Kairos Setup Procedure

This document covers setup procedure following the Standard Structures.

- 1. Standard Structure
 - 1.1 Single Repeater

Single Site	Tier2 Convisional (Standard Single Site)				Order sample:	STANDARD SINGLE-SITE				
Site1			Role	Mode	Primary Sync	Labor	License	External	Panel	
0	· III · IIIIII	Unit1	Master	Single Repeater	N/A	KA-SETUP	KA-DMR-L	N/A	KA-RK1v2	

No synchronization is required. The most simple, easy solution to expand coverage.

1.2. Single Repeater + Hot Standby Repeater (Option)

Single Site	Tier2 Convntional 1+1 Hot Sta	andby (Option)				Order sample:	STANDARD	SINGLE-SITE	5& 1+1 H	ot Standby	
Site1				Role	Mode	Primary Sync	Labor	Licer	15e	External	Panel
	all and all distilled	all cost of the fight	Unit1	Master	Single Repeater	N/A	KA-SETUP	KA-DMR-L		N/A	
			Unit2	Master	Single Repeater	N/A	KA-SETUP	KA-DMR-L	KA-1+1	N/A	KA-RKZ

Hot Standby repeater is ready for emergency case. KA-1+1 includes a cable to sync physically.

The 2nd repeater must have same configuration except Station ID.

1+1 Hot Standby is a strong point of Kairos. TKR-D series do not have any function for redundancy.

1.3. 2sites Roaming System

2Sites Tie	r2 Site Roamine Standard Zsites)				Order sample:	2sites STANDARD MU	UTI-SITE						
Site1			Role	Mode	Backup Master	PrimarySync	Second Sync	PTP Master	PTP Backup Master	Labor	License	External	Panel
VERIES	and the difference	Unit1	Master	Master		Internal Ref.	Internal Ref.	1		KA-SETUP	KA-DMR-L	N/A	KA-RK1v2
		Unit2	Slave	Broadcaster		Internal PTP	Internal Ref.			KA-SETUP	KA-DMR-L	N/A	KA-RK1v2
20	10						×						
Site2													

All of voice streaming have to through the Master Repeater. Slave repeater start to repeat the voice streaming locally when the Master Repeater offline.

Beacon Sync is required to realize roaming behavior on subscribers. Kairos has VCTCXO internally. Repeaters on the other sites will use this Master Reference via IP Network for synced Beacon transmitting. PTP algorithm allows this synchronization between Master and Slave. PTP sync is a strong point of Kairos. The sync quality is better than TKR-D series. Beacon Sync Quality is very important for site roaming subscribers.

1.4. 3sites Roaming System



Backup Master Repeater is available. A Slave repeater will become Backup Master Repeater. The function of Master Repeater immediately rollover to the Backup Master Repeater. Backup Master Function allows Inter-site call capability between the online sites.

Centralized Voting Structure based on RA simulcast system allows to having wide coverage by RX only site as an option. The Mater selects the best signal between the sites having same RX frequency selected. Backup Master Function covers the weak point of single point system structure.



3 Sites Sk	nulcast Tier1 Conventinonal with Backup Master Standard Baites Simu	casti			Order sample:	S sites STANDARD SI	NULCAST								
Site1		<u></u>	Role	Mode	Backup Master	Primary Sync	Secondary Sync	PTP Master	PTP Backup Master	Labor	License		Exte	mal	Panel
	and the second second second	Unit1	Master	Master	6 B	Internal PPS	InternalBef	1	11 V.	KASETUP	KA-DMR-L KA-	-SI-T2	KA-GPS	GPS-ANT	KA-RX1v2
		Unit2	Slave	Browcicester	1	Internel PPS	Internal PTP	- C-	1	KA-SETUP	KA-DMR-L KA-	-SI-T2	KA-GPS	GPS-ANT	KA-RK1v2
	C P C	Unit3	Slave	Broadcaster		Internal PPS	Internal PTP			KA-SETUP	KADMR-L KA	-SI-T2	KA-GPS	GPS-ANT	KA-RK1v2
Site2 Site3															

The concept is same as 3sites roaming system, however just 1 frequency is required on this system. KA-SI-T2 allows Simulcast Setup on the repeaters. KA-GPS and GPS-ANT for each repeater are mandatory to synchronize the TX timing in a system. PTP connection is still available as a second choice when the GPS connection is broken. DMR Simulcast solution is available now.

1.6. IP/RF Link Mixed System

<u>Baites Tie</u>	2 Site Roaming / IP and RFLink Mixed	19ystem			Order se	nple: 2 sites STA STANDARD	NDARD-MULTI-SITE & SINGLE-SITE	Additional Repeater						
Sitel	and an a section of the section of t	in the second		Role	Mode	Backup Master	Primary Sync	Second Sync	PTP Master	PTP Backup Master	Labor	License	External	Panel
			Unit1	Mester	Mester		Internel Ref.	Internal Ref.	4		KA-SETUP	KA-DMR-L	N/A	LADER
		1 .	Unit2	Link Down to Net	RFLink Down		Internal PTP	Internal Ref.		N	KA-SETUP	KA-DMR-L	16/A	RAMAZ
	RFDo	wn RF Up	Unit3	Slave	Broadcaster	1	Internal PTP	Internal Ref.		1	KA-SETUP	KA-DMR-L	N/A	KA-RE1v2
	All states and states		Unit4	Slave	Broadcaster		Internal PTP	Internal Ref.			KA-SETUP	KA-DMR-L	N/A	VALENT
Site2			UnitS	Link Up to Master	Rt Link Up		RFLink (DMR)	Internal Ref.	1	N	KA-SETUP	KA-DMR-L	N/4	NPHINA .
Site3														

RF Link is available if you cannot provide IP Connection for sites communication. There are no additional license for RF Link Connectivity. You can use RF Link Solution even if it is simulcast system. TKR-D series is not capable to RF Link Connectivity. We can offer this solution to a customer who wants DMR but does not have IP connection between sites.

2. Setup Procedure

- 2.0. Common Procedure
 - a. Open Kairos Manager

(AIROS (Default)	Set as Default
IP settings	Address / Hostname
	172.33.40.110
Access Parameters Access Mode	Station ID (1 ÷ 254) Use Secure Access Feature Messages Timeout [s]

b. Connect to the default IP Address attached on the label. <u>Main Menu</u>

IROS_Manager Software KAIROS ?	
ommunications	Status Buffer
Sent	0440 04D9 000B 0000 8001 0000 0003 0000 000F 3SC5 0000 0000 0100 0411 FFFF 911B BFFF E402 C005 0000 0100 0401 618 3A6C 4225 3A3F 93C4 DEDF 000F 0838 05C8 0850 0101 0000 E285 03FF 0000 0000 0000 0000 0000 0000 0000 0000
Received	Statistics Exchanged Messages 0 Incorrect Messages 0 Error Rate [%] 0
	Log on file Clear

c. Select Configuration Utility from KAIROS main menu.

	Configuration	
Communications	Alarms Configuration	Status Buffer
Sent	Controls	0440 0459 0005 000
		8001 0000 0003 0000
	Statistics	000F 39C5 0000 0000
	Restart	BFFF E002 C005 0000
	Configurations Utility	0100 0000 1718 2F60
		4224 3A3F 93C4 DEDI
/		0101 0000 E285 03F
		0000 0000 0000 1757
Received		
		Statistics
		Exchanged Messages 0
		Error Rate [%]
		Log on file Clear
		Exit
ROS_Manager Software I	KAIROS ?	
communications		Status Buffer
Sent		Status Buffer
Sent		Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 000F 39C1 0000 0000 0100 04D1 0000 0000
Sent		Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 000F 39C1 0000 0000 0100 0410 FFFF 911B BFFF E002 C005 0000
Sent		Status Buffer 0440 04D9 000B 0000 8001 0000 0030 0000 0005 39C1 0000 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 0100 0001 1718 2E6C 47924 3A3F 93C4 DEE1
Sent	© Configurations Utility - KAIROS < MASTER BDCST>	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 3951 0000 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 0100 0100 1718 2562 224 3A3F 93C4 DEE1 F 0898 0528 0355
Sent	© Configurations Utility - KAIROS <master bdcst=""></master>	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 0410 FFF 911B BFFF E002 C005 0000 0100 0410 FFF 911B BFFF E002 C005 0000 0100 0000 1718 2562 F 0898 0552 03FF 1 0000 2285 03FF 0 0000 0000 0000
Sent	© Configurations Utility - KAIROS <master bdcst=""> KAIROS (TRX+DSP)</master>	Status Buffer 0440 04D9 000B 0000 8001 0000 0033 0000 0005 39C1 0000 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 0100 0400 1718 256C 424 3A3F 93C4 DEE1 F 0898 05C8 0850 1 0000 2285 03FF 0 0000 0000 0000 0 0000 0000 0000
Sent	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 0100 0000 1718 2560 Y 0898 05C8 0850 1 0000 2245 03FF 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000
Sent	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Load configurations	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 9301 0000 0000 0100 0410 FFF 911B BFFF E002 C005 0000 0100 0000 1718 2260 1 0000 E285 03FF 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Load configurations	Status Buffer 0440 04D9 000B 0000 8001 0000 003 0000 0100 410 FFF 911E BFFF E002 C005 0000 0100 0410 FFFF 911E BFFF E002 C005 0000 0000 0100 1718 2560 1 0000 2528 03FF 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Load configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 9301 0000 0000 0100 0410 FFF 911B BFFF 2002 C005 0000 0100 0410 FFFF 911B BFFF 2002 C005 0000 0000 01718 2560 1 0000 2285 03FF 1 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 Utics 1 10000 1000
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Load configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 0033 0000 0100 3051 0000 0000 0100 0410 FFFF 911B BFFF 202 C005 0000 0100 0410 FFFF 911B BFFF 202 C005 0000 0100 0000 1718 224 1 0000 225 0350 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ged Messages 0 0 0
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Load configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 0033 0000 0100 3951 0000 0000 0100 0410 FFFF 911E BFFF 2002 COSS 0000 0100 0400 1718 2240 1 0000 5250 0300 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ged Messages 0 0 0 ate [%] 0 0 0
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Load configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 003 0000 0100 0410 FFFF 911E BFFF 2002 CODS 0000 0100 0410 FFFF 911E BFFF 2002 CODS 0000 0100 0000 1718 2526 1 0000 2285 0387 1 0000 2285 0375 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ged Messages 0 0 0 tics 0 0 0
Sent Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 0033 0000 0100 0410 FFFF 911E BFFF 2002 2005 0000 0100 0410 FFFF 911E BFFF 2002 2005 0000 0100 0000 1718 226 1 0000 2255 037F 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ged Messages 0 0 0 tcs ged Messages 0 0 tcg on file Clear 0 0
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0007 39C1 0000 0000 0100 0410 FFFF 911E BFFF 2002 C005 0000 0100 0410 FFFF 911E SFF 2002 C005 0000 0100 0285 0385 0 1 0000 0200 0000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ped Messages 0 0 0 tics 0 0 0 ct Messages 0 0 0 ct Messages 0 0 0
Sent	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0001 8001 0000 0003 0000 0100 9301 0000 0000 0100 0410 FFFF 9111 BFFF 2002 2005 0000 0100 0000 1718 2264 17 0898 05C2 0855 10 0000 2285 0387 10 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1751 tics ged Messages 0 0 14 Log on file Clear 0
Sent Sent Sent Sent Sent Sent Sent Sent	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Merge DSP data from old file Close	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 9301 0000 0000 0100 0410 FFFF 911E BFFF 2022 C005 0000 0100 0400 1718 2256 1 0000 2285 03871 0 0000 0000 0000 0000 0 0000 0000 0000 0000 0 0000 0000 1758 tics ged Messages 0 0 tics 0 0 0 0 tics 0 0 <td< td=""></td<>
ommunications Sent Received	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Merge DSP data from old file Close Close	Status Buffer 0440 04D9 000B 000C 8001 0000 0003 000C 0100 440 FFF 0000 0000 0100 0410 FFFF 911E BFFF 2002 C005 000C 0100 0400 1718 2526 1 0000 5225 0357 1 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ged Messages 0 0 0 tics ged Messages 0 0 ate [%] 0 0 0
Select Load con	Configurations Utility - KAIROS < MASTER BDCST> KAIROS (TRX+DSP) Save configurations Merge DSP data from old file Close figuration	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 0410 FFFF 911E BFFF 2002 C005 0000 0100 0410 FFFF 911E BFFF 2002 C005 0000 0100 0000 171E 224 1 0000 2285 035F 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 175E 0 0000 0000 175E ged Messages 0 0 0 ate [%] 0 0 0 Exit Exit 0 0
Select Load con	Configurations Utility - KAIROS < MASTER BDCST>	Status Buffer 0440 04D9 000B 0000 8001 0000 0000 0000 0100 0410 FFFF 911B BFFF E002 0000 0000 0100 0410 FFFF 911B BFFF E002 005 0000 0100 0000 1718 226 1 0000 2285 00 0 0000 0000 1758 0 0000 0000 1758 0 0000 0000 1758 0 0000 0000 1758 0 0000 0000 1758 0 0000 0000 1758 0 0 0 0 1 Log on file Clear Exit Exit Exit
Select Load continue of the second configuration of the second continue of the second contract of the second configuration of the second contract of	© Configurations Utility - KAIROS < MASTER BDCST>	Status Buffer 0440 04D9 000B 0000 8001 0000 0003 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 0100 0410 FFFF 911B BFFF E002 C005 0000 124 3A3F 93C4 DEE1 F 0898 0528 0850 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 1758 ged Messages 0 0 0 tics 0 0 0 et [%] 0 0 0 Log on file Clear Exit

BDCST MST SITE UHF.ka	7/3/2018 8:43 AM	KA File	54 KB
BDCST SLV SITE UHF.ka	7/3/2018 10:30 AM	KA File	54 KB
DOWNLINK MST SITE UHF.ka	7/2/2018 4:26 PM	KA File	54 KB
UPLINK SLV SITE UHF.ka	7/3/2018 4:50 PM	KA File	54 KB

You can select the default configuration provided by AFCO.

- MST.ka (for Standard IP Link)
- SLV.ka (for Standard IP Link)
- BDCST MST SITE.ka (for Standard RF Link)
- BDCST SLV SITE.ka (for Standard RF Link)
- DOWNLINK MST SITE.ka (for Standard RF Link)
- UPLINK SLV SITE.ka (for Standard RF Link)

e. Select load items

Network Settings	Select All
Logging Settings	
Primay Synchronization Settings	Deselect All
Main Configuration	
Alarm Traps Parameters	Select for Cloning
Alarm Events definitions	
TRX Configuration	
Channels Table	
Base Station Basic Data	
Base Station Operating Mode	
RPT Configuration	
SIP Configuration	ок
DSP Configuration	Cancel

The Default File has own IP Address and the model is KA450 But you can ignore these deleting Network Setting and Channel Table from the load items.

f. Edit Channel Table



Channel Table

	Channel B	Channel 1	Channel 2	Channel 3	Channel 4	Channel 5	Channel 6	Channel 7	Ch
Channel Name	Channel 0	Empty Channel	Empt						
Channel present	YES	NO							
Channel enabled	YES	NO							
ANALOG mode	YES	NO							
DMR ETSI mode	YES	NO							
DMR MeteTRBD mode	YES	NO							
Digital P25 mode	NO	NO	NO	NO	NO	NO	NO	NO	
POCSAG mode	NO	NO	NO	NO	NO	NO	NO	NO	
Channel Bandwidth [ki-lz]	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	
TK Frequency [MHz]	162,26250	0.00000	0.00000	0.00000	0.00000	0.0000.0	0.0000.0	0.00000	0
RX Frequency [MHz]	157.66250	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000	0.00000.0	0
Simplex Frequency Shift	NO	NO	NO	NO	NO	NO	NO	NO	
TX Power [W]	1.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Maximum continous tx time [s]	0	0	0	0	0	0	0	0	
Transm. dosure deley [ms]	500	500	500	500	500	500	500	500	
TX.DPL Code fact								-	
RX DPL Code [oct]	-		2						
TX TCS Frequency [Hz]	123.0	123.5	123.5	123.5	123.5	123.5	123.5	123.5	
RX TC5 Frequency [Hz]	123.0	123.5	123,5	123.5	123.5	123.5	123.5	123.5	
Multitone TCS	NO	NO	NO	NO	NO	NO	NO	NO	
Squeich Tail Cutoff on TX	NO	NO	NO	NO	NO	NO	NO	NO	
Squeich Tail Cutoff on RX	YES	NO							
Emergency TCS Frequency [Hz]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
RX TCS hold time [ms]	500	500	500	500	500	500	500	500	
Subtone deviation [Hz]	250	250	250	250	250	250	250	250	
Supertone Prequency [Hz]	D	D	D	0	0	0	0	0	
RX Squeich level [dB]	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	
RX Squeich Hysteresis [dB]	6.0	5.0	5.0	5.0	6.0	6.0	6.0	6.0	
RX DMR Colour Code (main)	5	1	1	1	1	1	1	1	
TX DMR Colour Code (main)	5	1	1	1	1	1	1	1	
RX DMR Colour Code (aux)	5	1	1	1	1	1	1	1	
TX DMR Colour Code (aux)	5	1	1	1	1	1	1	1	
Downlink P25 NAC code [hex]	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	Ó
Uplink P25 NAC code [hex]	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	DEFAULT	D

You can double Click on the Channel Number to edit the detail.

Channel Data Edit

🗯 Channels data editin	ıg - KAIROS <mst -="" si<="" th=""><th>P></th></mst>	P>
Channel 0 Channel 1	Channel 2 Channel 3	Channel 4 Channel 5 Cha
	Channel Name Channel Spacing[KHz] TX Frequency [MHz] RX Frequency [MHz]	Channel 0 12.5 162.262500 157.662500
PY	TX Power [W] Nax Continuous TX [s] TX Cutoff Delay [ms] RX Squelch level[dB]	1.0 0 500 20.0 6.0
	Channel Present Channel Enabled Simplex Shift ANALOG Mode ETSI DMR Mode MotoTRPO (TM) DMP Mo	5.0 V V V
	POSAG Mode POSAG Mode Squelch Tail Cutoff on T Squelch Tail Cutoff on R Multitone TCS	
Save Channel Data	a Can	cel

Modify the TX/RX Frequency and the operation mode following the customer's requirement. You can selsct ANALOG/ETSI DMR/P25 at one time. MotoTRBO DMR mode is for compatibiliity of Motorola subscribers.

<u>CC Edit</u>

Channel Name	Channel 0	Main TX Subtone	Main RX Subtone
Channel Spacing[KHz]	12.5 👻	TCS Freq. [Hz]	TCS Freq. [Hz] C DCS Code [oct]
TX Frequency [MHz]	453.150000	123.0	123.0
RX Frequency [MHz]	463.150000		
TX Power [W]	1.0 🔻	Uplink Emerg. Subto	ne [Hz] 0.0
Max Continuous TX [s]	0	TCS Hold on F	RX [ms] 500
TX Cutoff Delay [ms]	550	Subtone Deviati	on [Hz] 250
RX Squelch level[dB]	20.0	Superaudio Frequen	cy [Hz] 0
RX Squelch Hysteresis [dB]	6.0		
Channel Present		P25 TX NAC	P25 RX NAC
Channel Enabled Simplex Shift		C Default	C Default
ANALOG Mode	v	C Any	C Any
ETSI DMR Mode		O upen	O Open
MotoTRBO (TM) DMR Mod	e 🗌	50 × 1 303	1 202
P25 Digital Mode	₩		
Squelch Tail Cutoff on TX	L.		RX TX
Squelch Tail Outoff on BX		Main DMR Cold	or Code 5 📑 5

You can modify Co for Tx and Rx both.

g. Edit Base Layer Configuration.

	the second se			
Communications Sent	Configuration Alarms Configuration Controls Statistics Restart Configurations Utility	* * *	Network Settings Logging Options Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone	Buffer 0 04D9 000B 0000 1 0000 0003 0000 F 3505 0000 0000 0 0410 FFFF 911B F 2402 C005 0000 0 0000 1718 836C 4 3A3F 93C4 DFE1 F 0598 65C8 0850 1 0000 2285 33FF 0 0000 0000 0000 0 0000 0000 3253
Received			Base Station Layer Configuration Station Basic Data Base Station Operating Modes RTP Configuration SIP Configuration	tics ged Messages 31 ct Messages 0 ate [%] 0.00 Log on file Clear Exit
Configuration	suration	(0 ÷ 32767) -	∏ Reports	nternal Timinos
inable Half Trunking isend RC on Same Timeslot ispaly IDLE Packets Manual AT bit handling inable ETSI Tier III features TX: act as RX: act as	Group Calls Data Response Channel Timeslots Validity [30 ms	150 150 16 16 ticks]	Digital Mode Enabled C C C C C C C C C C C C C C C C C C C	Turrent Second - Timeslot N/A - 16 Turrent Extended Timeslot 116 st Received Timeslot 0 0 us offset rx [htz] 0 0 o vector 0.000 0.000

You can modify each Hand Timer. The step is 30[ms] based on DMR frame rate. And basically all repeaters in system will have same value.

h. Edit IP setting



You can edit the IP Address follwing customer requirement. Please use midified IP Address to login to Kairos Manager from next time.

