

CODAN
RADIO COMMUNICATIONS

P25 TRUNKED RADIO SYSTEM

PRODUCT INFORMATION

CODAN P25 TRUNKED RADIO SYSTEM

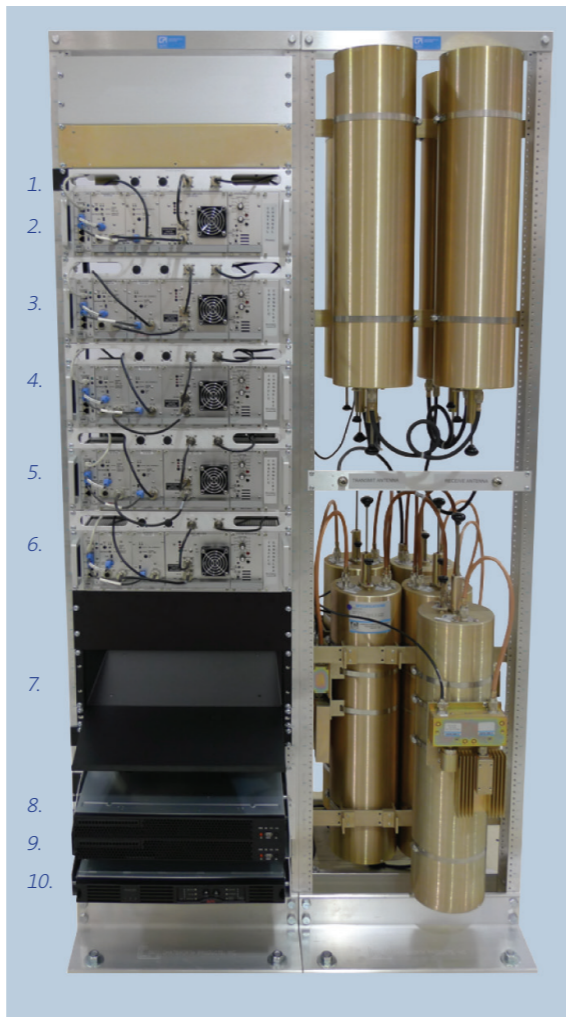
The Codan P25 Trunked Radio System provides a compact, low power trunked radio system for customers requiring P25 digital communications to a large number of users from a single site. For Police, Fire or Utility applications, the Codan P25 Trunked Radio System is a complete radio system that can be quickly deployed on a temporary or permanent basis without necessitating complex network or console interfaces. The Codan P25 Trunked Radio System builds on the existing MT-4E P25 conventional hardware platform offering a migration path from conventional P25 to Trunked P25 operation. The Codan P25 Trunked Radio System has four market differentiators:

1. Small Size – 5 Traffic Channels – There is a market need for a small trunked system capable of offering up to 5 traffic channels to address single site applications for rural regions. The Codan P25 Trunked Radio System is housed in a compact configuration that provides capacity for ~500 users. This is adequate for a small police or fire department in most small cities or to serve any industrial plant (oil & gas, utility) that needs P25. Dependant on antenna location, a single site could serve a community 20 kms in radius.

2. Low Current – Codan has a well established and respected reputation in the industry for providing low current products. The ability to extend this into trunked applications is unique to Codan. Since the 5 channel radio uses the same conventional hardware and one channel is always active the Codan trunked radio would consume ~ 25 A @ 12V based on a 30 Watt RF output. This is significantly lower than the competitive trunked offerings and a benefit for rural sites (highways) or temporary deployments where power is an issue.

3. Transportable – The small rack space required by the Codan P25 Trunked Radio System enables the entire trunked system to be packaged in a transportable case (Radio, Power Amplifiers, Combining Equipment) allowing for rapid field deployment.

4. Common Hardware Platform – The Codan P25 Trunked Radio System uses the identically same MT-4E hardware as Codan currently offers for P25 conventional applications. The Codan P25 Trunked Radio System is offered in the VHF, 380-520 MHz, and 700 / 800 MHz bands.



