DANIELS™
ELECTRONICS LTD.

# PRODUCT CATALOGUE

www.danelec.com

CELEBRATING 60 YEARS
60
OF CUSTOMER SATISFACTION

P25 DIGITAL · DIGITAL WIRELESS · SANS FIL NUMÉRIQUE · UNALAMBRICO

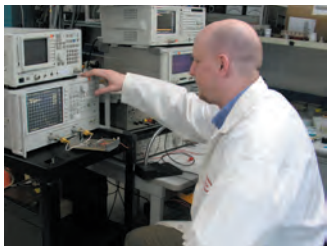
SYSTEM CERTIFICATION
ISO 9001:2008
SGS

RoHS

# DANIELS ELECTRONICS LTD.

Since 1950, Daniels Electronics has provided customers around the world with highly reliable rugged low current radio systems. In 2011, the company celebrated its 60TH year of incorporation. Based in Victoria, BC, Canada, Daniels designs, manufactures, markets and sells radio base stations and repeaters for analog and digital conventional/trunked Land Mobile Radio applications. The company is privately owned and employs 65 people.





## Certifications

Daniels products are certified to meet the requirements of TIA, P25, FCC, DHS CAP, IC, ACMA and Daniels is proud to comply with the ISO 9001:2008 Quality Assurance Standard. Daniels is also a signatory to the NXDN™ Forum.

In 2011, Daniels Electronics began shipping its first product that complied with RoHS - a European Union Directive for Restriction of Harmful Substances, with the goal of restricting the use of six hazardous materials in the manufacture of electronic equipment including: lead, mercury and cadmium. Daniels has chosen to be ahead of our industry by removing these substances from our products and ensuring we continue to be environmentally friendly and recyclable.

## Awards

Daniels Electronics is pleased to have been recognized by its industry peers with numerous awards including: Manufacturer of the Year, Vancouver Island's Top 25 Technology Companies, British Columbia's 50 Fastest Growing Technology Companies and VIATeC's Technology Company of the Year and Member Company of the Year.

# CUSTOMERS

Daniels Electronics is proud to have supplied products to meet the needs of the following customers:

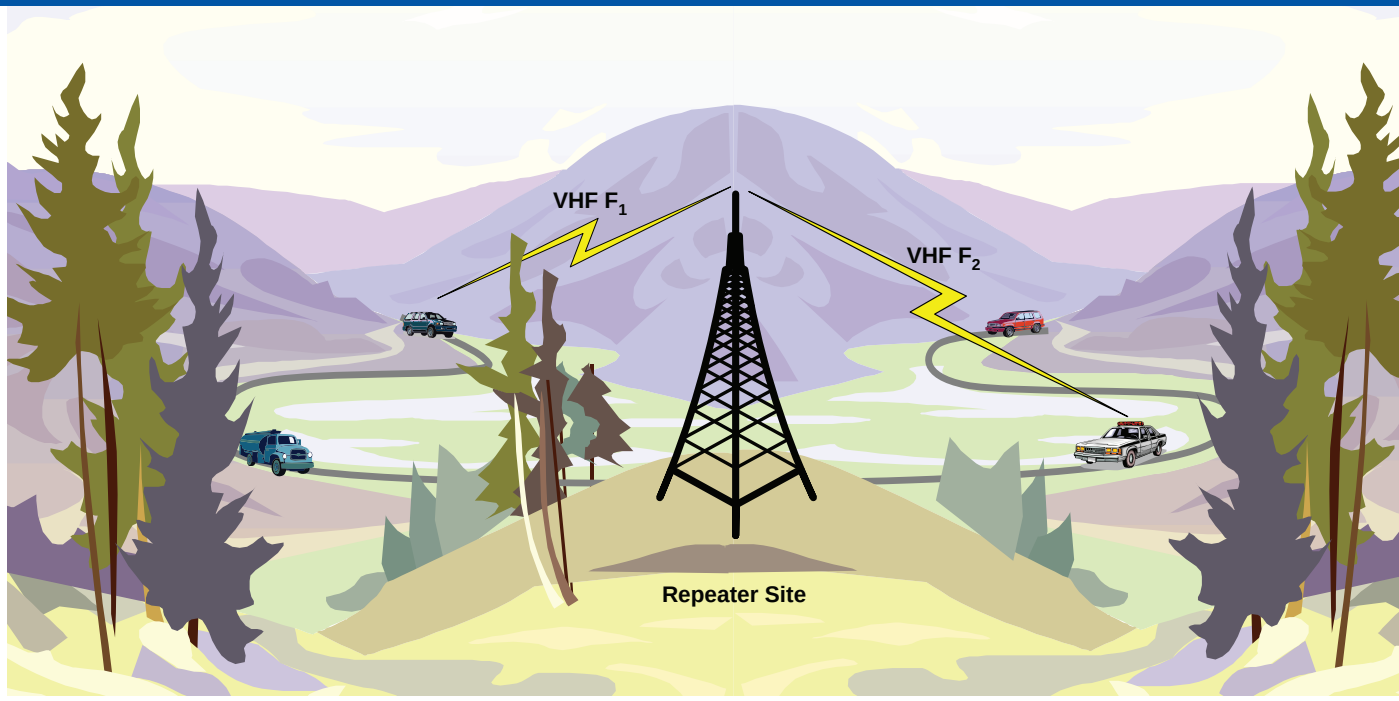
**Firefighting**
Denver Fire Department

**Forestry**
BC Ministry of Forests

**Military**
MFO (multinational peacekeeping force in the Sinai)

**National Parks**
United States National Park Service

**Police**
Peel Regional Police




## Basic Repeater System

Repeaters can be used to overcome geographical features that obstruct radio communications or to extend coverage to communicate over greater distances. This increases the ability of portable and mobile radio users to communicate with each other or back to the base station.