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i. Edit Repeater ID

KAIROS_Manager Software KAIROS ? Configuration ۲ Network Settings Communications Buffer Alarms Configuration k Logging Options Sent Controls Þ Main Setup 04D9 000B 0000 0000 39C5 8003 0000 1 F 0 F 0 5 3 1 0 0 0 Statistics TRX Operating Modes . Restart... Channels Table 0011 FFFF 911B EE00 0000 C005 1618 0000 356B Configurations Utility Calibration Parameters 92C4 05C8 DEE0 0850 3A3F Primary Synchronization 0898 TX Control 0000 E285 OSFF 0000 0000 0000 RX Control 0000 0000 0005 Audio Lines Configuration Subtone/Supertone Received Base Station Layer Configuration Station Basic Data Base Station Operating Modes tics RTP Configuration ged Messages 707 ct Messages 4 SIP Configuration ate [%] 0.57 Log on file Clear Exit

Main Setup

Equipment Name		Identity Data		-GNSS Optional Module	-1/0 Contacts	AUTO	ON	OFF -
MAS	TEP PDCST	Station ID (1 ÷ 254)	64	Epuble GNSS Module if present	ALARM OUT (ALR_OUT)	œ	C	С
I WAS	STER BDCST	letwork ID (1 ÷ 4095)	160	Supply Voltage to GNSS Antenna	EXT-1 IN (ALR_IN_1)	œ	C	C
		1+1 Address (1 + 254)	144	PPS Time Reference	EXT-2 IN (ALR_IN_2)	6	C	0
Geographic Data		DMR ID (1 ÷ 16776415)	2047		AUX-1 OUT (IO_OUT_1)	•	$^{\circ}$	C
Network Name	RA-NETWORK	Group ID (1 + 16776415)	101	UTC USNO:	AUX-2 OUT (PTT_CUT)	œ	С	C
Zone Name	RA-ZONE			UTC time as per the United States Naval Observatory (USNO)	Fans Activation (FAN)	G	C	С
Carrier Name	RA-CARRIER				ALARM Status Flag	œ	C	0
Site Name	RA-SITE	Remote Control						1
		-LAN Connection						
Manual coordinates	source 🔽	IP Port 4	000	Features				
Latitude		1 1 1 1 1 1 1 1 1 2 2 2 2	c	Run TRX Layer IV Run Station Layer IV				
degs mins	secs secs/1000 N (*	Remote Control Via RF Link		Run RTP Layer				
	s C	Enabled on Timeslot A Enabled on Timeslot B		Run SIP Layer 🔽				
Longitude								
degs mins	secs secs/1000 E	TLC Secure Access	- F-1		Doord from File			
0 0	0 000 W C	Upers' Database			Winte on Ele			
		Internal			Read			
Maidenhead Locator	A A DOCE				Welto	1	Jose	
								and the second second second

You must setup the Staion ID for each repeater in the network separately.

2.1. Single Repeater

Single Site Ti	ier2 Convntional (Standa	rd Single Site)				Order sample:	STANDARD	SINGLE-SI	ΓE	
Site1				Role	Mode	Sync Master	Labor	License	External	Panel
	all all alle	8	Unit1	Master	Single Repeater	N/A	KA-SETUP	KA-DMR-L	N/A	KA-RK1v2
	a the second		· · · · ·	с — 20			- 200		1.58	10 SO

<u>Site1</u>

Unit1: Master Repeater

- A. Single Repeater Setup
- Read (Open) default setting from Kairos following common procedure.
 All stocks of Kairos already done the Single Repeater Setup by Radio Activity. Load Configuration is not required.
- b. Modify the same items following common procedure.
- c. Modify TRX Mode.

ommunications	Configuration Alarms Configuration	Network Settings Logging Options	s Buffer	
Sent	Controls	Main Setup	0 04D9 000B	0000
	Statistics	TRX Operating Modes	1 0000 8003	0000
a selles de selles	Destert	Channels Table	F 39C5 0000	0000
	Kestart	Channels Table	E EE00 C005	0000
	Configurations Utility	Calibration Parameters	0 0000 1618	3265
	L	Priman Synchronization	4 3A3F 93C4	DDDB
	/	r minary synchronization	3 0898 05C8	0850
	/	TX Control	1 0000 E285	OSFI
		RX Control	0 0000 0000	0000
		Audio David Cardinautica	0 0000 0000	0000
		Audio Lines Configuration	0 0000 0000	0008
		Subtone/Supertone		
eceived	/	Base Station Laver Configuration		
	/	Station Basic Data		
	· · · · · · · · · · · · · · · · · · ·	Base Station Operating Modes	tics	
	· ·· ·· ·· ·· ·· ·/ ·· ·· ·· ··	RTP Configuration	ged Messages	709
	· · · · · · · · · · · · · · · · · · ·	kin comgatution	ct Messages	4
		SIP Configuration	ate [%]	0.56
				5,50
			Log on file	Clear

TRX Operation Mode

Decrative mode	- Enabling TRV		_	_
operauve mode		Codec to be used	INULL	
SINGLE REPEATER OR MOBILE/FIXED	Enabling TX	Tone length (10 ÷ 255 ms)	100	
	Enabling Main RX	Tonic length (10 T 200 mb)	1 100	·
anvice	V Enabling Diversity RX			
	PCM 1 (Analog Line 1) Enabled			
FULL DUPLEX	PCM 0 (Analog Line 0) Enabled	Enable Analog Selective Calls s	ending	
	✓ Line 3 (Local TRX) Enabled	Enable Analog Selective Calls re	eception	
vpe	Line 2 (IP Line) Enabled	Enable repeatition code insertio	00	
	Line 1 (Physical Line 1) Enabled			
STAND ALONE	Line 0 (Physical Line 0) Enabled	Enable repeatition code detecti	on	
r h h a				
Active/Hot-Spare Parameters				
utemptic Dale Calf Switching Time [win]				
utomatic Role ben-switching Time [min] 480				
0s AUTO ID (needs a codec)				
Automatic				
Forced OFF				
Forced ON				
se external PA	Service Class	Read from File	1	
			1	
ain [db] (0÷25.5)	Multimode DMR Tier II Node Multimode DMR Tier III Node	Write on File]	
lax Input Power [W]	C Half-Trunking Repeater	Read	l	
	Contraction of the second	101-14-		lose
		write		

d. Modify Base Station Operation Role.



Base Station Parameters	IP Parameters	Tier III Controller	Master-to-Master Parameters
Base Station Role	Master IP Address	IP Address	IP Address TSA TSB ANA
MASTER	Present	1	
Stand-Alone	Backup Master	Tier III Network	
Audio Gateway	Present IP Address	Model TINY	
	This BS	Net (0 ÷ 511) 0	
Radio Network Mode	Become Master on broken connection	Site (0 ÷ 7) 0	
Multisite Simulcast		Par PAR A+B	
-Natural Dataset		TS A Role PAYLOAD CH	
Voting Delay [8]		TS B Role PAYLOAD CH	
Beacon interval (pm:ss)		Idle Time [s] 3	
	Physical Console Parameters	Accept not registered terminals	
DMR Packets Framing Mode	Full-Duplex Console		
Double Packet Single Packet	Line 1 Console	Net-Site [hex] 0000	
LAN Compression Rate	Operating Mode Emergency C	Allow Tier II traffic 🦳 TS A 🛛 TS B 🥅	
TX end-tone	MAINLY ANALOG Group C Private C	ETSI Versions Compliance	
	16777215 Dest DMR ID	ETSI Version 1.5.1	
	, Line 2 Concole	ETSI Version 1.6.1 C	
Digital	All-Call (*	ETSI Version 1.8.1	Dood from Elo
λ	Operating Mode Group C		Write on File
	Private C		Read
	16777215 Dest DMR ID		Write Close

Base Station Role is MASTER

2.2. Single Repeater + Hot Standby Repeater

Single Site	Tier2 Convntional 1+1 Hot Sta	ndby (Option)				Order sample:	STANDARD	SINGLE-SIT	E & 1+1 H	ot Standby	
Site1				Role	Mode	Primary Sync	Labor	Lice	nse	External	Panel
	and the standing of the state	and a set of the set	Unit1	Master	Single Repeater	N/A	KA-SETUP	KA-DMR-L		N/A	14 B 14 B
			Unit2	Master	Single Repeater	N/A	KA-SETUP	KA-DMR-L	KA-1+1	N/A	KA-RK2

<u>Site1</u>

Unit1: Master Repeater

Unit2: Standby Repeater for Unit1

Sync Cable is required to tie the 2repeaters for redundancy.



This cable can be provided when the customer purchased KA-1+1 option.



- A. Primary Repeater Setup
- a. Modify the same items following Single Repeater Setup.
- b. Edit Main Setup.

ommunications	Configuration Alarms Configuration	Network Settings Logging Options	s Buffer
Sent	Controls Statistics Restart Configurations Utility	 Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone Base Station Layer Configuration Station Basic Data Base Station Operating Modes RTP Configuration SIP Configuration 	0 0 04D9 000B 00 1 0000 8003 00 F 39C5 0000 00 0 0011 FFF 91 F E200 C005 00 0 0001 1618 35 5 3A3F 92C4 D2 3 0398 05C8 08 1 0000 2285 03 0 0000 0000 000 0 0000 0000 000 0 0000 0000 000 0 0000 0000 000 0 0000 0000 000 0 0000 0000 000 0 0000 0000 000 0 0000 0000 0000 0 0000 0000 0000 0 0000 0000 0000
,			□ Log on fileCle
			Exit

Main Setup

Equipment Name	1	Identity Data		-GNSS Optional Module	-I/O Contacts	AUTO	ON	OFF -
MAS	STER BDCST	Station ID (1 ÷ 254) Network ID (1 ÷ 4095)	64 150	Enable GNSS Module if present 🔽 Supply Voltage to GNSS Antenna 🖵	ALARM OUT (ALR_OUT) EXT-1 IN (ALR_IN_1)	6 6	с с	c c
Geographic Data		1+1 Address (1 + 254)	2047	PPS Time Reference	EXT-2 IN (ALR_IN_2) AUX-1 OUT (IO_CUT_1)	(F	с с	c c
Network Name Zone Name	RA-NETWORK RA-ZONE	Group ID (1 ÷ 16776415)	101	UTC USNO: UTC time as per the United States Naval	AUX-2 OUT (PTT_OUT) Fans Activation (FAN)	•	c c	C C
Carrier Name	RA-CARRIER	Remote Control		Ubservatory (USNU)	ALARM Status Flag	¢	c	c
Marual coordinates as Latitude degs mins : 0 0 0 Longtude degs mins : 0 0 0 Maderhead Locator	source scor secs/1000 0 000 S C scor secs/1000 E C 0 000 W C 3100 AA	P Port 40 Remote Control Via RF Link Stabled on Timeslot A stabled on Timeslot B Ti C Secure Access Users' Database C Internal C From ->	<u>س</u>	Features Run TRX Layer Run Station Layer Run SIP Layer Run SIP Layer	Read from File Winte on File Read Write		0052	

You can modify 1+1 Address which works on active repeater between the 2repeaters. This address must be used on last 3digit following his network address. In this case scenario, it is 172.33.40.144.

c. Edit TRX Operation Modes.

ommunications	Configuration	*	Network Settings		. P	ffor		
ommunications	Alarms Configura	ation 🕨	Logging Options		, Du	iner		
Sent	Controls	× _	Main Setup		0	04D9	000B	000
	Statistics		TRX Operating M	odes	1	0000	8003	000
	Restart	*	Channels Table		0	0014	FFFF	911
	Configurations U	Hility	Calibration Param	neters	E	EE00	C005	000
1	configurations o		Drimany Synchron	vitation	10	0000 3A3F	1618 93C4	326 DDD
			TX Canton	1280011	13	0898	05C8	085
			TX Control		10	0000	E285	03F
			KA Control		0	0000	0000	000
			Audio Lines Conf	iguration	0	0000	0000	000
			Subtone/Supertor	ne				
Received			Base Station Laye	r Configuration				
			Station Basic Data	1				
			Base Station Oper	rating Modes	tics	-		
			RTP Configuratio	n	ged	Message	s [709
			SIP Configuration	É.	ct M	essages		4
					ate	[%]		0.56
				Г	Log on t	file		Clea
				1.0				
				<u></u>		Evi	ě.	
X Operation Mo	des							
X Operation Mo	des			Analog Selectiv	ve Calls Co	onfigural	ion —	
X Operation Mo	des	- Enabling TRX		Analog Selectiv Codec to be used	ve Calls Co	onfigural	ion	
X Operation Mo RX Configuration Operative mode SINGLE REPEATER OR MOBILE/	des FDED I	-Enabling TRX	RX	Analog Selectin Codec to be used Tone length (10 ±	ve Calls Co I † 255 ms)	onfigurat	ion 	
X Operation Mo RX Configuration Operative mode SINGLE REPEATER OR MOBILE/	des FDED	Enabling TRX	RX sity RX	Analog Selection Codec to be used Tone length (10 ±	ve Calls Co I t 255 ms)	onfigural NULL	ion 100	
X Operation Mo RX Configuration Operative mode [SITNGLE REPEATER OR MOBILE/ Service	des FDED	Enabling TRX F Enabing TX Enabing Main I Enabing Reper Enabing Reper	RX sity RX ster Mode Lice 1) Expliced	Analog Selection Codec to be used Tone length (10 ±	ve Calls Co I ÷ 255 ms)	onfigural NULL	ion - 100	
X Operation Mo RX Configuration Operative mode STINGLE REPEATER OR MOBILE/ Service FULL DUPLEX	des FDED	Enabling TRX Finabing TX Enabing Main 1 Enabing Aping Enabing Repei PCM 1 (Analog PCM 0 (Analog	RX sity RX ater Mode Line 1) Enabled Line 0) Enabled	Analog Selection Codec to be used Tone length (10 + Enable Analog Se	ve Calls Co I t 255 ms)	onfigurat	- - 100	
X Operation Mo RX Configuration Operative mode [SITIGLE REPEATER OR MOBILE/ Service	des FDED	Enabling TRX Finabing TX Enabing Main 1 Enabing Divers Enabing Repei PCM 1 (Analog F PCM 0 (Analog E Line 3 (Local Th	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled 2X) Enabled	Analog Selection Codec to be used Tone length (10 + Enable Analog Se Enable Analog Se	ve Calls Co I ÷ 255 ms) dective Calls dective Calls	s sending		
X Operation Mo RX Configuration Operative mode STINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type	ides IFDED	Enabling TRX Finabing TX Enabing Main 1 Enabing Nain 1 Enabing Repei- PCM 1 (Analog FCM 0 (Analog Line 3 (Local TI) Line 2 (IP Line) Line 1 (Physical Line 1 (Physic	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled 2X) Enabled Enabled I Line 1) Enabled	Analog Selection Codec to be used Tone length (10 + Enable Analog Se Enable Analog Se Enable reprodution	ve Calls Co I ± 255 ms) dective Calls dective Calls n code inse	s sending rtion	ion 100	
X Operation Mo RX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type 1+1 ACTIVE NODE	rdes	Enabling TRX Finabing TX Enabing Main 1 Enabing Nain 1 Enabing Repei- PCM 1 (Analog F CM 0 (Analog Line 3 (Local TI Line 2 (IP Line) Line 0 (Physica Enabling TX Line 0 (Physica)	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled 2X) Enabled Enabled I Line 0) Enabled I Line 0) Enabled	Analog Selection Codec to be used Tone length (10 + Enable Analog Se Enable Analog Se Enable reproduction Enable repeatible	ve Calls Co I = 255 ms) dective Calls dective Calls m code inse n code dete	s sending reception reconstruction	- - 100	
X Operation Mo RX Configuration Operative mode SITIGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type 3+1 ACTIVE NODE	rbeb .	Enabling TRX Finabing TX Enabing Main 1 Enabing Divers Enabing Reper- PCM 1 (Analog F PCM 0 (Analog F PCM 0 (Analog F Line 3 (Local TI Line 2 (IP Une) Line 1 (Physical Line 0 (Physical)	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 10 Enabled I Line 0) Enabled	Analog Selection Codec to be used Tone length (10 + Enable Analog Se Enable Analog Se Enable repeatition	ve Calls Co l = 255 ms) dective Calls dective Calls n code inse n code dete	s sending rtion ection	ion - 100	
X Operation Mo RX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type 1+1 ACTIVE NODE Ctive/Hot-Spare Parameters	rbeb 💽	Enabling TRX Finabing TX Enabing Main 1 Enabing Divers Enabing Reper- PCM 1 (Analog CLIM 2 (IP Line 2 Line 2 (IP Line) Line 0 (Physical)	RX sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 1) Enabled I Line 1) Enabled	Analog Selection Codec to be used Tone length (10 - 1 Enable Analog Se Enable Analog Se Enable repeatition Enable repeatition	ve Calls Co I t 255 ms) dective Calls dective Calls dective Calls dective Calls	s sending s sending s reception rtion	- - 100	
X Operation Mo RX Configuration Operative mode SITVGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type I+1 ACTIVE NODE Active/Hot-Spare Parameters Automatic Role Self-Switching Tir	HED T	Enabling TRX Enabing TX Enabing Main 1 Enabing Nain 1 Enabing Repei FCM 1 (Analog VCM 0 (Analog Ima 2 (JP Line 2 Line 2 (IP Line) Line 0 (Physica)	RX sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 1) Enabled I Line 0) Enabled	Analog Selectin Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatition	ve Calls Co I ÷ 255 ms) dective Call dective Call n code inse n code dete	s sending s sending s reception rtion action	ion 100	
X Operation Mo RX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type I+1 ACTIVE NODE Active/Hot-Spare Parameters Automatic Role Self-Switching Til	re [min] 480	Enabling TRX Enabing TX Enabing Main 1 Enabing Nain 1 Enabing Repeir PCM 1 (Analog VCM 0 (Analog VLm 2 (Lore 3 (Local TT Line 2 (IP Line) Line 0 (Physical	RX sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 1) Enabled I Line 1) Enabled	Analog Selectin Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatition Enable repeatition	ve Calls Co I = 255 ms) dective Call dective Call dective Call n code inse n code dete	s sending s sending s reception rtion action	ion 100	
X Operation Mo RX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type I+1 ACTIVE NODE Active/Hot-Spare Parameters Automatic Role Self-Switching Tir 30s AU/O ID (needs a codec)	re [min] 480	Enabling TRX Enabing TX Enabing Main 1 Enabing Reper- Enabing Reper- PCM 1 (Analog PCM 0 (Analog Line 3 (Local TI Line 2 (IP Line) Line 0 (Physical Line 0 (Physical)	RX sity RX ater Mode Line 1) Enabled Line 1) Enabled RX) Enabled Enabled I Line 1) Enabled I Line 0) Enabled	Analog Selectin Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatition Enable repeatition	ve Calls Co I = 255 ms) dective Call dective Call n code inse n code dete	s sending s reception rtion action	ion 100	1
X Operation Mo PRX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type I+1 ACTIVE NODE Active/Hot-Spare Parameters Automatic Role Self-Switching Tir 30s AUTO ID (needs a codec) — Automatic	rdes	Enabling TRX Enabing TX Enabing Main I Enabing Reper- Enabing Reper- PCM 1 (Analog PCM 0 (Analog Line 3 (Local TI Line 2 (IP Line) Line 0 (Physical Line 0 (Physical)	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 10 Enabled I Line 0) Enabled	Analog Selectin Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatiblo Enable repeatiblo	ve Calls Co l = 255 ms) elective Call dective Call n code inse n code dete	s sending s sending s reception rtion action	ion	
X Operation Mo PRX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type I+1 ACTIVE NODE Automatic Role Self-Switching Til 30s AUTO ID (needs a codec) — Automatic Automatic Forced QFF	rdes	Enabling TRX Enabing TX Enabing Main 1 Enabing Reper- Enabing Reper- PCM 1 (Analog PCM 0 (Analog Ime 3 (Local TT Line 2 (IP Line) Line 0 (Physical Line 0 (Physical)	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 10 Enabled I Line 0) Enabled	Analog Selection Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatible Enable repeatible	ve Calls Co l = 255 ms) dective Calls n code inse n code dete	s sending s reception rtion ection	100 100	
X Operation Mo PRX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type Service Automatic Role Self-Switching Til 30s AUTO ID (needs a codec) Automatic Forced OFF Forced OFF Forced OFF Forced ON	Ides	Enabling TRX Enabing TX Enabing Main 1 Enabing Divers Enabing Repeir PCM 1 (Analog PCM 0 (Analog Ime 3 (Local TT Line 2 (IP Line) Line 1 (Physical Line 0 (Physical)	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 10 Enabled I Line 0) Enabled	Analog Selection Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatiblo Enable repeatiblo	ve Calls Co l = 255 ms) ective Calls dective Calls n code inse n code dete	s sending s reception rtion	100 100	
X Operation Mo PRX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type SetviceNobe Automatic Role Self-Switching Til 30s AUTO ID (needs a codec) Automatic Forced OFF Forced OFF Forced OFF Forced ON	Ides	Enabling TRX Enabing TX Enabing Main 1 Enabing Divers Enabing Repeir PCM 1 (Analog PCM 0 (Analog Ime 3 (Local TT Line 2 (IP Line) Line 1 (Physical Line 0 (Physical)	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 1) Enabled I Line 0) Enabled	Analog Selection Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatiblo Enable repeatiblo	ve Calls Co l = 255 ms) elective Call elective Call n code inse n code dete	s sending s reception rtion ection	100 100	
X Operation Mo PRX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type SetVice/Hot-Spare Parameters Automatic Role Self-Switching Til 30s AUTO ID (needs a codec) Automatic Forced QFF Forced QFF Forced ON Use external PA	Ides	Enabling TRX Enabing TX Enabing Main 1 Enabing Reper- Enabing Reper- PCM 1 (Analog PCM 0 (Analog PCM 0 (Analog Ime 3 (Local TT Line 2 (IP Une) Line 1 (Physical Line 0 (Physical Service Class	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 0) Enabled I Line 0) Enabled	Analog Selection Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatiblo Enable repeatiblo	ve Calls Co I = 255 ms) dective Calls n code inse n code dete n code dete	s sending s reception rtion ection	100 100	
X Operation Mo PRX Configuration Operative mode SINGLE REPEATER OR MOBILE/ Service FULL DUPLEX Type Setvice Automatic Role Self-Switching Tir 30s AUTO ID (needs a codec) Automatic Forced VFF Forced VFF Forced ON Use external PA Gain [dB] (0+25.5)	Ides	Enabling TRX	2X sity RX ater Mode Line 1) Enabled Line 0) Enabled Enabled I Line 1) Enabled I Line 0) Enabled I Line 0) Enabled	Analog Selectin Codec to be used Tone length (10 ± Enable Analog Se Enable Analog Se Enable repeatition Enable repeatition	ve Calls Co I = 255 ms) dective Calls n code inse n code dete n code dete n code dete n code dete n code dete	s sending s sending s reception rtion ection	100 100	

You must select 1+1 ACTIVE NODE on the primary repeater.

