnBlock Delay	0	Sec
Blocked Zones	110110	
	OK Can	cel

General Zone 1 Z	one 2 Zone3/4 Zo	oneP PSB	SOTF		
SOTF Mode Settin	ngs				
0000000110000	0				
IPH< 0	(% of INom) tD		sec	s	
UPH< 0	(% of VNom) tRe	setTOR 0	sec	s	
tDLD 0	secs	tUI 0	sec	s	
tSOTF 0	secs				
		1			
	OK Cancel				

i Note:

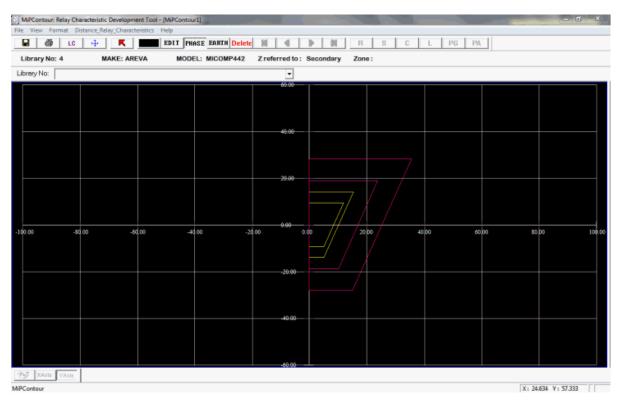
Zones and the default values will be different for various MAKE and MODEL.

7. Once you setup the zones, Click OK button.

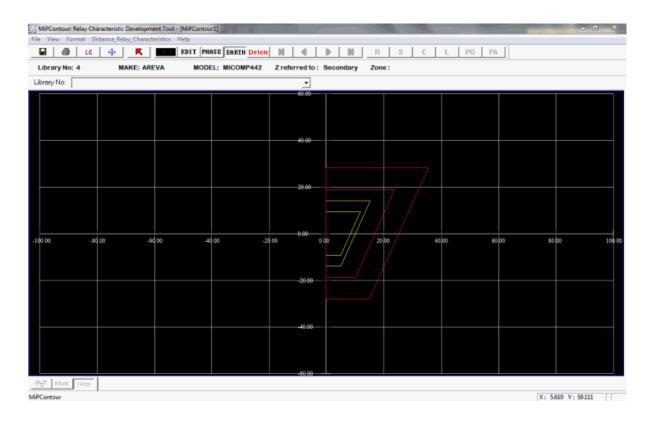
MICOM P442		×		
General Zone 1 Zone	e 2 Zone3/4 ZoneP PSB SOTF			
SOTF Mode Settings	1			
00000001100000				
IPH< 0	(% of INom) tDLDTOR	secs		
UPH< 0	(% of VNom) tResetTOR 0	secs		
tDLD 0	secs tUI 0	secs		
tSOTF 0	secs			
OK 7 Cancel				

This will draw a new distance relay characteristics for both PHASE and EARTH.

PHASE:



EARTH:



You have successfully drawn a new distance relay characteristics. Now, you need to save the newly drawn distance relay characteristics.

Saving distance relay characteristics:

1. Click File> Save As Characteristics Library or Save button from the tool bar. To select the zones refer Layers Control.

Following are the available MAKE, and MODEL:

MAKE	MODEL
	1 [REL100]
	2 [REL521]
1. [ABB]	3 [REL531]
	4 [REL670]
	17 [REL316]
	5 [7SA511]
2. [SIEMENS]	6 [7SA513]
	7 [7SA522]
	8 [MICOMP444]
	9 [MICOMP442]
3. [AREVA]	10 [MICOMP441]
	65 [MICOMP437]
	66 [MICOMP546]
	11 [EPAC3000]
4. [ALSTOM]	12 [EPAC3100]
	13 [EPAC3500]
5. [OHMEGA]	14 [OHMEGA406]
	15 [OHMEGA407]
6. [GE]	16 [D60]
7. [TOSHIBHA]	116 [GRZ100]
8 . [SEL]	



Similarly, you can create a new distance relay characteristics for various MAKE and MODEL.

9.2 View & Modify: Existing Distance Relay Characteristics

Follow these steps to view and edit the already created distance relay characteristics:

1. Click the Distance Relay Characteristics on the menu bar.

File View Format Distance_Relay_Characteristics Help

Distance Relay Characteristics dialog box is displayed.

2. Click on View & Edit radio button.

M&M and User-Defined radio buttons are enabled automatically after selecting View & Edit. Note: M&M is selected by default.

- 3. Select the manufacturer from the MAKE list box.
- 4. Select the version from the MODEL list box.
- 5. Select standard Relay characteristics Library number from Element/Characteristics Info combo box.
- 6. Click on View button.