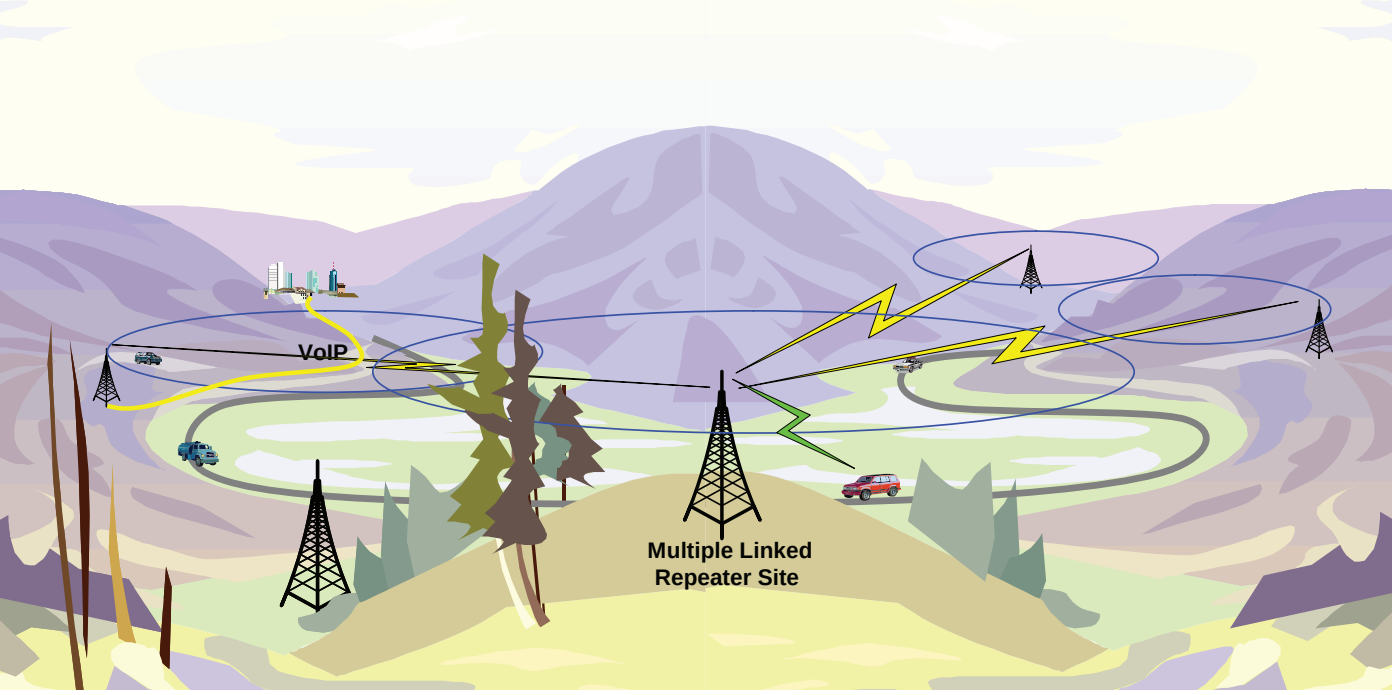
Daniels repeaters are available in analog or P25 digital configurations. In analog mode, the repeater can be configured for either wideband or narrowband operation. CTCSS or DCS operation, as well as selectable de- and pre- emphasis or flat audio can be set in the receiver and transmitter modules. P25 repeaters can operate in analog, P25 digital or mixed mode. (Mixed mode means retransmitting whatever mode is received). In P25 digital mode, the repeater will pass all clear and secure (encrypted) P25 digital information. NAC codes can be programmed into the receiver and transmitter modules or the system can be programmed to repeat any incoming signals with the NAC intact.

## Public Switch Telephone Network Interconnect

For applications requiring an interface between a microwave radio backbone and a LMR system, E&M interfaces can be used to connect the two systems. This connection allows remote communications between radios, beyond the normal coverage area of the individual radio systems via the microwave radio backbone.

30 Watt VHF Basic Repeater System

# APPLICATIONS – MULTI-LINK REPEATERS




## Multiple Linked Repeater Systems

A multiple linked repeater system provides radio coverage over long distances. In applications where the distance has become too long or the coverage provided is too restricted for a single repeater, more repeaters are needed to enable radio users to communicate over a greater distance.

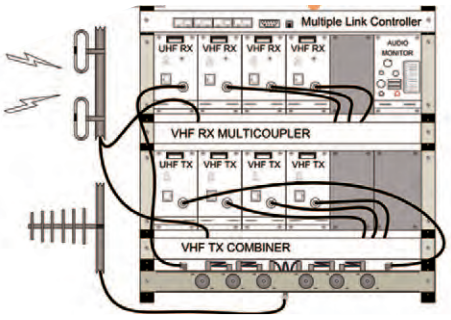
By establishing a series of repeater sites, a chain can be linked together to provide radio coverage over a large area. At each link site, one or two radios may be used to provide local coverage or aircraft coverage.

## VoIP Linked Repeater Systems

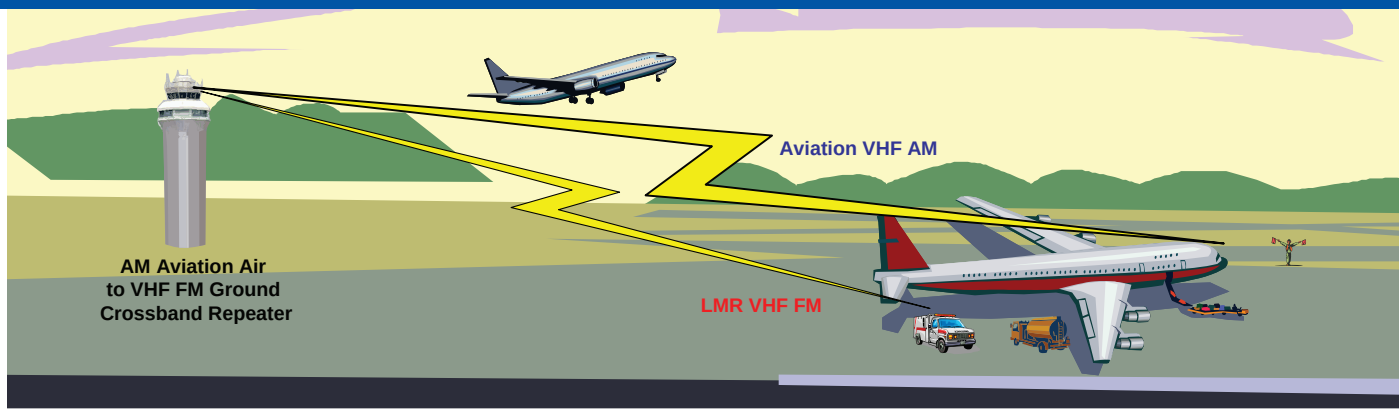
In instances where it is not practical to link the repeaters together via radio transmissions, a local (LAN) or wide area network (WAN) can be used at the repeater sites to link them together. Using existing network infrastructure eliminates the need for leased lines, microwave, or radio links and also allows for repeaters to be located in areas where line-of-sight paths between repeater sites may be difficult. A network extension unit is connected at both repeater sites allowing PTT / COR and audio signals to be sent across the LAN / WAN, to and from the remotely located repeaters.