- B. <u>Secondary Repeater Setup</u>
- a. Modify the same items following Single Repeater Setup.
- b. Edit Main Setup.

ommunications	Configuration	Network Settings	Buffer	
onnancacions	Alarms Configuration	Logging Options	/ build	
Sent	Controls	Main Setup	0 04D9 000E	0000
1 <u></u>	Statistics	TRX Operating Modes	1 0000 8003	0000
10 10000 10000000		not operating modes	F 39C5 0000	0000
	Restart	Channels Table	0 0011 FFFF	9118
	Configurations Utility	Calibration Parameters	0 0000 1619	25.60
	L	Dutana and Concellenting	5 3837 9204	DEEO
		Primary Synchronization	3 0898 0508	0850
		TX Control	1 0000 E285	OSFF
		RX Control	0 0000 0000	0000
		IX CONTO	0 0000 0000	0000
		Audio Lines Configuration	0 0000 0000	0005
S		Subtone/Supertone		
Received		Base Station Layer Configuration		
		Station Basic Data		
	/	Base Station Operating Moder	tics	
		base station operating modes		
		RTP Configuration	ged Messages	707
	/	SIP Configuration	ct Messages	4
			ate [%]	0.57
			Log on file	Clear
/			viation:	
			Exit	
/				
in Setup				

			-	
KAIROS	Manager	Software	KAIROS	?

Equipment Name	- Identity Data	GNSS Optional Module	_I/O Contacts	AUTO	ON DEF
MASTER BDCST	Station ID (1 ÷ 254) 68	Enable GNSS Module if present	ALARM OUT (ALR_OUT)	æ	с с
-	Network ID (1 ÷ 4095) 150	Supply Voltage to GNSS Antenna	EXT-1 IN (ALR_IN_1)	e	00
Geographic Data	1+1 Address (1 ÷ 254) 144	PPS Time Reference	EXT-2 IN (ALR_IN_2)	æ	0 0
	DMR ID (1 + 15775415) 2047		AUX-1 OUT (IO_OUT_1)	•	00
Network Name RA-NETWORK	Group ID (1 ÷ 16776415) 101	UTC USNO:	ALIX-2 OUT (PTT_OUT)	e	0 0
Zone Name RA-ZONE		UTC time as per the United States Naval Observatory (USNO)	Fans Activation (FAN)	(•	0 0
Carrier Name RA-CARRIER		, (,	ALARM Status Flag	ſ	0 0
Site Name RA-SITE	Remote Control		4		
Manual coordinates source Image: Coordinates source Im	IP Port 4000 Remote Control Via RF Link Enabled on Timeslot A 77 Enabled on Timeslot B 70 TLC Secure Access 7 Users' Database 7 C Interned 7 From ->>	Features Run TRX Layer Run Stabion Layer Run RIP Layer Run SIP Layer	Read from File Write on File Read		

You can modify 1+1 Address which works on active repeater between the 2repeaters. This address must be used on last 3digit following his network address. In this case scenario, it is 172.33.40.144. This address has to be same as the Primary Repeater Setup.

c. Edit TRX Operation Modes.

ommunications	Alarms Configur	ration	Logging Options		s Buffer	
Sent	Controls	×	Main Setup		0 04D9 000B	000
	Statistics		TRX Operating Mo	odes	1 0000 8003	000
	Restart		Channels Table		0 0014 FFFF	911
	Configurations	leilie .	Calibration Baram	actors	F EEOO COOS	000
i i i i i i i i i i i i i i i i i i i	Coningulations of	Juney		ieters	0 0000 1618	326
			Primary Synchron	nization	3 0898 05C8	085
			TX Control		1 0000 E285	031
			RX Control		0 0000 0000	000
			Audio Lines Confi	iguration	0 0000 0000	000
			Subtone/Supertor	ne		
Received			Base Station Layer	r Configuration		
ř		<u> </u>	Station Basic Data	-		
			Base Station Oper	rating Modes	tics	
-2 -2002 (22 -22022 -23		ion nerra	PTD Configuration	a ling modes	ned Messages	700
			KTP Configuration	n	ct Messages	4
	/		SIP Configuration		ate [%]	0.5
					Log on file	Clea
				<u> </u>	100 State 1	
X Operation Mc	odes				Exit	
X Operation Mc	odes			Analog Selective	Exit	
X Operation Mc	odes	Enabling TRX		Analog Selective Codec to be used	e Calls Configuration	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE	ides	Enabling TRX	RX	Analog Selective Codec to be used Tone length (10 ÷	e Calls Configuration NULL 255 me) 100	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service	repert	Enabling TRX Enabling TX Enabling Min Enabling Diver Enabling Reve	RX sity RX ater Mode	Analog Selective Codec to be used Tone length (10 ÷	e Calls Configuration NULL 255 me) 100	
X Operation Mc (RX Configuration Operative mode SINGLE REPEATER OR MOBILE Service	FDED	Enabling TRX Enabling TX Enabling Main Enabling Repe Enabling Repe PCM 1 (Analog	RX sity FX ster Mode g Line 1) Enabled	Analog Selective Codec to be used Tone length (10 ÷	Exit e Calls Configuration NULL 255 me) 100	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX	FDED V	Enabling TRX Enabling TX Enabling Main Enabling Repe PAD 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 2 (Analog	RX sity RX ater Mode g Line 1) Enabled g Line 0) Enabled g Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele	Exit e Calls Configuration NULL 255 ms) 100 ective Calls sending active Calls sending	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX	repert	Enabling TRX Enabling TX Enabling Main Enabling Repe PCM 1 (Analog PCM 1 (Analog PCM 0 (Analog C Line 3 (Local T C Line 2 (IP Line	RX sity RX ater Mode J Line 1) Enabled J Line 0) Enabled RX) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele	Exit e Calls Configuration NULL 255 ms) 100 ective Calls sending ective Calls reception orde location	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type	FDED V	Enabling TRX Enabling TX Enabling Main Enabling Repe PCM 1 (Analog PCM 0 (Analog PLM 2 (Analog PLM 2 (Analog Line 3 (Local T Line 2 (IP Line Line 1 (Physic	RX sity RX sater Mode j Line 1) Enabled g Line 0) Enabled RX) Enabled al Line 1) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition	Exit Exit Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion	
X Operation Mc Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type [1+1 HCT SPARE NODE	FDED V	Enabling TRX Enabling TX Enabling Main Enabling Repe PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 0 (Analog PCM 1 (Analog Che 3 (Local T Line 2 (IP Line Che 1 (Physic) Line 0 (Physic)	RX sity RX ater Mode J Line 1) Enabled J Line 0) Enabled 9 Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit Exit Exit Exit Exit Exit Exit Exit	
X Operation Mc Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type I+1 HCT SPARE NODE	FDED V	Enabling TRX Enabling TX Enabling Main Enabling Pore Enabling Repe POM 1 (Analog POM 1 (Analog POM 0 (Analog POM 0 (Analog PLM 0 (Analog Line 3 (Local T Line 2 (IP Line Line 1 (Physic) Line 0 (Physic)	RX sity RX ater Mode gLine 1) Enabled gLine 0) Enabled i Line 1) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls cending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type I+1 HCT SPARE NODE Active/Hot-Spare Parameters	reperties	Enabling TRX Enabling TX Enabling Main Enabling Pore Enabling Repe PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 2 (Analog PCM 2 (Analog Line 3 (Local T Line 2 (IP Line Line 1 (Physic) Line 0 (Physic)	RX sity FX ster Mode g Line 1) Enabled g Line 0) Enabled FRX) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type It+1 HGT SPARE NODE Active/Hot-Spare Parameters Automatic Role Self-Switching T	Time (min) 480	Enabling TRX Enabling TX Enabling Main Enabling Repe PCM 1 (Analog PCM 1 (Analog PCM 0 (Analog PCM 1 (An	RX sity RX ater Mode JLine 1) Enabled JLine 0) Enabled) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type It+1 HGT SPARE NODE Active/Hot-Spare Parameters Altomatic Role Self-Switching T	Time [min] 480	Enabling TRX Enabling TX Enabling Main Enabling Nepe PCM 1 (Analog PCM 1 (An	RX sity RX ater Mode JLine 1) Enabled JLine 0) Enabled) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	T
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type [1+1 HGT SPARE NODE Active/Hot-Spare Parameters Altomatic Role Self-Switching T 30s ANTO ID (needs a codec)	Time [min] 480	Enabling TRX Enabling TX Enabling Main Enabling Repe PCM 1 (Analog PCM 1 (Analog PCM 0 (Analog PCM 0 (Analog PCM 1 (Analog CLine 3 (Local T Line 2 (IP Line Line 1 (Physic	RX sity RX ater Mode JLine 1) Enabled JLine 0) Enabled Pnabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type [+1:HCT SPARE NODE Active/Hot-Spare Parameters Altomatic Role Self-Switching T 30s A&TO ID (needs a codec) Automatic	interferin 480	Enabling TRX Enabling TX Enabling Main Enabling Repe PCM 1 (Analog PCM 0 (Analog PCM 0 (Analog PLM 2 (Analog PLM 2 (Analog Line 3 (Local T Line 2 (IP Line Line 1 (Physic	RX sity RX sater Mode j Line 1) Enabled g Line 0) Enabled al Line 1) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls cending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type [H1HGT SPARE NODE Active/Hot-Spare Parameters Automatic Role Self-Switching 1 30s A&TO ID (needs a codec) Automatic Forced OFF	ides	Enabling TRX Enabling TX Enabling Main Enabling Dver PDM 1 (Analog PDM 1 (Analog PDM 0 (Analog CLine 3 (Local T Line 2 (IP Line Line 1 (Physic Line 0 (Physic	RX sity RX sater Mode j Line 1) Enabled g Line 0) Enabled RX) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 active Calls sending active Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type L+1 HCT SPARE NODE Active/Hot-Spare Parameters Actiomatic Role Self-Switching 1 30s AATO ID (needs a codec) Automatic Forced OFF Forced OFF Forced N	ides	Enabling TRX Enabling TX Enabling Main Enabling Dver PCM 1 (Analog PCM 0 (Analog PCM 0 (Analog Curver 1 (Physic Line 3 (cord) Line 1 (Physic	RX sity RX sater Mode g Line 1) Enabled g Line 0) Enabled RX) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type L+1 HCT SPARE NODE Active/Hot-Spare Parameters Actionatic Role Self-Switching 1 30s AATO ID (needs a codec) Automatic Forced OFF Forced OFF Forced N Lise external Parameter	inte [min] 480	Enabling TRX Enabling TX Enabling Main Enabling Dver PCM 1 (Analog PCM 0 (Analog PCM 0 (Analog CUP Line 3 (cord) Line 3 (cord) Line 1 (Physic Line 0 (Physic	RX sity RX seter Mode g Line 1) Enabled g Line 0) Enabled RX) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type E+1 HOT SPARE NODE Active/Hot-Spare Parameters Actionatic Role Self-Switching T 30s A&TO ID (needs a codec) Automatic Forced OFF Forced OFF Forced N Use externalPA	ine [min] 480	Enabling TRX Enabling TX Enabling Main Enabling Dver PCM 1 (Analog PCM 1 (Analog PCM 0 (Analog Chr 1 (Physic Line 3 (Deal Line 2 (Physic Line 0 (Physic Service Class	RX sity RX sater Mode g Line 1) Enabled g Line 0) Enabled TRX) Enabled al Line 1) Enabled al Line 0) Enabled	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit e Calls Configuration NULL 255 me) 100 ective Calls sending ective Calls reception code insertion code detection	
X Operation Mc IRX Configuration Operative mode SINGLE REPEATER OR MOBILE Service FULL DUPLEX Type [+++HOT SPARE NODE Active/Hot-Spare Parameters Actionatic Role Self-Switching T 30s A&TO ID (needs a codec) Actionatic Forced OFF Forced OFF Forced OFF Gain [dB] (0+25.2)	ine [min] 490	Enabling TRX Enabling TX Enabling Main Enabling Dver PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 1 (Analog PCM 0 (Analog PCM 1 (Analog PCM 0 (Physic Line 2 (P Line Line 2 (P Line Line 0 (Physic Service Class Multimode DM C Multimode DM	RX sity RX sater Mode g Line 1) Enabled g Line 0) Enabled 3) Enabled al Line 1) Enabled al Line 1) Enabled al Line 0) Enabled R Tier III Node	Analog Selective Codec to be used Tone length (10 ÷ Enable Analog Sele Enable Analog Sele Enable repeatition Enable repeatition	Exit Exit Exit Exit Configuration NULL 255 ma) 100 Exitive Calls eending Exitive Calls reception code insertion code detection d from File te on File	

You must select 1+1 HOT SPARE NODE on the secondary repeater.

2.3.2 sites Roaming System

2Sites Tie	er2 Site Roaming (Standard 2sites)				Order sample:	2sites STANDARD N	IULTI-SITE			
Site1			Role	Mode	Primary Sync	Second Sync	Labor	License	External	Panel
	all and deleter	Unit1	Master	Master	Internal Ref.	Internal Ref.	KA-SETUP	KA-DMR-L	N/A	KA-RK1v2
	And and a second se	Unit2	Slave	Broadcaster	Internal PTP	Internal Ref.	KA-SETUP	KA-DMR-L	N/A	KA-RK1v2
	(P)				•					
Site2	and the second									

<u>Site1</u>

Unit1: Master Repeater

<u>Site2</u>

Unit2: Slave Repeater

- A. Master Repeater Setup
- a. Open "MST.ka" following common procedure.
- b. Modify the same items following common procedure.
- c. Select Base Station Operation Mode.

ommunications	Configuration Alarms Configuration	•	Network Settings Logging Options	s But	fer		
Sent	Controls Statistics Restart Configurations Utility	•	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone Base Station Layer Configuration Station Basic Data	0 1 F 0 4 F 1 0 0	04D9 0000 39C5 0014 E002 0000 3B3F 0898 0000 0000 0000 0000	0000B 0003 00000 FFFF C005 1819 93C4 05C8 E285 0000 0000 0000	0000 0000 9118 0000 346C DDDF 0850 03FF 0000 0000 1783
			Base Station Operating Modes	tics	5 1-1		
			RTP Configuration SIP Configuration	ged f ct Me ate [Message essages %]	s	2 0 0.00
	,			🗆 Log an fi	lej		Clear
	/				Exi	t	

Base Station Operation Mode

ase Station Parameters	IP Parameters	Tier III Controller	Master-to-Master Parameters
Rase Station Role	IP Address	IP Address	IP Address TSA TSB AM
Stand-Alone Audo Gateway MotoTRBO(TN) TX-Interrupt handing Radio Network Mode Multisite Simulcast	Backup Master Provert Provert Provert Provert Provert	Tier III Network Model TINY Net (0 + 511) 0 Site (0 + 7) 1 Par PAR A+B TS A Role PAVLOAD CH TS B Role PAVLOAD CH	
Beecon intervel [mmoss] 0:30 4	Physical Console Parameters Full-Duplex Console Line 1 Console Al Col Operating Mode Binergency Group ANALOG ORLY 16777215 Dest DMR ID Line 2 Console	Lile Time [s] 13 Accept not registered terminals IT C-syscade [hex] 0007 Net Site [hex] 0001 Alow Tier III traffic [TIS A TIS B ETSI Version 1.5.1 C ETSI Version 1.5.1 C	Red for Fir

You can modify Beacon Interval

d. Modify Base Station Role.

Base Station Role is MASTER

e. Select Primary Synchronization



Primary Synchronization

Synchronization mode	PPS Signal Handling		
1st Choice Internal Ref (full)	_Internal from GPS/GLONASS _	Internal from PTP device	External from rear plug
2nd Choice Internal Ref (full)	Validity	-Validity	Validity
3rd Choice Internal Ref (full) 4th Choice Internal Ref (full)	Automatic Forced OFF Forced ON	Automatic Forced OFF Forced ON	Automatic Forced OFF Forced ON
Superaudio Synchronization Lock Frequency [Hz] 3400 RF Synchronization Frequency Offset [Hz] 0.0 Do frequency self-correction	Polarity © Straight C Reversed PPS to Internal	Polarity © Straight © Reversed PTP Event PPS to Ref Interna	Polarity Polarity © Straight © Reversed prear plug IRef
Internal PTP Handling Domain (0 + 255) Role Domain (0 + 255) OFF Master Offset Master Slaves Groups Slave Slave Group Membership Backup Maste UNICAST mode for PTP M PTP IP Parameters Backup Mst IP Address I172.33.40.110 Backup Mst IP Address	0 • <td>rce ets on TS A ets on TS B Rea</td> <td>d from File_ ite on File Read WriteClose</td>	rce ets on TS A ets on TS B Rea	d from File_ ite on File Read WriteClose

You can modify Synchronization Mode and Internal PTP Handling Mode. You can separate the PTP master repeater and the Master Repeater as a role. It depends on the position on the rack or the network posion in the system. In this case senario, there is no external referense and the Master Repeater will provide his Internal Ref. (VCTCXO) to Slave Repeater. The 1st choice must be Internal Ref (full) and the role of PTP Handling mast be Master.

Internal PTP Handling

- Internal PTP Handling)
Role	Domain (0 ÷ 255) 0
C OFF	Master Offset 0
• Master	Max Slaves Groups
C Slave	Slave Group Membership 🔽 📩
C Backup Master	Peer-to-Peer Operations
PTP IP Parameters	
Master IP Address	Backup Mst IP Address
172.33.40.110	

The PTP Slave follows PTP Master as his timing of any transmitting.

