

## Digital Link Controller

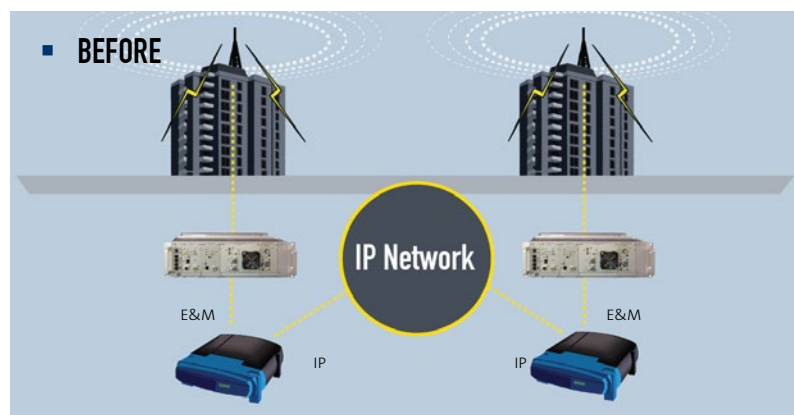
### FEATURES AT A GLANCE

- Analog, P25 Clear and P25 Encrypted RF CAI transmissions
- Eliminates the need for a second pair of frequencies to link sites
- Supports VHF, UHF, 700, 800 & 900 MHz band repeaters and base stations
- 1U rack mounted

Codan has developed a Digital Link Controller (DLC) to connect Codan repeaters together via IP into an all digital network.

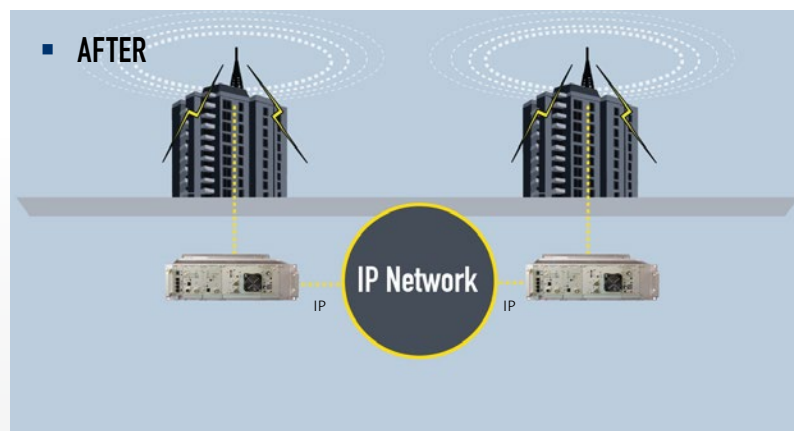
### THE PROBLEM

In the past, repeaters could only be linked together in an analog format using E&M circuits connected together via leased lines or microwave. More recently, products have been developed to convert E&M to IP enabling linking over an IP network but the connection was still analog with the resulting loss of: audio quality in the analog to digital (A/D) conversion, limited control signaling and no encryption.



### THE CODAN ALL DIGITAL IP SOLUTION

Codan now offers an all digital IP solution called the DLC — Digital Link Controller that overcomes the above problems by enabling Codan repeaters and Base Stations to be linked together in an all digital network via IP as shown in the diagram below.

