Activate HMI 500/REBWIN ver 6.10 or 7.xx. The following screen will appear. Check out the Read Only box & type the password "System". Click ok.

System log-on	
E Read only	
Password: *****	1
<u> </u>	<u>C</u> ancel

Connect the black communication cable from the Com port until the front HMI of the central unit. If there is any problem in communication, the following message will be displayed & the program will work off line.

REBWIN	×
⚠	Unable to communicate with the protection system. REBWIN will start in the off-line mode.
	ОК

If the communication is through, then the above message will not appear.

By default the last opened project will be opened.



To establish communication settings :

Tools :

Settings :

HMIS	00 - REBWI	N - [JU`AYM/	AH BSP]				
File Vie	w Settings	Configuration	Testing	Tools Wind	dows Help		
				Version			
				Reports			
				Change p Settings	assword		
				Set cycle	m lime		
				MMC coci	cino menorare		
				1000	n ya na na gyan '		
HMI5	00 - REB <mark>WI</mark>	N - [JU`AYMA	AH BSP]				
∃ile ⊻ie	w S <u>e</u> ttings	Configuration	Testing	T <u>o</u> ols <u>W</u> ind	dows <u>H</u> elp		
Setting	s						×
Progra	m settings [) atabase locatio	ns PSM	support			
	- Target com	munication			.ogfiles		
	Communica	ation mode			Vrite DB download	-	
	C On-line	Che	ck Online -		Vrite DB upload log fil	e	
	 Off-line 			┛╽└			
	C Simulat	ed					
	Communica	ition port:					
	COM1:	-					
	Communica	tion baud rate:		C	olumn limiter for ASCII expo	rt: j;	
	38400	•		E	vent reading interval:	10	
	ΰK		App		Bestore	Cancel	

This is used to set the communication settings for communicating from PC/Laptop to REB 500.

Click on Apply & then click OK.

One can upload the configuration file either from the REB 500 or from a stored data base. If it is to be uploaded from the REB 500 then go to file & do upload.



Else open the DB file that is available with you.



Select the database for the project required. E.g. juyamah_238010.MDB & click open.

Open database							? ×
Look <u>i</u> n:	🔁 Database			•	÷ 🖻 c	* 🎟 •	
History Desktop My Documents My Computer	 123456_610. 238011sp.MD Dammam_236 juyamah_238 Khobar_2367 migrate610.m Qatif_236910 work.mdb 	mdb B 810.MDB 010.MDB 10.MDB db .MDB					
My Network P	File <u>n</u> ame: Files of <u>t</u> ype:	juyamah_238 Installations	8010.MDB (*.mdb)]	- -	<u>O</u> pen Cancel
<mark>55 HMISOO - REBWIN - [JU`AY</mark> Ele <u>Vi</u> ew S <u>e</u> ttings <u>C</u> onfigurati	MAH BSP] on <u>T</u> esting T <u>o</u> ols <u>Wi</u> ndows	Feb					

Do not attempt to download DB file from BUs. If you face problems while reading the Binary inputs, please press the Reset knob on the main CU.

Settings :

System Response :

HMI500 - REBWIN -	[JU`AYMAH BSI	•]			
Eile ⊻iew Settings ⊆	onfiguration <u>T</u> esti	ng T <u>o</u> ols	<u>W</u> indows	Help	
System n	esponse				
Busbar pi Voltage /	rotection external release				
Bay Prote Overcum End fault	ection ent protection protection				
Event me	emory				
Communi	cation I				
System response	- I				
G Continuo in operal	alann 220				
C Pleak Pushar Prot	uori				
C Selective Block Bi	usbar Protection				
	usbar roccolorr				
For an isolator alarm					
 Continue in operat 	tion				
C Block Busbar Prot	ection and Intertripp	ing			
C Selective Block B	usbar Protection and	Intertrippir	ng		
Isc	olator operating time	10000	• [ms]		
Remol	te trip impulse width	200	• [ms]		
<u>o</u> k	<u>A</u>	pply		<u>R</u> estore	<u>C</u> ancel

Select the type of response you need for Differential Current alarm & for Isolator alarm. Input the Isolator operating time (this will ensure that there is no isolator alarm for this much of time period when the isolators are changing state). Also the minimum trip pulse can be defined in Remote Trip Impulse width. Click on Apply & then click OK.

Click on Apply & then click OK.

- 1) If Continue in operation is selected, then on differential/Isolator alarm, the BBP will trip once the set differential current is achieved.
- 2) If block BBP is selected then if Differential or Isolator alarm is available, then the complete BBP is blocked.
- 3) If block selective is selected then, the bus on which the alarm has appeared will be blocked. Here one has to notice that on alarm all the BUs that are on the same bus where the alarm is generated will be blocked. Note that the BBP Blocked Alarm will appear on all the BUs.

Busbar Protection :



Input the minimum differential operating current (in terms of primary) & also put the stability factor K. K defines the slop for Bias. Set the Differential Current alarm as well as the time delay.

Click on Apply & then click OK.



I	Time-overcurrent pro	tection		×	\subset	
	Details	Overvie	w			ouble click for
	Feeder	Label	Function	مسلم		
I	A619	T1	active		54	ettings /deactivate for
I	A617	T1	active		50	
I	A615	CT31	active			CDT
I	A613	CT29	active		()	CDT
I	A611	CT27	active			-
I	A609	CT1	active			
I	A607	CT3	active			
I	A605	CT5	active			
I	A603	CT7	active			
I	A601	CT9	active			
I	H	C110	active			
I	A602	UT12	active			
I	4.004	CT14	active			
I	A004	CT10	active			
I	A000	CT10	active			
I	A610	CT10	active			
I	A612	CT23	active			
I		III Galaati	aadar b N			
I	OK	Applu	Postoro	Canaal		
I		SPPY	Tiestore	Cancer		
	Details	Feeder components:				
lick h eacti	ere to vate OCDT	Time delay:	2000 💌 [ms]			
		Select f	eeder PI			
I	<u>U</u> K	Apply	Hestore	Lancel		

Set Pickup current & time delay.



Details	Overview					
			Emetion		C	
A619	Eegder CB		active	-		Double click for
A613	Feeder CB	00	active			
A617	Feeder CB	4615	active			settings /deactivate fo
A613	Feeder CB	A613	active			settings / deactivate to
A613	Feeder CB	A611	active			FED
4609	Feeder CB	4609	active			
4607	Feeder CB	A607	active		\sim	
4605	Feeder CB	4605	active			
4603	Feeder CB	A603	active			
4601	Coupler CB	4601	inactive			
A602	Coupler CB	A602	inactive			
A604	Eeeder CB	4604	active			
A606	Feeder CB	A606	active			
A608	Feeder CB	A608	active			
A610	Feeder CB	A610	active			
A612	Feeder CB	A612	active			
A614	Feeder CB	A614	active			
4616	Eeeder CB	00	active	-		
	- Applu	Postoro		-		
End fault protection				_		
Find fault protection	Overview			_		
The fault protection Details	Overview					
End fault protection	Overview Feeder: A619					
End fault protection Details	Overview Feeder: A619 Circuit-breaker type; Feeder	CB				
End fault protection Details Find fault protection active	Overview Feeder: A619 Circuit-breaker type: Feeder t	CB				
	Overview Feeder: [A613 Circuit-breaker type: Feeder I	CB				
C End fault protection Details	Overview Feeder: A619 Circuit-breaker type: Feeder t					
End fault protection Details Control End fault protection active	Overview Feeder: A619 Circuit-breaker type: Feeder t					
	Dverview Feeder: [A613 Circuit breaker type: [Feeder I					
	Overview Feeder: A619 Circuit-breaker type: Feeder t					
End fault protection Details Control fault protection active	Overview Feeder: A619 Circuit-breaker type: Feeder 1					
	Overview Feeder: A613 Circuit-breaker type: Feeder V Pick-up time: 400					
End fault protection Details Find fault protection active	Overview Feeder: A619 Circuit-breaker type: Feeder 1 					
End fault protection Details C End fault protection active c here to	Overview Feeder: A619 Circuit-breaker type: Feeder X Y Pick-up time: 400 Pick-up value:					
	Overview Feeder: A619 Circuit-breaker type: Feeder V V Pick-up time: 400 Pick-up value:	CB (ms) × I _N				
End fault protection Details If End fault protection active Find fault protection active A fault protection active	Overview Feeder: A619 Circuit-breaker type: Feeder I X Pick-up time: 400 Pick-up value:	CB (ms) × I _N				
End fault protection Details If and fault protection active End fault protection active A fault protection active	Overview Feeder: A619 Circuit-breaker type: Feeder 1 X Pick-up time: 400 Pick-up value:	□ [ms] ▼ [ms] ▼ × I N				
Find fault protection Details Find fault protection active Find fault protection active chere to ctivate EFP It It	Overview Feeder: A613 Circuit-breaker type: Feeder X Pick-up time: 400 Pick-up value:	CB				