You can modify the Max Slaves Group Number which is the maximum number of direction from the PTP Master who provides the PTP signal. In 2sites case, you can select "1" because there is just 1Slave Repeater. Slave Group Membership must be 0 on the PTP Master.

f. Modify TRX Operation Mode

ukOS_ivianager Software	KAIRUS :		
Communications	Configuration +	Network Settings	Buffer
communications	Alarms Configuration	Logging Options	builti
Sent	Controls •	Main Setup	0 04D9 000B 0000
	Statistics	TRX Operating Modes	1 0000 8003 0000
ao amin'n da selleo	Restart	Channels Table	E 3905 0000 0000
			F EE00 C005 0000
	Configurations Utility	Calibration Parameters	0 0000 1618 3265
	/	Primary Synchronization	4 3A3F 93C4 DDD
		TX Control	1 0000 E285 03FI
		BX Control	0 0000 0000 0000
		Auto David California Pro-	0 0000 0000 0000
		Audio Lines Configuration	0.0000.0000.0008
		Subtone/Supertone	
Received	/	Base Station Layer Configuration	
		Station Basic Data	
		Base Station Operating Modes	tics
		RTP Configuration	ged Messages 709
			ct Messages 4
		SIP Configuration	ate [%] 0.56
			Clear
			Exit
X Operation Mod	le		
	<u> </u>		

Operative mode	Enabling TRX	Codec to be used NULL	-
MASTER BASE STATION	Enabling TX Enabling Main RX Enabling Main RX	Tone length (10 ÷ 255 ms) 100	
Service FULL DUPLEX Type STAND ALONE	Enabling Diversity RX Enabling Diversity RX Enabling Repeater Mode PCM 01 (Analog Line 1) Enabled PCM 0 (Analog Line 0) Enabled Line 3 (Local TRX) Enabled Line 2 (IP Line) Enabled Line 1 (Physical Line 1) Enabled Line 0 (Physical Line 0) Enabled	Enable Analog Selective Calls sending Enable Analog Selective Calls reception Enable repeatition code insertion Enable repeatition code detection	ם ם ס
Active/Hot Spare Parameters Automatic Role Self-Switching Time [min] 480 30s AUTO ID (needs a codec) • Automatic • Forced OFF			
C Forced ON Use external PA	Service Class	Read from File Write on File	

- B. <u>Slave Repeater Setup</u>
- a. Open "SLV.ka" following common procedure.
- b. Modify the same items following common procedure.
- c. Select Base Station Operation Mode.

Communications	Configuration Alarms Configuration	*	Network Settings Logging Options	-	Buffer	
Sent	Controls Statictics Restart Configurations Utility	•	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Superione Base Station Layer Configuration Station Basic Data		04D9 00 0000 00 39C5 00 0014 FF E002 C0 0000 18 3B3F 93 0898 05 0000 E2 0000 00 0000 00	0B 0000 03 0000 FF \$110 05 0000 FF \$12 05 0000 19 3466 C4 DDDF C8 0850 86 0850 00 0000 00 0000 00 1783
· · · · · · · · · · · · · · · · · · ·			Base Station Operating Modes RTP Configuration SIP Configuration	9 2	cs ed Messages Messages e [%]	2 0 0.00
				□ Log o	n file	Clear
	/	· · · · ·			120520	

Base Station Operation Mode

Base Station Parameters Base Station Role BROADCASTER	IP Parameters Mester IP Address		-Master-Lo-Master P IP Address	TSA TSB AN
Kard-Alane Color Galeway Morread (179) Tri-Interruct (187) Andre Radia (Network Mode	Beckup Mester Present Address Address C 1hs 88 Become Master on broken connection	Tier III Network Model TINY Net (0 + 511) 0 Site (0 + 7) 1		
Network Renameters Voting Delay [Is]	- Voke/Data reception from Master Multicaet C Broadcaat C Unicaet C	Par PAR A +B TS A Role PAYLOAD CH TS B Role PAYLOAD CH PAYLOAD C		
Beacon interval (imm:sc)	Physical Console Parameters FullOuplex Console Une L Console Al-Cal	Ide Time [s] 13 Accept not registered terminals Image: C-eyscode [hex] C-eyscode [hex] 0007 Net-Site [hex] 0001		
LAN Compression Plate 0 -	Operating Mode Emergency C ANALOG CINLY Private C 16777215 Dest DMR ID	Alow Tier II traffic T TS A TS 8 -ETSI Versions Compliance ETSI Version 1.5.1 C ETSI Version 1.6.1 C		
Digitz	Line 2 Console Al-Call C Operating Mode Emergency C Group C DMR. DNLY Private C	ETSI Version 1.7.1 C ETSI Version 1.8.1 C	Read from File	
V	16777215 Dest DMR ID		Read Write	Close

You can edit Master Repeater IP Address and Data Reception Method following customer requirement. Beacon Interval is Blank because all Slave Repeater follows Master Beacon timing.

d. Modify Base Station Role

Base Station Role is BROADCASTER

e. Select Primary Synchronization



Synchronization mode	PPS Signal Handling	
1st Choice Internal PTP 2nd Choice Internal Ref (full) 3rd Choice Internal Ref (full) 4th Choice Internal Ref (full) 4th Choice Internal Ref (full) Superaudio Synchronization Lock Frequency [Hz] 3400 RF Synchronization Frequency Offset [Hz] 0.0	Internal from GPS/GLONASS Internal from PTP device External from rear p Validity Validity Validity © Automatic © Automatic © Automatic © Forced OFF © Forced OFF © Forced OFF © Forced ON Polarity © Straight © Straight © Straight © Straight © Reversed © Reversed External from rear p	lug
Do frequency self-correction Internal PTP Handling Role C OFF C Master MaxSlaves Groups	PPS to PTP Event PPS to rear plug Internal Ref PPS to rear plug Sync Packets on TS A Sync Packets on TS A Sync Packets on TS B	
Slave Group Membership Slave Group Membership Peer-to-Pier Operations UNICAST mide for PTP N PTP IP Parameters Master IP Address 172.33.40.110	Read from File	Close

In this case senario, the Master Repeater will provide his Internal Ref. (VCTCXO) to Slave Repeater. The 1st choice must be Internal PTP and the role of PTP Handling mast be Slave. And you must edit PTP Master IP Address to get the PTP signal from the Master.

Internal PTP Handling

-	Internal PTP Handling	
	Role	Domain (0 ÷ 255) 0
	COFF	Master Offset
	C Master	Max Slaves Groups
	Slave	Slave Group Membership 📘 📑
	C Backup Master	Peer-to-Peer Operations
	o backup Master	UNICAST mode for PTP Messages 🔲
	PTP IP Parameters	
	Master IP Address	Backup Mst IP Address
	172.33.40.110	

The PTP Slave follows PTP Master as his timing of any transmitting.

You can modify the Max Slaves Group Number even if it is on the PTP Slave because some PTP Slave becomes Slave Group Master. But it is kind of an option for complicated site structure. In this case senario, I simply suggest Max Slaves Groups on PTP Slave is '1' because there is just 1 slave repeater. Basically this number should be the number of Slaves.

Slave Group Membership must not be 0 on the PTP Slave. Each PTP Slave should have different number except the case of a Slave under Slave PTP Master.

ommunications	Configuration Alarms Configuration	Network Settings Logging Options	s Buffer
Sent	Controls Statistics Restart Configurations Utility	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone	0 04D9 000B 0000 F 39C5 0000 0000 F 29C5 0000 0000 0 0014 FFFF 911F F E200 C005 0000 0 0000 1618 326E 4 3A3F 93C4 DDD 3 0898 05C8 0350 1 0000 2285 0357 0 0000 0000 0000 0 0000 0000 0000
The set of		Base Station Layer Configuration	
		Station Basic Data Base Station Operating Modes RTP Configuration SIP Configuration	tics ged Messages 709 ct Messages 4 ate [%] 0.56

f. Modify TRX Operation Mode

TRX Configuration		Analog Selective Calls Configuration	
Operative mode	Enabling TRX	Codec to be used NULL	•
SLAVE BASE STATION	✓ Enabling TX ✓ Enabling Main RX ✓ Enabling Main RX	Tone length (10 ÷ 255 ms) 100	
Service Ault DUPLEX Type STAND ALONE Active And Sparse Purspectore	Enabling Diversity RX Enabling Repeater Mode PCM 1 (Analog Line 1) Enabled PCM 0 (Analog Line 0) Enabled Uine 3 (Local TRX) Enabled Line 2 (IP Line) Enabled Uine 1 (Physical Line 1) Enabled Line 0 (Physical Line 0) Enabled	Enable Analog Selective Calls sending Enable Analog Selective Calls reception Enable repeatition code insertion Enable repeatition code detection	지 지
Active/holespare Parameters Automatic Role Self-Switching Time [min] 480 30s AUTO ID (needs a codec) Automatic C Forced OFF C Forced OFF C Forced ON			
Use external PA	Service Class C Multimode DMR Tier II Node Multimode DMR Tier II Node Half-Trunking Repeater	Read from File Write on File Read Write	e
Operation Mode is SLAVE BASE	STATION.		

- C. Beacon Duration Time (Common Setup)
- a. Select Base Station Layer Configuration.

KAIROS_Manager Software	KAIROS ?		
KAIROS_Manager Software Communications Sent Received	KAIROS ? Configuration Alarms Configuration Controls Statistics Restart Configurations Utility	Network Settings Logging Options Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone Base Station Layer Configuration Station Basic Data	5 Buffer 4 04E9 820A 0000 1 0000 0003 0000 F 35C1 0000 0000 F 35C1 0000 0000 0 0410 FFFF 911B F AE00 C005 0000 1 8F00 1C1B FFF 6 4547 9ACC E5E4 F 0898 05C8 0850 1 0000 E084 03FF 0 0000 0000 0000 0 0000 0000 17E9
		Base Station Operating Modes RTP Configuration SIP Configuration	tics ged Messages ate [%] 0.00 Log on file Clear Exit
Configuration Enable Repeater Mode Direct Mode Reception Enable Half Trunking Send RC on Same Timeslot Display IDLE Packets Manual AT bit handling Enable ETST ITEr III Features	Configuration Hang Times [30 ms ticks] (0 + 32767) Private Calls Group Calls Data Response 16 Channel 16	DMR Status Digital Mode Enabled TSA TSB	nternal Timings Jurrent Second - Timeslot 0 - 1 Jurrent Extended Timeslot 1 St Received Timeslot 0 0 quency offset rx [Hz] 0 0
TX: act as RX: act as TX: act as Base Station Mobile Station Mobile Station MAIN Color Codes AUX Color Code RX 5 TX 5 TX 5	Timeslots Validity [30 ms ticks] Automatic Network Delay [30 ms ticks] RX Pkts Advance [30 ms ticks] Distance for timing adv [6m] 0	TRANSMITTING FF TRANSMITTING FF TRANSMITTING FF La	e offset rx [ms] 0.00 0.000 or Vector 0 0 0 or Vector 0 0 0 0 st Received Color Codes 0 0 0 0 st Transmitted Data Types 9 9 9 9

You can modify Channel Hang Time it affect Beacon Duration Time. You must modify this value to each repeaters and it must be same value for expected site roaming behavior on subscriber units.

This affect for voice and data transmission. Channel Hang Time does not allow any interruption from subscriber units which use Busy System Lockout during the timer. I do not recommend to setup long duration for this setting.

2.4.3 sites Roaming System

32	ites Tier 2 Site Roeming with Beckup Mester (Standard 3Sites)				Order sample	3 sites STAN DARD MU	JLTI-SITE						
SIL		Same and	Role	Mode	Backup Mastar	Primary Sync	Second Sync	PTP Master	PTP Backup Master	Labor	License	External	Panel
0.00	In Constrait William	Unit1	Mester	Mester		Internel Ref.	Internal Ref.	1	and the second second second	KA-SETUP	KA-DMR-I	N/A	KA-RK1v2
		Unit2	Slave	Broedcester	1	Internal PTP	Internal Ref.		1	KA-SETUP	KA-DMR-I	N/A	KA-RK1v2
		Unit3	Stave	Broadcaster		Internal PTP	Internal Ref.	2		KA-SETUP	KA-DMR-	N/A	KA-RK1v2
Sit	22 (1)												
	and the second se												

<u>Site1</u>

Unit1: Master Repeater

<u>Site2</u>

Unit2: Backup Master Repeater

<u>Site3</u>

Unit3: Slave Repeater

- A. Master Repeater Setup
- a. Modify the same items following procedure 2.3. (Master Repeater Setup)
- B. Backup Master Repeater Setup
- a. Pick a Slave Repeater for Backup Master Repeater.
- b. Modify the same items following procedure 2.3. (Slave Repeater Setup)
- c. Select Base Station Operation Mode.

Communications	Configuration Alarms Configuration	*	Network Settings Logging Options	5 Buffer
Sent	Controls Statistics Restart Configurations Utility	•	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone Base Station Layer Configuration Station Basic Data	0 04D9 0C0B 0000 F 39C5 0C00 0000 0 0014 FFFF 511B F 2002 C005 0000 0 0000 1619 346C 4 3B3F 93C4 DDDF F 0998 05C8 05D 1 0000 2265 03FF 0 0000 0000 0000 0 0000 0000 1783
			Base Station Operating Modes	tics
			RTP Configuration SIP Configuration	ged Messages 2 ct Messages 0 ate [%] 0.00
	/	/	ſ	Log on file Clear

Base Station Operation Mode

Base Station Parameters	- IP Parameters Master		-Master-bo-Master Pa	rameters —
Base Station Role	IP Address		IP Address	
	10 Frederic 172.33.40.110			
Stand Alone	Backup Master	Tier III Network	and the second s	i i i i i
MotoTHBO(TM) TX-Interrupt handling	Present IP Address			
	Recome Mester on broken connection	Net (0 + 511)		
Radio Network Mode		Site (0 + 7) 0	E C	
Multiste Smulcast	Voice/Data reception from Master	Par PAR A +B	1.57	L. T. A
Network Parameters	Multicast C Broadcast	TS A Role PAYLOAD CH		
Votor Delay [ts]	Unicast (*	TS B Role PAYLOAD CH		
Beacon interval [mm:ss]		Icle Time [s] 3 수		
	Physical Console Parameters	Accept not registered terminals		
DMR Packets Framing Mode	FulbOpiex Conside 💦	r course band		
Double Packet Single Packet	-Line 1 Console	Net-Site [hex] 0000		
LAN Compression Rate 0	Operating Mode Emergency C	Alow Tier 11 traffic 🔽 TS A 🛛 TS B 🕅		
- TK and tons	MAINLY ANALOG Private	- ETSI Versions Compliance		
Analog 🗖	16777215 Dest DMR ID	ETSI Version 1.5.1		
Diata 🗌	Line 2 Console	ETSI Version 1.6.1		
	Ali-Cali (+ Degration Mode Emergency (*	ETSI Version 1.8.1	Read from File	
	DMR ONLY V Private		Write on File	
	15777115 Dest DMP ID		Read	
	Larren Contracto		Write	Close

You must all check in Backup Master setup.

d. Select Primary Synchronization



Primary Synchronization

Synchronization mode	PPS Signal Handling		
1st Choice Internal PTP	Internal from GPS/GLON	ASS Internal from PTP device	External from rear plug
2nd Choice Internal Ref (full)	▼ Validity	Validity	-Validity
Ad Choice Internal Ref (full) 4th Choice Internal Ref (full) Superaudio Synchronization Lock Frequency [Hz] 34 RF Synchronization Frequency Offset Hz] 0	C Forced OFF C Forced OFF C Forced ON Polarity C Straight C Reversed	C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed	C Automatic Forced OFF Forced ON Polarity Straight Reversed
Do frequency self-correction Internal PTP Handling Role C OFF Master Offse	255) 0 FF Syn t 0 Sync	PPS to PTP Event PPS ternal Ref Insulat C Source Packets on TS A	to rear plug red
Master Max Slaves Slave Slave Group Slave Peer-to-Peee UNICAST mo PTP IP Parameters	roups 1	Packets on TS B	ad from File
Master IP Address Backup Mst IP 172.33.40.110 172.33.40.	Address	W	rite on File Read Write Close

In this case senario, this Slave Repeater becomes Master Repeater when the Primary Master Repeater offline. The 2nd choice must be Internal Ref. (full) and the role of PTP Handling mast be Backup Master.

- C. Slave Repeater Setup
- a. Modify the same items following procedure 2.3. (Slave Repeater Setup)
- b. Select Base Station Operation Mode.