## Radio Routing

A series of repeaters can be configured with Daniels Multiple Link Controllers to operate in different ways, depending upon the NAC code, CTCSS or DTMF received. For instance, subscribers could send one NAC to talk through a Daniels radio system as a local repeater. If the subscriber sent a different NAC, he could bring up every other repeater in the chain and talk to all other subscribers on the network as part of an ALL CALL. Alternatively, the subscriber could enter a different NAC to address an individual repeater. Since Daniels Multiple Link Controllers steer or “route” the radio signal, the Multiple Link Controller may be called a “Radio Router.”



# APPLICATIONS – CROSSBAND AND GROUND TO AIR REPEATER




## Crossband Repeater System

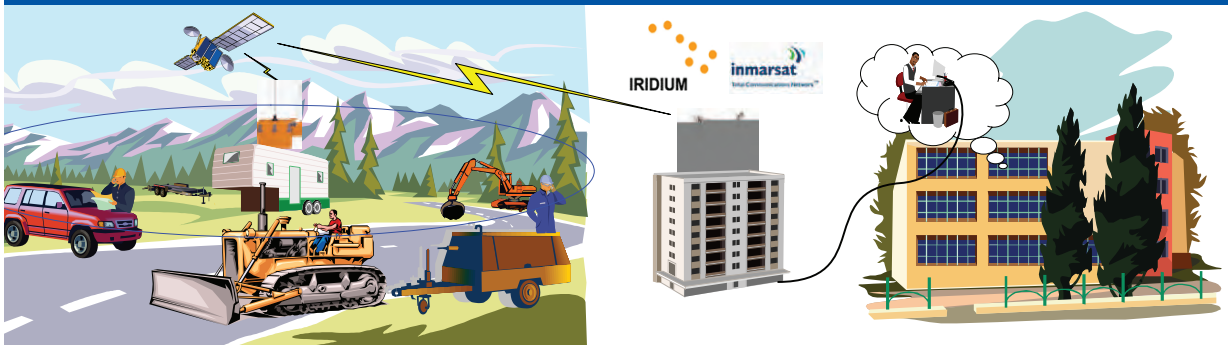
A crossband repeater system enables system interoperability by changing frequency bands between two radio systems. For example, a police department using VHF may need to communicate with the local fire department on their UHF frequencies. The crossband repeater receives a VHF signal from the police department and then retransmits the signal on UHF to the fire department.

## Aviation Ground to Air Crossband Repeater

A ground-to-air crossband repeater allows FM ground radios (VHF or UHF) to communicate with AM VHF airband radios. This is ideal for providing ground-based firefighters or search and rescue crews with direct communication to supporting aircraft and helicopters. This technology is also used on oil rigs for Intrinsically Safe (IS) communication with incoming helicopters. Fixed locations such as a control tower or FM station can be provided with extended coverage to aircraft that are using AM radio equipment.

Ground to Air Crossband Repeater System

# APPLICATIONS – SATELLITE REPEATERS

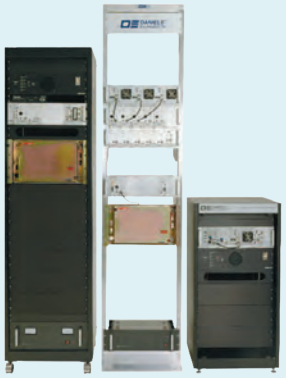



## Satellite Telephone Interface in a Transportable Case

A transportable repeater or base station can be interfaced to a satellite telephone system allowing communications to and from any location in the satellite network (Iridium or Inmarsat). Radio users in the field access the satellite telephone by a DTMF sequence and then use the satellite telephone to dial out to any outside line. Other users can access the repeater / base station from anywhere in the world by dialing into the satellite telephone system (a regional telephone number enabled for the satellite telephone).

# APPLICATIONS – BASE STATIONS

Base Station



Base Stations in Cabinets

## Basic Base Station

Base station radio systems are used to communicate between a dispatch / command center and mobile or portable equipped radio users in the field. Base stations typically need to communicate on multiple channels and frequently the radio itself needs to be located at a remote location so as to provide improved radio coverage.

Daniels radios can be configured for a variety of base station applications. The simplest configuration is a basic base station in which the Daniels radio communicates with a variety of handheld or mobile radios either in analog or P25 digital mode. A Daniels analog base station can operate in any of the following frequency bands: lowband, VHF (AM and FM), UHF, T-Band or 700 / 800 / 900 MHz. A digital base station can operate in the VHF, UHF, T-Band or 700 / 800 MHz bands. A base station can be equipped with monitor receivers allowing the operator to monitor more than one channel at the same time in order to ensure communications are not missed by the dispatch office.

