



A System to Assess the Alignment of a Radio
OVER-THE-AIR IN REAL TIME, ALL THE TIME



This First-of-Its-Kind Technology Uses the Airwaves to Detect a Problem Before It Becomes an Emergency

DiagnostX is an over-the-air (OTA) radio waveform analyzer. It enables public safety and government agencies to identify radios in need of service by measuring their alignment and operating characteristics long-range, over-the-air in real time without user intervention. This unique patented technology is non-intrusive to a radio system, and multiple devices can be networked to provide system-wide coverage.

DX-2002 Model Series



- Monitors the Base Station Receive Control Channel (Inbound) Frequency
- Protocol Options: P25, DMR, NXDN, TRBO and Legacy systems
- P25 System Metrics:
 - ◆ RF Frequency Error
 - ◆ Symbol Frequency Error 600 and 1800
 - ◆ Modulation Fidelity
 - ◆ Average Symbol Deviation
 - ◆ Emission Mask Conformance
 - ◆ BER, RSSI and SNR
 - ◆ Reserve Gain at the Multi-coupler (dBm)
- Available Frequency Bands:
 - ◆ VHF 136-174
 - ◆ UHF 380-430, 450-470, 470-512
 - ◆ 700, 800, 900 MHz
- Installation: Two (2) connections - universal AC power and an antenna. Can connect to the Rx antenna multi-coupler
- One (1) DX unit can be networked with other DX units or up to three (3) NX-200 Remote Receivers to provide system-wide coverage - all data is stored in a unified database accessed through DiagnostX Viewer (DV)
- Autonomous - DiagnostX is non-intrusive and has no impact on the radio network
- Portable - allows a unit to be moved to multiple sites for additional area coverage
- Optional DiagnostX Viewer (DV) licenses can be installed on any computer on the network
- User defined thresholds can be changed on the fly at any time

Specifications

DX-2002 Model Series	DX-2002a: Single Protocol / Single Frequency Band
	DX-2002b: Single Protocol / Dual Frequency Band
	DX-2002c: Dual Protocol / Single Frequency Band
	DX-2002d: Dual Protocol / Dual Frequency Band
	DX-2002e: Dual Protocol / Three Frequency Bands
Dimensions (H x W x D in)	(2) Rack Units - 3.5 x 17 x 19
Approximate Weight (lbs)	27

NX-200 Remote Receiver Series

The DiagnostX NX-200 Remote Receiver is designed to extend the DiagnostX coverage of a radio system at a reduced cost.



The NX-200 is only able to be used with the DX or MX devices. All results are forwarded across the Ethernet WAN back to the master unit and presented in a single consolidated view in the DiagnostX Viewer (DV). Up to three (3) NX-200 Remote Receivers may be added to a single DX-2002 unit, and a large deployment of units can be connected to the MX-3000. Data transfer rate per transmission sent is 13 KB.

Specifications

NX-200 Remote Receiver Series	NX-200: Single Protocol / Single Frequency Band
	NX-200b: Single Protocol / Dual Frequency Band
	NX-200c: Dual Protocol / Single Frequency Band
	NX-200d: Dual Protocol / Dual Frequency Band
	NX-200e: Dual Protocol / Three Frequency Bands
Dimensions (H x W x D in)	(1.5) Rack Units - 1.75 x 17 x 13.75
Approximate Weight (lbs)	16

MX-3000 Master Series

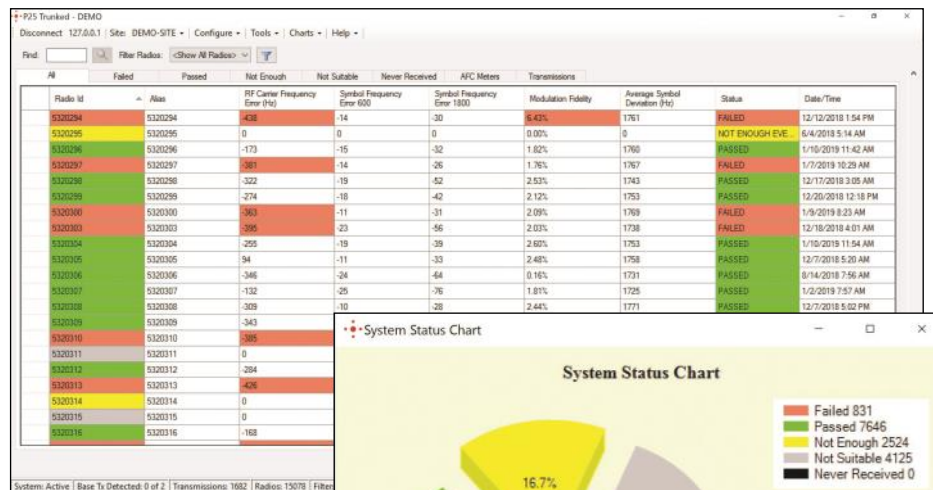
Extend Coverage of Your Radio System

Many agencies have moved their DiagnostX unit periodically from site to site to cover their entire system. Others have licensed multiple DiagnostX devices to set up a networked configuration to ensure continuous system-wide coverage. Now it is possible to use the smaller, more economical NX-200 to achieve the same result.