Set pickup time & Pickup value. Pickup time is the time for which EFP will be inactive after CB close command input (momentary)is given.

Bay Protection :

т	MI500	- REBWI	N - [110/13.8	K¥ JEDD	AH NOR	TH 5/5]	
File	View	Settings	Configuration	Testing	Tools	Windows	Help
		System response Busbar protection Voltage / external release					
		Bay Protection					
		Event memory					
		Comm	unication	•			

View Settings	Configuration Testing Tools Windows He	lp	
ay Protection	- Configuration		×
			. (
Unit	Bays	 Continue 	Double click on the
=ABB01	AH01;		
=ABB02	AH02;	Copy	BU where you
=ABB03	AH03;		
=ABB04	AH04;		want to do the
=ABB05	AH05;	Paste	
=ABB06	AH06;		configuration
=ABB07	AH07;	Sequencer	
=ABB08	AH08;		
=ABB09	AH09;		1
=ABB10	AH10;	Ljose	
=ABB11	AH11;		
=ABB12	AH12;		
=ABB13	AH13;		
=ABB14	AH14;		
=ABB15	AH15;		1
=ABB16	AH16;AH17A;	Delete configuration	
=ABB17	AH17B:	-	

Select Protection Function - =ABB01		X
Drag the function block to the right side	ParSet 14 ParSet 1 ParSet 2 ParSet 3 ParSet 4 No. Func: P1 P2 P3 P4 Copy Of 1 BP Output P P P F	
Cancel		

Se	elect Protection Function - =ABB01		×
50	Delay Cogic	ParSet 14 ParSet 1 ParSet 2 ParSet 3 ParSet 4 No. Func. P1 P2 P3 P4 Copy Of 1 BP Couper I	
	Cancel		_

Select Protection Function - =ABB01	2
Delay Cogic	ParSet 14 ParSet 1 ParSet 2 ParSet 3 ParSet 4 No. Func: P1 P2 P3 P4 Copy Of 1 BP Image: Imag
Cancel	

Logic		×
Parameters		
Logic Mode OR 💌	Select the type of gate	
Block AND RS-FlipFlop	Binary Inp 1 ≥1	
Binary Input 1 (R1) Always FALSE		
Binary Input 2 (R2) Always FALSE	Binary Inp 2	arv Output
Binary Input 3 (S1) Always FALSE		
Binary Input 4 (S2) Always FALSE	Bina,	
Binary Output Signal	Select the different binary inputs	
OK Cancel		

Select Binary Input	×
TRUE / FALSE Output from Function	
 Select this if you want the inputs from any function or from Binary Inputs. Else select false if OR gate is used & True if AND gate is used & True if AND gate is used Always TRUE Always FALSE 	
OK Cancel	

Select Binary Input	×
TRUE / FALSE Output from Function	Default General Purpose 1 C 21110_TR 2 C 23105_BFF 3 C 23315_BFF 3 C 23325_BFF 4 C 23325_BFF 5 C 23325_BFF 6 C 25305_0CD1 7 C 21805_In serv Click here if you want to use the Binary inputs Inputs
OK Cancel	

Select Binary Input	×
TRUE / FALSE Output from Function	
BP Binary Input	Default General Purpose 1 Isolator Close 2 3 4 1 5 1 6 1 7 1 8 1 9 1 10 1 11 1 12 1 13 1 14 1 15 1 16 1 17 1 18 1 19 1
OK Cancel	

Logic			×
Parameters			
Logic Mode	OR		
Block	Always FALSE	Binary Inp 1 🔜 ≧ 1	
Binary Input 1 (R1)	BI General Sig. 1	Pinaru Ing 2	
Binary Input 2 (R2)	Always FALSE	binaiy inp 2	Binary Output
Binary Input 3 (S1)	Always FALSE		
Binary Input 4 (S2)	Always FALSE	Binary Inp 3 —	
		Binary Inp 4	
Binary Output Signal			
		Click OK. The Outputs have configured separately.	to be
ОК	Lancel		

Select Protection Function - =ABB01	×
Delay Logic	ParSet 14 ParSet 1 ParSet 2 ParSet 3 ParSet 4 No. Func. P1 P2 P3 P4 Copy Of 1 2 2 Double Click here o assign Binary Output
OK Cancel	

Bi	nary Output					×
	Default General Purpose			(Select this one	
	13610_BP_Trip_Transfer	Edit	Always FALSE			
	13770_BP_Start_BFP_L1	Edit	Always FALSE	(
	13775_BP_Start_BFP_L2	Edit	Always FALSE			
	13780_BP_Start_BFP_L3	Edit	Always FALSE			
	13785_BP_Start_BFP_L1L2L3	Edit	Always FALSE			
	29410_BP_Partial_Blocked	Edit	Always FALSE			
	Cancel					

Bi	nary Output				×
	Default General Purpose				
	BP Output Channel 1	Edit -	Always FALSE		
	BP Output Channel 2	Edit	Always FALSE	Select this one	
	BP Output Channel 3	Edit	Always FALSE		
	BP Output Channel 4	Edit	Always FALSE		
	BP Output Channel 5	Edit	Always FALSE		
	BP Output Channel 6	Edit	Always FALSE		
	BP Output Channel 7	Edit	Always FALSE		
	BP Output Channel 8	Edit	Always FALSE		
	BP Output Channel 9	Edit	Always FALSE		
	BP Output Channel 10	Edit	Always FALSE		
	BP Output Channel 11	Edit	Always FALSE		
	BP Output Channel 12	Edit	Always FALSE		•
	(OK) Cancel				

Select Binary Input	ъ
TRUE / FALSE Output from Eunction	
Select this one	
C Always TRUE Always FALSE	
]
Cancel	

Select Binary Input		×
Select Binary Input TRUE / FALSE Output from Function 02 Logic OR	Channel Inv. Signal Text	
	to invert the signal	
OK Cancel		

Go again to the logic & see that the output is assigned as shown below.