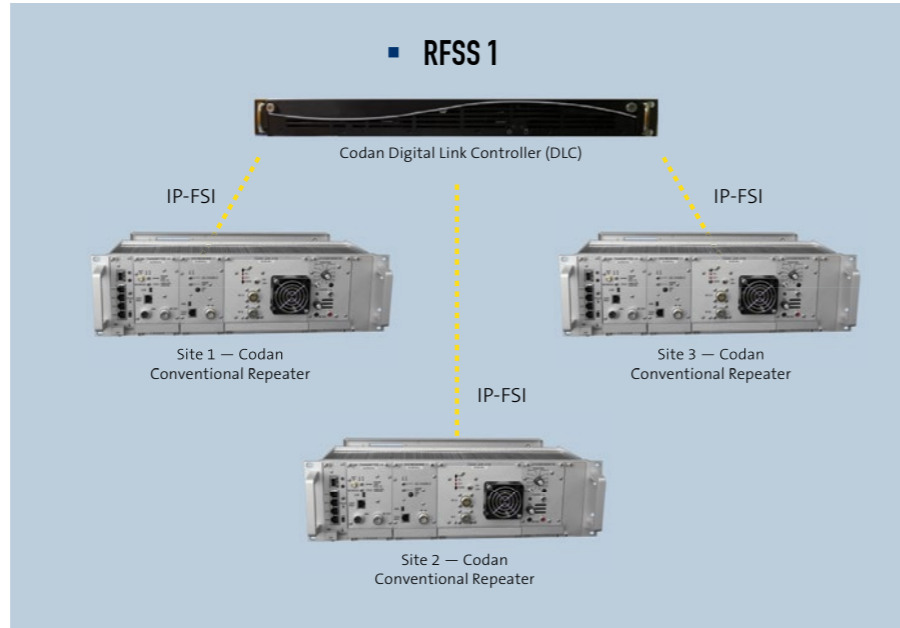


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## IP LINKED CODAN REPEATERS

The Codan solution is based on the P25 Digital Standard and uses the standard digital IP connection from a repeater / base station — the P25 Digital Fixed Station Interface (FSI) protocol. This is available on any Codan base station with the addition of a Universal Interface Card (UIC). The Codan Digital Link Controller (DLC) receives the digital audio and control signals from the radio via the FSI and then routes the call based on the P25 Network Access Code (NAC), Talk Group ID (TGID) or Unit ID. Encrypted calls are routed transparently.

P25 supports mixed mode operation so the subscribers can be analog, digital or encrypted digital and all three modes are supported by the DLC. From a standards perspective the system (shown to the right) forms a RF Subsystem (RFSS).



## THE CODAN DIGITAL LINK CONTROLLER — DLC

The Codan Digital Link Controller (DLC) is an industrial PC in a 1U package running the Codan DLC software application. The DLC can interconnect up to 5 sites together via the P25 IP Fixed Station Interface (FSI) from each Codan Base Station.

The Codan Digital Link Controller (DLC) receives the digital audio and control signals from the radio via the FSI and then routes the call based on the P25 Network Access Code (NAC), Talk Group ID (TGID) or Unit ID. Analog, P25 clear or encrypted transmissions are supported. Encrypted calls are routed transparently.

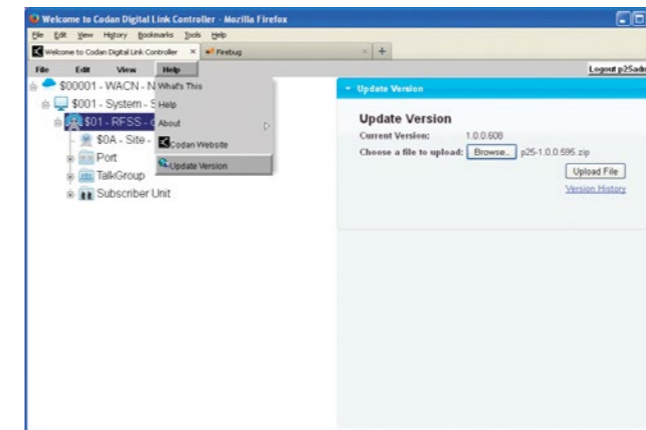
## GRAPHICAL USER INTERFACE

Programming of the DLC is managed by a password protected, web-based GUI which also provides on line diagnostics. Software programming of the following capabilities is offered:

