

# DECODIO NET for TETRA

Based on Decodio RED, **NET FOR TETRA** is a highly flexible and extendable air interface analysis tool for TETRA. Decodio NET for TETRA provides interactive troubleshooting and fast identification of TETRA emissions.

Planning, deploying and maintaining complex TETRA networks can be challenging for PMR-consultants, network operators and users of mission-critical communication networks, such as police, fire departments or other public safety agencies. 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 PMR network a breeze.

## HIGHLIGHTS

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

## ANALYZE YOUR NETWORK AND BASE STATION BROADCASTS

Decodio NET is a PC-based software solution able to perform TETRA 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 SYNC-PDU and SYSINFO-PDU is decoded, giving a detailed view of the network. Mobile country code, mobile network code, location area, supported security classes, service details as well as other data fields are made available. In addition, the neighbor cell information is decoded, which allows to troubleshoot networks with multiple base stations.

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

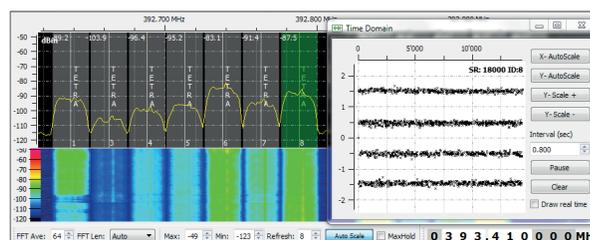
Interferences on the air interface caused by other TETRA carriers, signals from other systems, or intentional jamming can become a serious problem for secure and reliable communications. When building an on-demand network in a remote or crisis area, one must ensure that the spectrum is clean for communications.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

Continuous logging of signal quality, signal power and current transmitted parameters allows early detection of signal quality drop, external interferences and system outage. 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 and database logging are available, and a PDU output option can be used to detect configuration errors and extract load statistics.

Calls and data messages can be searched and filtered.



Spectrum and quality

Stream	Label	Frequency	Power	Running	ChannelStatus	Calc. ModFreq	System	BER	Quality	MCC	MNC	LA	CC	SecClass	ServiceDetails	
1	TETRA	392.7120	-76.6	true	ACTIVE	392.612000	TMO	0	100	204	Netherlands	1000	1436	36	1, 3	0x007
2	TETRA	394.3132	-76.4	true	ACTIVE	394.213000	TMO	0	100	204	Netherlands	1000	1436	36	1, 3	0x007
3	TETRA	392.5628	-76.8	true	ACTIVE	392.462800	TMO	0	100	204	Netherlands	1000	1431	42	1, 1	0x007
4	TETRA	394.1628	-76.6	true	ACTIVE	394.062800	TMO	0	100	204	Netherlands	1000	1436	36	1, 3	0x007
5	TETRA	392.6128	-76.1	true	ACTIVE	392.512800	TMO	0	100	204	Netherlands	1000	1431	42	1, 1	0x007
6	TETRA	392.5628	-76.0	true	ACTIVE	394.462800	TMO	0	100	204	Netherlands	1000	1436	36	1, 3	0x007
7	TETRA	394.5124	-75.4	true	ACTIVE	392.412400	TMO	0	100	204	Netherlands	1000	1436	36	1, 3	0x007
8	TETRA	392.6128	-76.8	true	ACTIVE	392.512800	TMO	0	100	204	Netherlands	1000	1432	52	1, 1	0x007
9	TETRA	392.6128	-75.6	true	ACTIVE	392.512800	TMO	0	100	204	Netherlands	1000	1441	42	1, 1	0x007
10	TETRA	394.5628	-80.5	true	ACTIVE	392.672800	TMO	0	100	204	Netherlands	1000	1432	52	1, 1	0x007
11	TETRA	394.5628	-80.3	true	ACTIVE	392.672800	TMO	0	100	204	Netherlands	1000	1441	42	1, 1	0x007
12	TETRA	392.5880	-80.3	true	ACTIVE	392.412800	TMO	0	100	204	Netherlands	1000	1436	26	1, 3	0x007
13	TETRA	396.8380	-84.6	true	ACTIVE	392.872800	TMO	0	100	204	Netherlands	1000	1433	33	1, 3	0x007
14	TETRA	396.8120	-85.8	true	ACTIVE	394.712800	TMO	0	100	204	Netherlands	1000	1437	17	1, 1	0x007
15	TETRA	392.4628	-85.5	true	ACTIVE	392.872800	TMO	0	100	204	Netherlands	1000	1433	33	1, 3	0x007
16	TETRA	392.3728	-85.8	true	ACTIVE	392.262800	TMO	0	100	204	Netherlands	1000	1431	75	1, 3	0x007
17	TETRA	392.3878	-83.7	true	ACTIVE	392.282800	TMO	0	100	204	Netherlands	1000	1441	42	1, 3	0x007
18	TETRA	394.6124	-85.7	true	ACTIVE	392.872800	TMO	0	100	204	Netherlands	1000	1438	18	1, 3	0x007
19	TETRA	394.3128	-83.4	true	ACTIVE	394.212800	TMO	0	100	204	Netherlands	1000	1434	43	1, 3	0x007