Communications	Configuration	• N	etwork Settings	s Buffer
and the second se	Alarms Configuration	+ Lo	ogging Options	
Sent	Controls	► M	lain Setup	0 04D9 000B 0000
serve serve serve	Statistics	+ TF	RX Operating Modes	F 39C5 0000 0000
	Restart	+ CI	hannels Table	0 0014 FFFF 911B
	Configurations Utility	Ci	alibration Parameters	F E002 C005 0000 10 0000 1819 346C
		Pr	rimary Synchronization	4 3B3F 93C4 DDDF
		T	Control	IF 0898 05C8 0850
		R	Control	0 0000 0000 0000
		Δι	udio Lines Configuration	
la la		5	ihtone/Supertone	
Dessived			and the four configuration	
Received			ase station Layer Configuration	
		St	ation Basic Data	the
		Ba	ase Station Operating Modes	0.5
		R	IP Configuration	ged Messages 2
		SI	P Configuration	ate [%] 0.00
		/		Log on file Clear
1	/			Exit
ase Station Oper	ation Mode			
ase Station Oper	ation Mode			-Master-to-Master-Parameter
ase Station Oper	IP Parameters	IP Address		- Master-to-Master Parameter IP Address TSA TS
ISE Station Oper ase Station Parameters Base Station Role (BROADCASTER	IP Parameters Master Present	IP Address 172.33.21.110		Master-to-Master Parameter IP Address TSA TS
ase Station Oper ase Station Parameters Base Station Role (SROADCASTER Sonne Acce	IP Parameters Master Present Backup Master	IP Address 172.33.21.110	Ther III Network	Master-to-Master Parameter IP Address TSA TS
ISE Station Oper ase Station Parameters Base Station Role BROADCASTER Stand Aone Audio Sateway Made Sateway	Parameters Parameters Parameters Present Present Present	IP Address 172.33.21.110 IP Address	Tier III Network Model TINY	Master-to-Master Parameter IP Address TSA TS IP III III IIII IIIIIIIIIIIIIIIIIIIIII
ISE Station Oper ase Station Parameters Base Station Role BROADCASTER Stand Aone Audio Satoway Mode Satoway Mode Satoway	Pation Mode	IP Address 172.33.21.110 IP Address IP Address IP Address IP Address	Ther III Network Model TPV/ Net (0 + 5 11) 0	Master-to-Master Parameter SP Address TSA TS C C C C C C C C C C C C C C C C C C C
ase Station Parameters Base Station Parameters Base Station Rols [ROADCASTER Stant Aone Audo Gateway: Mecc1869(IPP) 1X-interrupt handing Radio Network Mode	Teation Mode	IP Address 172.33.21.110 IP Address 172.33.40.112 roken connection	Tier III Network Model TINY Net (0 + 511) 0 Site (0 + 7) 0	Master-to Master Parameter SP Address T5A T5 T T T T T T T T T T T T T T T T T T T
ase Station Parameters Base Station Role BROADCASTER Station Role BROADCASTER Station Role Rodo Sateway: Mode Sateway: Multisate Simulcost Multisate Simulcost	Tation Mode	IP Address I72.33.21.110 IP Address I72.33.40.112 IP Address I72.33.40.112 IP Address I72.33.40.112	Ther III Network Model TDV/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+6	Master to Master Parameter P Address TSA TS T T T T T T T T T T T T T T T T T T T
ase Station Oper ase Station Parameters Base Station Role (ROADCASTER SROADCASTER Pudo Satowey NocicilaBO(1010 th-interrupt handing Radio Network Node Multisate Simulcost Network Parameters	The second secon	IP Address 172.33.23.110 IP Address 172.33.40.112 IP Address 172.33.40.112 orden connection om Master	Tier III Network Model TIV/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+6 C TS A Role PAVLOAD C	Master-to-Master Parameter P Address TSA TS T T T T T T T T T T T T T T T T T T T
ase Station Parameters Base Station Role SROADCASTER Sonn Aore Ando Sateway Mocci REGITIO Tri-Interspt handing Radio Network Mode Multisite Simulator Network Parameters voten Delay [16] 3	IP Parameters Plaster Parameters Plaster Preent Sciup Master Preent Preent Decome Master Present Decome Master on b Videe/Data reception fri Multicast Decodesat Encodesat	IP Address 172.33.21.110 IP Address 172.33.40.112 roken connection om Master	Ther III Network Model TPN/ Net (0 + 5 ± 1) 0 Site (0 + 7) 0 Par PAR A HB TS A Role PAVLOAD C TS B Role PAVLOAD C	Master-to-Master Parameter 3P Address T5A TS T T T T T T T T T T T T T T T T T T T
Ase Station Parameters ase Station Parameters Base Station Role BROADCASTER Some Aone Made Sateway MediciteBO(110) 1N-interspit handing Radio Network Mode Multisite Simulater Sim	IP Parameters Plaster Parameters Plaster Preent Sodup Master Preent	IP Address 172.33.21.110 IP Address 172.33.40.112 roken connection om Master	Ther III Network Model TPN/ Net (0 + 5 ±1) 0 Site (0 + 7) 0 Par PAR A HB TS A Role PAVLOAD C TS B Role PAVLOAD C Lobe Time [5] 3	Master-to-Master Parameter 3P Address TSA TS T T T T T T T T T T T T T T T T T T T
ase Station Parameters Base Station Parameters Base Station Role [SROADCASTER Scane Aone Ando Gateway Mode CIREO((140) 1N-interrupt handing Radio Network Mode Multisite Simulatoot Network Parameters Voeting Delaya [Ib] 3 Beacon Interval [Immise] 3	The second secon	IP Address I72.33.21.110 IP Address I72.33.40.112 roken connection on Master meters	Ther 111 Network Model TDY/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+0 TS A Role PANLOAD C IS B Role PANLOAD C Like Time [c] 3 Accept not registered terminais Contraction	Master-to-Master Parameter JP Address TSA TS T T T T T T T T
ase Station Parameters Base Station Parameters Base Station Role [BROADCASTER 'Contr Aorte 'Contr Aorte 'Contr Aorte 'Addo Gateway Modo CateBol (M0) 1N-Interrupt handing Radio Network Node Multisate Simulator Network Parameters Vettop Delay [ts] 3 Seacon Interval [mmss] DMR Packets Framing Mode	Image: Parameters Master Image: Present Bodue Master Image: Present Image: Prese	IP Address 172.33.21.110 IP Address 172.33.40.112 IP Address I72.33.40.112 IP Address IP IP I	Ther III Network Model TDV/ Model TDV/ Site (0 + 51.1) O Site (0 + 7) D Par PAR A+60 TS A Role PANLOAD C IS B Role PANLOAD C Lole True [c] 3 Accept not registered terminais C-syscode frext	Master-to-Master Parameter P Address TSA TS D Address TSA TS D
Ase Station Parameters Base Station Parameters Base Station Role Base Station Role Base Station Role Base Station Role BROADCASTER Sonne Anne Audio Sateway MecolorB92(IM) 13-Interrupt handing Radio Network Mode Multisate Simulcost Multisate Simulcost Network Parameters Voting Delay [tb] 3 Beacon Interval [immiss] DMR Podiets Framing Mode Double Padiet Single Padie	Image: Parameters Master Image: Present Backup Master Image: Present Image: Pres	IP Address 172.33.21.110 IP Address 172.33.40.112 IP Address IP Address	Ther III Network Model TDV/ Net (0 + 511) 0 Site (0 + 51) 0 Site (0 + 7) 0 Par PAR A+6 TS A Role PANLOAD C IS B Role PANLOAD C Lole Thre [s] 3 Accept not registered terminals C-syscode frext C. syscode frext 0000	Master-to-Master Parameter P Address TSA TS P Address TSA TS T T T T T T H Address TSA TS T T T T T T T
Ase Station Parameters Base Station Parameters Base Station Role BROADCASTER Stants Aore Andio Sateway MoocresS(TM) TA-energet handing Radio Network Mode Multisate Simulator Network Parameters Veting Delay [Es] Beacon Interval [mmss] DMR Pockets Framing Mode Double Paddet Single Pack LAN Compression Rate 0	Image: Parameters Image: Parameters <t< td=""><td>IP Address 172.33.21.110 IP Address 172.33.40.112 roken connection om Master meters Al-Cal Emergency</td><td>Ther III Network Model TDV/ Model TDV/ Net (0 + 511) 0 Site (0 + 7) 0 Far PAR A+6 Par PARLOAD C IS B Role PANLOAD C Lele Trine [s] 3 Accept not registered terminals C -syscode [Pex] 0000 Net-Site [Pex] 0000</td><td>Master-to-Master Parameter IP Address TSA TS I I I I I I I I I I I I I I I I I I I</td></t<>	IP Address 172.33.21.110 IP Address 172.33.40.112 roken connection om Master meters Al-Cal Emergency	Ther III Network Model TDV/ Model TDV/ Net (0 + 511) 0 Site (0 + 7) 0 Far PAR A+6 Par PARLOAD C IS B Role PANLOAD C Lele Trine [s] 3 Accept not registered terminals C -syscode [Pex] 0000 Net-Site [Pex] 0000	Master-to-Master Parameter IP Address TSA TS I I I I I I I I I I I I I I I I I I I
Ase Station Parameters Base Station Role BROADCASTER Stone Ando Sateway Mocc1880(1M) N-interrupt handing Radio Network Mode Multisate Simulcost Network Parameters Voting Delay [ts] 3 Beacon interval [mmss] DNR Podiets Framing Mode Double Podet Single Peek LAN Compression Rate 0 CTR ord-to	Tation Mode	IP Address I72. 33. 21. 110 IP Address I72. 33. 40. 112 I72. 34. 40. 112 I72. 34. 40. 112 I72. 34. 40. 112 I72. 34. 40. 112 I72. 40. 40. 40. 40. 40. 40. 40. 40. 40. 40	Ther III Network Model TINY Model TINY Net (0 + 511) 0 Site (0 + 7) 0 Site (0 + 7) 0 Far PAR ArtB Par PAR ArtB Libe Tine [s] 3 Accept not registered terminals C C -syscode (hex) 0000 Alow Tier II traffic T5 A C - ETSI Versions Compliance	Master to Master Parameter P Address TSA TS P C P P P C P P T P P P P P P P P P P P P P P P P P P P
Action Parameters Base Station Parameters Base Station Role BROADCASTER Somm Avere Audio sateway MocoTRED((M) TX-Interrupt handing Radio Network Mode Multisile Simulcost Network Parameters Voting Delay [ts] Bascon interval [imitse] DMR Podicts Froming Mode Deuble Podict LAN Compression Rate 0 TX end-to	The second Master The second M	IP Address IP Ad	Tier III Network Model TIV/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+6 TS A Role PANLOAD C IS B Role Is B Role Is B Role Is B Role Is B Role Is B Role Is B Role <t< td=""><td>Master to Master Parameter P Address TSA TS P C P C P T C P C T C P C P C T C P C P C T C P C T C P C T C P C P C P C P C T C P C P C P C P C P C T C P C P C P C P C T C P C P C P C P C P C P C P C P C P C</td></t<>	Master to Master Parameter P Address TSA TS P C P C P T C P C T C P C P C T C P C P C T C P C T C P C T C P C P C P C P C T C P C P C P C P C P C T C P C P C P C P C T C P C P C P C P C P C P C P C P C P C
Asse Station Oper Base Station Parameters Base Station Role [BROADCASTER "Somn Akken" Pudio Gatoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: Model Satoway: DMR Packets Framing Mode Double Packet Double Packet Of Packet Direct to Analog	The second Master The second M	IP Address I72 33.23.110 IP Address I72 33.40.112 I72 34.40.112 I72 34.40.112 I74 34.40.112 I74 34.40.11	Ther III Network Model TDV/ Model TDV/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+6 TS A Role PAVLOAD C IS B Role PAVLOAD C Life Time [s] 3 Accept not registered terminals C-ayscode [hex] 0000 Alow Tier III anfile TS A 000 Alow Tier III anfile TS A C ETSI Version L5.1 ETSI Version L5.1 ETSI Version L6.1	Master to Master Parameter P Address TSA TS F F F F F F F F
Asse Station Parameters Base Station Parameters Base Station Role [BROADCASTER "Druch Gateway Mode Gateway Device Praduets Datable Praduet Datable Praduet Ching Praduets Single Padde Datable Praduet Ching Compression Rale 0 Ching Compression Rale Ching Compression Rale	The second mode of the second mo	IP Address I72.33.22.110 IP Address I72.33.40.112 I72.34.40.112 I72.34.40.11	Ther III Network Model TPN/ Model TPN/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A16 TS A Role PANLOAD C IS 8 Role PANLOAD C Like Time [5] 3 Accept not registered terminals C-syscode (hex) C -syscode (hex) 0000 Net-Site [hex] 0000 Alow Tier III traffic TS A C - ETSI Version L5.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.6.1	Master to Master Parameter P Address TSA TS P C C C C C C C C C C C C C C C C C C C
Asse Station Parameters Base Station Parameters Base Station Role [BROADCASTER 'Control Androway Mode Stateway Mode Stateway Mode Stateway Mode Stateway Mode Stateway Mode Stateway Mode Stateway Mode Stateway Mode Stateway Mode Stateway DNR Pochets Framing Mode DNR Pochets Framing Mode	IP Parameters Plaster Parameters Plaster Present Backup Master Present Backup Master Present Decome Master Physical Console Para Decoming Mode Decomp Mode Decome Mode	IP Address IP Address IP Address IP Address IP Address I72 33-21-10 IP Address I72 33-40-112 I72 33-40-	Ther III Network Model TDY/ Model TDY/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+6 TS A Role PANLOAD C TS B Role PANLOAD C Lille Time [c] 3 Accept not registered terminais C-syscode (hex) C - piscode (hex) 0000 Alow Tier II traffic TS A - ETSI Version Compliance ETSI Version 1.5.1 ETSI Version 1.5.1 ETSI Version 1.5.1 ETSI Version 1.5.1 ETSI Version 1.6.1 ETSI Version 1.8.1 ETSI Version 1.8.1	Master-to-Master Parameter 3P Address TSA TS T T T T T T T T T T T T T T T T T T T
Asse Station Parameters Base Station Parameters Base Station Role State Station Role State Station Role State Station Role State Station Role State Station Role Mutisite Simulator Mutisite Simulator Simulator Mutisite Simulator Simulator Mutisite Simulator Mutisite Simula	Image: Construction of the second of the	IP Address IP Address IP Address IP Address IP Address I72 33-21.110 IP Address I72 33-40.112 Iroken connection on Master Al-Cal Emergency Group Private Dest DMR.ID Al-Cal Emergency Group Private	Ther III Network Model TDY/ Model TDY/ Net (0 + 511) 0 Site (0 + 7) 0 Par PAR A+0 TS A Role PANLOAD C IS B Role PANLOAD C Lile Time [s] 3 Accept not registered terminais C-syscode (frex) C - Syscode (frex) 0000 Alow Time II traffic TS A - ETSU Version Compliance ETSU Version 1.5.1 ETSU Version 1.5.1 ETSU Version 1.6.1 ETSU Version 1.6.1 ETSU Version 1.6.1 ETSU Version 1.8.1 ETSU Version 1.8.1	Master-to-Master Parameter 3P Address TSA TS T T T T T T T T
Ase Station Parameters Base Station Parameters Base Station Parameters Base Station Parameters BROADCASTER Sonne Aore Audo catowary MecortsB9(TMP) Th-Interrupt handing Radio Network Mode Multisate Simulcost Network Parameters Voting Delay [b] 3 Bascon interval [mmss] DNR Pochets Framing Mode Double Packet Single Pack LAN Compression Rate 0 () () () () () () () () () () () () ()	Image: Section Mode Image: Section Matter I	IP Address I72.33.21.110 IP Address I72.33.40.112 IR Address I72.33.40.112 IR Address IR IR IR IR IR IR IR IR IR IR IR Address IR	Ther III Network Model TDV/ Model TDV/ Site (0 + 511) 0 Site (0 + 7) 0 Par PAR A+6 TS A Role PANLOAD C IS B Role PANLOAD C Lile Time [s] 3 Accept not registered terminals C-pyscode (hex) 0003 Net-Site (hex) 0000 Alow Tim II traffic TS A C ETSI Version L5.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.7.1 ETSI Version 1.3.1	Master to Master Parameter P Address TSA TS P C C C Read from File White on File Read from File Read from File

You must edit Backup Master IP Address.

c. Select Primary Synchronization

ommunications	Configuration Alarms Configuration	•	Network Settings Logging Options	5 E	Buffer	
Sent	Controls Statistics Restart Configurations Utility	;	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone Base Station Layer Configuration Station Basic Data	0 1 1 0 5 5 1 1 0 0 0 0 0	04D9 000E 0000 0003 39C5 0000 0410 FFFF E002 C005 0000 1819 3A40 93C4 0898 05C5 0000 2285 0000 0000 0000 0000	0000 0000 911E 0000 386C DDDF 0850 03FF 0000 03FF 0000 17A2
			Base Station Operating Modes RTP Configuration SIP Configuration	tio ge ct at	c s ed Messages [Messages [e [%] [14 0 0.00
				∣ Log o	n file	Clear
5-						

Primary Synchronization

Synchroniz	ation mode	PPS Signal H	landling			
1st Choice	Internal PTP 🔹	-Internal from	n GPS/GLONASS	☐ Internal from PTP device	External from rear plug	
2nd Choice	Internal Ref (full)	-Validity -		- Validity	- Validity	
Brd Choice	Choice Internal Ref (full)			C. Automatia	C. Automotio	
th Choice	Internal Ref (full)	C Force	d OFF	C Forced OFF	C Forced OFF	
		C Force	ed ON	C Forced ON	Forced ON	
Superaudio	Synchronization	Deleritu		Delevitu	Delevitu	
Lock Freque	ency [Hz] 3400	Polarity		Polarity	Polarity	
-DE Synchro	pization	Straig	ht .	Straight	Straight G Bauarand	
Ki Synchio		C Reve	rseu	(Reversed	() Reversed	
Frequency (Offset [Hz] 0.0					
			PPS to	PTP Event PPS t	to rear plug	
0	Do frequency self-correction		Internal	Ref 🔹 Insulat	ed 💌	
Internal PT Role	P Handling Domain (0 ÷ 255) Master Offset Max Slaves Groups		RF Sync Sou OFF Sync Packe Sync Packe	ets on TS A ets on TS B		
C Slave	Slave Group Members	nip 🚺 🕂				
Backup I	Master Peer-to-Peer Operati UNICAST mode for PT	P Messages				
PTP IP Para	meters			Rea	ad from File	
Master I	P Address Backup Mst IP Address			W	rite on File	
172.33	3.40.110 172.33.40.112				Read	
					Write Close	
	7					

You must edit Backup Master Repeater IP Address on all of Slave Repeaters.

2.5.3 sites Simulcast System

3 Sites S	imulcast Tierz Conventinonal with Backup Master Standard Spites Sir	mulcasti			Order sample:	S SILES STANDARD SI	MULCAST							
Site1			Role	Mode	Backup Master	Primary Sync	Secondary Sync	PTP Master	PTP Backup Master	Labor	License	Ex	lemai	Panel
	and the second second second	Unit1	Master	Master	10	Internal PPS	InternalRef	1	18	KA-SETU	KA-DMR-L KA-SI-T	2 KA-GPS	GPS-ANT	KA-RX1v
		Unit2	Slave	Broscicester	1	Internel PPS	Internal PTP	1.00	1	KA-SETU	KA-DMR-L KA-SI-T	2 KA-SPS	GPS-ANT	KA-RH1v
		UnitS	Slave	Broadcaster		Internal PPS	Internal PTP			KA-SETU	KA-DMR-L KA-SI-T	2 KA-GPS	GPS-ANT	KA-RK1v2
Site2														
Sit#3														

<u>Site1</u>

Unit1: Master Repeater

<u>Site2</u>

Unit2: Backup Master Repeater

<u>Site3</u>

Unit3: Slave Repeater

- A. Simulcast Repeater Setup
- a. Modify the same items following procedure 2.4. (for each repeater role)
- b. Select Base Station Operation Mode.

