

DECODIO NET

FOR DMR, NXDN, DPMR, P25

Based on Decodio RED, **NET** is a highly flexible and extendable air interface analysis tool for digital mobile radio systems. Decodio NET allows interactive troubleshooting and fast identification of digital emissions.

Planning, deploying and maintaining digital communication networks can be challenging for PMR-consultants, network operators and users of mission-critical communication networks, such as police, fire-fighters or ambulance services. Decodio NET offers a detailed insight into the network traffic and configuration through an easy-to-use interface which does not require specialized skills to be operated, making maintaining a digital land mobile radio network a breeze.

ANALYZE YOUR NETWORK AND BASE STATION BROADCASTS

Decodio NET is a PC-based software solution able to perform channel extraction and processing from the physical layer to the protocol layer. It operates in conjunction with a spectrum analyzer or I/Q receiver and can extract and decode multiple channels in parallel.

Every important PDU (such as color code, radio access number or site ID) is decoded, allowing detailed analysis of the network traffic.

Reports containing all the decoded information can be generated for further processing in other software, such as Microsoft Excel.

DETECT INTERFERENCES ON THE AIR INTERFACE

Interferences on the air interface caused by signals from other systems or intentional jamming can become a serious problem for secure and reliable communications. When building an on-demand network in a remote or crisis area, one must ensure that the spectrum is clean for communications. In such a case, Decodio NET acts as a self-protection tool answering the question: does everything work as expected?

Continuous logging of both signal quality and signal power for all channels allows early detection of system outage, signal quality drop and external interferences. Besides, frequency planning can be easily verified by measuring the quality of each channel.

LIVE ANALYSIS AND DECODING

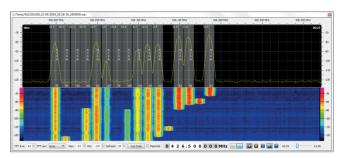
Get an overview of the network occupancy and record unencrypted voice content and data messages for quality assurance.

Voice recording, content decoding (short data messages, position reports) and database logging are available.

Calls and data messages can be searched and filtered, making it easy to analyze long recording sessions.

HIGHLIGHTS

- Network monitoring via air interface
- Simple operation and clear visualization
- Monitoring of broadcasts and contents
- Signal quality and power monitoring
- Automatic detection of digital PMR emissions



Parallel channel extraction

DON > Carrie	n													
Streamld	Label	Frequency	Power (d8m)	Eurning	Channel Status	RFChannelType	Direction	RAN	ManufacturerNo	LocationID	ServiceInfo	ChristructureInfo	VersiceNo	Key
209	NXDN	425.661	-91.9	true	ACTIVE	RTCH	Outbound	1	104					0
206	NUMBER	425.061	-61.8	true	ACTIVE	RTCH	Outbound	1	104					0
207	NUMBER	426.061	-905.2	true	ACTIVE	RTCH	Outbound	1	104					0
206	NUMBER	425.065	-201.9	true	ACTINE	RTCH	Outbound	1	104					0
125	NUDN	425,099	-90.6	true	ACTIVE	RTCH	Outhound	1	104					0
204	NOIDN	426.111	-54.9	true	ACTIVE	RTCH	Outbound	1	104					0
203	NUMBER	426.123	-84.7	true	ACTIVE	RTCH	Outbound	1	104					0
202	NUMBER	425.036	-67.3	true	ACTIVE	RTCH	Outbound	1	104					0
201	140014	426.023	-118.7	true	DISC	RTCH	Outbound	1	104					0
200	NOIDN	425.461	-119.9	true	DESC	RTCH	Outbound	1	104					0
99	NOON	426,411	-118.9	true	DESC	RTCH	Outbound	1	104					0
98	NUMBER	425.885	-81.0	true	ACTIVE	RTCH	Outbound	1	104					0
97	NUMBER	425.636	-82.1	true	ACTIVE	RTCH	Outbound	1	104					0
96	NUDN	426.161	-120.1	true	DESC	RTCH	Outhound	1						
95	NOIDN	426.623	-119.1	tive	CESC	RTCH	Outbound	1	104					0
91	NUMBER	427.111	-99.0	true	ACTIVE	RTCH	Outbound	1	104					0
90	NOON	425,535	-86.2	trus	ACTIVE	ROOM	Outbound	1		4226401	9052	18708	1	
92	NUMBER	425.91	-86.2	true	ACTIVE	RTCH	Outbound	1	104					0
66	NUDN	426.761	-118.7	frue	DISC	RTCH	Cuthound	1	104					
90	MINDM	427.011	-83.4	true	ACTIVE	RTCH	Outbound	1	104					
89	NKON	427.185	-83.8	true	ACTIVE	RTCH	Outbound	1	104					0
68	NUMBER	427.061	-63.1	true	ACTIVE	RTCH	Outbound	1	104					0
87	NUMBER	426.964	-81.9	true	ACTIVE	RTCH	Outbound	1	104					0
86	NUMBER	426.423	-119.8	true	DESC	RTCH	Outbound	1	104					0
85	MEXICAN	426.564	-61.7	true	ACTIVE	RTCH	Outbound	1	104					0
84	100000	425.435	-120.0	true	cesc	RTCH	Outbound	1						
63	NXDN	425.143	-119.9	true	cesc	RTCH	Outbound	1						
82	NUMBER	425.048	-85.5	true	ACTIVE	RTCH	Outbound	1	104					0
81	NUMBER	425.185	-120.2	true	DISC	RTCH	Outbound	1						
80	MINDRE	425.011	-119.7	frue	ACTINS	RTCH	Outbound	1	104					0
79	NUMBER	425.073	-119.9	true	DESC	RTCH	Outbound	1	104					0
78	MODINE	425,008	456	from	ACTIVE	RCCH	Outhound	1		4235431	9052	18725	1	