VHF COMBINERS 30 WATTS RF

- 1. Power Monitor (per channel)
- 2. Control Channel
- 3. Traffic Channel 1
- 4. Traffic Channel 2
- 5. Traffic Channel 3
- 6. Traffic Channel 4
- 7. Power Supply
- 8. Ethernet Switch
- 9. Redundant Trunking Controllers
- 10. Uninterruptible Power Supply

APPLICATIONS

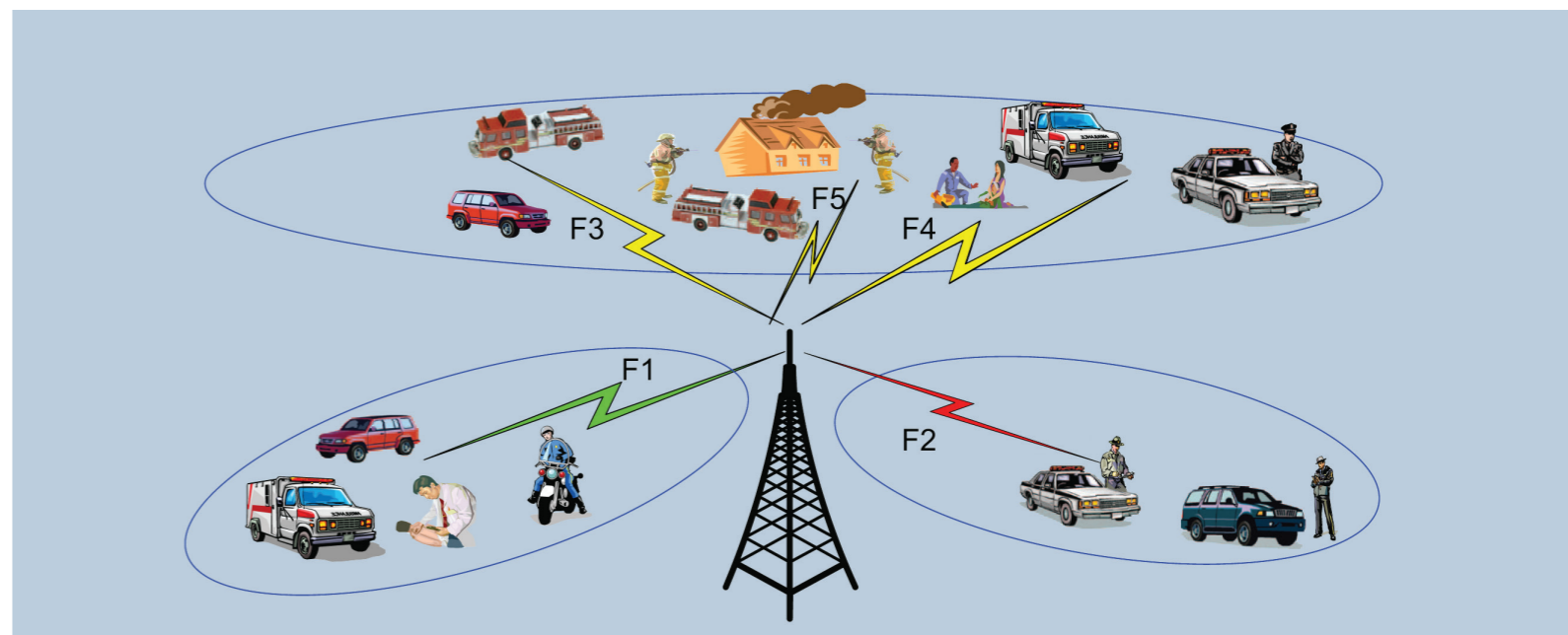
The Codan P25 Trunked Radio System has been designed to uniquely meet the requirements of standalone and end of the network trunked site applications:

a) Rural Public Safety Agencies – Rural police, fire and EMS agencies can benefit from a standalone trunked system to provide a cost effective solution to their agency’s need for fixed radio infrastructure. The trunked site can be optimally sized to meet the needs of a small agency, yet have the capacity to easily expand in the future. It can also operate in either a standalone mode or with an IP interface to a dispatch console.