## Channel Selection

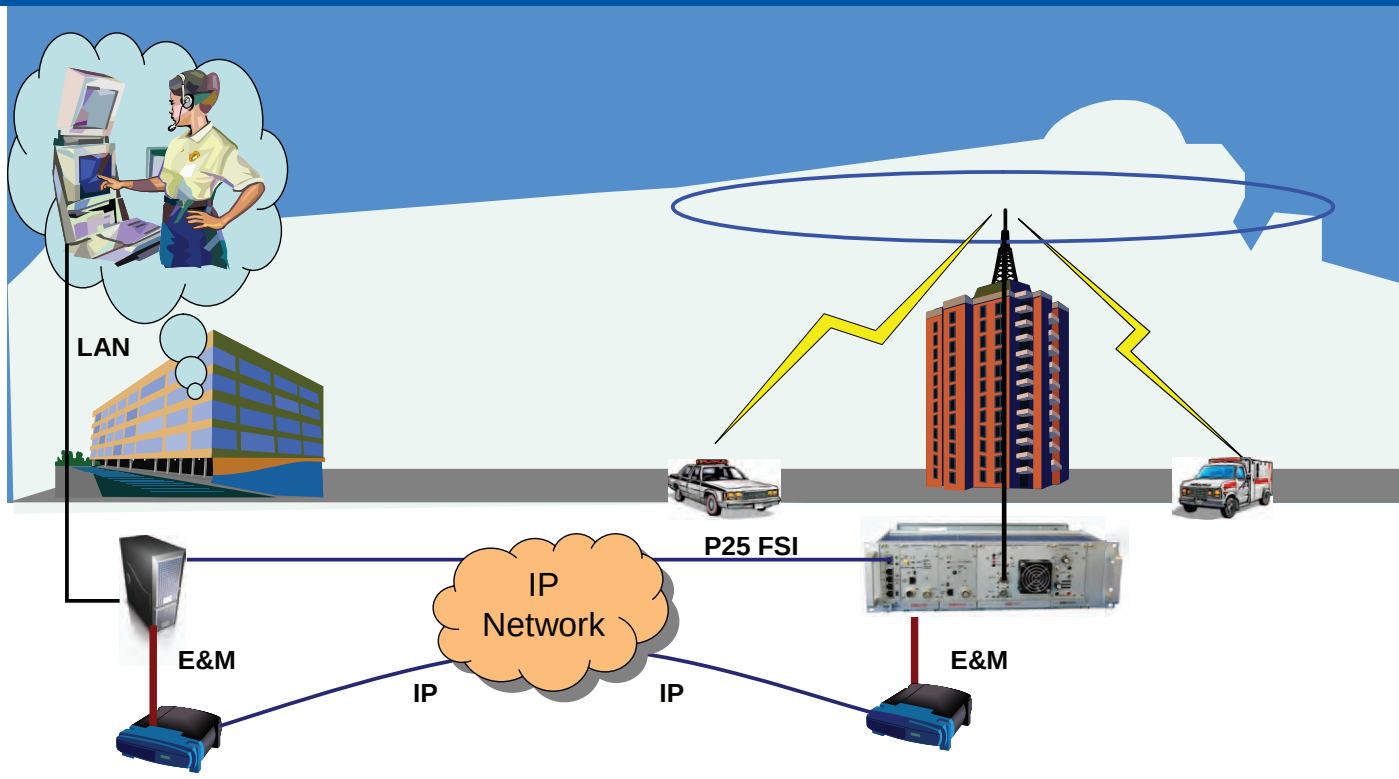
Daniels Electronics digital transmitters and receivers each have a 32 channel capacity. Channels can be selected with jumpers on the subrack, through optional front panel rotary switches or by accessing the channel select lines through an auxiliary connector. Channels may also be selected remotely by using tone sequences.

Communications between the base and mobile / portables can be selectable from the base to go to specific users in the field. The base station is operated by a tone remote and CTCSS tones are used for selecting users.

## Encrypted P25 Base Station (Secure or Clear)

Daniels digital base station radios support either secure or clear digital mode operation (encrypted or non-encrypted) using FIPS 140-2 certified AES 256-bit or DES-OFB 64-bit encryption modules[1]. Daniels digital base stations have the ability to automatically detect and differentiate between analog and digital as well as encrypted or non-encrypted signals. The digital base station locally or remotely selects (via tone remote consoles) secure or clear operation.

**1 Subject to Export Control.**




## Base Station with Digital IP Interface (TIA FSI Compliant)

A Daniels base station can provide a digital IP Ethernet interface to a console or IP switch using the TIA P25 Digital Fixed Station Interface (DFSI) compliant Universal Interface Card (UIC). The UIC provides Daniels customers with access to the base station signals (analog and P25 digital) through the Ethernet interface. Backplane signals as well as the front panel connections between the transmitter and receiver have been extended externally out of the radio via the UIC. The UIC provides additional functionality compared with the analog interface and enables end-to-end digital connectivity and encryption from the dispatch console to the portable.

