

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

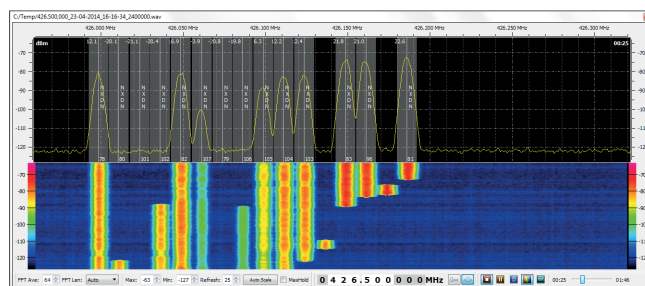
Get an overview of the network occupancy and record unencrypted voice content and data messages for quality assurance.

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



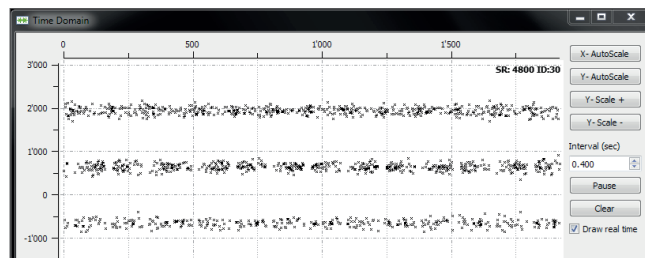
Parallel channel extraction

StreamID	Label	Frequency	Power (dBm)	Running	ChannelStatus	RFChannelType	Direction	RAI	Manufacturer	LocationID	Sitecode	ChirpDuration	Version	Qty
108	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
109	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
110	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
111	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
112	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
113	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
114	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
115	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
116	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
117	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
118	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
119	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
120	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
121	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
122	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
123	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
124	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
125	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
126	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
127	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
128	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
129	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
130	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
131	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
132	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
133	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
134	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
135	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
136	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
137	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
138	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
139	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
140	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
141	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
142	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
143	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
144	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
145	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
146	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
147	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
148	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
149	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
150	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8
151	N209	426461	-89.9	true	ACTIVE	PTCH	Outbound	1	184					8

NXDN Cell list

StreamID	Label	Frequenc	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



DMR symbol output

StreamID	Label	Frequency	Dir	Status	Destination	Breakout	Emergency	Priority	Power	RFCC	Index	Length	Position	Dir
1	DMR	446.425	0	892	892	None	None	0	18	group	RL123	01:02:20	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
2	DMR	446.425	0	184000	892	None	None	0	18	group	RL123	01:02:20	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
3	DMR	446.425	0	344620	2071233	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
4	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
5	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
6	DMR	446.425	0	582	892	None	None	0	18	group	RL123	01:02:20	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
7	DMR	446.425	0	344620	2071233	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
8	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:02:20	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
9	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:02:20	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
10	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
11	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
12	DMR	446.425	0	344620	2071233	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
13	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
14	DMR	446.425	0	485	892	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21
15	DMR	446.425	0	344620	2071233	None	None	0	18	group	RL123	01:04:23	C:\Temp\log\DMR-2024-04-27\7525_DMR_446425M_2_...	2024-04-27 15:21

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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