2. Kullanılan Mesafe Koruma Rölesi

Deneyde kullanılacak olan mesafe koruma rölesi, Siemens firmasının ürettiği 7SA612 model röledir.



Resim 1 : Siemens Marka 7SA612 model mesafe koruma rölesi.

Röle RS232 seri port üzerinden bilgisayar kullanılarak programlanabilmektedir.



Resim 2: Röle bağlantı şeması.

2.1. Deneyin Yapılışı



 Masaüstündeki çift tıklayınız. simgesine tiklayınız. Açılan ekranda : 7SA612 Var 2 yazısına

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E - A atolye	

Resim 3: Program açılış ekranı.

2. Ardından gelen ekranda Settings'e çift tıklayınız.

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atolye / Folder / 7SA612 V4.7 Var 2/ Offline Offline Offling Offlin	7SA612 Select function Settings Annunciation Measurement Socillographic Records	

Resim 4: Röle ayar ekranı

- 3. Açılan ekranda power system data 1'e çift tıklayınız. Ayarları resim 5'te görüldüğü şekilde yapınız.
- Setting Group A'ya çift tıklayınız. Açılan pencerede Power System Data2'ye çift tıklayınız. Ayarları resim 6'da görüldüğü şekilde yazınız.
- 5. Distance protection, general settings'i açınız. Ayarları resim 7 ve 8'de görüldüğü gibi yapınız.
- 6. Distance Zones ayarlarını resim 9-10-11'de görüldüğü gibi yapınız.
- 7. Program menüsünde Device \rightarrow DIGSI \rightarrow Device tiklayınız (Resim 12).
- 8. Açılan pencerede parola yerine 000000 (6 tane sıfır) yazınız.
- Open device online penceresi açıldığında "Connection Type" Direct, "PC interface" Com 1,
 "Device interface" Front seçilerek OK tuşuna basılır ve program röleye yüklenir.

JIGSI - atolye / Folder / 7SA612 V4. File Edit Insert Device View (日 四 四 义 隐 民 命 (2) 第四	7 Var 2/7SA612 Options Win	2 dow Help **- ==== 1 Mir im N2	
atolye / Folder / 7SA612 V4.7 Var	∠/7SA612	:=== \$9"€ 1¶9 "\ *	
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□- <u>-</u>	Device (Masking CFC George Power S	Configuration g I/O (Configuration M ystem Data 1	
⊕-ஊ Uscillographic Records	Power Syst Transform Settings:	em Data 1 ers Power System Breaker	×
	No.	Settings	Value
	0201	CT Starpoint	towards Line 💌
	0203	Rated Primary Voltage	154,0 kV
	0204	Rated Secondary Voltage (Ph-Ph)	100 V
	0205	CT Rated Primary Current	5000 A
	0206	CT Rated Secondary Current	1A
	0210	U4 voltage transformer is	not connected
	0211	Matching ratio Phase-VT To Open-Delta-VT	1,73
	0215	Matching ratio Usy1 / Usy2	1,00
	0220	14 current transformer is	Neutral Current (of the protected line)
	0221	Matching ratio I4/lph for CTs	1,000
1	□ □ □ □ □ □ □ □ □ □ □ □	ay additional settings	
			About
	Tamam	Uygula DIGSI -> Device	iptal Yardım