## Remote Base Station (RF Link, VoIP or Tone Remote)

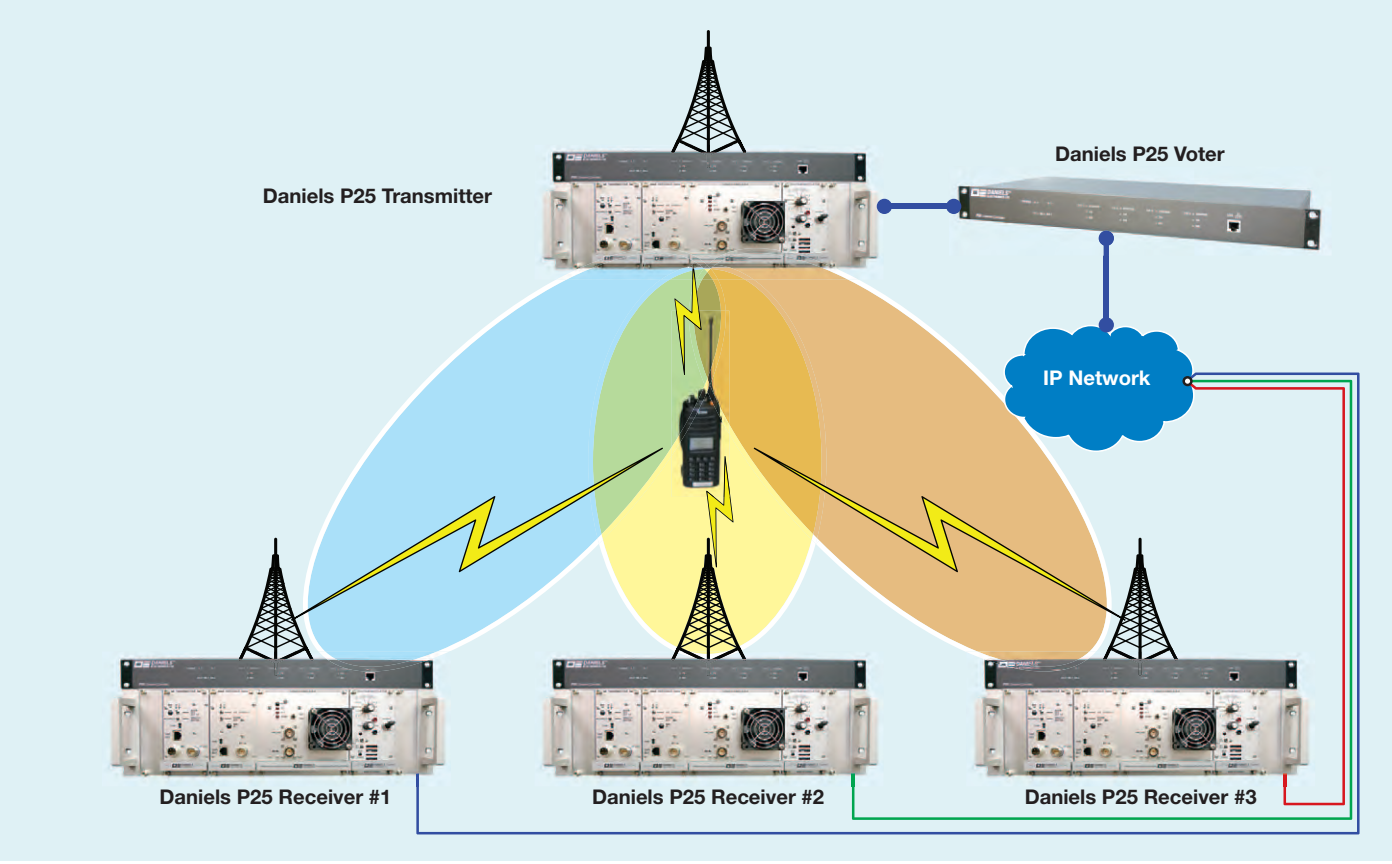
Remote base stations are used when the dispatch office is located in an area where the radio coverage is not adequate (e.g. a valley or an urban area). To extend the coverage, the base station must be located on higher ground.

Remote control of the base station via a console at the dispatch office can be accomplished in four ways:

1. An RF link can be used if the remote site is not accessible or is too distant for wireline connection.
2. VoIP – A LAN or WAN can be used to link the dispatcher and the remotely located base station site.
3. A telephone line using a tone or DC remote adapter. Tone remotes use PTT, guard, monitor and function tones to control the station.
4. A microwave channel using E&M signaling.

NEW!

# APPLICATIONS – P25 VOTING AND SIMULCAST




## P25 Voting

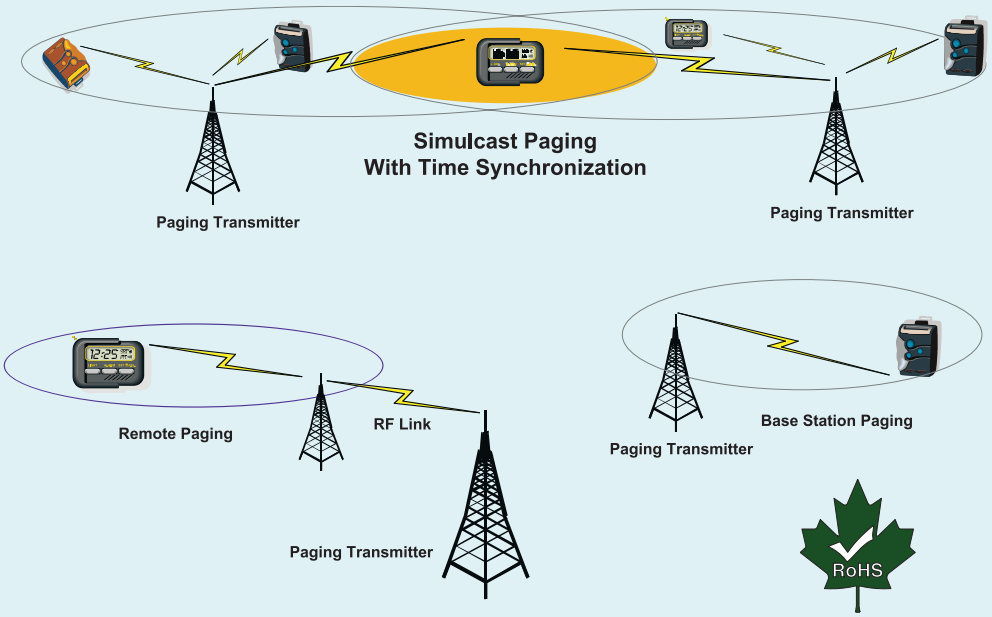
In a typical radio installation (analog or digital P25), a single receiver is assigned per site/frequency to serve a particular coverage area. When extended or improved coverage is required, multiple receivers can be installed on the same frequency. In this case, when the Subscriber Unit transmits, many (and possibly all) of the receivers may hear the transmission, depending on the location of the Subscriber Unit.

The receiver voting system determines and selects the "best" received signal from all the signals received by the various receivers. The best signal is then rebroadcast from the base station transmitter. This allows improved talk-back capability between mobiles in the field. Each local receiver's received signal is back-hauled to the voter and transmitter base station via IP links (Microwave or wired). As shown in the diagram above for a 3 site voted system with a single transmitter, each receiver receives the signal from the Subscriber Unit. These signals are then evaluated and compared and the best possible representation of the signal received is passed to the Daniels P25 voter. The Daniels Voting System is based on the versatile and proven MT- 4E conventional radio system. P25 Voting requires no changes to existing MT-4E radios and is supported in all the P25 frequency bands (VHF, UHF, T-Band, 700 and 800 MHz).

Each P25 traffic packet received includes an indication of the Bit Error Rate (BER) detected by the receiver. This error rate is defined by Forward Error Correction (FEC) encoding and is used by the voting logic to determine the relative quality of packets in the case that multiple streams are received. This process is performed continuously as the quality of the received RF signal varies at each of the different receivers as a result of Subscriber Unit movement within the coverage area, atmospheric conditions, or other factors that impact the integrity of an RF signal.