NXDN Cell list

StreamId	Label	Frequency	Power	Running	ChannelStatus	MODEL	NET_SITE	Registration	ColorCode	PAR
7	DMR	447.7262	-90.6	true	ACTIVE	2	3079	true	7	3
11	DMR	447.4261	-94.8	true	ACTIVE	2	3078	true	6	3
12	DMR	447.1136	-94.3	true	ACTIVE	2	3077	true	5	3
2	DMR	446.8262	-75.2	true	ACTIVE	2	3075	true	3	3
13	DMR	446.4637	-105.1	true	ACTIVE	2	3074	true	2	3
14	DMR	446.3136	-109.1	true	ACTIVE	2	3073	true	1	3
3	DMR	440.3636	-83.2	true	ACTIVE	2	2	true	2	3
10	DMR	440.2762	-80.5	true	ACTIVE	2	1	true	1	3

DMR cell list

	0 5	00	1'000	1'500	X- AutoScale
- 000				5R: 4800 ID	
000 —	Sec. 28 Comp	delo surio plane en	enspektoryj	esomeratoristice	Y- Scale +
- 000					Interval (sec)
0 -	CARROLL AREA	CAND SELF COM	AND AND		0.400 Pause
-	Section Sections	e výsty i praka statí a	and Block	a sasa salam in taka interioren	Clear Traw real tin