The DiagnostX MX-3000 is designed to accommodate the requirements of larger systems. Utilizing more robust hardware with higher performance processors, the MX device will handle a large deployment of NX-200 units connecting simultaneously. The MX does not function as a receiver; it gathers the data from the remote

Over-the-Air Radio Analyzer Features and Reports

- Tabs for individual categories **Failed**, **Passed**, or **Never Received** for **ALL** radios in one comprehensive view (below)
- Color-coded to show status at a glance
- Search box to locate a radio by ID
- Columns sort ascending or descending
- Displays the total number of radios in the database
- Filter on specific Radio ID range
- Displays active base station receive frequency

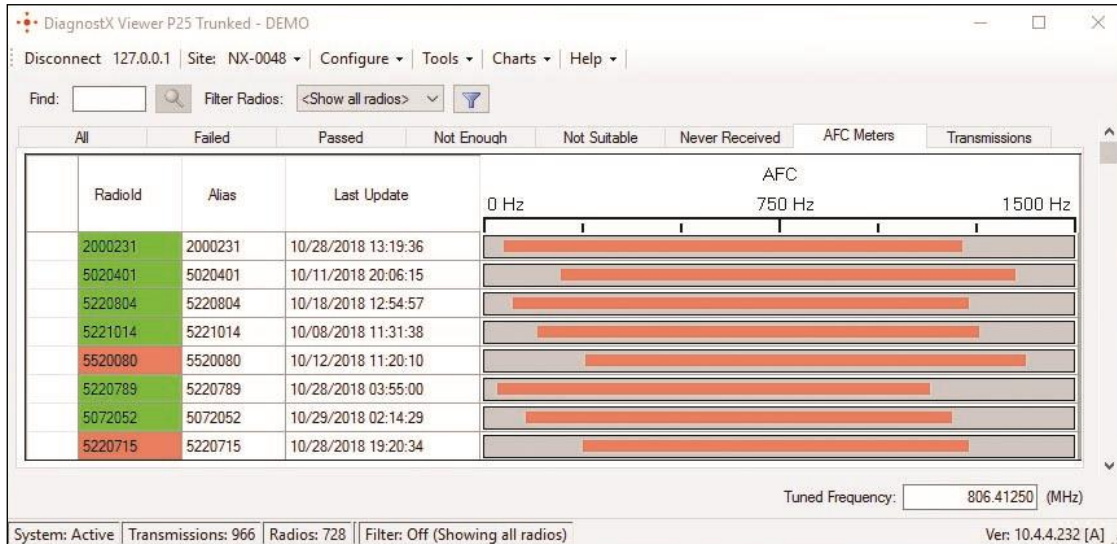


Visual Reports

- DiagnostX Viewer (DV): Home Navigation Screen
- Site Configuration, Thresholds
- Control Channels
- System Status Reports (to the right)
- Detailed Data Reports for Export
- Waveform Visualization - Time Domain and Frequency Domain

Automatic Frequency Control (AFC) Meter

DiagnostX provides an evaluation of the radio based on specific metrics including Frequency Error (FE). Sometimes a radio will show as being within spec according to pre-set DX thresholds. The DiagnostX AFC Meter will display what percentage of AFC is being engaged. This means that there is a temporary correction of FE of up to 1000 or 1500 Hz depending on the manufacturer. A radio that is extensively misaligned will experience issues connecting to the system. The AFC Meter, the only tool available for identifying Automatic Frequency Control, is an add-on feature to the DX-2002 and NX-200 devices.



Technical Background

Radios have their own oscillator sources which drift over time. These crystals are directly impacted by the voltages applied to them which make them resonate. These controlling voltages are affected by the aging of electronics, battery power, temperature, environment, and mounting conditions. The effect of these variables can be seen in the drift or detuning of oscillators which contribute to the degradation of communication devices. This is where AFC is useful because it can temporarily control and correct the oscillator drift of the radio until it is turned off. Automatic Frequency Control attempts to correct for these variables, within limits, masking a hidden problem until total communication failure occurs.

About LocusUSA

LocusUSA is an engineering and software development company located in West Melbourne on the Space Coast of Florida since 2001. It is a leader in radio frequency capture for radio analysis and location. The ability to capture and analyze the actual waveform of a radio transmission led to the development of DiagnostX, a patented system that can measure the alignment and operating characteristics of a radio, over-the-air in real time without user intervention.

LocusUSA supports government customers across the United States and Canada on the local, state and federal levels with this first-of-its-kind, proactive tool, ensuring the optimal performance of a radio system.

Patent Nos.

United States: #8,565,096, #8,948,022, #9,282,482, #8,600,371, #8,825,042, #9,432,866 #9,681,321 B2, #10,200,902
Canadian: #2,746,238 • Australian: #2010235881, #2012253596 #2015203442 • Other patents pending

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Innovative. Reliable. Proven. Proactive Radio Maintenance.