## Paging Features:

- Wideband 25 kHz or Narrowband 12.5 kHz (NTIA compliant)
- POCSAG 512, 1200, 2400 bps
- Flex™ 2 and 4 level modulation
- Multitone format
- External reference input for simulcast




## General Information

Daniels radios support narrowband (12.5 kHz) and wideband (25 kHz) paging. Three main paging applications are supported – Base Station paging, Simulcast, and Remote Station paging.

A variety of transmission standards are supported including:

- POCSAG at data transfer rates of 512, 1200, and 2400 Baud
- Motorola's FLEX™ 2 and 4-level modulation Paging Protocol at data rates up to 6400 bps
- PURC controller signals

Paging Transmitter with 30 Watt Power Amp

## Base Station Paging

Base Station paging is the simplest configuration with the paging encoder connected to the Daniels radio for broadcast over the local coverage area. Optional high-power power amplifiers are available to extend coverage. A third party paging encoder generates the paging format for analog (tone and voice) or digital display (numeric output). The Daniels radio then relays the radio signal to the pager or a subsequent paging receiver.

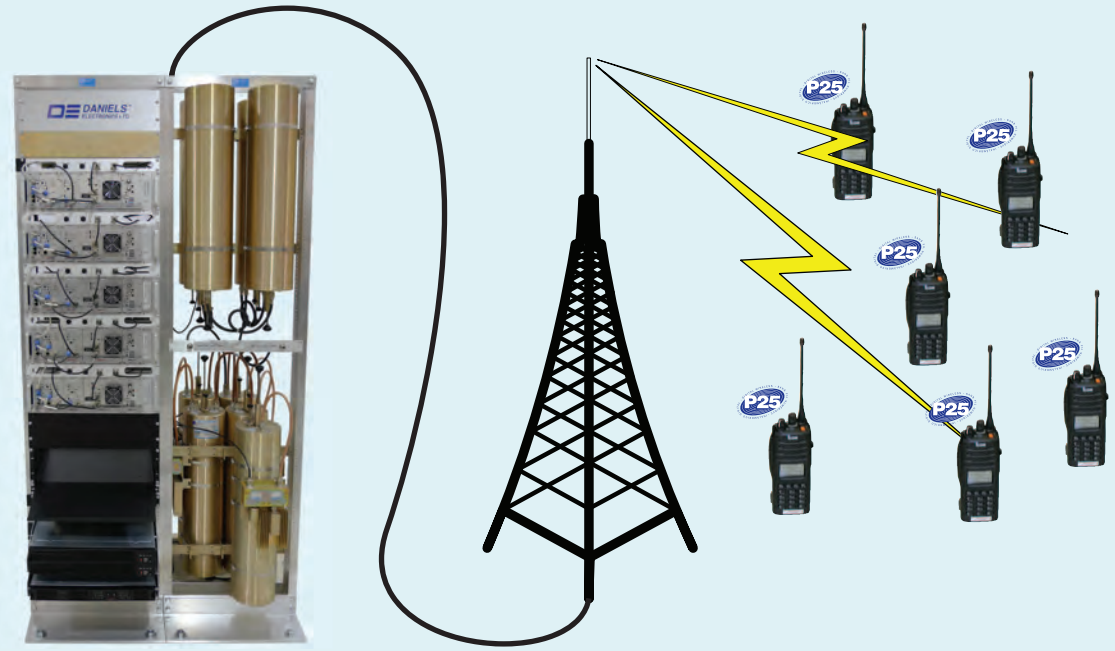
## Simulcast Paging

A simulcast system enables a message to be sent to all pagers in a coverage region simultaneously.

## Remote Paging Station

A remotely operated paging transmitter can be connected back to the base paging transmitter through a Daniels RF link for greater paging coverage. The paging encoder generates a signal that can be transmitted over the RF link. The received signal is then converted to a paging format for broadcast by the paging transmitter.

Paging Transmitter with 100 Watt Power Amp




## Daniels P25 Trunked Radio System

Daniels P25 Trunked Radio System provides a compact, low power system for customers requiring P25 digital communications for a large number of users from a single site. For Police, Fire or Utility applications, the Daniels 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 P25 Trunked Radio System from Daniels builds on the existing MT-4E P25 conventional hardware platform.

The Daniels Trunked Radio System has four market differentiators. They are:

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 Daniels 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** – Daniels 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 Daniels. Since the 5 channel radio uses the same conventional hardware and one channel is always active the Daniels trunked radio would consume ~ 25 A @ 12V based on a 30 Watt RF output. This is significantly lower then 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 Daniels Standalone 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 Daniels P25 Trunked Radio System has the identically same MT-4E hardware that Daniels uses for P25 conventional applications. The P25 trunked system is offered in the following bands: VHF, 380-520 MHz, or 700 / 800 MHz.

NEW!