Resim 5: Röle ayar ekranı

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atolye / Folder / 7SA612 V4.7 V	/ar 2/75A612		
🗄 🗐 Offline	Select function		
⊡,2 Settings 	Operation Masking I/O (Configuration M 歴史の) CFC の Power System Data 1	Setting Group A	×
🗄 🛃 Oscillographic Records	Setting Group A	Functions	
	Oscillographic Fault Records	Ne Emetion	
	and General Device Settings ♥ Time Synchronization ♥ Interfaces ♥ Passwords ■ Language	Total Education 0011 Power System Data 2 0012 Distance protection, general settin 0015 Distance zones (Circle) 0029 Measurement Supervision 0038 Fault Locator	ngs
Por	wer System Line Status Trip 1-/3-pole ettings:		
Pov Se	wer System Line Status Trip 1-/3-pole ettings: No. Settings	5	Value
Poi	wer System Line Status Trip 1-/3-pole ettings: No. Settings 1103 Measurement: Full Scale Voltage (1	s 00%)	Value 154,0 kV
Poi	wer System Line Status Trip 1-/3-pole ettings: No. Settings 1103 Measurement: Full Scale Voltage (1 1104 Measurement: Full Scale Current (1	s 00%) 00%)	Value 154,0 kV 5000 A
Por	wer System Line Status Trip 1-/3-pole ettings: No. Settings 1103 Measurement: Full Scale Voltage (1 1104 Measurement: Full Scale Current (1 1105 Line Angle	s 00%) 00%)	Value 154,0 kV 5000 A 65 ° opt reversed
Por	wer System Line Status Trip 1-/3-pole ettings: No. Settings 1103 Measurement: Full Scale Voltage (1 1104 Measurement: Full Scale Current (1 1105 Line Angle 1107 P,Q operational measured values si 1107 × Line Reactance per length unit	s 00%) 00%) gn	Value 154,0 kV 5000 A 65 ° not reversed 0.0475 Ohm / km
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Por	wer System Line Status Trip 1-/3-pole ettings: No. Settings 1103 Measurement: Full Scale Voltage (1 1104 Measurement: Full Scale Current (1 1105 Line Angle 1107 P,Q operational measured values si 1110 X ⁻ Line Reactance per length unit 1111 Line Length 1116 Zero seq. comp. factor RE/RL for Z 1117 Zero seq. comp. factor RE/XL/Cr Z	9 00%) 00%) gn 1 1	Value 154,0 kV 5000 A 65 ° not reversed 0,0475 0 hm / km 80,0 km 1,50 0,67 407
Por	wer System Line Status Trip 1-/3-pole ettings: No. Settings No. Settings 1103 Measurement: Full Scale Voltage (1 1104 Measurement: Full Scale Voltage (1 1105 Line Angle 1107 P,Q operational measured values si 1110 Line Angle 1111 Line Length 1112 Zero seq, comp. factor RE/RL for Z 1113 Zero seq, comp. factor XE/XL (> Z1) 1114 Zero seq, comp. factor XE/XL (> Z1) 1117 Zero seq, comp. factor RE/RL (> Z1)	s 00%) 00%) gn 1 1	Value 154,0 kV 5000 A 65 * not reversed 0,0475 0 hm / km 80,0 km 1,50 0,67 1,00 0.67
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Pou	wer System Line Status Trip 1-/3-pole ettings: No. Settings 1103 Measurement: Full Scale Voltage (1 1104 Measurement: Full Scale Current (1 1105 Line Angle 1107 P,Q operational measured values si 1110 x' - Line Reactance per length unit 1111 Line Length 1116 Zero seq. comp. factor RE/RL for Z 1117 Zero seq. comp. factor RE/RL (> Z1) 1119 Zero seq. comp. factor XE/XL (> Z1)	s 00%) 00%) gn 1 1	Value 154,0 kV 5000 A 65° not reversed 0,0475 Ohm / km 1,50 0,677 1,00 0,67