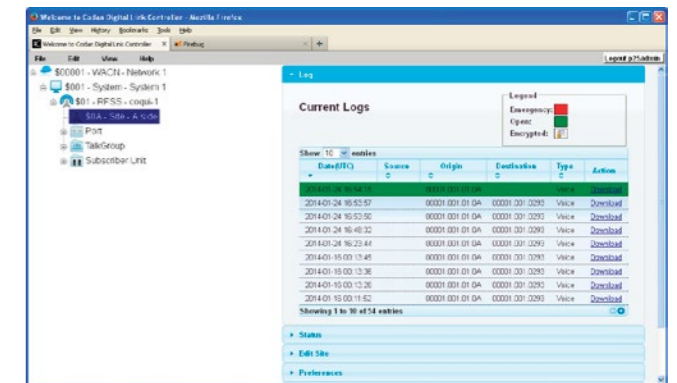
- IP Addresses
- Base Station/Repeater IP Address
- Routing based on NAC, TGID or Unit ID
- Subscriber Groups
- Subscriber Units
- Call type — analog, P25 clear, P25 encrypted
- Configuration Log Print

The web based GUI also provides the following self diagnostics:

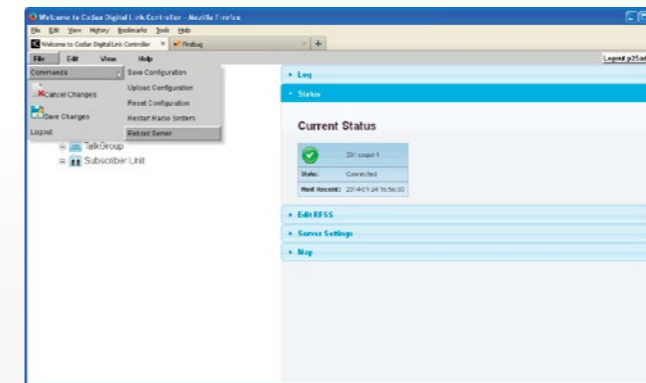
- DLC operational
- Forced remote reset
- Logs of calls
- Logs of errors
- Notification of lost IP links
- Software updating from the Codan software download page
- Online help files



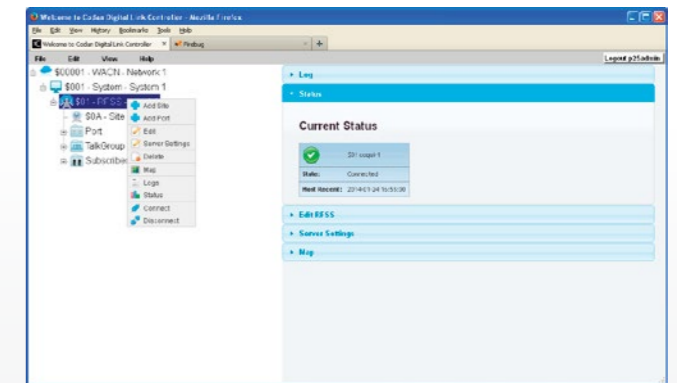
Web-based software update



Voice logs with current conversation in green



Forced remote reset



Right-click menu allows control of DLC state

# Digital Link Controller

## SPECIFICATIONS

FEATURE	RELEASE
RFSS supported	1
Radio interface to the controller	FSI
Radio sites supported per RFSS	5
Analog, P25 or P25 encrypted voice transmission	Yes
Routing/restriction based on NAC, TGID or Unit ID	Yes
All digital backbone (IP)	Yes
P25 encryption support	Yes
VHF, UHF, 700, 800 & 900 MHz bands	Yes
IP based web interface for programming and maintenance (password controlled)	Yes
Voice and event logging (external device — unencrypted)	Yes
Availability	Feb 2014

## SUMMARY

In summary the Codan DLC provides a new level of digital interconnect between Codan P25 Repeaters and Base Stations. Key features of the DLC include:

- All digital P25 IP connectivity between Codan Repeaters and Base Stations
- Analog, P25 Clear and P25 Encrypted RF CAI transmissions eliminates the need for a second pair of frequencies to link sites
- No E&M — IP conversion boxes are required
- Elimination of leased lines saves money.
- 1U rack mounted
- Supports VHF, UHF, 700, 800 & 900 MHz band repeaters and base stations

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## CODAN RADIO COMMUNICATIONS

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