b) Rural Public Safety Agencies in a State-wide trunked network – For rural police, fire and EMS agencies, the Codan standalone trunked system can provide seamless operation for all users at the remote standalone site without the need for expensive backbone connectivity to the statewide core network. The remote trunked site can be optimally sized to meet the needs of a small agency, yet have the capacity to easily expand in the future. It can also operate in either a standalone mode or with an IP interface to a dispatch console. The system can be configured to support any radio operating on the state-wide network without the backbone network to support roaming.

c) Rapid Deployment Trunked Site in a State-wide trunked network – For Public Safety Agencies (Police, Fire, Ambulance and other First Responders) a Codan P25 Trunked Radio System configured in a Transportable package offers a Rapid Deployment solution for large scale responses in an emergency. The Codan transportable trunked system can be rapidly deployed anywhere in response to an emergency in an unserved region or in response to the loss of fixed infrastructure due to natural disasters. The system can be preconfigured and tuned to assigned frequencies for deployment at a moment’s notice and is capable of supporting any radio configured for operation on the state-wide network.

d) Utilities – Power plants, oil refineries and ports can benefit from a standalone P25 trunked system permanently deployed at their facility to serve a large number of radio users and provide interoperability with local public safety agencies in the event of an emergency.



PRODUCT CONFIGURATIONS

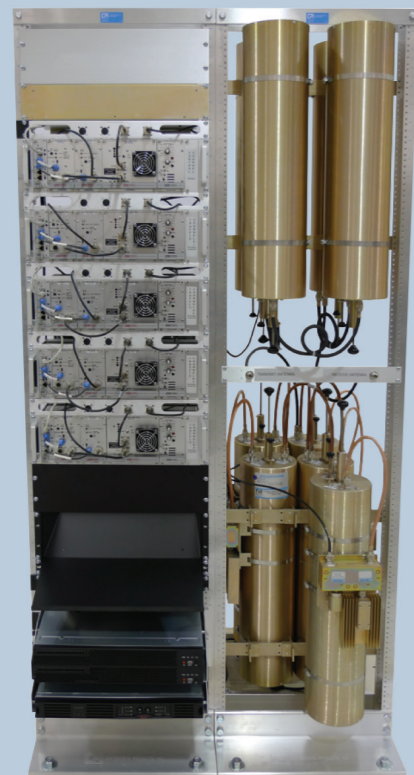
The Codan P25 Trunked Radio System is configured with one channel per subrack as shown below to the left with two 1U industrial servers performing the function of the redundant trunking controller. A Universal Interface Card (UIC) in each shelf provides the IP communication path between the radios and the trunking controllers. Codan offers its P25 Trunked Radio System in two main configurations:

1. 7' Rack for Fixed Installations

For permanent fixed site applications such as a small town police force or a power plant, the Codan P25 Trunked Radio System can be mounted in a standard 19" 7' equipment rack as shown below, left.

2. Transportable Cases

For temporary deployment by firefighting agencies, police departments involved in search and rescue or security details setting up temporary communications to protect dignitaries, the Codan P25 Trunked Radio System can be packaged in a transportable case for easy deployment. Cases, such as the one shown below, right will accommodate the RF racks, the industrial servers, power supplies, power amplifiers, combiners and duplexers and other cases can be filled with preconfigured handhelds. This is very similar to our existing conventional P25 briefcase repeater but offers increased traffic capacity.