Logic					×
Parameters					
Logic Mode 0	R				
Block	Always FALSE	Binary Inp 1 —	≧1		
Binary Input 1 (R1)	Always FALSE	Discoulus 2			
Binary Input 2 (R2)	Always FALSE	Binary Inp 2			
Binary Input 3 (S1)	Always FALSE			entaly empiri	
Binary Input 4 (S2)	Always FALSE	Binary Inp 3 ——			
		Binary Inp 4			
Binary Output 01 BO: Ger Signal	neral Signal 1				
OK Cance	el				



	Binary module					×	
	Inputs	Outputs	Overv	iew			Doublo
Ш			Binary module				Double
Ш	ABB ref.	Feeder	Device		Slot Module	·	click on the
Ш	=ABB00		CU01		16 500BIO01		
Ш	=ABB00		CU01		10 5000		BH
Ш	=ABB01	AH01	-AH01		1 T500BU03_1		50
Ш	=ABB02	AH02	-AH02		1 T500BU03_1		
Ш	=ABB03	AH03	-AH03		1 T500BU03_1		
Ш	=ABB04	AH04	-AH04		1 T500BU03_1		
1	=ABB05	AH05	-AH05		1 T500BU03_1		
Ш	=ABB06	AH06	-AH06		1 T500BU03_1		
Ш	=ABB07	AH07	-AH07		1 T500BU03_1		
Ш	=ABB08	AH08	-AH08		1 T500BU03_1		
Ш	=ABB09	AH09	-AH09		1 T500BU03_1		
Ш	=ABB10	AH10	-AH10		1 T500BU03_1		
Ш	=ABB11	AH11	-AH11		1 T500BU03_1		
Ш	=ABB12	AH12	-AH12		1 T500BU03_1		
Ш	=ABB13	AH13	-AH13		1 T500BU03_1		
Ш	=ABB14	AH14	-AH14		1 T500BU03_1		
Ш	=ABB15	AH15	-AH15		1 T500BU03_1		
Ш	=ABB16	AH16, AH17A	-AH16		1 T500BU03_1		
Ш	=ABB17	AH17B	-AH17		1 T500BU03_1		
Ш	=ABB18	AH19	-AH18		1 T500BU03_1		
Ш	=ABB19	AH20	-AH19		1 T500BU03_1		
1	=ABB20	AH21	-AH20		1 T500BU03_1		
1	=ABB21	AH22	-AH21		1 T500BU03_1		
	=ABB22	AH23	-AH22		1 T500BU03_1		
	=ABB23	AH24	-AH23		1 T500BU03_1		
	=ABB24	AH25	-AH24		1 T500BU03_1		
	=ABB25	AH26	-AH25		1 T500BU03_1		
	<u>N</u> ew signal		H 4	Select module			
	Delete	OC event config.	<u></u> K	Apply	<u>R</u> estore	Cancel	

HMI500 - REBWIN - [110/13.8KV JEDDAH NORTH 5/5]	
Ele View Settings Configuration Testing Tools Windows Help	
Inputs Outputs Overview	
ABB reference: =ABB01 Type: Bay unit Device: AH01 Storm	
Details Overview	Select Output
	Tab
CR01 CR02 CR03 CR04 CR05 CR06 CR07 CR08 CR09 CR10 CR11 CR12 CR13 CR14 CR15 CR16	
Output signals CR CR	
AH01.21820 Alarm × .	
AH01.21110_TRIP	
Click here	
Delete CB event confin	
On-line Edit Database version: 7.00 D:\HMI500\REBCON 7.00 EN\DATABASE\JEDDAH NOR	TH 13.8 KV SYSTEM FINAL W CB.MDB 🔬

Select binary signal										×
Select signal										
Signal Type		Signal								
Bay Protection	•	222	805_LI	DGIC B	inary ()	utput.2				•
		136	10_BP	_Trip_T	ransfe	r				-
Signal allocation		13770_BP_Start_BFP_L1								1
		137	75_BP	_Start_	BFP_L	2				
		137	80_BP	_Start_	BFP_L	3				
		137	85_BP	_Start_	BFP_L	1L2L3				
		294	05_BP	_block	ed					
		294	10_BP	_partial	_block	ed				_
	0	298	05_BP	_Test_	Sequer	nce_ac	tive			
	- Ch	- 222	805_LI	յնլը թ	inary U	utput.2				
Output signals		Ln j	un	UN	un	un	Un	Un	un	머니
		01	02	03	04	05	06	07	08	09
AD01.21820 Alarm		x								
AD01.21110_TRIP(2)			х							
AD01.21110_TRIP				х		×	x	×		
AD01.24305_EFP trip					х					×
New signal						[4			Se
Delete	C	R eve	nt conf	ig.			ļ	<u>0</u> K		,

Binary module							
Inputs	γ	Dutputs		Overview	<u> </u>		
ABB reference: =ABBI)1 Type:	Bay unit	Device:	AD01	Slot	1	
Details		Iverview					
· Output signal:	AD01.222805_L()GIC Binary Outpu	it.2				
Signal delay							
		6				t 0	• [ms]
C Latching		Reset	delay		L		
If output signals are blocke	d system wide						
 do really block this signal 	nal	🔘 do not	t block this sig	nal			
Tripping relay output							
CR01	CR02	CR03	CR	04 🔲 CROS		CR06 🗌	CR07
🔽 CR08 🔲 CR09	CR10	CR11	CR12	CR13	🗖 CR	14 🗖 CR15	CR16
Event configuration							
	O No record	ling	• F	ecording			
Generate Event							
at leading edge		User defined text	t	Isolator Alarm			
🔲 at lagging edge		Default text:		AD01.222805_L0	GIC Binary	Output.2	
Send event to:							
		Iv External I	MMU connect	ed to central unit			
L IBB 2		External I	MMC connect	ed to bay unit			
			14	Select :	signal	► H]
<u>N</u> ew signal				Select n	nodule	• •]
							-

Select binary signal		X
- Select signal		
Signal Type	Signal	
General Signals	21840_GP_Out_1	•
	21105_EXTERNAL	LTRIP
Signal allocation	21105_EXTERNAL	L TRIP(2)
	21115_REMOTE_1	TRIP
	21115_REMOTE_	TRIP(2)
	21120_EXT_TEST	_TRIP
	21305_Trip	
	21405_SP_blocker	d
	21410_Output relay	ys blocked
Criticz	21805_In service	¢
Output signals	21810_Loss of sup	iply voltage
	21815_Inspection/	/ maintenance
N AH01 21920 Alarm	21840_GP_Out_1	-
AH01.21110 TBIP(2)	21845_GP_Out_2	
AH01.21110 TRIP	21850_GP_Out_3	
Anonzerino_inin	21855_GP_Out_4	
	21860_GP_Out_5	
	21865_GP_Out_6	
	21870_GP_Out_7	
	21875_GP_Out_8	
	21880_GP_Out_9	
	21885_GP_Out_10)
New signal		
<u>ixew signal</u>		
<u>D</u> elete	<u>C</u> R event config.	<u>0</u> K /

Configuration :

Activate /Deactivate :

Т	MI500	- REBWI	N-[JU`AYMA	H BSP]			
Eile	⊻iew	Settings	<u>C</u> onfiguration	Testing	T <u>o</u> ols	Windows	Help
			Activate / d	eactivate	device		
			Isolators Circuit-brea Current tran Voltage tran BP Licences	kers hsformers hsformers			
			Device struc Binary modu Disturbance	ture ile recorder			
			LMI LED				
			CB inspectio	'n			
			GPS Time Sy	nchronisa	ation		

Use this option if you want to deactivate (do not want the currents of these units to be used for differential current calculations) some bay units.

Active/deactive device			_	. 🗆 🗙			
ABB references	Modules in the	e central unit	System objects				
	Bay ur	nit status					
ABB ref.	Feeder		Status	_ <u></u> ▲			
=ABB01	A619		inactive				
=ABB02	A617		inactive				
=ABB03	A615		active				
=ABB04	A613		active				
=ABB05	A611		active	•			
	The	connection of inactivated voltag	e transformers is alway	s open!			
Activate (no objects)		Deactivate (all objects open)					
A <u>c</u> tivate (all)		Deactivate (all objects closed)					
			(<u>C</u> anc	el)			

Select the Bay or feeder that you want to Activate/ Deactivate. Select Deactivate (all objects open) to Deactivate & select Activate (all) to activate a feeder.

Activate (no objects) : The BU is activated with the CT measurement out. Note that if both isolators are closed (for double bus system), then the CT measurement is automatically considered.

Activate (all) : The BU is activated with all objects in their actual states.

Deactivate (all objects open) : The BU is deactivated with all the objects considered Open.

Deactivate (all objects closed) : The BU is deactivated with all the Isolators & Breakers considered closed.