Communications	Configuration	THEEVO	researings	s Buffer
	Alarms Configuration	 Loggin 	ig Options	
Sent	Controls	 Main S 	etup	0 04D9 000B 0000
	Statistics	TRX O	perating Modes	1 0000 0003 0000 F 39C5 0000 0000
	Restart	► Chann	els Table	0 0014 FFFF 911B
	Configurations Utility	Calibra	ition Parameters	F E002 C005 0000 0 0000 1819 346C
	L	Primar	y Synchronization	4 3B3F 93C4 DDDF
		TX Cor	ntrol	1 0000 E285 03FF
		RX Cor	ntrol	0 0000 0000 0000
		Audio	Lines Configuration	0 0000 0000 1783
		Subtor	ne/Supertone	
Received		Base St	tation Layer Configuration	
		Station	Basic Data	
		Base St	tation Operating Modes	tics
**. ** **. ** **. **		RTP Co	onfiguration	ged Messages 2
		SIP Co	nfiguration	ct Messages 0
		1		ate [%] 0.00
				Log on file Dear
		/		
1		/		Evit
se Station Ope	eration Mode			
se Station Ope	eration Mode		Ther III Controller	- T Haster-to-Haster Parameter:
Se Station Ope se Station Parameters are Station Role	Parameters	IP Address	Ther III Controller	Haster-to-Master Parameters IP Address TSA TSE
Se Station Ope se Station Parameters are Station Role MASTER	Parameters	IP Address	Ther III Controller	Haster-to-Master Parameters
se Station Ope se Station Parameters are Station Role MASTER Hard-Alone	Pration Mode	IP Address	Tier III Controller P Address Tier III Network	Haster-to-Master Parameters
se Station Ope se Station Parameters ase Station Role MASTER Stand-Alone Lucko Generacy Mobil/BOU(M) Di-interrupt handlin	Pration Mode	IP Address	Ther III Controller IP Address Tier III Hetwork Model TINY	Haster-to-Master Parameters
se Station Ope se Station Parameters ase Station Role MASTER Stand-Alone Ludio Gelenay dob/REO(TM) TX-interrupt handlin	Pration Mode	IP Address	Ther III Controller IP Address Tier III Hetwork Model TINY Net (0 + 511) 0	Haster-to-Master Parameters
se Station Ope Ise Station Role MASTER Stand-Alone Ludio Getenay Moto REBO(TM) TX-interrupt handlin Ludio Network Mode	Pration Mode	IP Address IP Address	Ther III Controller IP Address Tier III Hetwork Model TINY Net (0 + 511) D Sile (0 + 7) 1	Haster-to-Haster Parameters IP Address TSA TSB
se Station Ope Ise Station Parameters Ise Station Role MASTER Stand-Alone Ludio Getenay Aloo REBO(TM) TX-mterrupt handlin Ladio Network Mode Pulitistz	Eration Mode	IP Address IP Address IP Address index correction	Ther III Controller IP Address Tier III Hetwork Model TINY Net (0 + 511) 0 Sile (0 + 7) 1 Par PAR A+B	Haster-to-Haster Parameters IP Address TSA TSB
se Station Ope Ise Station Role MASTER Stand-Alone Ludio Getersay doo REBO(TM) TX-interrupt handlin Ladio Network Mode Multiste	eration Mode	IP Address IP Address IP Address	Tier III Controller IP Address Tier III Network Model TINV Net (0 + \$11) 0 Site (0 + 7) 1 Par PAR AHB TS A Role	Haster-to-Haster Parameters IP Address TSA TSB IP Address TSA TSB IP III III III IIII IIII IIIIIIIIIIIII
Se Station Ope se Station Parameters ase Station Role MASTER Stand-Alone Liand-Alone Liand Gateway Mato TREO(TM) TX-interrupt handline ladio Metwork Mode Multiste Edwork Parameters oting Delay [ts]	eration Mode	IP Address IP Address IP Address	Tier III Controller IP Address Tier III Hetwork Model Thr Notd Thr Sile (0 + 7) 1 Par PAR A+8 TS A Role PAYLOAD OF TS B Role PAYLOAD OF	Haster-to-Haster Parameters IP Address TSA TSE
Se Station Ope se Station Parameters ase Station Role MASTER Stand-Allone Ladio Geteroay Ladio Geteroay Ladio Hebrork Mode Pulliste Pulliste Simula letwork Parametera oting Delay [16] cacon interval [mmitas]	eration Mode	IP Address IP Address IP Address	Tier III Controller IP Address Tier III Hetwork Model TINY Net (0 + 511) 0 Site (0 + 7) 1 Par PAR A+8 TS A Role PAYLOAD C TS B Role PAYLOAD O Idte Time [s] 13	Haster-to-Haster Parameters IP Address TSA TSD IP IP Address TSA TSD IP IP I
Se Station Ope ase Station Role MASTER Stand-Alone Auto Geteroxy Acto RESO(TM) TX-interrupt handling Actio Network Mode Pulitiste Simuli ledvork Parametera- outing Delay [16] cocon interval [tminas]	Beckup Master Presert Beckup Master Presert Decome Master on	IP Address IP Address IP Address	Tier III Controller IP Address Tier III Hetwork Model TINY Net (0 + 511) 0 Site (0 + 7) 1 Par PAR A+8 TS A Role PAYLOAD C TS B Role PAYLOAD O Ide Time [s] 13 Accept not regetered terminate	Haster-to-Haster Parameters IP Address TSA TSD IP Address TSA TSD IP III III IIII IIIIIIIIIIIIIIIIIIIIII
Se Station Ope ase Station Role MASTER Stand-Alone Auto Getereay Acto RESO(TM) TX-interrupt handline Actio RESO(TM) TX-interrupt handline Actio RESO(TM) TX-interrupt handline Actio Resort Actio Resort Market Straining Mode Data backets Framing Mode Data backets Framing Mode	eration Mode	IP Address IP Address IP Address	Tier III Controller IP Address Tier III Hetwork Model TBHY Net (0 + 511) 0 Site (0 + 7) 1 Par PARLAHD TS & Role PAYLOAD CO TS & Role PAYLOAD CO Ide Time [s] 13 Accept not regetered terminale C C syscode (hex) 0007	Haster-to-Haster Parameters IP Address TSA TSD IP IP Address TSA TSD IP IP I
Se Station Ope Ise Station Parameters Ise Station Role MASTER Stand-Alone Stand-Alone Stand-Alone Stand-Alone Matters Masters Ma	eration Mode	IP Address IP Address IP Address Induction	Tier III Controller IP Address Tier III Hetwork Mode TINY Net (0 + 511) 0 Site (0 + 7) 1 Par PARLAD TS & Role PAYLOAD O Ide Time [s] 13 Accept not regetered terminals C syscode (hex) C syscode (hex) 0001	Haster-to-Haster Parameters IP Address TSA TSD IP In Iteration International Internati
Se Station Ope ise Station Parameters lase Station Role MASTER Stand-Alone Stand-Alone Stand-Alone Stand-Alone Math Geteray Moto RESO(TM) DX-interrupt handline Math Geteray Moto Network Mode Multiste Single Parameters Disuble Packet Single P Alv Compression Rate 0	Arration Mode	IP Address	Tier III Controller IP Address Tier III Hetwork Mode TINY Net (0 ÷ 511) 0 Site (0 ÷ 7) 1 Par PARLAD TS & Role PANLOAD C TS & Role PANLOAD C Ide Time [s] 13 Accept not registered terminals C syscode (hex) C syscode (hex) 0001 Alow Tier II treffic (" TS A T	Master-to-Master Parameters IP Address TSA TSD IP In the second s
Se Station Ope ise Station Parameters lase Station Role MASTER Stand-Alorie Lucio Gateway dotoTRBO(TM) TX-interrupt handline lucio Intervork Mode Multisite Multisite ietviork Parameters oting Delay [IS] Goacon interval [imitss] Duuble Packet Single P AN Compression Rate 0	Prace Parameters Master Master Presert Beckup Master Presert Beckup Master Presert Beckup Master Presert Presert Presert Presert Physical Console Par Ful-Outper Console The I Console Coperating Made NAUCG OILY	IP Address IP Address IP Address Index connection Address Connection Address Connection	Tier III Controller IP Address Tier III Network Model TINY Net (0 + 511) 0 Sile (0 + 7) 1 Par PAR A+8 TS & Role PAYLOAD C TS & Role PAYLOAD C Ide Time [s] 13 Accept not registered terminals C dyscode [hex] C dyscode [hex] 0001 Alow Tier III heffic [~ T5 A T -ETSI versione Compliance	Master-to-Master Parameters IP Address TSA TSD IP Address TSA TSD IP III III IIII IIIIIIIIIIIIIIIIIIIIII
AN Compression Rate	Present Beckup Mester Master Master Master Master Present Beckup Mester Present Decome Meder on Physical Console Par Full-Opties Console Line 1 Console Correcting Mode ANALCG OILY 16777215	IP Address IP Address IP Address In the connection annectors All-Call Emergency C Group C Private C Dest DMR. ID	Tier III Controller IP Address Tier III Network Model TINY Net (0 + 511) 0 Sile (0 + 7) 1 Par PAR A+8 IS A Role PANLOAD C TS B Role PANLOAD C Ide Time [s] 13 Accept not registered terminals 0001 Alow Tie: II heffic [T TS A T -ETSU versions Compliance ETSU version 1.5.1 ETSU version 1.6.1 1	Haster-to-Haster Parameters IP Address TSA TS0 IF IF IF IF IF IF I
Ase Station Ope ase Station Parameters Ease Station Role MASTER Stard-Nore Audio Gateway Mato TREPO(TM) TX-Interrupt handline Radio Network Mode Multiste Mu	Praction Mode Matter Matter Matter Matter Present Bodup Master Present Present Decome Mader on Physical Console Par Ful Ouplex Console Line 1 Console Corroting Mode ANAUCG OTLY Store Store The 2 Console Line 2 Consol	IP Address	Tier III Controller IP Address Tier III Network Model TINY Net (0 + 511) 0 Sile (0 + 7) 1 Par PAR A+8 IS A Role PATLOAD C TS B Role PATLOAD C Ide Time [s] 13 Accept not registered terminals C-syscode [hex] C-syscode [hex] 0001 Alow Tier II traffic [T TS A T T FETSI Version 1.5.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.6.1	Haster-to-Haster Parameters IP Address TSA TS0 IF IF IF IF IF IF I
Ase Station Ope ase Station Parameters Base Station Role MASTER Stard-None Audio Geternay MotoTREO(TM) TX-Interrupt handline Radio Network Mode Putitiste Simule Network Parameters Voiting Delay [ks] Beacon intervol [Immiss] DMR Packets Framing Moor Double Packet Single P AN Compression Rate 0	Praction Mode Matter Matter Matter Proof Beckup Master Proof Beckup Master Proof Decome Meder on Physical Console Par Ful-Duplex Console Coperating Mode ANALOG OFLY ISTREE Coperating Mode	P Address P Address P Address Address Address Address C C C C C C C C C C C C C C C C C C	Tier III Controller IP Address Tier III Network Model TINY Net (0 + 511) 0 Sile (0 + 7) 1 Par PAR A+8 TS B Role PATLOAD OF Lide Time [s] 13 Accept not registered terminals C-syscole (hex) C-syscole (hex) 0001 Alow Tier II heffic [T TS A T ETSI Version 1.5.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.6.1	Master-to-Master Parameters IP Address TSA TSO IP Address TSA TSO IF I
ase Station Parameters Sase Station Role MASTER Stard-Norie Audio Geteway Moto/TREPO(TM/ TX-interrupt handline Radio Network Mode Multiste Simule Network Parameters Radio Network Mode Multiste Simule Simule Simule Compression Rate Compression R	Praction Mode Master Master Preact Backup Master Preact Backup Master Preact Decome Master Physical Console Par Ful-Duplex Console Coperating Made ANALOG OFLY ISTREE Coperating Made Coperati	P Address P Address P Address P Address P Address Al-Cal C Energency C C Provat C Dest DPR ID Al-Cal C Energency C C Provat C Dest DPR ID Al-Cal C Energency C C Provat C C C C C C C C C C C C C C C C C C C	Tier III Controller IP Address Tier III Network Model TINY Net (0 + 511) 0 Sile (0 + 7) 1 Par PAR A18 IS A Role PAYLOAD OF Iste Time [s] 13 Accept not regetered terminale 0007 C-syscole (hex) 0007 Net Site (hex) 0007 FIS I Version 1.5.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.8.1 18.1	Master-to-Master Parameters IP Address TSA TSD IP Address TSA TSD IP III IIIIIIIIIIIIIIIIIIIIIIIIIIIIIII
Ase Station Ope ase Station Parameters Base Station Role MASTER Stard-None Audio Getenay Moto TREO(TM) TX-interrupt handline Radio Network Mode Pullisite Simula Network Parameters Voting Delay [Is] Beacon intervel [Immiss] DMR Packets Framing Mode Double Packet Single P LAN Compression Rate 0	eration Mode	P Address P Address P Addres	Ther III Controller IP Address Tier III Network Model TDV Notd TDV Net (0 + 511) 0 Site (0 + 7) 1 Par PAR AHB TS A Role PAYLOND CF TS B Role PAYLOND CF Lide Time [s] 13 Accept not registered terminals 0007 Vescode [hex] 0007 Net Site [hex] 0007 Net Site [hex] 0007 THE Haffic [T TS A T ETSI Version 1.5.1 ETSI Version 1.5.1 ETSI Version 1.5.1 ETSI Version 1.6.1 ETSI Version 1.6.1 ETSI Version 1.7.1 ETSI Version 1.8.1 1	Bead from Pile

You must select Simulcast Mode Beacon Interval Time is not available when you select Simulcast.

c. Select Primary Synchronization.

Communications	Configuration Alarms Configuration	•	Network Settings Logging Options	5 B	uffer	
Sent	Controls Statistics Restart Configurations Utility	*	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization	0 1 F 0 5	04D9 000B 0000 0003 39C5 0000 0410 FFFF E002 C005 0000 1819 3A40 93C4	0000 0000 911E 0000 3860 DDDB
Received			TX Control RX Control Audio Lines Configuration Subtone/Supertone Base Station Layer Configuration Station Basic Data	F 1 0 0	0898 05C8 0000 E285 0000 0000 0000 0000 0000 0000	0850 03FI 0000 0000 17A2
			Base Station Operating Modes RTP Configuration SIP Configuration	tic geo ct i ate	s I Messages I Messages [%]	14 0 0.00
				□ Log on	file	Clear

Primary Synchronization

Ist Choice Internal PPS (GPS/GLONASS) 2nd Choice Internal Ref (full) 3rd Choice Internal Ref (full) 4th Choice Internal Ref (full) Superaudio Synchronization Internal Ref Lock Frequency [Hz] 3400 RF Synchronization Polarity Frequency Offset [Hz] 0.0 Do frequency self-correction PS to PTP Event PS to PTP Event PPS to rear plug Internal PTP Handling Orff Rele Domain (f ÷ 255) 0 C OFF Master offset 0 Gave Group Membership 1 1 C Backup Master Slave Group Membership 1 PTP IP Parameters Backup Master Read from FIle Water of FIP Address Backup Mast IP Address Read from File PTP IP Parameters Backup Mast IP Address Backup Mast IP Address	Synchronization mode	PPS Signal Handling		
2nd Choice Internal Ref (full) 3rd Choice Internal Ref (full) 4th Choice Internal Ref (full) 4th Choice Internal Ref (full) Superaudio Synchronization Forced OFF Lock Frequency [Hz] 3400 Polarity Polarity © Straight © Straight Prequency Offset [Hz] 0.0 Do frequency self-correction PPS to PTP Event PPS to rear plug Internal PTP Handling Master offset 0 Role Domain (l + 255) 0 Master Slave Strouge 0 © Slave Peet-to-Peer Operations PTP IP Parameters Parameters Read from File Master IP Address Backup Mst IP Address Read	1st Choice Internal PPS (GPS/GLONASS)	Internal from GPS/GLONASS	-Internal from PTP device	External from rear plug
3rd Choice Internal Ref (full) Automatic Forced OFF Forced ON Polarity Straight Forced ON Polarity Straight Reversed Polarity Straight Reversed PS to PTP Event PPS to rear plug Internal Ref Internal Ref Master Offset Master Offset Slave Pee-to-Peer Operations UNCAST mode for PTP Messages PTP IP Parameters Master IP Address Backup Mast IP Address Read T12.33.40.110 Read Read Read<th>2nd Choice Internal Ref (full)</th><th>Validity</th><th>Validity</th><th>Validity</th>	2nd Choice Internal Ref (full)	Validity	Validity	Validity
Superaudio Synchronization Generation Synchronization Lock Frequency [Hz] Straight Straight Straight Straight Straight Straight Reversed Polarity Straight Straight Reversed Polarity Straight Reversed Polarity Straight Reversed Polarity Straight Reversed PPS to PTP Event PPS to rear plug Internal Ref Internal Ref Internal Ref Sync Packets on TS A Sync Packets on TS A Sync Packets on TS B Stave Peet to Pte Properations UNCAST mode for PTP Messages PTP IP Parameters Master IP Address Backup Mst IP Address Internal Ref Read	3rd Choice Internal Ref (full)	Automatic Eorced OFE	Automatic Eorced OFF	Automatic Eorced OFE
Dok Frequency [Hz] 3400 RF Synchronization		C Forced ON	C Forced ON	C Forced ON
RF Synchronization • Straight • Straight • Reversed • Reversed • Reversed • Reversed • PPS to PTP Event • PPS to rear plug Internal Ref • OFF • Master Offset • OFF • Master Offset • Slave Groups • Slave Group Membership • Slave Group Membership • Pee-to-Peer Operations • UNCAST mode for PTP Messages • PTP IP Parameters • Master IP Address • Backup Mst IP Address • Int2.33.40.110 • Master IP Address • Int2.33.40.110 • Other • Constant of the total consta	Lock Frequency [Hz] 3400	Polarity	Polarity	Polarity
Frequency Offset [Hz] 0.0 Do frequency self-correction PPS to PTP Event PPS to rear plug Internal Ref Internal Ref Internal Ref Role Domain (0 + 255) 0 C OFF Master Offset 0 © Master Slave Groups 1 C Slave Slave Group Membership 1 © Backup Master Pee-to-Peer Operations INCAST mode for PTP Messages PTP IP Parameters Read from File Master IP Address Backup Mst IP Address	-RF Synchronization	 Straight Reversed 	 Straight Reversed 	 Straight Reversed
Do frequency self-correction PPS to PTP Event PPS to rear plug Internal Ref Internal Ref Internal Ref Internal PTP Handling Domain (0 ÷ 255) 0 Role Domain (0 ÷ 255) 0 OFF Master Offset 0 Master Slave Groups 1 Slave Slave Group Membership 1 Backup Master UNCAST mode for PTP Messages Read from File Write on File Write on File Write on File 172.33.40.110 Read Read	Frequency Offset [Hz] 0.0			
Internal PTP Handling Domain (0 ÷ 255) 0 Role Domain (0 ÷ 255) 0 C OFF Master Offset 0 Master Slave Groups 1 C Slave Slave Group Membership 1 C Backup Master UNCAST mode for PTP Messages Read from File PTP IP Parameters Write on File Write on File Master IP Address Backup Mst IP Address Read	Do frequency self-correction	PPS to Internal	PTP Event PPS to Ref Internal	o rear plug Ref _▼
C Slave Peet-to-Peer Operations C Backup Master UNICAST mode for PTP Messages PTP IP Parameters Read from File Master IP Address Write on File 172.33.40.110 Read	Internal PTP Handling Domain (0 ÷ 255) Role Domain (0 ÷ 255) C OFF Master Offset @ Master Master Garget Slave Groups Slave Groups	0 C OFF 0 C Sync Packet 1 C Sync Packet	rce ets on TS A ets on TS B	
PTP IP Parameters PTP IP Parameters Master IP Address Backup Mst IP Address T72.33.40.110 Read	C Slave Peer-to-Peer Operations UNICAST mode for PTP 1	Messages		
Master IP Address Write on File 172.33.40.110 Read	PTP IP Parameters		Rea	d from File
1/2.33.40.110	Master IP Address Backup Mst IP Address		Wri	te on File
Write Close	1/2.33.40.110			Write Close

You must select Internal PPS for 1st Choice.

2.6. IP/RF Link Mixed System

Case1

<u>Seites Tie</u> Site1	r2 Ske Roaming/IF and RF	Link Mixed System				Order se	nple: 2 sites STA STANDARD	NDARD MULTI-SITE & SINGLE-SITE	Additional Repeated						
	and a communic	III and the second	100		Role	Mode	Backup Master	Primary Sync	Second Sync	PTP Master	PTP Backup Master	Labor	License	External	Panel
	Statistics of the local division of the loca	Contraction of the local division of the loc		Unit1	Mester	Mester		Internal Ref.	Internal Ref.	1		KA-SETUP	KA-DMR-	N/A	110.000
				Unit2	Link Down to Net	RFLink Down		Internal PTP	Internal Ref.		×	KA-SETUP	KA-DMR-	N/A:	RAHAZ
		RFDown	RE-Up	Unit3	Slave	Broadcaster	1	Internal PTP	Internal Rei.		1	KA-SETUP	KA-DMR-	N/A	KA-RE1v2
	Alterna weeking		Unit4	Slave	Broadcaster		Internal PTP	Internal Ref.			K.A.SETUP	KA-DMR-	N/6	XA DEC	
SiteZ	Saling Constitution			UnitS	Link Up to Master	Rt Link Up		RFLink (DMR)	Internal Ref.	1	N	KA-SETUP	KA-DMR-	11/5	NAULT I
Site3															

<u>Site1</u>

Unit1: Master Repeater

Unit2: RF Down Link Repeater on Master Site

<u>Site2</u>

Unit3: Backup Master Repeater

<u>Site3</u>

Unit4: Broadcaster on Slave Site

Unit5: RF Up Link Repeater on Slave Site

- These 2repeaters have to be connected by PPS cable.



- A. Master Repeater Setup
- a. Select BDCST MST SITE.ka.
- b. Modify the same items following procedure 2.4. (Master Repeater Setup)
- B. Backup Master Repeater Setup
- a. Select BDCST SLV SITE.ka.
- b. Modify the same items following procedure 2.4. (Backup Master Repeater Setup)

- C. <u>RF Down Link Repeater on Master Site Setup</u>
- a. Select DOWNLINK MST SITE.ka.
- b. Modify the same items following procedure 2.4. (Slave Repeater Setup)
- c. Modify Base Station Role

Base Station Parameters	IP Parameters				Master-to-Master P	arameters —
Base Station Role	Master	IP Address			IP Address	TSA TS8 AN/
	/ Presenc	172.33.40.110				
Rand-Akine	Backup Master		Tier III Networ	k		
Pudo Gateway	V Present	IP Address	Model	YNET		EEE
strained to a sense of concerning 1	This BS	172.33.40.112	Net (0 ÷ 511)	0		
Radio Network Mode	Become Master on	broken connection	Site (0 ÷ 7)	0		
Nuitteite Sinukast	Voice/Data reception	from Mester	Par	PAR A+B		
	Multicast		C TO LO L		1	
Vetwork Parameters	Broadcast		C	PAYLOAD CH		
(oting Delay (ts)	Unicast		TS E Role	PAYLOAD CH		
Seacon interval (mm:ss]			tde Time [s]	3 1		
	Physical Console Par	rameters	Accept not regist	ered terminals		
MR Packets Framing Mode	Pul-Duplex Console		E	2		
Dauble Reduct	1 100000000		C-syscode [hex]	0003		
Double Paover Single Packet	-Line 1 Console	All-Call	ret-site [nex]	0000		
AN Compression Rate	Operating Mode	Emergency	C Allow Tier II traff	C TTSA TSB T		
-TX and tone	MAINLY ANALOG	Group Private	C - ETSI Versions C	ompliance		
nalog 🗆	16777215	Dest DMR ID	ETSI Version 1.	5.1 🕝		
Diated IT	Line 2 Console		ETSL Version 1.	71		
		All-Call	ETSL Version 1.	8.1 C		
Λ	Operating Mode	Emergency	C		Read from File	
	DMR ONLY	Private	C		Write on File	
	16777215	Dest DMR ID			Read	
		110000000000000000000000000000000000000			Write	Close

Base Station Role is LINK DOWN TO NET.

d. Modify TRX Operation Mode

opedatemode	Enabling TRX	Codec to be used	JLL
RF LINK-DOWN NODE	Enabling TX Enabling Main RX Enabling Diversity RX	Tone length (10 ÷ 255 ms)	100
vivce	Enabling Repeater Mode PCM 1 (Analog Line 1) Enabled PCM 0 (Analog Line 1) Enabled PCM 0 (Analog Line 0) Enabled Line 3 (Local TRX) Enabled Line 2 (IP Line) Enabled	Enable Analog Selective Calls sendin Enable Analog Selective Calls recept Enable repeatition code insertion	0 ion
	 Line 1 (Physical Line 1) Enabled Line 0 (Physical Line 0) Enabled 	Enable repeatition code detection	
automatic Role Dell'Switching Time (min) 480 30s AUTO ID (needs a codec) Automatic Forced OFF Forced ON			
Jse external PA	Service Class	Read from File Write on File	
Gain [dB] (0÷25.5)	(Multimode DMP Lier III Node		

- D. <u>RF Up Link Repeater on Slave Site Setup</u>
- a. Select UPLINK SLV SITE.ka.
- b. Modify the same items following common procedure.
- c. Select Primary Synchronization