Cell list

The screenshot shows a 'TETRA > Tree' view on the left, listing various carriers with their status and cell info. On the right, a 'Carrier info' window is open, displaying detailed parameters for a selected carrier, including MCC, MNC, LA, CC, and security classes.

Multiple TETRA networks - overview

Stream	Label	Frequency	Sm	Power	Duration	State	Encryption	Link	Call ID	Usage Monitor	Date
17	TETRA	427.884	1	102059	110000	UNENCRYPTED	None	11	122	70	2008-04-21 17:04:24:65
18	TETRA	427.884	1	102059	110000	UNENCRYPTED	None	11	122	70	2008-04-21 17:04:24:65
19	TETRA	428.819	1	102064	802005	UNENCRYPTED	None	11	4845	36	2008-04-21 17:04:24:65
20	TETRA	428.819	1	102064	802005	UNENCRYPTED	None	11	4845	36	2008-04-21 17:04:24:65

Live call list

## DECODIO NET CONFIGURATIONS

Configuration	NET_16	NET_32	NET_64	Custom
Number of channels	16	32	64	custom
Support for multiple receivers	no	yes	yes	custom
Remote control interface	optional	optional	optional	optional

## FLEXIBLE EXTENSIONS

Decodio NET can be extended with the following features:

<b>Decodio RUNNER</b>	Drive test
<b>Decodio PINK/QoS</b>	Network monitoring and QoS
<b>Decodio BLUE</b>	Logging, visualization and post-processing in the web browser
<b>Decodio ReX</b>	Recording and analysis of unknown emissions and analog PMR
<b>TETRA PDU-output</b>	Comprehensive PDU output for protocol analysis

### APPLICATIONS

- Interference detection
- Signal quality analysis
- Voice and data communication recording
- Load measurements
- Network coverage planning and verification

## 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 80 MHz in fixed setups
Decoded broadcast parameters	Frequency, main frequency, channel status, quality (BER,FER), mobile country code (MCC), mobile network code (MNC), location area (LA), color code (CC), security class, service details
Decoded SYS-INFO	PDU type, broadcast type, main carrier, frequency band, offset, duplex spacing, reverse operation, number of common secondary control channels in use, MS_TXPWR_MAX_CELL, RXLEV_ACCESS_MIN, ACCESS_PARAMETER, radio downlink timeout, hyperframe / cipher key flag, hyperframe / cipher key, optional field flag, extended services, security information, SDS-TL addressing method, GCK supported, section, extended service broadcast section D-MLE-SYSINFO: LA, subscriber class, BS service details
Decoded SYNC	System code, color code, time slot number, frame number, multi-frame number, sharing mode, TS reserved frames, U-plane DTX, Frame 18 extension D-MLE-SYNC: MCC, MNC, neighbour cell broadcast, cell service level, late entry information
Decoded call parameters	Frequency, slot, usage marker, call ID, source ID, destination ID, encryption

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