Distance Relay Ch	aracteristics			X
C Create New	View & Edi2		C User-De	fined
MAKE	3 •	MODEL		4
Element/Charac	teristics Info			5
Create	View	6	Cancel	

This displays the distance relay characteristics for both PHASE and EARTH. **PHASE:**

		evelopment Tool -		Sugar State (Sugar		10211				- 0 ×
File View Format										
🖃 🊳 L	c 4	K	EDIT PHASE EARTH	Delete 📕 🔳	► H	R S	C L P	G PA		
Library No: 2	MAK	E: SIEMENS	MODEL: 78A51	1 Z referred to :	Secondary	Zone :				
Library No: 2				•						
				60.00						
				40.00						
				20.00						
				× ×	a I					
-100.00	-80.00	-60,00	-40,00	-20.00 (20,00	40,00	60,00	80.00	100.0
				-20.00						
				-20.00						
				-40.00						
				-60.00						
Axis VAxis	5									
MiPContour									X: 8.049 Y: 59	.778

EARTH:

		eristic Development Tool - (N		
Library No: 2 MAKE: SIEMENS MODEL: 75A511 Z referred to : Secondary Zone : ibrony No: 2 00000 0000 0000 0000 0000 00000				
	Library No: 2	MAKE: SIEMENS	MODEL: 78A511	Z referred to : Secondary Zone :
	Library No: 2			
				66.00
				40.00
				2000
-40.00	00.00 -30.00	-60.00	-40,00 -	-20,00 0,00 20,00 40,00 60,00 80,00 1
-40.00				
-40.00				
60.00				
60.00				
60.00				
				-40.00
	Age XAxis VAxis			
	PContour			X: 5.854 V: 57.333

You have successfully viewed the already drawn distance relay characteristics.

- 7. On clicking the User-Defined radio button, MAKE and MODEL list gets disabled.
- 8. Select standard Relay characteristics Library number from Element/Characteristics Info combo box, click the View button.

C Create New View & Edit M&M User-Defined
MAKE MODEL
Element/Characteristics Info
1
2
Create View Cancel

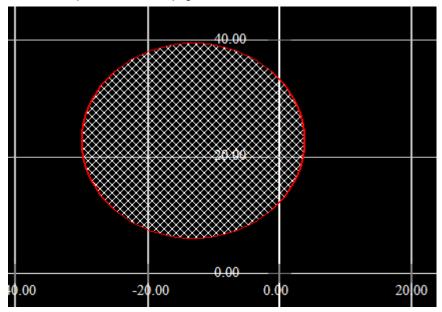
To edit the distance relay characteristics refer Layers Control, and to save the drawing refer Save As Image and Save As Characteristics Library.

9.3 Create: User defined Distance Relay Characteristics

1. Click to select on the required shape button.

R	S	С	1 L	PG	PA

2. Draw the shape in MiPContour page.



Shape details window is displayed.

- 3. Modify the existing details as per requirement.
- 4. Click OK button.

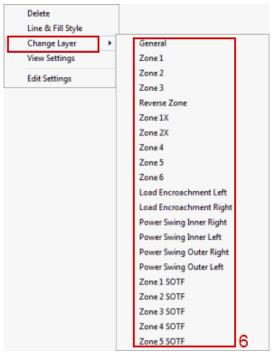
Draw 0	Circle	AB		x
	Center :	R (ohm) -19.024391	X (ohm) 23.777778ŧ	
	Radius :	16.44444513	32092 ohm	3
[OK	\square_4	Cancel]

5. Click on Selection button.



Right click on the shape to open a context menu.

6. Go to "Change Layer" and Select the required zone.



7. Click on Save As characteristics Library button.

H

User defined Distance Relay Characteristics is created.

9.4 View & Modify: User Defined Distance Relay Characteristics

1. Click the Distance Relay Characteristics on the menu bar.

```
File View Format Distance_Relay_Characteristics Help
```

Distance Relay Characteristics dialog box is displayed.

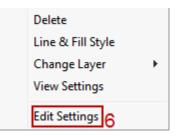
- 2. Click to select View & Edit radio button.
- 3. Click to select User-Defined radio button.
- 4. Select the required library from the Element/Characteristics Info combobox.
- 5. Click View button.

The selected distance relay characteristics is displayed.

Distance	e Relay Cha	racteristics			x
0	Create New	View & Edit	_⊂ м&м	🖲 User-De	fined
MA	κe		MODEL		
		v			<u> </u>
Elen	nent/Charact	eristics Info			
					<u>-</u> 4
	Create	View	, ₅	Cancel	

Note: Select Selection button, if not selected. Right click on the shape to open a context menu.

6. Click on Edit Settings.



- 7. Edit the required fields.
- 8. Click OK button.

Drav	v Square	K
	R -9.7560975i ohm X -12 ohm	
	оті от2 а	
	⊂ B1	
	а 36.22222222 b 36.22222222	,
	OK 8 Cancel	

This edits the User defined Distance Relay Characteristics.







Power System Network Editor



Graph Utility

Database Manager



COMTRADE

Free Programmable



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