Communications	Configuration	•	Network Settings	Buffer
sinfinancacions	Alarms Configuration	n ▶	Logging Options	built
Sent	Controls	•	Main Setup	0 04D9 000B 0000
	Statistics	*	TRX Operating Modes	1 0000 0003 0000 F 39C5 0000 0000
	Restart	•	Channels Table	0 0410 FFFF 911B
	Configurations Utility	У	Calibration Parameters	0 0000 1819 386C
			Primary Synchronization	5 3A40 93C4 DDDF
			TX Control	1 0000 E285 03FF
			RX Control	0 0000 0000 0000
			Audio Lines Configuration	0 0000 0000 17A2
			Subtone/Supertone	
Received			Base Station Layer Configuration	
			Station Basic Data	
		· /· ··	Base Station Operating Modes	tics
			RTP Configuration	ged Messages 14
	/	6 350 375	SIP Configuration	ct Messages 0 ate [%] 0.00
		603		
				Clear Clear
	/			2000
	/			Exit
ynchronization mode It Choice RF Link (DMR) Id Choice Internal Ref (tit	nization	5 Signal Har nternal from G	PS/GLONASS Internal from PTP device	External from rear plug
imary Synchro where a second	nization ring only) ring only) ring only) ring only) ring only) ring only)	S Signal Har nternal from G Validity (* Automal Forced (Polarity (* Straight C Straight	Adling PS/GLONASS DFF DN d d d DFF DN DN DFF DN DN DN DFF DN DN DN DN DN DN DN DN DN DN	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Reversed
imary Synchro which is a second seco	nization ming only) ming only) ming only) ming only) ming only) ming only) ming only) ming only) ming only) ming only	S Signal Har nternal from G Validity in Automa Forced (Polarity Straight C Reverse	hdling PS/GLONASS DFF DN d d Internal from PTP device Validity (° Automatic (° Forced OFF (° Forced ON Polarity (° Straight (° Reversed	External from rear plug Validity C Automatic Forced OFF Forced ON Polarity Straight Reversed
imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (tri rd Choice Internal Ref (tri th Choice Internal Ref (tri Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz]	nization	S Signal Har hternal from G Validity Forced (Polarity C Straight Reverse	ndling PS/GLONASS DFF DFF N d Polarity	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed
mary Synchro mode mode st Choice RF Link (DMR) di Choice Internal Ref (tir di Choice Synchronization Lock Frequency [Hz] RF Synchronization Frequency Offset [Hz] Do frequency self-	nization ming only) ming only) ming only) ming only) ming only) ming only) ming only) ming only	S Signal Har hternal from G Validity Porced (Polarity Straight Reverse	Adling PS/GLONASS DFF DN d POlarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Polarity Internal Ref T	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed
imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (tit rd Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self-	nization	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS DFF DN d POlarity Pola	External from rear plug Validity C Automatic C Forced OPF C Forced ON Polarity C Straight C Reversed
Imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (ti th Choice Internal Ref (ti th Choice Internal Ref (ti Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self- nternal PTP Handling	nization	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS PS/GLONASS Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed PPS to PTP Event Internal Ref PS Source	External from rear plug Validity C Automatic C Forced OPF C Forced ON Polarity C Straight C Reversed
Imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (tit d Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization Lock Frequency [Hz] RF Synchronization Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role	nization	5 Signal Har hternal from G Validity © Automai Porced (Polarity © Straight © Reverse	Adling PS/GLONASS PS/GLONASS Validity C Automatic C Forced OFF C Forced ON Polarity C Straight Reversed PPS to PTP Event RF Sync Source C Sync Packets on TS A	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed
	nization	5 Signal Har ternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS PS/GLONASS PS/GLONASS Validity (* Automatic C Forced OFF C Forced ON Polarity (* Straight C Reversed PPS to PTP Event RF Sync Source (* OFF C Sync Packets on TS A C Sync Packets on TS A	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed
imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (tit rd Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role C OFF Master	nization	5 Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS PS/GLONASS Validity (* Automatic C Forced OFF C Forced ON Polarity C Straight Reversed PPS to PTP Event Internal Ref PS to PTP Event RF Sync Source (* OFF C Sync Packets on TS A (* Sync Packets on TS A	PS to rear plug PS to rear plug
imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (tit rd Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization Lock Frequency [Hz] RF Synchronization Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role © OFF Master © Slave	nization PP: iming only) iming only im	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS PS/GLONASS Validity (* Automatic C Forced OFF C Forced ON Polarity • Straight PPS to PTP Event Internal Ref PS ync Source • Sync Packets on TS A • Sync Packets on TS A	PS to rear plug PS to rear plug
imary Synchro ynchronization mode st Choice RF Link (DMR) nd Choice Internal Ref (tit rd Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role © OFF Master © Slave Backup Master	nization PP: iming only) iming only i	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS PS/GLONASS PS/GLONASS PS/GLONASS Particle Polarity	PS to rear plug PS to rear plug
imary Synchro synchronization mode st Choice RF Link (DMR) and Choice Internal Ref (tit rd Choice Internal Ref (tit th Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role © OFF Master C Slave Backup Master PTP JP Parameters	nization	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS DFF DN d POlarity Pola	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed PS to rear plug remal Ref
imary Synchro synchronization mode st Choice RF Link (DMR) and Choice Internal Ref (tit rd Choice Internal Ref (tit th Choice Internal Ref (tit th Choice Internal Ref (tit Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role OFF Master C Slave C Backup Master PTP JP Parameters Master IP Address B	nization	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS DFF DN d POlarity Pola	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed PS to rear plug emai Ref
imary Synchro synchronization mode st Choice RF Link (DMR) and Choice Internal Ref (tir rd Choice Internal Ref (tir th Choice Internal Ref (tir th Choice Internal Ref (tir Superaudio Synchronization – Lock Frequency [Hz] RF Synchronization – Frequency Offset [Hz] Do frequency self- nternal PTP Handling Role OFF Master C Slave C Backup Master PTP IP Parameters Master IP Address B	nization	S Signal Har hternal from G Validity © Automal Porced (Polarity © Straight © Reverse	Adling PS/GLONASS Internal from PTP device Validity Automatic Forced OFF Forced ON Polarity Straight Reversed PPS to PTP Event PTInternal Ref Straight RF Sync Source Sync Packets on TS A Sync Packets on TS A	External from rear plug Validity C Automatic C Forced OFF C Forced ON Polarity C Straight C Reversed PS to rear plug emai Ref

The synchronization sourse is RF Link Down Repeater. So the 1st choice must be RF Link (DMR) and the role of PTP Handling mast be OFF because this repeater will provide PPS signal by a cable backside.

d. Modify Base Station Role

Base Station Parameters	IP Parameters		Master-to-Master Parameters
Base Station Role	Master IP Address		IP Address TSA TSB ANA
LINK UP TO MASTER	Present		
Stand-Alone	Backup Master	Tier III Network	
Audio Gateway	Present IP Address	Model TINY	
	This B5	Net (0 ÷ 511) 0	
Radio Network Mode	Become Master on broken connection	Site (0 ÷ 7) 0	
Multisite Simulcast		Par PAR A+B	
Natural Disease		TS A Role PAYLOAD CH	
Voting Delay Ital		TS B Role PAYLOAD CH	
Beacon interval mmisel			
	Physical Console Parameters	Accent not registered terminals	
DMR Packets Framing Mode	Full-Duplex Console		
Double Packet Single Packet	Line 1 Console	C-syscode [hex] 0003 Net-Site [hex] 0000	
LAN Compression Rate	All-Call (• Emergency C	Allow Tier II traffic 🕅 TS A 🛛 TS B 🥅	
Act as Master for	MAINLY ANALOG Group	ETSI Versions Compliance	
None	16777215 Dest DMR ID	ETSI Version 1.5.1	
Timeslot A C Inalog		ETSI Version 1.6.1	
Timeslot B C Digital	Line 2 Console All-Call	ETSI Version 1.7.1 C ETSI Version 1.8.1 C	
	Operating Mode Emergency C Group C		Read from File
	DMR ONLY Private C		Write on File
	16777215 Dest DMR ID		Read Close
			Write

Base Station Role is LINK DOWN TO MASTER.

e. Modify TRX Operation Mode

Comparation			
perative mode	Enabling TRX	Codec to be used NULL	-
F LINK-UP NODE	Enabling TX	Tone length (10 ÷ 255 ms)	00
	Enabling Main RX		.00
ervice	Enabling Repeater Mode		
	PCM 1 (Analog Line 1) Enabled	Enable Analog Selective Calls sending	г
	PCM 0 (Analog Line 0) Enabled	Enable Analog Selective Calls sensitive	
	✓ Line 3 (Local TRX) Enabled	Enable Analog Selective Calls reception	1
pe	✓ Line 1 (Physical Line 1) Enabled	Enable repeatition code insertion	F
	Line 0 (Physical Line 0) Enabled	Enable repeatition code detection	F
tive/Hot-Spare Parameters			
tomatic Role Self-Switching Time [min] 480			
100			
IS AUTO ID (needs a codec)			
Automatic			
Forced OFF			
se external PA	Service Class	Read from File	
	C. Malfarada DMD Tas II Nada	Write on File	
ain [dB] (0 ÷ 25 5)	I VILITIMOGE LIVIR HELLINOGE		
ain [dB] (0÷25.5)	C Multimode DMR Tier II Node		
ain [dB] (0 ÷ 25.5)	Multimode DMR Tier II Node Multimode DMR Tier III Node C Half-Trunking Repeater	Read	d

- E. Broadcaster on Slave Site Setup
- a. Select BDCST SLV SITE.ka.
- b. Modify the same items following common procedure.
- c. Select Base Station Operation Mode.

1 A	Configuration		Network Settings	1. "
ommunications	Alarms Configuration		Logging Options	s buner
Sent	Controls Statistics Restart Configurations Utility	•	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone	0 04D9 000B 000 F 39C5 0000 000 0 0014 FFFF 511 F 20C2 C005 000 0 0000 1219 346 4 3B3F 93C4 DDD F 0898 05C2 035 1 0000 2286 03F 0 0000 0000 000 0 0000 0000 178
Received	100 00 00 10 00 00 00 00		Base Station Layer Configuration Station Basic Data Base Station Operating Modes	bcs
			RTP Configuration SIP Configuration	ged Messages 2 ct Messages 0 ate [%] 0.00
			1	Log on fileClear

Base Station Operation Mode

Base Station Role	Master IP Address		IP Address	TSA TSB ANA
BROADCASTER Stand-Ahme Code Sateway CoorReso(1790 1X-Interupt handing Review Node Multisaite Simulaset	Present 1/2.33.30.110 Present IP Address Present IP Address Become Master on broken connection Voice/Data reception from Master	Tier III Network Model TUNY		
Networ Parameters Voting Deav [te] Beacon Indivisi (immise)	Pulicast C Broadcast C Unicast C Physical Console Parameters	TS & Role PAYLCAD CH +		
DVR Padveta Framng Mode Double Padvet Single Padvet LAN Congression Rote 0	Fid-Duplex Controle	Accept not registered terminals C-argode [hex] 0003 Net-Shi (rev) Alow Ter A traffic TIS A TIS B ETSI Version 1.5 FTSI Vers		
Digita/ ["	Line 2 Console All-Cal (* Operating Mode Briergancy (* DMR CNLY T) Private (* 16777215 Dest DMR ID	ETSI version 1.7.1 C ETSI version 1.7.1 C ETSI Version 1.8.1 C	Read from File	Close

You can edit Master Repeater IP Address in this island site and Data Reception Method following customer requirement. Beacon Interval is Blank because all Slave Repeater follows Master Beacon timing.

d. Modify Base Station Role

Base Station Role is BROADCASTER

e. Select Primary Synchronization



Primary Synchronization

Synchronization mode	PPS Signal Handling		
1st Choice External PPS (full)	_Internal from GPS/GLONASS _	Internal from PTP device	External from rear plug
2nd Choice Internal Ref (full)	Validity	Validity	Validity
3rd Choice Internal Ref (full)	Automatic	Automatic	C Automatic
4th Choice Internal Ref (full)	C Forced OFF	C Forced OFF	C Forced OFF
	C Forced ON	C Forced ON	Forced ON
Superaudio Synchronization			
Lock Frequency Hz]	Polarity	Polarity	Polarity
	Straight	Straight	 Straight
RF Synchronization	C Reversed	C Reversed	C Reversed
Frequency Offset [Hz] 0.0			
		DDC to	a rear plug
Do frequency self-correction	PPS to F	PIP Event PPS u	- I
	Internali		
_ Internal PTP Handling	RF Sync Sou	rce	,
Domain (0 ÷ 255)			
Kole Master Offset	C Sync Packe	ats on TS A	
© OFF	C Sync Packe	ets on TS B	
C Master Max Slaves Groups			
C Slave Slave Group Membership			
C Peer-to-Peer Operations			
UNICAST mode for PTP N	lessages 🔽		
PTP IP Parameters	N	Rea	d from File
Master IP Address Backup Mst IP Address		Wri	ite on File
			Read
			Write Close
	\		

In this case senario, the Master Repeater in this island site will provide PPS signal following the RF Link Synchronization. The 1st choice must be External PPS(full) and the role of PTP Handling mast Off.

f. Modify TRX Operation Mode



Operation Mode is SLAVE BASE STATION

Case2

<u>Jaites Tie</u>	2 Site Roamine / IP and RF Link	k Mixed System				Order ser	nple 2 sites STA STANDARD	NDARD MULTISITE® > SINGLE-SITE	Additional Repeater						
Site1	Constanting I	all sectors			Role	Mode	Backup Master	Primary Sync.	Second Sync	PTP Mester	PTP Beckup Mester	Lebor	License	İxternal	Panel
	Contraction of the local division of the loc	diama and		Unitd	Sleve	Broedcaster		Internal Ref.	Internalfief			KA-SETUP	KA-DMR-L	WA .	N. 8 1947
				Unit2	Master	RFLink Down		Internal PTP	Interna i Ref.	1	8 S	KA-SETUP	KA-DMR-L	ija 🛛	MACHINE
		REDown	REUp	Unit3	Slave	Broadcaster	1	Internal PTP	Internal Ref.	-	4	KA-SETUP	KA-DMR-L	(A)	KA-RK1v2
	All states and states			Unit4	Slave	Broadcaster		Internal PTP	Interna (Ref.			KA-SETUP	RA-DMR-L	4/A	100000
Site2	Contraction of the local division of the loc			Units	Link Up to Master	RF Link Up		RF Link (DMR)	Internal Ref.	4	3 8	KA-SETUP	KA-DMR-L	u/A	NUMA2
Site3															
	atter to minite	- <u> </u>													

<u>Site1</u>

Unit1: Broadcaster on Master Site

Unit2: Master / RF Down Link Repeater on Master Site

<u>Site2</u>

Unit3: Backup Master Repeater

<u>Site3</u>

Unit4: Broadcaster on Slave Site

Unit5: RF Up Link Repeater on Slave Site

- These 2repeaters have to be connected by PPS cable.



- A. Broadcaster on Master Site Setup
- a. Select BDCST MST SITE.ka.
- b. Modify the same items following procedure 2.4. (Slave Repeater Setup)
- B. Master / RF Down Link Repeater on Master Site Setup
- a. Select DOWNLINK MST SITE.ka.
- b. Modify the same items following procedure 2.4. (Master Repeater Setup)
- c. Modify Base Station Role

Base Station Parameters	IP Parameters	Tier III Controller	Master-to-Master Parameters
Base Station Role	Master IP Address	IP Address	IP Address TSA TSB ANA
Stand None Ludio Gateway Control of Control	Backup Master Present Present Address T Address Decome Mester on troken connection	Tier III Network Model TIMY Net (0 + 511) 0 Site (0 + 7) 0 Par PAR.A+5 TS A Rale PAYLOAD CH	
Voting Delay [6] 3	Physical Console Parameters Full-Oxplex Console Une 1 Cons	TS B Role PAYLOAD O1	
pradog Dografi	Line 2 Conside Al-Cal Program Derating Mode Derating Mode DMR DNLY T Private C 16777215 Dest DMR ID	ETSI Version 1.6.1 C ETSI Version 1.7.1 C ETSI Version 1.8.1 C	Read from File Write on File Read Write Coose Coose

Base Station Role is MASTER

d. Modify TRX Operation Mode

RX Configuration		Analog Selective Calls Configuration	
Operative mode	Enabling TRX	Codec to be used NULL	•
RF LINK-DOWN NODE	Enabling TX Enabling Main RX Enabling Diversity RX	Tone length (10 ÷ 255 ms) 10	0
FUL DUPLEX	Enabling Repeater Mode PCM 1 (Analog Line 1) Enabled PCM 0 (Analog Line 0) Enabled Line 3 (Ancel TDX) Enabled	Enable Analog Selective Calls sending	1
Type	✓ Line 2 (IP Line) Enabled	Enable repeattion code insertion	í
	✓ Line 1 (Physical Line 1) Enabled ✓ Line 0 (Physical Line 0) Enabled	Enable repeatition code detection	I
Active/Holt-Stare Parameters Automatic Role Self-Switching Time [min] 480 30s AUTO ID (needs a codec) Automatic Forced OFF Forced OFF Forced ON			
Use external PA	Service Class C Multimode DMR Tier II Node Multimode DMR Tier III Node C Half-Trunking Repeater	Read from File Write on File Read	Close

Operation Mode is RF LINK-DOWN NODE.