Circuit Breakers :

rcuit-breakers		10005 11	indotto (Tolb				<i>(</i>	
Details		Пve	ruiou				(Al	ways use the
Distans			a 41644					tondad Blacking
der filter 🔲		CB filt	er				"	lenueu biocking
Feeder	Туре	Label	Breaker	Extended blocking	Breaker position	1-1	fo	r BC & BS. The
			reclaim time	function for	used for BBP			
			[ms]	bus tie-breaker			m	easurement's are
AD12	Feeder CB	QO	120	•	No		l no	t takon into
AD13	Feeder CB	QO	120	•	No			
AD14	Feeder CB	QO	120	•	No		/ ar	count in case of
AD15	Feeder CB	QO	120	•	No		au	count in case of
AD16	Feeder CB	QO	120	•	No		10	ad transfer or
AD17A	Coupler CB	QO	120	Yes	Y		20	
AD18A	Coupler CB	QO	120	Yes 🖌 🥌			hc	th Isolators
AD19B	Coupler CB	QO	120	Yes J	Yes		7 ~~	
AD20	Feeder CB	QO	120	•	No			nsed
AD21	Feeder CB	QO	120	•	No			
AD22	Feeder CB	QO	120	•	No		\sim	
AD23	Feeder CB	QO	120	•	No			
AD24	Feeder CB	QO	120	•	No	-		
	III €	Se	elect CB	► FI				
<u>0</u> K	AP	oly	E	estore	<u>C</u> ancel			



For the above figure both isolators are closed for AD 16, the BS & BC breakers are closed, the isolators Q2A & Q2B are closed & feeder AD 20 is connected to Bus 2. If extended blocking for Bus-Tie breakers is made Yes, then the current measurements of BU & BS breakers is not considered in event of load transfer. If it is made No, then the current measurements of BU & BS are considered.

Modules in Central Unit :

Ŧ٢	MI500) - REBWI	IN - [JU`AYMA	H BSP]							
Eile	⊻iew	Settings	⊆onfiguration	Testing	T <u>o</u> ols	Windows	Help				
	Active	/deactive	e device								_ 🗆 X
\square		ABB refere	ences) M	Iodules	in the centr	al unit		9	System objects	
				S	itatus ol	f central uni	t modul	les			
	Centr	al unit		Module					Slot	Status	^
	-F391	.CU1		500PSM0)3				1	active	
	-F391	.CU1		500CPU0)4				4	active	
	-F391	.CU1		500TRM	02				5	active	
	-F391	.CU1		500CPU0)4				7	active	
	-F391	.CU1		500TRM)2				8	active	
	-F391	.CU1		500CPU0)4				10	active	
	-F391	.CU1		500TRM)2				11	active	
	-F391	.CU1		500SCM0)1				17	active	
	-F391	.CU1		500B1001	1				18	active	
	-F391	.CU1		500B1001	1				19	active	
	-F391	.CU1		500PSM0)3				20	active	
	-F391	.CU2		500PSM0)3				1	active	
	-F391	.CU2		500MBA0)1				5	active	
	-F391	.CU2		500MBA0)1				6	active	
	-F391	.CU2		500MBA0)1				8	active	
	-F391	.CU2		500SCM0)1				12	active	-
			Activate				þ	nactivate			
										[Cancel

This displays all the feeders that are available & their status. Also the different Hardware that is available in the central unit can be seen from here.

Do not touch the System Objects screen.

Active/de	eactive device
⚠	Activating and inactivating objects indiscriminately may produce configurations that cannot be interpreted correctly by the system or no longer correspond to the primary system.
	Consult the supplier before inactivating system objects.
	(OK

HMI500 - REBWIN -	[JU`AYMAH BSP]	als Windows Help		
Active/deactive de	evice	No Wildows Gab		_ 🗆 🗙
ABB reference	es Modu	les in the central unit	System objects	
ABB reference	Feeder	System object	Status	-
▶ =ABB01	A619	Q1	inactive open	
		Q2	inactive open	
		QO	inactive open	
		T1	inactive open	
		T5	inactive open	
=ABB02	A617	Q1	inactive open	
		Q2	inactive open	
		QO	inactive open	
		T1	inactive open	
		T5	inactive open	
=ABB03	A615	Q1	active	
		Q2	active	
		QO	active	•
		The connection of inact	ivated voltage transformers is al	ways open
	Activate		Inactivate (object open)	
			Inactivate (object glosed)	
			Ca	incel

This screen gives the complete break down for the hardware of each feeder (Isolators, breakers, CTs, VTs) and their status.

Current transformers :



Use this to input the CT ratios.

Ŧ١	IMI500) - REBWI	N - [JU`I	AYMA	H BSP]									
Eile	⊻iew	Settings	⊆onfigur	ation	Testing	T <u>o</u> ols	Wind	dows	Help					
	Currer	nt transfo	rmers										_	
7	Details Querview													
⊫														
Fe	eder filt	erj												
∥┌╴	Feed	er		Labe				11.	12.13	11.12.13		14	14	
								P	rimary	Secondary	F	rimary	Secondary	
⊪ъ	A619	1		T1					1600	1		1600	1	
	A617			T1					1600	1		1600	1	
	A615			T1					1600	1		1600	1	
	A613			T1					1600	1		1600	1	
	A611			T1					1600	1		1600	1	
	A609			T1					1600	1		1600	1	
	A607			T1					2500	1		2500	1	
	A605			T1					1600	1		1600	1	
	A603			T1					1600	1		1600	1	
	A601			T1					3000	1		3000	1	
				T2					3000	1		3000	1	
	A602			T1					3000	1		3000	1	
				T2					3000	1		3000	1	
	A604			T1					1600	1		1600	1	
Ľ۵	ممميا		1	a la l					4000			4000		
				4		Select	currer	nt tran:	stormer	,				
		<u>0</u> K			Appl	y			F	estore			<u>C</u> ancel	

Double click on any feeder to change the CT ratio. The same screen can be made available by selecting the feeder & then selecting Details.

Ŧ	HMI500	- REBWI	N - [JU`AYM	AH BSP]					
Eile	⊻iew	S <u>e</u> ttings	Configuration	<u>T</u> esting	T <u>o</u> ols	<u>W</u> indows	<u>H</u> elp		
Þ	Curren	t transfo	rmers						
ſ		Detail	\$)		Overview			
				Feeder	compone	ents: 🗛619			
					Markir	ngs: T1			
	- Transfo	rmer ratio-		" 	1, 12, 13: 14:	160		/ <u>1</u>	v
			- Inda		Calaat				
		ОК		Ann	Select	current trai	Bestore		Cancel

Click on Apply & then click OK.

Voltage Transformers :



Use this to input VT ratios.

Ŧ۲	IMI500) - REBWI	N - [JU	`AYMAI	H BS	P]							
Eile	⊻iew	S <u>e</u> ttings	⊆onfigu	uration	Test	ing T <u>o</u> ol	s <u>W</u> in	dows	Help				
M	Voltag	e transfo	rmers										x
		Detai	ls		Y		Over	view)				
Fe	eder filt	ed [
	Feed	ler	Labe	I	Τ	U1, U2, L Prima	I3 U1, ry Sec	U2, U3 ondary	U4 Primary	U4 Secondary	U5 Primary	U5 Secondary	Ŀ
⊪ъ	A619	1	T5			1150	00 100		115000	100	115000	100	
	A617		T5			1150	00 100		115000	100	115000	100	
	A615		T5			1150	00 100		115000	100	115000	100	7
	A613		T5			1150	00 100		115000	100	115000	100	7
	A611		T5			1150	00 100		115000	100	115000	100	
	A609		T5			1150	00 100		115000	100	115000	100	1
	A607		T5			1150	00 100		115000	100	115000	100	1
	A605		T5			1150	00 100		115000	100	115000	100	1
	A603		T5			1150	00 100		115000	100	115000	100	1
	BUS1	I-VT	T15			1150	00 100		115000	100	115000	100	1
	BUS3	3A-VT	T25			1150	00 100		115000	100	115000	100	1
	BUS2	2-VT	T15			1150	00 100		115000	100	115000	100	1
	BUS3	3B-VT	T25			1150	00 100		115000	100	115000	100	1
	A604		T5			1150	00 100		115000	100	115000	100	1.
	ممميا		2.0				مميلمم				445000	400	
						Sele	ct voltaj	ge trans	former	N N			
		<u>0</u> K			Į	Apply			<u>R</u> estore		<u></u>	ancel	

Double click on any feeder to change the VT ratio. The same screen can be made available by selecting the feeder & then selecting Details.