7" Rack for Fixed Installations



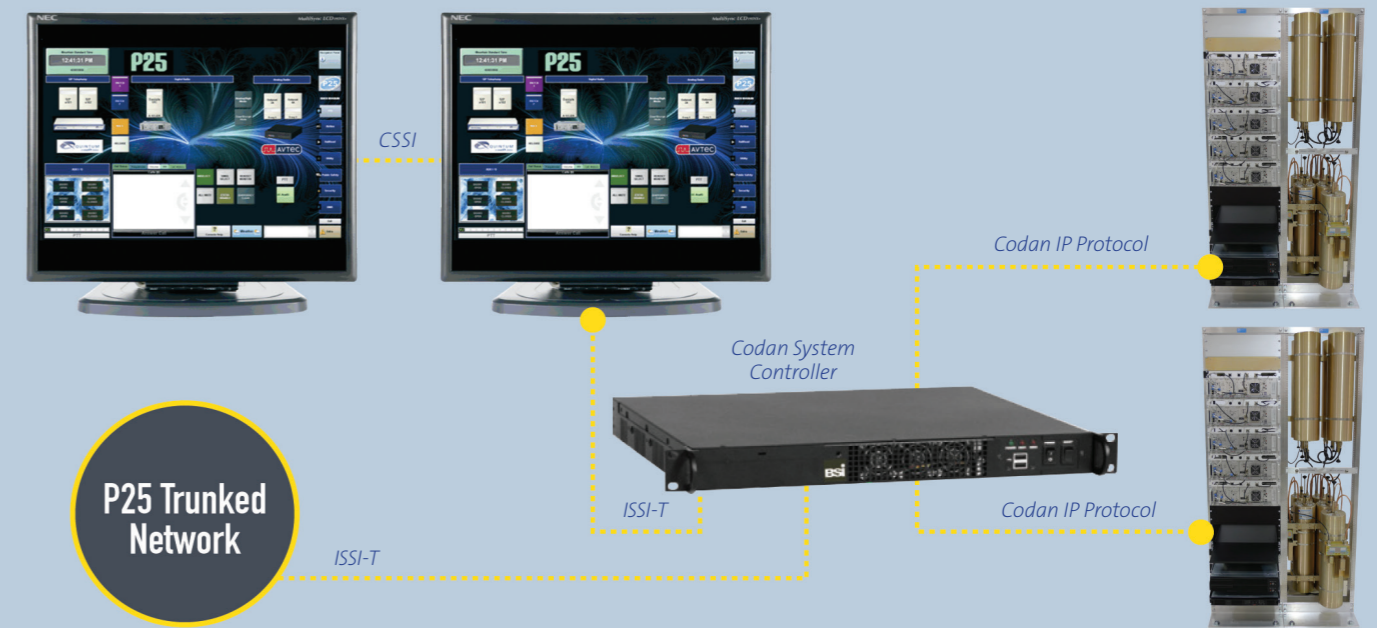
Transportable Case

PRODUCT ROADMAP

The Codan P25 Trunked Radio System will continue to evolve to enhance its functionality. It is Codan's intent to offer new product releases expanding the capabilities of the Trunked Radio system to meet the unique requirements for standalone, end of the network and transportable trunked applications. To that end Codan is developing the following functional enhancements for its Trunked Radio System:

- Composite Control / Traffic channel for single channel trunked repeaters for end of the network or dead zone infill applications.
- Inter Sub-System Interface (ISSI) to support interconnectivity to other P25 trunked equipment.
 - ISSI to the Console subsystem
 - ISSI connectivity between Codan Trunked Radio Sites
 - ISSI connectivity to another vendor's Radio Frequency Sub System (RFSS) for end of the network connectivity
 - ISSI Conventional connectivity
 - ISSI connectivity from trunked to conventional sites
- Expanded channel capacity from 1 – 10 channels

The next planned release for the Codan P25 Trunked Radio System is the addition of the Inter Sub-System Interface (ISSI) connection to support connectivity to dispatch consoles and other RFSS sites as illustrated below. For all releases it is Codan's intention to obtain P25 CAP compliance as the standards are defined and completed.



TRUNKING CONTROLLER

The Codan P25 Trunked Radio System is controlled by redundant Codan Trunking Controllers located in the bottom of the equipment rack shown below. The Trunking Controller is comprised of a software application running on redundant carrier grade servers housed in 2U packages as shown to the right. The server's Intel Core 2 Duo processors offer performance, ruggedness, reliability and long life to meet the mission critical needs of a P25 trunked radio system. Full redundancy is provided standard for all P25 trunked systems to ensure maximum reliability and minimal downtime for mission critical applications. Codan also provides standard an Uninterruptible Power Supply (UPS) for the servers to ensure graceful shutdown in the event of a major loss of power.



Communications with each of the radio channels is accomplished via an IP connection to each radio channel (subrack) and its associated Universal Interface Card (UIC). Power monitors are also connected to the Trunking Controller to provide full alarm and management information to the Trunking Controller should a radio channel fault be detected. This enables the Trunking Controller to automatically switch the Control Channel to a Traffic channel to ensure continued operation in the event of a fault. Codan has selected the industry standard FreeBSD as its operating system for the Trunking Controller. FreeBSD is derived from BSD, a version of UNIX developed at the University of Berkeley in California. FreeBSD provides robust network services under the heaviest loads and uses memory efficiently to maintain response times during thousands of simultaneous processes.