# P25 TRUNKING – MULTI-SITE – ISSI SUPPORT

## Product Configurations

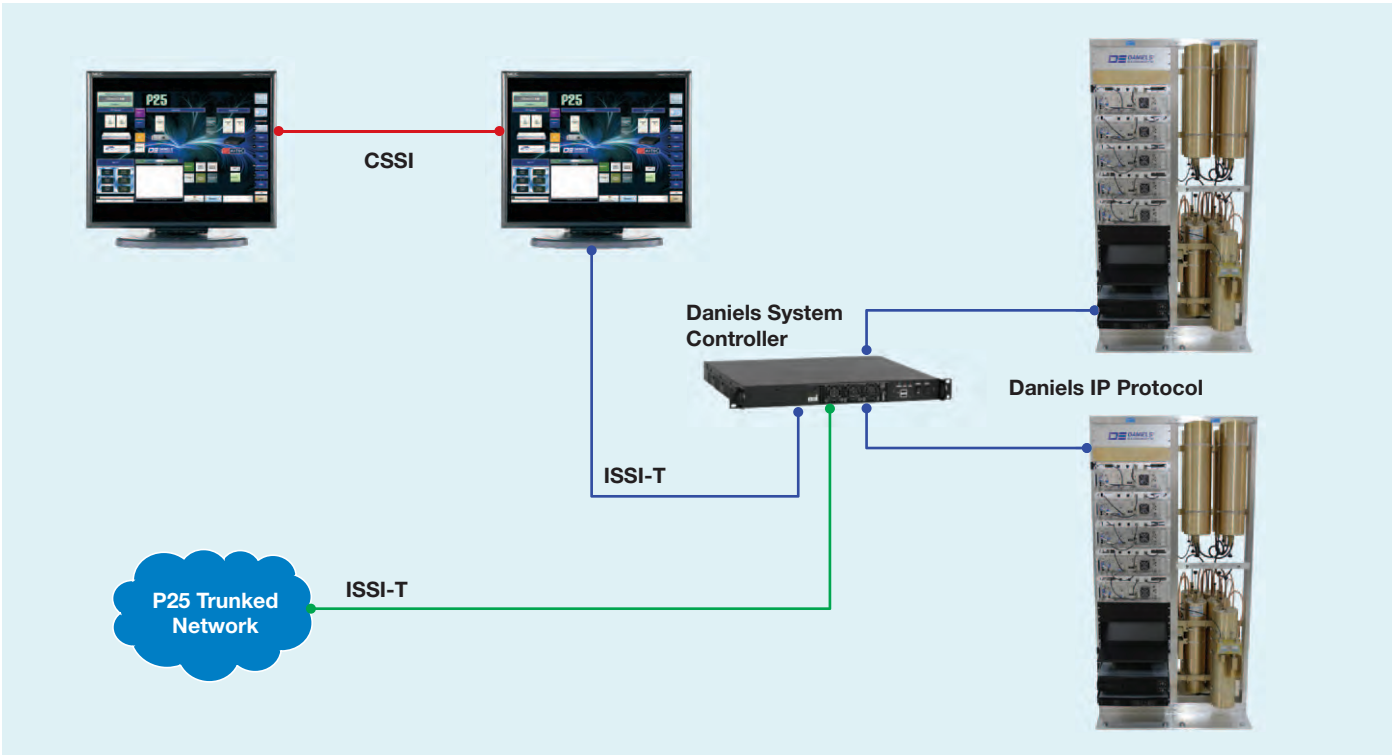
The Daniels P25 Trunked Radio System is configured with one channel per subrack as shown to the right with two 1U Industrial Servers performing the function of the redundant trunking controller. A Universal Interface Card (UIC) in each shelf provides the IP communication path between the radios and the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

- **7' Rack for Fixed Installations** – For permanent fixed site applications such as a small town police force or a power plant, the Daniels P25 Trunked Radio System can be mounted in a standard 19" 7' equipment rack as shown to the right.
- **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 Daniels P25 Trunked Radio System can be packaged in a transportable case for easy deployment. Cases, such as the one shown to the right will accommodate the RF racks and the industrial PC, while other cases can support power supplies / batteries, 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.

NEW!

# MULTI–SITE TRUNKING

The Daniels P25 Trunked Radio System is capable of supporting multi-site trunked applications as shown in the diagram below. Using the P25 open industry standard of ISSI – Inter Sub System Interface, the Daniels P25 trunked sites can be linked together, connected to P25 trunked consoles or connected into a large statewide P25 trunked network.



# RF PRODUCTS – TRANSMITTERS & RECEIVERS

## MT-4E Transmitters and Receivers (VHF, UHF & 700 / 800 / 900 MHz) FM

The MT-4E high performance and low-current consumption transmitters and receivers offer the following capabilities:

- Capable of 12.5 kHz (narrowband) and 25 kHz (wideband) operation (analog only).
- 12.5 kHz P25 digital operation is available via a purchasable firmware upgrade
- For secure digital communications,* an encryption module and associated firmware may also be purchased.
- Settings such as frequency, CTCSS, NAC and analog / digital / mixed mode operation are PC programmable on a channel by channel basis via the Daniels Radio Service Software (RSS) which can be connected to the receiver or transmitter through the front panel USB port.
- The transmitters and receivers can be programmed with up to 2 banks of 16 channels each.
- An optional external frequency input can be enabled on the transmitter to allow higher frequency stability than the standard of ± 1.0 ppm (VHF), ± 0.5 ppm (UHF) or ± 0.1 ppm (800 MHz).
- MT-4E receivers are available in two versions supporting either Class A or Class B performance as defined by TIA. Class A receivers offer improved Adjacent Channel Rejection, Spurious Response Rejection and Intermodulation Rejection. Class B receivers are optimized for low power consumption.

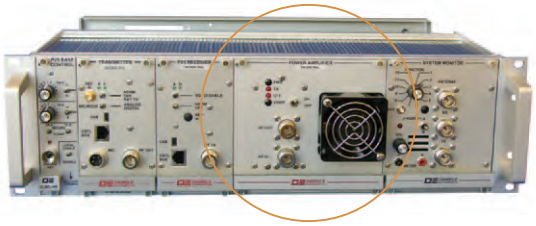
*** Subject to Export Control.**

| Band | Frequency (MHz) | Analog | P25 |
|---|---|---|---|
| Low Band | 29 – 50 | Yes | No |
| VHF AM | 118 – 137 | Yes | No |
| VHF | 136 – 174 | Yes | Yes |
| Military Band UHF | 308 – 406 | Yes | Yes |
| UHF | 406 – 430 | Yes | Yes |
| UHF Amateur Band | 430 – 450 | Yes | Yes |
| T- Band | 450 – 520 | Yes | Yes |
| 700 MHz | 769 – 806 | Yes | Yes |
| 800 MHz | 806 – 869 | Yes | Yes |
| **NEW!** 900 MHz | 896 – 960 | Yes | Yes |

# RF PRODUCTS – AMPLIFIERS AND DUPLEXERS

Daniels offers power amplifiers and duplexers for a variety of frequency bands and power outputs. For the 132-174 MHz and the 406-470 MHz bands, Daniels offers 20-30 Watt power amplifiers that mount directly inside the Daniels 19" subrack. For higher power amplification or for different frequency bands, Daniels offers a variety of amplifiers which are either 19" rack mountable or mounted on the back of the subrack.