Ŧ١	IMI500) - REBWI	N - [JU	`AYMA	H BSP]								
Eile	⊻iew	S <u>e</u> ttings	⊆onfigu	ration	Testing	T <u>o</u> ols	<u>W</u> indows	<u>H</u> elp					
1	Voltag	e transfo	rmers										_ 🗆 🗵
C		Detai	ls)		Overview		7	1			
					Feeder c	ompone	ents: 🗚 🗛 🗛 🗛 🗛						
						Marki	ngs: T5						
F	Transfo	mer ratio —			U1, U	12, U3:	115000	•	7	100	•		
						U4: [115000	•	7	100	- -		
						U5:	115000	-	7	100	•		
	Input vo	ltage scalir	ng factor										
					U1, U	12, U3:	1.000	- -		3Phase_	Star	- -	
						U4:	1.000	÷		1Phase_	Phase	- -	
						U5:	1.000	÷		1Phase_	Phase	÷	
									_		1		
						Select	voltage trar	nsformer		• •			
		<u>0</u> K			Appl	y		<u>R</u> esi	tore			Canc	el

Click on Apply & then click OK.

Binary Module :

₫н	MI500) - REBWI	N-[JU`AYMA	H BSP]			
File	View	Settings	Configuration	Testing	Tools	Windows	Help
			Activate / d	Activate / deactivate device			
			Isolators Circuit-breal Current trar Voltage trar BP Licences Device struc Binary modu Disturbance LMI LED CB inspectio	kers Isformers Isformers ture Ie recorder			
			GPS Time Sy	nchronisa	ation		

Use this to configure Inputs & Outputs.

4DD				
ADD (Binary module		
ABB IEI.	Feeder	Device	Slot	Module
=ABB00		+F391.CU1	19	500BI001
=ABBOO		-F391.CU1	18	500BI001
=ABB01	A619	-F391.01	1	T500BU03_2
=ABB02	A617	-F391.02	1	T500BU03_2
=ABB03	A615	-F391.03	1	T500BU03_2
=ABB04	A613	-F391.04	1	T500BU03_2
=ABB05	A611	-F391.05	1	T500BU03_2
=ABB06	A609	-F391.06	1	T500BU03_2
=ABB07	A607	-F391.07	1	T500BU03_2
=ABB08	A605	-F391.08	1	T500BU03_2
=ABB09	A603	-F391.09	1	T500BU03_2
=ABB10	BUS1-VT, A601	-F391.10	1	T500BU03_2
=ABB11	BUS3A-VT, ,	-F391.11	1	T500BU03_2
=ABB12	A602, BUS2-VT	-F391.12	1	T500BU03_2
=ABB13	BUS3B-VT	-F391.13	1	T500BU03_2
=ABB14	A604	-F391.14	1	T500BU03_2
=ABB15	A606	-F391.15	1	T500BU03_2
=ABB16	A608	-F391.16	1	T500BU03_2
=ABB17	A610	-F391.17	1	T500BU03_2
=ABB18	A612	-F391.18	1	T500BU03_2
=ABB19	A614	-F391.19	1	T500BU03_2
=ABB20	A616	-F391.20	1	T500BU03_2
=ABB21	A618	-F391.21	1	T500BU03_2
=ABB22	A620	-F391.22	1	T500BU03_2
=ABB23	A622	-F391.23	1	T500BU03_2
<u>N</u> ew signal		I € Select mo	dule	► H

Select any feeder or BIO from Central Unit & then double click.

💕 Binary module																X
Inputs		Outputs			Y		Ov	erview								
ABB reference: =ABB	00	Type: BIOs in 0	20		De	vice: 🕞	391.CL	J1	_	Slo	: 19]				
Details	$ \ge \gamma $	Overview	v		<u>}_</u>											
		A1 A2 A3	A4 5 A	≜Ę 			A8 20006	A9 A 200	1011 A	12 3	۵	.13 A1	14 A15	5 A16	17A18	
	Aux.	voltage [V]	125	<u> </u>		Aux.	voltage	•[V]	125	•		Au	ux. volta	age 1	25 👱	
Input signals			(DC 01	0C 02	0C 03	0C 04	0C 05	0C 06	0C 07	0C 08	0C 09	0C 10	0C 11	0C 12	
31905_Accept bus imag 31810_External reset 3205_Block BBP 34215_Block EFP BUS-1.31105_External T	e alarm RIP BB zon	° ck here t	o ac	bk	ne	w s	igna	al		×	×					
<u>N</u> ew signal					14			Se	ect mo	dule			► H			
<u>D</u> elete	00	event config.				<u>0</u> K		4	Apply		E	estore		<u>(</u>	ancel	

Click on Input or Output tab to navigate between Inputs & Outputs.

Select binary signal		×
- Select signal		
Signal Type	Signal	
General Signals General Signals	31105_External TRIP BB zone	•
BBP EFP OCDT DR ba	ar section BUS-2	•
1	<u>D</u> K <u>C</u> anc	el

Select type of signals. Click on Apply & then click OK.

For Isolator/Breaker allocation, an option will be available for choosing the right Isolator/Breaker.

Select binary signal			2
Select signal Signal Type		Signal	
General Signals	•	11530_Isolator/Breaker position	-
		11105_External TRIP	-
- Signal allocation		11110_External TRIP BB zone	Т
		11115_Ext_Test_TRIP	
	Circuit-breaker/I	11205_Block_SP	
		11210_Block output relays	
		11215_Ext. measuring disturbed	-
		11510_Supervision aux. voltage_1	
		11515_Supervision aux. voltage_2	ł
Aux.		11520_Supervision aux. voltage_3	F
voltage [V] 125	⊥ 1 ¹²⁵ ⊥	11525_Supervision aux. voltage_4	ļ
Input signals		11530_Isolator/Breaker position	F
in participation		11605_External release Trip	
		11610_External reset	ŀ
		11615_Inspection_1-Off	
		11620_Inspection_1-On	
		11625_Inspection_2-Off	
		11630_Inspection_2-On	
		11635_Inspection_3-Off	
		11640_Inspection_3-On	
		11645_Inspection_4-Off	
		11650_Inspection_4-On	-
		11645_Inspection_4-0ff 11645_Inspection_4-0ff	
•			
<u>N</u> ew signal			Se
<u>D</u> elete	00	event config. DK	ł

Select binary signal			×
- Select signal			
Signal Type	Signal		
General Signals	▼ 11530_	Isolator/Breaker position	_
Signal allocation			
	Circuit-breaker/Isolator	\ D603	<u> </u>
		\ D603	
		\ D607	
		<u>0</u> K	<u>C</u> ancel

Inputs	Outputs	Υ	Overview		
ABB reference: ABB17	Type: Bay unit	Device: AD17	7 Slot	1	
Details	Overview				
Input signal:	AD17A.11110_External TRI	PBB zone			
Contact mode					
C No auxiliary contact	One auxiliary contact				
		CLOSE sid	anal		
					- 1
Prolongation of input signal:	0 <u> </u>] Upto-cou	pler input:	l l'	ī
		Invert sig	nal:		
vent configuration					
	O No recording	Record	rding		
Generate Event	Liser defir	ad heat			
↓ at leading edge	Default te		1110_External TRIP BB 201 1174 11110 External TRIP	ne BB zone	
Send event to:	e ordan te			00 20110	
🗖 IBB 1	🔽 Ex	ternal MMC connected to	central unit		
📕 IBB 2	IV E>	ternal MMC connected to	bay unit		
			Select signal	► H	
Newsignal			Select module		
			Selectifiedule		