Resim 6: Röle ayar ekranı

Offline Select function Settings Device Configuration M CFC Masking I/O (Configuration M Setting Group A X Setting Group A X Socillographic Records Setting Group A Socillographic Records Setting Group A Setting Group A X Socillographic Records Setting Group A Setting Group A X Setting Group A X Setting Group A X Setting Group A X Setting Group A Setting Group A Setting Group A X Setting Group A X Setting Group A Setting Group A General Earth faults Time Delays Setting Group A General Earth faults Time Delays Settings Settings: No. Settings No. Setting Group A Setting Group A General Earth faults Time Delays	Settings Setting Group A Setting Group A Setting Group A Setting Group A Setting Group A Oscillographic Records Setting Group A Setting Group A Setting Group A Oscillographic Records Setting Group A Setting Group A Setting Group A Oscillographic Records Setting Group A Setting Group A Setting Group A Oscillographic Records Setting Group A Setting Group A Setting Group A Setting Group A Setting Group A Oscillographic Records Setting Group A Setting Group A Setting Group A Settings Value Distance protection, general settings On Settings: Value Settings: Settings <td< th=""><th>atolye / Folder / 7SA612 V4.7 Var</th><th>2/7SA612</th><th></th><th></th></td<>	atolye / Folder / 7SA612 V4.7 Var	2/7SA612		
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A second se	Cocillographic Fault Records General Device Settings Uniterfaces Passwords are. Language Distance protection, general settings - Setting Group A General Earth faults Time Delays Settings No. Settings Value Distance protection 2 Passecure threshold for dist. meas. 0.10 2 Phase Current threshold for dist. 1222 Phase Current threshold for dist. 1233 Read, minimum Load Angle (ph-e) 4 1242 PHI load, maximum Load Angle (ph-ph) 4 1357 Z1B enabled before 1st AR (nt. or ext.)	Annunciation Measurement Scillographic Records	# Masking I/O (Configuration M 建てFC 留Power System Data 1 図 Setting Group A	Setting Group A ×	
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1206 Series compensated line 1232 Instantaneous trip after SwitchOnToFault Inac 1241 Ribad, minimum Load Impedance (ph-e) 0:00 Q 1242 PHI load, maximum Load Angle (ph-e) 0:00 Q 1243 R load, minimum Load Impedance (ph-ph) 0:00 Q 1244 PHI load, maximum Load Angle (ph-ph) 0:00 Q 1245 Z1B enabled before 1st AR (int. or ext.) 0:00 Q	1208 Series compensated line 1232 Instantaneous trip after SwitchOnToFault Inaction 1241 R load, minimum Load Impedance (ph-e) 00 O 1242 PHI load, maximum Load Angle (ph-e) 4 1243 R load, minimum Load Angle (ph-ph) 00 O 1244 PHI load, maximum Load Angle (ph-ph) 00 O 1244 PHI load, maximum Load Angle (ph-ph) 00 O 1244 PHI load, maximum Load Angle (ph-ph) 00 O 1257 Z1B enabled before 1st AR (int. or ext.) 00 O	c	Settings: No. Set 1201 Distance protection 1202 Dasse Current threshold for di	ittings Value	ON_
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1244 PHI load, maximum Load Angle (ph-ph) 4 1357 Z1B enabled before 1st AR (int. or ext.) 4	1244 PHI load, maximum Load Angle (ph-ph) 4 1357 Z1B enabled before 1st AR (int. or ext.) 5 Display additional settings 5		Beneral Earth faults Time Delays Settings: No. Set No. Distance protection 1202 1201 Distance protection 1202 1202 Phase Current threshold for di 1212 1203 Bistance bergensated line 1232 1204 Histantaneous trip after Switcl 1241 1242 Pitliced maximum Load Impedantaneous for the set of the set o	ttings Value ist. meas. NOnToFault I (0, e) (0, e) (0, e) (0, e) (0, e) (1, e) (ON N 0,10 A N Inactiv o Ohn
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	Display additional settings		Common Section Common Section No. Set 1201 Distance protection 1202 Phase Current threshold for di 1212 Reserve for fault resistance 1208 Series compensated line 1221 Instantaneous trip after Switcl 1241 PHI load, maximum Load Angle 1242 PHI load, maximum Load Impedan 1244 PHI load, maximum Load Impedan 1244 PHI load, maximum Load Impedan	Value ist. meas. (i) hOnToFault i icc (ph-e) or icc (ph-ph) or	ON N 0,10 A N Inactiv o Ohn 45 o Ohn 45
	☐ Display additional settings		Settings: No. Set 1201 Distance protection 1202 Phase Current threshold for di 1212 Reserve for fault resistance 1208 Series compensated line 1228 Instantaneous trip after Switch 1221 R load, minimum Load Impedan	ttings Value ist. meas. OnToFault I cce (ph-e) On	01 0,11