SYSTEM CONTROLLER

For multi-site trunked applications based on ISSI connectivity between sites, Codan will use the same carrier grade server platform for the System Controller. The System Controller will provide the call management for the entire Codan RFSS including ISSI connectivity between Codan Trunked Sites as well as to other RFSSs (other vendors or consoles). This will ensure commonality of hardware, software, service and training for the IT infrastructure.



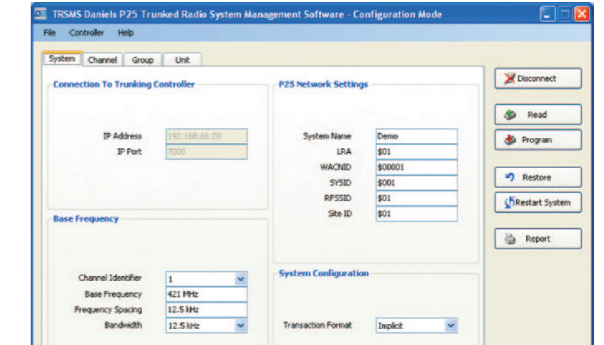
TRUNKING RADIO SYSTEM REMOTE MANAGEMENT SOFTWARE

Codan has developed a Trunking Controller software application called the Trunking Radio System Remote Management that runs on the FreeBSD Operating System of our redundant carrier grade servers. The Trunked Radio System Remote Management for the Trunking Controller contains a number of Graphical User Interface (GUI) screens to support trunking controller programming, operation and maintenance. Representative screens are shown.

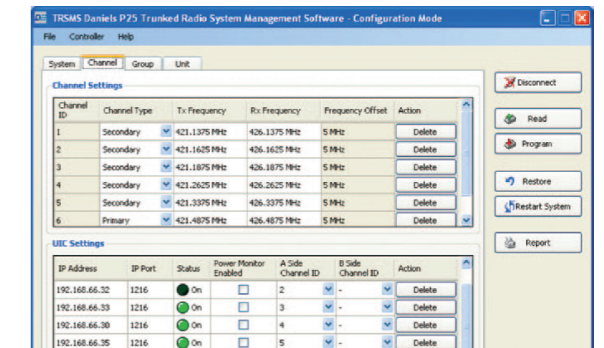
- On the system screen (shown to the right) the IP address, frequency and IDs are set for the system.
- On the channel screen (shown bottom left) the frequencies, IP addresses and power monitoring features are set for each radio channel (subrack).
- The remaining screens (group screen shown bottom right) enable the programming of the Talk Group IDs (TGIDs), Announcement Groups and Group Calls. Finally the user screen (not shown) assigns the unit ID and private call function.

For all screens Codan has enabled batch programming to enter in ranges of parameters instead of having to program each user individually. As well the system will accommodate wildcard values allowing a range of users to be able to operate on the system without having to program in all possible combinations. This is extremely valuable for remote or emergency site operation, when users from all over the state will be responding and need to have instant access to the trunked site without reprogramming.

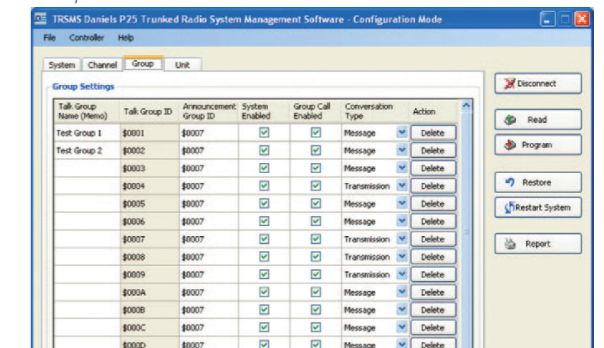
System Screen



Channel Screen



Group Screen



SALES OFFICE LOCATIONS



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Note that all specifications in this document are subject to change.