Common Procedure on RF Linked Repeater



a. Select Channel Table

Communications	Alarms Configuration	t torr	ting Ontions	s Buffer
Cont	Cantala	Loge	ang options	
sent	Controis	Mair	Setup	1 0000 0003 0000
talat anite thist	Statistics	TRX	Operating Modes	0 0010 0000 0000
	Restart	Char	nnels Table	0 0017 FFFF 139B
	Configurations Utility	Calib	oration Parameters	0 0000 1616 BF60
抗		Prim	ary Synchronization	3 4348 SACB E7E5
		TXC	entrol	1 0000 C584 003E
		RXC	entro	0 0000 0000 0000
	/	Audi	n Lines Configuration	0 0000 0000 0000
	/	Subt	one/Supertone	15 0000 C000 102A
n		5000		
Received		Base	Station Layer Configuration	
		Stati	on Basic Data	
		···· Base	Station Operating Modes	tics
		RTP	Configuration	ged Messages 20
		SIP C	Configuration	ct Messages 0
	** ** ** ** ** **			ate [%] 0.00
			E CONTRACTOR	Log on file Clear
	/			-
/				Exit
Channel 0 Channel 1 Cha	annel 2 Channel 3 Channel -	4 Channel 5 Cha	nnel 6 Channel 7 Channel 8 (Channel 9 Channel 10 Char
Channel Table	nnel 2 Channel 3 Channel -	4 Channel 5 Cha	nnel 6 Channel 7 Channel 8 (Channel 9 Channel 10 Char
Channel Table	Channel Name Channel	4 Channel 5 Cha	Main TX Subtone	Channel 9 Channel 10 Char
Channel 0 Channel 1 Cha	Channel Name Channel American Channel Name Channel Spacing (KHz)	4 Channel 5 Cha el 0	Main TX Subtone	Channel 9 Channel 10 Char Main RX Subtone
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha	Channel Name Channel Channel Channel Name Channel Spacing[KHz] 12.5 (Frequency [MHz] 442.233	4 Channel 5 Cha el 0 • 5000	Main TX Subtone (° TCS Freq. [Hz] (° DCS Code [oct] 141.3	Channel 9 Channel 10 Char Main RX Subtone
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha דא גא	Channel 2 Channel 3 Channel Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 432.233	4 Channel 5 Cha el 0 • 5000 5000	Main TX Subtone (* TCS Freq. [Hz] (* DCS Code [oct] 141.3 Unlink Emerg. Subt	Channel 9 Channel 10 Char Main RX Subtone TCS Freq. [Hz] DCS Code [oct] 141.3 tone [Hz] 0.0
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha דא גא	Channel 2 Channel 3 Channel Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 432.233 TX Power [W] 1.0	4 Channel 5 Cha el 0 • 5000 5000	Main TX Subtone Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subt	Channel 9 Channel 10 Char Main RX Subtone (TCS Freq. [Hz] DCS Code [oct] 141.3 tone [Hz] 0.0
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha T) R) Max	Channel 2 Channel 3 Channel Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 432.233 TX Power [W] 1.0 Continuous TX [s] 0	4 Channel 5 Cha el 0 • 5000 5000	Main TX Subtone Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or	Channel 9 Channel 10 Char Main RX Subtone TCS Freq. [Hz] DCS Code [oct] 141.3 tone [Hz] 0.0 nRX [ms] 500
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha T) R) Max TX	Channel 2 Channel 3 Channel Channel Name Chann annel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 442.233 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50	4 Channel 5 Cha el 0 • 5000 •	Main TX Subtone Main TX Subtone TCS Freq. [Hz] DCS Code [oct] [141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia	Channel 9 Channel 10 Char Main RX Subtone (* TCS Freq. [Hz] C DCS Code [oct] 141.3 tone [Hz] 0.0 n RX [ms] 500 ation [Hz] 250
iannel Table Channel 0 Channel 1 Cha Cha Ti Ri Max TX Ri Ri	Channel 2 Channel 3 Channel Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.(4 Channel 5 Cha el 0 • 5000 • •	Main TX Subtone Main TX Subtone (* TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subi TCS Hold or Subtone Devia Superaudio Freque	Channel 9 Channel 10 Char_ Main RX Subtone (*) (*) (*) (*) TCS Freq. [Hz] (*) (*) (*) DCS Code [oct] (*) (*) (*) DCS Code [oct] (*) (*) (*) TCS Freq. [Hz] (*) (*) (*) DCS Code [oct] (*) (*) (*) TCS Freq. [Hz] (*) (*) (*) TCS Code [oct] (*) (*)
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha TJ RJ Max TX RX Squel	Channel 2 Channel 3 Channel Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 (Frequency [MHz] 4432.23 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0. (ch Hysteresis [dB] 6.0	4 Channel 5 Cha el 0 • 5000 5000	Main TX Subtone Main TX Subtone (TCS Freq. [Hz] C TCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque	Channel 9 Channel 10 Char Main RX Subtone Image: Constraint of the second
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th Rh Max TX RX Squel Char	Channel 2 Channel 3 Channel - Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 (Frequency [MHz] 4432.23 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (ch Hysteresis [dB] 6.0 unel Present	4 Channel 5 Cha el 0 v 5000 5000	Main TX Subtone Main TX Subtone TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque	Channel 9 Channel 10 Char Main RX Subtone C TCS Freq. [Hz] DCS Code [oct] 141.3 tone [Hz] 0.0 n RX [ms] 500 attion [Hz] 250 ency [Hz] 0
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Cha T) R) Max TX RX Squel Char Char	Channel 2 Channel 3 Channel 4 Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (ch Hysteresis [dB] 6.0 Intel Present Intel Enabled	4 Channel 5 Cha el 0 • 5000 5000 • • • •	Main TX Subtone Main TX Subtone (TCS Freq. [Hz] C TCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC	Channel 9 Channel 10 Char_ Main RX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 tone [Hz] 0.0 nRX [ms] 500 ation [Hz] 250 ency [Hz] 0 P25 RX NAC
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Tr Ro Max TX RX Squel Char Char Simpl	Innel 2 Channel 3 Channel - Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (ch Hysteresis [dB] 6.0 Inel Present Inel Enabled lex Shift	4 Channel 5 Cha el 0 • 5000 5000 • • • •	Main TX Subtone Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subi TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC C Default C Any	Channel 9 Channel 10 Char Main RX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 tone [Hz] 0.0 nRX [ms] 500 ation [Hz] 250 ency [Hz] 0 P25 RX NAC C Default C Any
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Ti Ri Max TX RX Squel Char Char Simpl ANAL	Annel 2 Channel 3 Channel 4 Channel Name Chann Annel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 442.233 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (ch Hysteresis [dB] 6.0 annel Enabled lex Shift LOG Mode	4 Channel 5 Cha el 0 • 5000 • • • • • • •	Annel 6 Channel 7 Channel 8 Main TX Subtone (a TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subtone Devia Subtone Devia Superaudio Freque P25 TX NAC (c Default C Any C Ooen	Channel 9 Channel 10 Char_ Main RX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 tone [Hz] 0.0 n RX [ms] 500 ation [Hz] 250 ency [Hz] 0 P25 RX NAC C Default C Any C Open
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th Rh Max TX RA RX Squel Char Simpl ANAL ETSI	Channel 2 Channel 3 Channel Channel Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 442.233 (Frequency [MHz] 442.233 (Frequency [MHz] 442.233 (Frequency [MHz] 432.233 (Frequency [MHz]	4 Channel 5 Cha el 0 • 5000 • • • • • • • • • • • • • •	Main TX Subtone Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subi TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC C Default C Any C Open C>	Channel 9 Channel 10 Char_ Main RX Subtone (° TCS Freq. [Hz] C DCS Code [oct] 141.3 tone [Hz] 0.0 nRX [ms] 500 ation [Hz] 250 ency [Hz] 0 P25 RX NAC (° Default C Any C Open C ···>
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th Ri Max TX RX Squel Char Simpl ANAL ETSI Moto	Channel 2 Channel 3 Channel 4 Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.233 (Frequency [MHz] 442.233 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (Squelch level[dB] 20.0 (Squelch level[dB] 20.0 (Squelch level[dB] 20.0 (Squelch level[dB] 20.0 Cutoff Delay [ms] 50 Continuous TX [s] 0 Cutoff Delay [ms] 50 Cutoff Delay [ms] 50 Continuous TX [s] 0 Cutoff Delay [ms] 50 Continuous TX [s] 0 Cutoff Delay [ms] 50 Cutoff Delay [ms] 50 Continuous TX [s] 0 Cutoff Delay [ms] 50 Cutoff Delay [ms] 50 Continuous TX [s] 0 Cutoff Delay [ms] 50 Continuous TX [s] 0 Continuous TX [s] 0 Cutoff Delay [ms] 50 Continuous TX [s] 0 Cutoff Delay [ms] 50 Continuous TX [s] 0 Continuous	4 Channel 5 Cha el 0 • 5000 5000 • • • • • • • •	Main TX Subtone (* TCS Freq. [Hz] * DCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC * Default * Any * Open *>	Channel 9 Channel 10 Char_ Main RX Subtone TCS Freq. [Hz] DCS Code [oct] 141.3 tone [Hz] 0.0 nRX [ms] 500 attion [Hz] 250 ency [Hz] 0 P25 RX NAC P25 RX NAC Default C Any C Open C>
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th RX Max TX RX Squel Char Char Simpl ANAL ETSI Moto P251	Innel 2 Channel 3 Channel - Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 (Frequency [MHz] 4432.23 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (ch Hysteresis [dB] 6.0 Innel Present Innel Enabled lex Shift .OG Mode DMR Mode TRBO (TM) DMR Mode SJGL Mode SIG Mode	4 Channel 5 Cha el 0 5000 5000	Main TX Subtone Main TX Subtone TCS Freq. [Hz] C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC P25 TX NAC C Default Any C Open C>	Channel 9 Channel 10 Char_ Main RX Subtone TCS Freq. [Hz] DCS Code [oct] 141.3 tone [Hz] 0.0 n RX [ms] 500 stion [Hz] 250 ency [Hz] 0 P25 RX NAC Pefault Any Open >
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th RN Max TX RX RX Squel Char Simpl ANAL ETSI Moto P25 G Sque	Innel 2 Channel 3 Channel - Channel Name Chann Innel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 432.23 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 (Squelch le	4 Channel 5 Cha	Main TX Subtone Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC C Default C Any C Open C>	Channel 9 Channel 10 Char Main RX Subtone
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th Ru Max TX RX RX Squel Char Chan Simpl ANAL ETSI ANAL ETSI Sque Sque Sque	Innel 2 Channel 3 Channel - Channel Name Chann Innel Spacing[RHz] 12.5 (Frequency [MHz] 442.233 TX Power [W] 1.0 Continuous TX [s] 0 Cutoff Delay [ms] 50 Cutoff Delay [ms] 50 (Squelch level[dB] 20.0 ch Hysteresis [dB] 6.0 Inel Present Inel Enabled lex Shift .OG Mode DMR Mode TRB0 (TM) DMR Mode Digital Mode SAG Mode Ich Tail Cutoff on TX kh Tail Cutoff on RX	4 Channel 5 Cha el 0 5000 5000 5000 5000 5000 5000 5000 5	Annel 6 Channel 7 Channel 8 Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subt TCS Hold or Subtone Devia Superaudio Freque P25 TX NAC P25 TX NAC C Default C Any C Open C> Main DMR CC	Channel 9 Channel 10 Char_1 Main RX Subtone
Channel 0 Channel 1 Cha Channel 0 Channel 1 Cha Th Rh Max TX RX Squel Char Char Char Char Char Char Char Char	Annel 2 Channel 3 Channel - Channel Name Chann Annel Spacing[KHz] 12.5 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 442.23 (Frequency [MHz] 432.23 (Frequency [MHz] 432.2	4 Channel 5 Cha el 0 5000 5000 • • • • • • •	Annel 6 Channel 7 Channel 8 Main TX Subtone C TCS Freq. [Hz] C DCS Code [oct] 141.3 Uplink Emerg. Subtone Devia Subtone Devia Superaudio Freque P25 TX NAC C Default C Any C Open C> Main DMR Co Aux DMR Co	Channel 9 Channel 10 Char, Main RX Subtone C TCS Freq. [Hz] C TCS Freq. [Hz] C DCS Code [oct] 141.3 tone [Hz] 0.0 nRX [ms] 500 ation [Hz] 250 ency [Hz] 0 P25 RX NAC C Default C Any C Open C> plor Code 1 ÷ 1 ÷ 1 ÷

Squelch Tail Cutoff on RX must be checked on RF Linked Kairos.

b. Select Base Station Layer Configuration

ommunications	Configuration Alarms Configuration	• •	Network Settings Logging Options	5 B	uffer		
Sent	Controls Statistics Restart Configurations Utility	•	Main Setup TRX Operating Modes Channels Table Calibration Parameters Primary Synchronization TX Control RX Control Audio Lines Configuration Subtone/Supertone	E 1 F 0 F 1 0 0	04E9 0000 39D0 0010 4E00 0000 434D 0898 0000 0000 0000 0000	820A 0003 0000 FFFF C005 1413 99CE 05C8 C404 0000 0000 0000	0000 0000 911E 0000 7B61 E6E9 0850 00FF 0000 76FE
Received		-L	Base Station Layer Configuration				
			Station Basic Data Base Station Operating Modes RTP Configuration SIP Configuration	tic ge ct ate	s d Message Messages : [%]	es	2 0 0.00
	/		1	Log or	ı file	1	Clear
					Ev		

Base Station Layer Configuration

Configuration		Reports
Enable Repeater Mode	Hang Times [30 ms ticks] (0 ÷ 32767)	- Internal Timings
Direct Mode Reception	Private Calls	DMR Status Current Second - Timeslot N/A - 25
Enable Half Trunking	Group Callo	Digital Mode Enabled Current Extended Timeslot 125
Send RC on Same Timeslot		
Display IDLE Packets	Data Response 0	TS A TS B
Factual AT bit handling	Channel 100	TSA TSB Erequency offset rx [Hz]
		TRANSMITTING Time offset rx [ms]
TX: act as RX: act as	Timeslots Validity [30 ms ticks]	RECEIVING Error Vector 0 0
	Automatic 32	MS-TO-MS DIRECT Last Received Color Codes 0 0
Mobile Station C Mobile Station 📀		Last Transmitted Data Types 9 9
	Network Delay [30 ms ticks]	
MAIN Color Codes AUX Color Codes	Automatic 6	
	RX Pkts Advance [30 ms ticks]	
	Distance for tining adv [Km] 0	
	\sim 1	Accesso
	\sim 1	Save to EE
		Read Reading Write
	X	Close

You must enable Display IDLE Packet on RF Linked Kairos.

Basically TX/RX acts are set to Base Station. But Mobile Station must be checked for RX acts on RF Linked Kairos.

Channel Hang Timer must be set to 100 (3000ms) to have enough synchronization.

3. Additional Information

3.1. Add Hot Standby Repeater

<u>28ites Ti</u>	er25iteRoamine/1+1HotStandby(Recommend)				Order samp	ple STA STA	ANDARD SENGLE-SITE	& 1+1 Hot Standt	n						
Site1			Role	Mode	Backup N	Master	Primery Sync	Second Sync	PTP Master	PTP Backup Master	Labor	Licer	nse	External	Panel
	Citer and Citer	Linit	1 Mast	er Mester		1	Internal Sef	Incernal Bef		1	KA-SETUP	KA-DMR-L		N/A	1
	and and a second s	Unit	2 Mast	er Master		3	Incernal Ref.	Internal Ref.	8	2	KA-SETUP	KA-DMR-L	KA-1+1	N/A	KA-RK2
		Unit	3 Slave	Broadcast	91		Incernal PTP	Internal Ref.	5		KA-SETUP	KA-DMR-L	N/A	N/A	KA-RK1v2
		1	- 20			00			- C.	570				100	10
Site2	Market Million														
Rings Ti	or 7 Site Reaming with Barken Master (1+1 Hot Standby (Renomen	ŧĨ			Ordersami	nia: STA	NOLED SINGLE SITE	& 1+1 Hot Standh							
	and a second stand of the second standard in a second standard in the second standard	-			Children a string	241	Ces STANDARD MUL	TI-SITE	1						
Site1			Rola	Mode	Backup N	Master	Primary Sync	Second Sync	PTP Master	PTP Backup Master	Labor	Licen	150	External	Panel
	deals and a district	Unit	1 Mast	er Master			Internal Ref.	IncernalRef	1		KA-SETUP	KA-DMR-L	VALUE	N/A	VA. DV2
		Unit	2 Mast	er. Master			Internal Ref.	IncernalRef			KA-SETUP	KA-DMR-L	WH-111	N/A	KA-RINE
		Unit	3 Sleve	Bras de exte	ar J		Internal PTP	Internal Ref.	1	1	KA-SETUP	KA-DMR-L	N/A	N/A	KA-RK1v2
		Unit	4 Sleve	Broedcast	er		Internal PTP	Interneifief	8	1	KA-SETUP	KA-DMR-L	N/A	N/A	KA-RK1v2
Site 3															
Blites Sir	nuicast Tier2 Conventinonal with Backup Master/ 1+1 Hot Standby for Ma	ster (Recon	mended)	01	der sample:	STANDARD SIN	MULCAST & 1+1 Hot S	tandby							
Start .	Alternatily Alternatily	- Ia	Inla I	Made	Bacine Master	Primary	VID SIMULUAT	Same PTP M.	PTP Bachup	Master Labor	1 in an		- Er	terme 1	Perel
	ALCONTRACTOR ALCONTRACTOR	Unit1 /	Master	Master	un our ainsei	Incernal P	PPS Internal	Ret	The sectory	RA-SETUP KA-D	MR-CKA-SH	12	KA-GPS	GPS-ANT	
		Unit2 /	Master	Master		Internal P	PPS Internal	Raf	. 8	KA-SETUP KA-D	MR-L KA-SI-	T2 KA-1+1	KA-GPS	GPS-ANT	KA-RK2
		Unit3 9	lana	Broadcaster	3	Internal P	PPS Internal	PTP 🖌	a 1.	KA-SETUP KA-C	MR-L KA-SH	82 N/A	KA-GP9	GPS-ANT	KA-RK1v2
		Unit4	ilave	Broadcaster		Insernal P	PPS Internal	PTP	1	KA-SETUP RA-C	MR-C KA-SH	FZ N/A	KA-GPS	GPS-ANT	KA-RX1v2
Site2 Site3															
our of the second s				_											

When you add Hot Standby Repeater into system, you must consider which repeater can be redundant. Above picture is a recommended structure with hot standby repeater.

Kairos System must have Master Voting Repeater and Master PTP Repeater when you will use PTP sync between sites. Then you can have Backup Repeater for both function. But Hot Standby Repeater is not available to PTP Master function.

Here is the case of lost repeaters.

Lost Repeater	System Behavior
Voting Master Repeater	No Intersite Call in the system.
PTP Master Repeater	No synchronization between sites.

Voting Master is the most important repeater in the system. The system will continue to work without PTP Master Repeater. To having Backup Voting Master Repeater, you must setup PTP Master to a Voting Slave Repeater. And you can add a PTP Backup Repeater into over 3 sites system in this case scenario.

You can follow the setup procedure 2.2 when you add Hot Standby Repeater into system. But please consider which repeater will have Voting Master or PTP Master.

3.2. Appendix A

The reason why we have default data file for some case is the Kairos Manager has too much detailed setup items.

I picked the important setting on each display. You have to take care this portion based on the structure which customer requested but you do not need to take care in case standard structure case which I mentioned on this document.

Base Station Operating Mode

Voting Delay: This is a parameter for Voting Master Repeater when the voter repeat voice/data streaming to Broadcaster Repeaters. Please check Appendix B to see the parameter example.

Base Station Parameters	IP Parameters	Tier III Controller	Master-to-Master Parameters
Base Station Role	IP Address	IP Address	IP Address TSA TSB ANA
MASTER	Present		
Stand-Alone	-Backup Master	Tier III Network	
MotoTRBO(TM) TX-interrupt handling	Present IP Address		
Radio Network Mode	Become Master on broken connection	Site (0 ÷ 7) 1	
Multiste Smulcast		Par PAR A+B 🛨	
Network Parameters		TS A Role PAYLOAD CH	
Voting Delay [ts]		TS B Role PAYLOAD CH	
Beacon interval [mm:ss] 0:30	Physical Console Parameters	Idle Time [s] 13 🔆	
-DMR Packets Framing Mode	Full-Duplex Console	Accept not registered terminals	
Double Packet Single Packet		C-syscode [hex] 0007 Net-Site [hex] 0001	
LAN Compression Rate	Operating Mode Emergency	Allow Tier II traffic 🥅 TS A 🛛 TS B 🥅	
TX end-tone	ANALOG ONLY Private C	ETSI Versions Compliance	
Analog 🗌	16777215 Dest DMR ID	ETSI Version 1,5,1 C	
Digital 🦷	Line 2 Console All-Call (ETSI Version 1.7.1	
315	Operating Mode Emergency C		Read from File
	DMR DNLY Private C		Write on File
	16777215 Dest DMR ID		Read
			Write

Base Station Layer Configuration

Network Delay/Rx Packets Advance: There are parameters for all repeaters to have synchronized transmit timing. Please check Appendix B to see the parameter example.

Distance for timing adv: You must setup this parameter for RF Linked System even if it is simulcast system to having synchronized transmit timing. Please modified following site location.

Configuration		Reports
Configuration Enable Repeater Mode Direct Mode Reception Enable Half Trunking Send RC on Same Timeslot Display IDLE Packets Manual AT bit handling Enable ETSI Tier III features	Hang Times [30 ms ticks] (0 ÷ 32767) Private Calls 150 Group Calls 150 Data Response 16 Channel 16	Reports Internal Timings DMR Status Current Second - Timeslot Digital Mode Enabled Current Extended Timeslot TSA TSB TSA TSB TRANSMITTING Frequency offset rx [Hz]
TX: act as Base Station (* Mobile Station (* Mobile Station (*	Timeslots Validity [30 ms ticks]	RECEIVING Ime offset rs [ms] 0.000 0.000 RECEIVING Ime offset rs [ms] 0.000 0 MS-TO-MS DIRECT Ime offset rs [ms] 0.000 0 Last Transmitted Data Types 9 9
MAIN Color Codes AUX Color Codes RX 5 - TX 5 - TX 5 -	Automatic 8 RX Pkts Advance [30 ms ticks] 0 Distance for timing adv [Km] 0	
		Accesso Reading Save to EEP Read Reading Write Close

TX Control

HP filter: These parameters are for RF Linked System. Based on Kairos structure, you have to have fixed value for RF Linked system. But you do not need to take care these because the base default date file for RF Link will cover this parameters.

TX Configuration	Delay Dis ms.µs Null Ena km	FM PM
Parameters of transmission	TX Measures	Access
Supertone tone [Hz] 0	Limiter (dB)	WRITE
Max Cont. Tx [s]		
✓ Hold Time [ms] 550		Reading Save to EEP
		Read
Enable Tx end tone	TX Module Status	Set
Chan Bandwidth 12,5 kHz 💌	💻 Limiter On	Reading

RX Control

HP filter: These parameters are for RF Linked System. Based on Kairos structure, you have to have fixed value for RF Linked system. But you do not need to take care these because the base default date file for RF Link will cover this parameters.



Below Picture is provided by Radio Activity. You must follow this structure.

Percorsi audio analogici rete SAT+MST "MIXED" KAIROS



3.3. Appendix B

You must modify some parameters from default data file to having the system works correctly based on the system structure if the customer's requirement was out of this document.

Standard Structure which this document covered

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2level IP Linked System



- 2level IP and RF Linked Mixed System



Optional Structure which this document did not cover

We must consider the system and network design following Radio Activity Team when we sale these optional System Structure.



*Sub-Master is one of role on Kairos.

Over 3level IP and RF Linked Mixed System using Sub-Master Repeater



- Pipeline RF Linked System