Resim 7: Röle ayar ekranı



Resim 8: Röle ayar ekranı

atolye / Folde	r / 7SA612 V4.1	/ Var 2/ /SA612			0		JL
Setting	15	Select function	Setting Group A			×	ŀ
	C	Masking I/O (Configuration M	Functions:				l
Annunciation		武 CFC F Power System Data 1	No. Funct	ion			l
🕂 🔛 Measu	rement graphic Recor	rds Setting Group A	0011 Powe 0012 Distar	/ System Data 2 nce protection, general settings			L
	grop ne neco	Store Contraction Contractic Contracti	0015 Distar	nce zones (Circle)			L
		General Device Settings	0029 Meas 0038 Fault	urement Supervision Locator			L
		7 Interfaces					
		Passwords					ſ
	Distance	Language			~	1	
	Distance 201	nes (encle) - Setting oroup A			^		
	Zone Z1	Zone Z1B-exten. Zone Z2 Zone Z3 Zone Z	Z4 Zone Z5 Zor	ne Z6			
	Settings:						
	No.	Settings		Value		1	l
	1301	Operating mode Z1 ZP(Z1), radius of circle Z1			Forward		Į
	1502	ALPHA(Z1), angle for R-reserve			65 °	1	l
	1305	T1-1phase, delay for single phase faults	70		0,00 sec		Į
_	1306	T1multi-ph, delay for multi phase faults			0,00 sec		
	🗖 Displa	y additional settings					
			10	11			
			Export	Graph	About		
	-			1			

Resim 9: Röle ayar ekranı

atolye / Folder /	75A612 V4.7 Var	2/7SA612		
S) Offline		Select function	Setting Group A	×
Settings		Masking I/O (Configuration M	Functions:	
Annuncia	tion	CFC	No. Function	
Heasurer	nent	Setting Group A	0011 Power System Data 2	
+ Scillogra	ipnic Records	Scillographic Fault Records	0015 Distance protection, general settings 0015 Distance zones (Circle)	
		General Device Settings	0029 Measurement Supervision	
		Time Synchronization	0038 Fault Locator	
		Passwords		
		abcLanguage		
[)istance zones (Circle) - Setting Group A	×	
			the set of the set	
	Zone Z1 Zone	e 21B-exten. 20he 22 Zone 23 Zone 2	4 Zone Z5 Zone Z6	
	Settings:			
	No.	Settings	Value	
	1311 Oper	ating mode Z2	Forward	
	1513 ALPH	HA(Z2), angle for R-reserve	65 °	
	1315 T2-1	phase, delay for single phase faults	0,40 sec	
	1316 T2mu	ulti-ph, delay for multi phase faults	0,40 sec	_
			2	
	Display add	ditional settings		
	Display add	litional settings		

Resim 10: Röle ayar ekranı

	/3A012 V4.7 V8F		
Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Settings Setti	tion nent aphic Records	Device Configuration Masking I/O (Configuration M CFC Power System Data 1 CFC Configuration Data 1 Cocillographic Fault Records General Device Settings Configuration Time Synchronization Time Synchronization Interfaces Ser Passwords	Secting Group A X Functions:
1	Distance zones (G	Circle) - Setting Group A	×
	Zone Z1 Zone Settings:	Z1B-exten. Zone Z2 Zone Z3 Zone Z	4 Zone Z5 Zone Z6
	No.	Settings	Value
	1321 Open	ating mode Z3 3), radius of circle Z3	Forward 7 220 Ohm
	1523 ALPH	A(Z3), angle for R-reserve	65°
	1325 T3 de	lay	0,80 sec

Resim 11: Röle ayar ekranı

JIGSI - atolye / F File Edit Insert	older / 7SA612 V4.7 Var 2/7SA612 Device View Options Window Help	
	DIGSI -> Device Ctrl+L	N 10 K?
atolye / Folder	Switch On/Off-line	
Doffline	Test Mode Block Data Transmission Reset LEDs	tion M
⊕-∑ Measur ⊕-⊠ Oscillor	Startup Restart	cords
	Operational Status Ctrl+D	
	Set Date and Time	1

Resim 12: Röle ayar ekranı