Binary Output :

			2	<
Inputs	Outputs	Overview		
ABB reference: =ABB0	00 Type: BIOs in CU	Device: -F391.CU1 Slot: 19		
Details	Overview	-)		Click here to select
Output signal:	42405_BBP blocked			Latched contacts
Signal delay C Latching If output signals are blocke C do really block this sig Tripping relay output	d system wide nal c do not	t block this signal		The contacts operate for 5S. If extra time
Event configuration	C No recording	© Recording		required, put
Event configuration Generate Event	C No recording	ି Recording		delay is required, put the time here
Event configuration	C No recording User defined text	Recording 42405_BBP blocked 1005_DBD blocked		delay is required, put the time here
Event configuration Generate Event I at leading edge I at lagging edge	C No recording User defined text Default text:	Recording 42405_BBP blocked 42405_BBP blocked		delay is required, put the time here
Event configuration Generate Event iv at leading edge iv at lagging edge Send event to: iv IBB 1	C No recording User defined text Default text:	Recording 42405_BBP blocked 42405_BBP blocked C External MMC connected to central unit		delay is required, put the time here
Event configuration Generate Event V at leading edge Send event to: 188.1 188.2	C No recording User defined text Default text:	Recording		delay is required, put the time here
Event configuration	C No recording User defined text Default text:	Recording 42405_BBP blocked 42405_BBP blocked External MMC connected to central unit External MMC connected to bey unit Select signal		delay is required, put the time here
Event configuration Generate Event G at leading edge G at lagging edge Send event to: BB 1 BB 1 BB 2 New signal	C No recording User defined text Default text:	Recording 42405_BBP blocked 42405_BBP blocked External MMC connected to central unit External MMC connected to bay unit. External MMC connected to bay unit. Select signal 4 Select module	> H	delay is required, put the time here

In this way, one can configure all the inputs & Outputs for the Central as well as the Bay Units.

Disturbance Recorder :





The sampling rate decides how long the record will be recorded.



New signal	1
Available binary signals	
Signal Slot 🔺	
A619.11105_External TRIP 1	
A619.11505_Close command CB 1	
A619.21805_In service 1	
After allocating all signals, click here	
<u>OK</u> <u>Apply</u> <u>C</u> ancel	
Disturbance recorder Image: Signal Configuration Overview ABB reference: ABB reference: ABB reference: ABB reference: Station number: Image: Signal Voltage inputs Signal Voltage inputs Binary signals Mating 11110_External TRIP BB zone 1 Astis 21105_EXTERNAL TRIP 2 Astis 21105_EXTERNAL TRIP 3 Astis 21105_EXTERNAL TRIP 3 Astis 21105_ETP REMOTE TRIP 4 Astis 21105_ETP REMOTE TRIP 4 Astis 2105_ETP REMOTE TRIP 4 Astis 2105_ETP REMOTE TRIP 4 Astis 2105_ETP REMOTE TRIP 5 Astis 2505_OCDT TRIP 5 QK Apply Bestore Qisturbance recorder M Delete signal	ere to get s for trigger s
Configuration Overview License status ABB reference: mADB01 Feeder: A619 Image: Configuration	
Station number: 1 T	
P Disturbance recorder active Click he	ere to navigate to
✓ Voltage inputs The next	t feeder
Orthographic Signal Signal Signal Text Trigger A A619.11110_External TRIP B8 zone 1 11110_External TRIP Imaging edge A A619.21110_EXTERNAL TRIP 2 21105_EXTERNAL TRIP Imaging edge A 619.21110_ETRIP 3 21110_EFR Imaging edge A 619.20105_EXTERNAL TRIP 4 24105_EFR EMOTE both edges A 619.20105_UCDT TRIP 5 25105_OCDT TRIP 5 25105_OCDT TRIP	
New signal 14 4 Select disturbance recorder N Delete signal	

Once all the settings have been done then download the configuration to the Central Unit.

т	HMI500 - REBWIN - [JU`AYMAH BSP]										
File	⊻iew	Settings	\underline{C} onfiguration	Testing	Tools	<u>W</u> indows	Help				
0 Si	pen ave as.										
	pload fi	rom protec	tion system								
D	ownloa	d to protec	tion system								
	ompare										
E	xit										

Tools :

Reports :

ĒН	MI500	- REBWI	N - [JU`AYM	AH BSP]				
File	View	Settings	Configuration	Testing	Tools	Windows	Help	
					Vers	sion		
					Rep	orts		
					Cha Sett	inge passw tings	ord	
					Set	system tim	е	
					MM	C session m	anager	



The Disturbance recorder configuration/ Overview gives the reference between ABB reference number & the Bay numbers.

REB50	0 Station: '	JU`AYMA	H BSP'						ABB	
Disturba	ance recorder co	onfiguration	/ overview							
A BB ref.	Fee der	Station number	Analogue channe lu	Sampling frequency Not	Number of records	Recording time [1]	Pre-faultime (I)	Should memory overflow	Function	
-A8801	A5 19	1	4I + SU 2880	2	0.75	0.00	Ouenwithe oldest	actue		
-A8802	A6 17	2	4I + SU 288B	2	0.75	0.00	Ouenwithe oldest	actue		
-A8803	A615	3	41 + 50 2880	2	0.75	0.00	Ouenwithe oldest	actue		
-A8804	A613	•	4I + SU 2880	2	0.75	0.00	Ouenwitte oldest record (FIFC)	actue		
-A8805	A611	5	41 + 50 2880	2	0.75	0.00	O us no mis oldest	actue		
-A8805	A609	6	4I + SU 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A8807	ASDT	7	41 + 50 2880	2	0.75	0.00	Ouerwithe oldest record (FIFO)	actue		
-A8806	ASDS	8	4I + SU 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A8809	A603	9	41 + 50 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 10	BUS1-VT, A501	10	4I + SU 2880	2	0.75	0.00	Ouerwithe oldest record (FIFO)	actue		
-A8811	BUS3A-VT,,	11	41 + 50 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 12	A602, 8 US2-VT	12	41 + 50 2880	2	0.76	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 13	8US38-VT	13	4I + 5U 288B	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A8814	A604	14	41 + 50 2880	2	0.76	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 15	A605	15	4I + 5U 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 16	A6D8	16	41 + 50 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 17	A610	17	41 + 5U 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 18	A612	18	41 + 50 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
-A88 19	A514	19	4I + SU 2880	2	0.75	0.00	Ouenwithe oldest record (FIFO)	actue		
										_
Systemfil	e: JUYAMAH_2380	10.MDB V1.	00A 10/25/200	4	REBWIN Ver	sion 6.10 Rev.1			Page: 1/2	

The Star coupler allocation report gives us which bay unit is supposed to be connected to which star coupler (via fiber optic cable).