DMR symbol output

DMR > CHI	history													
Strawid	Lebel	frequency	Slet	Source	Destination	Breedcast	Emergency	Prienty	Festure0	RCO	Stetus	Length	FileName	Date
4	Q648	464.625	0	6063	900	falce	falce	9	15	group	RELEASE	00:02.520	C.I.Templ.putputi.DNRI-2016-04-20T173430 DMR 464.625M942 0.way	2006-04-20717-040
1	0448	454.625	0	16448250	900	falce	Calce	0	16	group	RELEASE	00.01.440	C.I.Tempi putput DMR-3066-04-30T173422 DMR-464-625MHz 0 may	2006-04-20717-240
1	CAR	464.625	0	6063	900	false	fable	0	16	green	RELEASE	09850-00	C1.Templeutput DNRh.2016-04-201173432_DNR,464.625MHz.0.1.vav	2006-04-20717-34
1	C446	464.625	0	16448250	16777215	trus	fabe	9	0	97000	RELEASE	00:04.329	C.I.Templ.putputi DMR-2016-04-201173436 DMR-464-625M94; 0 wer	2006-04-20717-540
1	CARR	464.625	0	4365	900	falce	falce	9	15	group	RELEASE	00:02.350	C.I.Templ.putputi DNRI-2015-04-20T173439 DMR 454.625N942 Guvey	2006-04-20717-240
1	CARR	454.625	0	4265	900	falce	Colce	0	16	group	RELEASE	00.00.360	C.I.Tempi output DMR-3016-04-30T173445 DMR-454-525MHz 0 may	2006-04-20717-24-
1	CARK	464.676	0	4365	900	fabir	Cabin	0	16	greup	RELEASE	00:04.680	C1.Templ.output/D88h.2016-04-201173445_DMR_464.625MHz_0.1.wav	2006-04-20717-74
1	0446	464.625	0	16445250	200	false	false	9	15	97090	RELEASE	00:00,440	C.1.Templ.putputi DMR12016-04-201173448. DMR. 464-625M94; 0 wer	2006-04-20717-34-
1	CARR	464.625	0	5063	900	falce	falce	9	15	group	RELEASE	00:02.520	C.I.Templ.putputi.DNRI-2016-04-20T172521 DMR-464.625M94z Guvey	2006-04-20717-250
1	0448	454.625	0	16449250	900	falce	falce	0	16	group	RELEASE	00.01.440	CI-Terrol output DMR-3016-04-30T172522 DMR-464-625MHz 0-may	2006-04-20717-25
1	Cook	464.675	0	6063	900	fable	Eable	0	16	greup	RELEASE	09852900	C1.Templ.purpuri D0.00-2016-04-201179585, DMR, 464.625MPIp.D.wev	2006-04-20717-350
1	CA46	464.625	0	16445250	16777215	true	false	9	0	97000	RELEASE	00:04.329	C.1.Templ.putputi DMR12016-04-201173538. DMR. 464-625M94; 0 wer	2006-04-20717-050
1	CARR	464.625	0	4365	900	falce	falce	9	15	group	RELEASE	00:02.350	C.I.Templ.putputi.DNRI-2016-04-20T172541_DMR-454.625N94z Guvey	2006-04-20717-25-
1	CARR	454.625	0	4265	900	falce	Calce	0	16	anne	RELEASE	00.00.360	CI/Templ.output/DMR-3016-64-201179547_DMR-464.625MHz-0-nev	2006-04-20717-25-
1	Cook	454.675	0	4385	900	fabur	fabur	9	16	green	RELEASE	00:04.680	Chillemot euteun Enah 2016 da 2001/795ah DAVR alia AZSADAN Duray	2006-04-20717-554
1	24.00	464.625		16448250	200	febs	false		15	97090	RELEASE	00:00,440	C1/Templ output DMR1/2016-04-201173553, DMR, 464-625M94; Ower	2006-04-20717-05

DMR live call list

DECODIO NET CONFIGURATIONS

Decodio NET supports DMR, dPMR, NXDN and P25.

Configuration	NET_16	NET_32	Custom
Supported protocol	DMR, NXDN	, dPMR, P25	custom
Number of supported protocols	1 – 2	2 – 4	custom
Number of channels	16	32	custom
Support for multiple receivers	no	yes	custom
Remote control interface	optional	optional	optional

APPLICATIONS

- Air interface signal quality analysis and interference detection
- Voice and data communication recording
- Load measurements
- Network coverage planning and verification

FLEXIBLE EXTENSIONS

Decodio NET can be extended with the following features:

Decodio RUNNER	Drive test
Decodio PINK/QoS	Network monitoring and QoS
Decodio BLUE	Logging, visualization and post processing in the web-browser
Decodio ReX	Recording and analysis of unknown emissions and analog PMR
PDU-output	Comprehensive PDU output for protocol analysis
Decryption/Descrambling	Decryption options for DMR, NXDN, dPMR, P25 on request

TECHNICAL DATA

Decodio software components	RED (BLUE and PINK available as options)
Frequency range	9 kHz – 6 GHz
Bandwidth	up to 27 MHz in portable setups and 50 MHz in fixed setups
Hardware setup	Laptop + portable receiver, fixed setup

Protocol	Broadcast parameters	Call parameters
DMR ETSI TS 102 361-1 (Air interface) ETSI TR 102 398 (General system design) ETSI TS 102 361-4 (DMR trunking protocol)	MODEL, NET, SITE, Registration, Color Code, PARAMETER	Slot, SourceID, DestinationID, Broadcast, Emergency, Priority, FeatureID, FullLinkControlOpcode
NXDN NXDN Technical specifications NXDN TS 1-A Version 1.3 Remarks: Automatic 15 bit scrambling key decryption	RFChannelType, Direction, RAN, ManufacturerNo, LocationID, ServiceInfo, ChannelStructureInfo,VersionNo, Key	SourceID, DestinationID, Encryption, CallType, Key
dPMR ETSI TS 102 658 (Air Interface) ETSI TS 102 490 (Air Interface license free)	ChannelCode, SystemIdentityCode, Infill, ServiceFunction, NetConnection, Registration	SourceID, DestinationID, CommonID, CommFormat, Emergency
P25 TIA-102.BAAA-A - Project 25 FDMA – Common Air Interface TIA-102.AABC-B - Project 25 Trunking Control Messages	NAC, WACID, SYSID, RFSSID, SiteID, LRA, ServiceClass	SourceID, DestinationID, Encryption

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