Ξŀ	IMI500 - REBWIN - [JU`AYMAH BSP]		
Eile	<u>View</u> S <u>e</u> ttings <u>C</u> onfiguration <u>T</u> esting T <u>o</u> ols <u>W</u> indows <u>H</u> elp		
3	Reports		
	Report	•	Preview
	Event memory		Print
	Binary module configuration / Inputs		<u> </u>
	Binary module configuration / Outputs		PD <u>F</u> File
	Binary module: event configuration for opto-couplers		HTML
	Binary module: event configuration for tripping relays		
	Binary module: event configuration for input signals		Connect
	Binary module: event configuration for output signals		
	Disturbance recorder configuration / overview		B 1 C
	Disturbance recorder configuration / signals		Printing quality
	Isolators		C Draft
	Circuit-breakers		
	Current transformers		Normal
	Voltage transformers		
	Bus section and device allocation		
	Star coupler allocation		
	Device structure		_
	CB inspection	-	Print all reports

	REB500 Station: 'JU'	AYMAH BSP'			ABB	
	Star coupler allocation					
	Central unit	Slot	Pair of contacts	ABB ref.	Bus section	
	-F391.CU1	17	1		1	
			2		2	
			3		3	
			5			
	-F391.CU2	19	1 <u>1</u>		Ĭ	1
			2	=ABB01	1	1
			3	=ABB02	1	1
			4	=ABBU3	1	1
		18	1	=ABB05		
			2	=ABB06	1	1
			3	=ABB07	1	1
			4	=ABB08 =ABB00	1	
		17	1	-Abbue	2	
			2	=ABB 10	2	
			3	=ABB11	2	1
			4	=ABB12	2	1
		48	1	=ABB13 =ABB14	2	
		10	2	=ABB 15	2	
			3	=ABB 16	2	1
			4	=ABB 17	2	1
		AE	5	=ABB 18	2	1
		OI	2	-ADD 18		
			3	=ABB20	3	
			4	=ABB21	3	
			5	=ABB22	3	
		12	+ 1	+	- 1	
			3		3	
	<u></u>				;;	
	Systemfile: JUYAMAH_238010.M	DB V1.00A 10/25/2004	REBWIN Versi	ion 6.10 Rev.1	Page: 1/2	
1						
						1

Ensure that all fiber optic cables are connected from the central unit to the various bay units.

Start the secondary injection test by injecting only in one bay unit at a time. Ensure that the Binary inputs for Isolators/Breakers are activated.

Record the readings on the REB 500 STR.

View :

Single Line Diagram :









Click on Update Status to get the status of the Isolator/Breaker positions as well as the currents read by the BU's. The Active BUs are shown as dark where as the inactive BUs are faded. Green indicates Closed, Red indicates Open & Yellow indicates Invalid status.

Protection Zone Measurements :

2. E	Prote	ction zone mea	surements					_ 🗆 X
		Detailed view		Overviev	v			
				Protection zone m	easuremen	ts		
	No.	Busbar zones		L1	L2	L3	Measurement assigned	·
	1	BUS-1		invalid	invalid	invalid		
	2	BUS-3A		invalid	invalid	invalid		
	3	BUS-2		0	0	0	X	
	/ 4	BUS-3B		invalid	invalid	invalid		
		Refresh		Select protecti	on zone		► N C	ose

This screen gives the status of the different zones. In our case we have a total of 4 zones. However only 2 BUs are active. Both the BUs are connect to Bus 2. Thus only Bus-2 zone is valid. Double click on the desired Zone to see the currents.

Hereition zone measurements					_ 🗆 ×
Detailed view	Ove	rview			
	No.:	3			
	Busbar zones:	BUS-2			
Meas	urement assigned:	,			
Feeder		L1	L2	L3	-
A612		1600	1600	1596	
_/ A614		0	0	0	
					T
Differential current:	21	0	0	0	
Restraining current:	ΣΙΙ	1600	1600	1596	
Stability factor:	k	0.00	0.00	0.00	
<u>R</u> efresh II ◀	Select pro	tection zone		► H	<u>C</u> lose

Though there is current, it is observed that the differential current is still zero. Thus is due to the fact that the breaker is open. The below figures shows the same status with the breaker closed.

Hereition zone measurements					_ 🗆 ×
Detailed view	Overv	iew			
	No.:	3			
	Busbar zones:	BUS-2			
Measu	rement assigned: 🖡	7			
Feeder		L1	L2	L3	-
A612		1600	1600	1600	
A614		0	0	0	
Differential current:	1.821	1000	1.001	1500	
Differential content.	1 2 1 1	1600	1601	1099	
Restraining current:	Σ Ι	1600	1600	1600	
Stability factor:	k	1.00	1.00	1.00	
<u>R</u> efresh I€ €	Select prote	ction zone		► H	Close

Analogue Input Measurements :

Binary Input/Output Status :

One can open as many windows as possible.

Click on Output tab to see the different Outputs.

F391.CU1	×	74 -F391.CU1 X
Input	Output	Input Output
1: 41305_Trip BB zone.BUS-1 2: 41305_Trip BB zone.BUS-2 3: 41305_Trip BB zone.BUS-3A		1: 42405_BBP blocked 0 2: 44305_EFP trip 0 3: 44405 EFP blocked 0
4: 41305_Trip BB zone.BUS-3B 5: 41815_Diff. current alarm 6: 41505_Isolator alarm	0	4: 41305_Trip BB zone.BUS-1 0 5: 41815_Diff. current alarm 1 6: 41810_In service 1
7: 42315_BBP trip L1 8: 42320_BBP trip L2 9: 42325_BBP trip L3		7: 41305_Trip BB zone.BUS-2 8: 41305_Trip BB zone.BUS-3A 9: 41305_Trip BB zone.BUS-3B
A612	X	A614 ×
Input	Output	Input Output
1: A612.21805_In service	1	1: A614.21805_In service 1
2: A612.25105_0CDT TRIP		2: A614.24105_EFP REMOTE TRIP
3: A612.21105_EXTERNAL TRIP		3: A614.21105_EXTERNAL TRIP
4: A612.21105_EXTERNAL TRIP	1	4: A614.21105_EXTERNAL TRIP 1
5: A612.21105_EXTERNAL TRIP		5: A614.21110_TRIP
6: A612.21110_TRIP		6: A614.21105_EXTERNAL TRIP
8: 4612:21105_EXTERNAL TRIP 8: 4612:21105_EXTERNAL TRIP	片	7: A614.21110_1RIP 8: 6614.21105_EXTERNAL TRIP
9: A612.21105_EXTERNAL TRIP 10: A612.21110_TBIP		9: A614.21110_TRIP
11: A612.21105_EXTERNAL TRIP 12: A612.21105_EXTERNAL TRIP 13: A612.21105_EXTERNAL TRIP	ğ	11: A614.21105_EXTERNAL TRIP 12: A614.21105_EXTERNAL TRIP 13: A614.21105_EXTERNAL TRIP 13: A614.21105_EXTERNAL TRIP 14: A614.21105_EXTERNAL TRIP 14: A614.21105_EXTERNAL TRIP 15: A614.21105_E
14: A612.21110 TRIP		14: A614.21110 TRIP
15: A612.21110_TRIP	1	15: A614.21110_TRIP
16: A612.21105_EXTERNAL TRIP	1	16: Ab14.21105_EXTERNAL TRIP

Switchgear objects :

2	5	witchgear objects				X
ſ		Detailed view	 Overv	riew	1	
			Feeder: Device: ABB reference:	A612 F391.18 =ABB18		
		Switchgear object	Туре		Status	
		D635	Isolator		open	
		D636	Isolator		closed	
		A612	Feeder CB		closed	
						×
		<u>R</u> efresh	Select	feeder	► F 1	N <u>C</u> lose

Protection Zone Circuit-breakers :

٠	Protection zone circu	it-brea	kers		_ 🗆 🗡
ſ	Detailed view		Overview		
			No.: 4 Busbar zones: BUS-38		
	Feeder		Circuit-breakers		
	_Ø A612		A612		
					×
	<u>R</u> efresh	4	Select protection zone	► H	<u>C</u> lose

Disturbance Recorder :

Upload disturbance recorder records		1
Directory		Define the
D:\HMI500\REBCON 6.10 US\DATABASE		directory
Delete disturbance recorder records after successful upload	1	where the data is to
Upload disturbance recorder records manually		he stored
1 Number of disturbance recorder records	<u>U</u> pload	Click
Upload disturbance recorder records automatically		here to
10 [s] Interval between uploads	Start <u>t</u> ransfer	upioad
Number of records uploaded		
Start automatic upload		
	<u>C</u> lose	
Binary data Analogue data Elapsed time 00:00:02 Prospective time 0 Cancel	100%	
PSM X Do you want to evaluate the uploaded file ? OK Cancel WINEVE X Start of evaluation software failed		

Open WinEve to evaluate the disturbances else ensure that the PSM settings are done properly. This is available in the **Tools-Settings** menu.

Settings		X
Program settings Database locations PSM support		
Behaviour Send notification after automatic upload Send notification after manual upload		
File C:\Program Files\ABB Industrie AG\Indactic 650 3.0.1\Wineve.exe	Select	PSM
	Bestore	Cancel

- Indactic 650 WinEve - [06801802]	_ 8 ×
😥 Elle Edit View Format Iools Parameters Options Window Help	_ 8 ×
t [ms] -180 -160 -140 -120 -100 -80 -60 -40 -20 0 20	40
21110_TRIP	

This will be report if the breaker opens & the fault is interrupted.

#HMI500 - REBWIN - [ESTEXPRES 5/S]	
<u>File View Settings Configuration</u> <u>Testing</u> Tools <u>Windows</u> <u>H</u> elp	
Test mode	
Activate test generator mode	Password is Test
	T assword is rest
Password: ****	
OK Cancel	
HMI500 - REBWIN - [JEDDAH NORTH380/110/13.8kV]	
<u>Fi</u> le <u>V</u> iew S <u>e</u> ttings <u>C</u> onfiguration <u>T</u> esting T <u>o</u> ols <u>W</u> indows <u>H</u> elp	
Test mode	
Unblock all relays	
Block all relays	
Block tripping relays	
Li Kosot al overridden eignale	

Now go to View, Binary Status

н	MI500 - REBWIN - [jeddah Nort	H380/11	0/13.8k¥]				
File	View Settings Cont	figuration Test	ng Tools	Windows	Help)		
Tes	Single-line diagram							
	Protection zone measurements Analogue input measurements Binary input/output status							
	Switchgear objects Protection zone circ BP function monitor	jear objects ion zone circuit-breakers tion monitoring						
	Dicturbance recorder		- 11					
			- 10					
	Event list							
	Reset latoning relay	ys PS						l
18	status of binary inpu	its/outputs			×			
	Binary module							
	Device	Slot	Feeder	eder 🔺		(Dou	bla click on the
►	CU01	16					DOL	ible click off the
	CU01	18		feed		der or CLI that		
	AD01	1	AD01	\sim	_		icet	
	AD02	1	AD02				vou	want to test
	AD03	1	AD03			1	,,,,,	Marie to test
	AD04	1	AD04		_			
	AD05	1	AD05		_			
	AD06	1	AD06		_			
	AD07	1	AD07		_			
	AD08	1	AD08		_			
	AD09	1	AD09		_			
	AD10	1	AD10		_			
	AD11	1	AD11		_			
	AD12	1	AD12					
•		1	0013		۱ ۲			
	Open status windov	A	Arrange	windows				
	Update status U		Update o	cyclically				
			<u>C</u> lo	ise]			

Bias (Slope verification) Test :

For Amplitude comparision :

Inject, 1 A @ 0° (R phase current from Freja) in 1st BU (Ia)& 0.5A@ 180° (Y phase current phase from Freja) in 2nd BU (Ib). Reduce current in Y phase until trip occurs. Record this value & verify that (Ia-Ib)/(Ia+Ib) = 0.8, which is the K setting.

For phase comparision :

Inject, 1 A @ 0° (R phase current from Freja) in 1^{st} BU (Ia)& 1 A @ 110° (Y phase current from Freja) in 2^{nd} BU (Ib). Reduce the current angle for Y phase until trip occurs. Record this value & verify that this is about 74°.

Inject, 1 A current (R phase current from Freja) in 1st BU (Ia)& 1 A current (Y phase current @ 250° phase shift from Freja) in 2nd BU (Ib). Increase the current angle for Y phase until trip occurs. Record this value & verify that this is about 360°-74°=286°

e.g.							
	Current	t angle in 1 st	bay (Ia)	Current angle in 2 nd bay (lb)			
	L1 (R)	L2 (S)	L3 (T)	L1 (R)	L2 (S)	L3 (T)	
	0°	0°	0°	74.7°	74.4°	74.5°	
	0°	0°	0°	285.5°	285.5°	285.3°	

Note : While testing the Binary Output relays for Differential trip, please ensure that the System response for Differential alarm is "Continue in operation" else the output relays will reset after the differential alarm time delay.

To measure Isolator running time for Isolator alarm :

Connect the Isolator close input via one pole of a DP MCB. Use the 2nd pole of the MCB to initiate the TM 200 timer. The Isolator alarm contact (from CU) is wired to stop the timer.

Memory Image for Isolators/Breakers :

Evaluating the isolator and circuit-breaker statuses					
The isolator and circuit-breaker statuses are evaluated as follows:					
Return confirmation that isolator/CB "CLOSED"	Return confirmation that isolator/CB "OPEN"	icolatoriCB Image			
inactive	Inactive	Last status retained and delayed - isolator alarm - switch inhibit signal			
inactive	active	OPEN			
active	Inactive	CLOSED			
active	active	CLOSED and delayed - Isolator alarm - switch inhibit signal			
An active "CB CLOSE" signal ("CB CLOSE" command) forces the circult- breakers into the "CLOSED" position.					

To measure Pickup time for End Fault Protection (EFP) :

Note to measure Pickup time for EFP, CB has to be Open. If CB is Close, then EFP will not operate. If CB Close command is active, EFP will not operate. However, Differential will operate if current injected is higher than settings.

Connect the CB Close command input via one pole of a DP MCB. Use the 2nd pole of the MCB to initiate the TM 200 timer. The EFP REMOTE TRIP contact (from BU) is wired to stop the timer. The MCB has to be kept ON & the TM 200 timer start is to be initiated with NC selection. Inject current higher than the EFP setting. Switch OFF the MCB, record the timing. This gives the EFP Pickup time + the EFP Operating Time.

To measure Remote Trip Impulse :

Wire the EFP REMOTE TRIP contact in parallel to the Start & Stop of TM 200 timer. The Stop has to be initiated with NC contact. Inject current higher than the EFP settings. Record the timings.

To measure Reclaim Time of BC :

Feeder1 : a fault on BB1 as shown Feeder2 rimary injection recommended). It will be noticed that the Coupler & feeder \cdot mass immediately. Feeder 2 trips after the reclaim time of Coupler if the Coupler fails to Open.

For a fault as shown below, the breakers at AD18A & AD17A will trip instantaneously & the feeders on Bus 1A will trip after the reclaim time of the BC & BS (assuming that the breakers for BC & BS do not Open & the fault is still present)

For Dead Zone condition :

If all the 3 isolators D603, D606 & D607 are open & current is injected to BU A602 or BUS-3B, then there is no tripping as the section between D606 & D607 is a Dead Zone.

By simulating the CB open condition via the BO of the Freja, one can view the Trip pulse via the DR. If CB is always closed, then the Trip O/P is like a continuous pulse.

Note that the trip output is a continuous pulse of width = to the reclaim time of the BC/BS.

To test Isolator Alarms with selective blocking :

Assume that BS & BC along with the associated Isolators are closed. Thus we have 3 Zones, namely Bus-1, Bus-2 & Bus-3 (which is Bus-3A+Bus-3B)

Connect A603 to Bus-1, A604, A606 to Bus-2 & A608 & A610 to Bus-3B.

Create Isolator alarm on A603 by opening D608 close contact. Now Bus-1 will be Blocked for Differential Trip. If current is injected in A604, no trip will occur at A 603.

The same will be true for Differential alarm on A603.

Loss of communication with one BU :

On the same SLD, if communication is lost with A606 (which is connected to Bus-2). Bus 3 & Bus-2 will be blocked. However, if Isolator D607 is Open, then Bus-2 & Bus-3B will be blocked.