There are various choices of duplexers regarding frequency separation and isolation specifications. Duplexers can be integrated into a cabinet configuration along with the Daniels subrack and cabled as a system. All duplexers comply with FCC and IC standards. For more information, visit: http://www.danelec.com/products/rfmodules



## Digital Base Station Control Card (CI-BC-4E-00)


The P25 base control card is used with the P25 base receiver and transmitter in an MT-4 base station and provides audio routing, COR and PTT routing and front panel control. It can drive an external speaker directly and can select up to 32 programmed channels in each radio module. Selection of encrypted or clear transmission is made from the front panel. As well, a pushbutton is mounted to erase all encryption keys in both radio modules.

## Digital Repeater Card (CI-RC-4L-00)


The P25 repeater control module is used with a P25 receiver and transmitter system. The repeater control card allows P25 digital or analog signals to pass transparently from the receivers to the transmitters in repeater, crossband, or linked repeater systems.

The P25 repeater control module provides serial data routing, COR-PTT routing, and receiver priority settings for an MT-4 radio system.

## Universal Interface Card (UIC-4-00)

The Daniels digital Universal Interface Card (UIC) provides an Ethernet connection from the Daniels radio system to other LMR subsystems in a network. The UIC supports both the P25 Digital Fixed Station Interface Standard (DFSI) for end to end digital connectivity from the Base Station to the console, as well as a Daniels open interface based on PCM for non-P25 applications.


The open PCM release supports the following capabilities:

- Channel control (Channel Select lines, Bank A/B Select lines)
- Squelch control (Squelch Override)
- Receive / transmit baseband PCM audio via UDP protocol over Ethernet
- Read NACs in the P25 transmissions
- Ability to interface with Avtec, Catalyst, Microvoice, Pantel and Twisted Pair

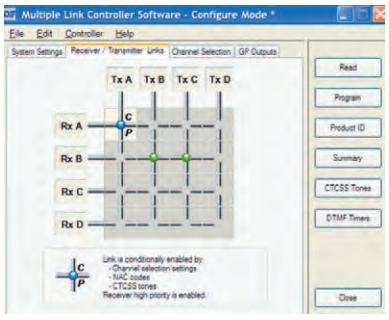
The P25 FSI release provides these additional capabilities:

- Support for IMBE vocoded audio (optionally encrypted) from the console via RTP protocol
- Comply with the TIA FSI standard TIA-102.BAHA
- Transmits the P25 Unit ID and Emergency ID
- Interfaces to Avtec, Bosch / Telex, Moducom and Zetron consoles

## Multiple Link Controller (CI-RC-4M-00)

Multiple Link Controller

The Multiple Link Controller enables repeater steering across multiple hops by providing control of multiple radio links for MT-4E P25 Digital radios. In this way, it acts as a "radio router" since it is routing the radio signals. The linkages are defined via an interconnection matrix in the Multiple Link Controller Programming Software. The CI-RC-4M Multiple Link Controller is capable of controlling up to four P25 RX/TX radio pairs. This unit can control each transceiver pair in a number of different configurations from standard drops and links to CTCSS, NAC and DTMF controlled drops and links. Seven CTCSS tones and seven NAC codes can be programmed into each path of the controller allowing the user to steer the transceivers by turning links on and off. Transmitter channels can also be changed according to a global channel selection table, using NACs (Channels 1-16) or CTCSS tones (Channels 1-15.)




Multiple Link Controller Software

## Audio Control Card (AC-3E)


The AC-3E Audio Control Card includes four potentiometers on the front panel for adjusting internal audio levels. Optional CTCSS and frequency select rotary switches can also be mounted on the front panel of the audio control cards giving easy access to 10 pre-programmed CTCSS tones and 16 pre-programmed receiver and transmitter operating frequencies. Two switches are mounted on the front of the audio control card that can be configured to control CTCSS on / off or repeat disable.

The AC-3E Audio Control Card has cross-linking audio, audio switching, custom tone signaling and adjustable hang-timers. It also includes a Type 2 E&M interface, providing 600 Ω RX and TX audio paths with buffered / independent level controls, opto-coupler isolated COR and opto-coupler switched PTT controls. This card allows a remote to seize control of the radio system.

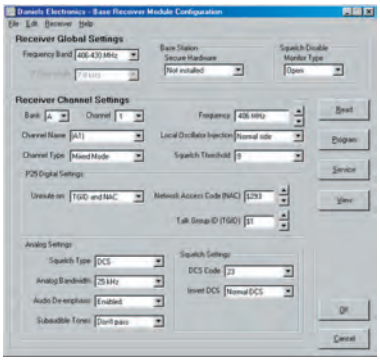
## Paging Interface Card (CI-PM-3)


The CI-PM-3 Paging Interface Card supports encoder interfaces for analog and digital paging formats. Both analog and digital paging formats are supported and the card can transmit POCSAG, Flex™, Golay, and other 2-level modulation schemes at data transfer rates of 512, 1200, and 2400 Baud. The CI-PM-3 can also be configured as a data repeater, whereby two-level paging data is recovered, reshaped and retransmitted to an additional repeater / paging transmitter. It supports 4-level modulation formats in non-repeater mode only, at data transfer rates up to 6400 baud. Each of the four modulation deviation levels can be independently set.

## Redundant Switch (CI-RSWITCH-0)

The Redundant Switch is a 1U high, 19” rack mountable unit that facilitates automatic or remote user-controlled switching from a main to a backup radio system.
The switching can be controlled manually via wireline or a received DTMF tone. Alternatively, the Redundant Switch can be set up for automatic switchover via the use of various alarm modules such as the Daniels Power Monitors. The Redundant Switch also has two high quality internal RF antenna relays that can be used when the user does not require a complete redundant antenna system. This relay option can combine the Main A-side radio transmitter and receiver pair into one “Antenna A” output. The B-side Main and Backup can also be combined into one “Antenna B” output.

## Radio Service Software




The radio service software (RSS) is used to configure, service, and test Daniels digital transmitters and receivers.

Features include:

- GUI Windows Interface
- Multiple channel programming
- Calibration Mode plus a variety of test patterns
- Modes of operation, e.g. NACs, Talkgroups
- CTCSS, DCS tone selection in analog mode
- Time-out timer controls

## Polyethylene (ET-1)

The Daniels ET-1 case supports a standard 19" Daniels subrack and has an internal mounting height of 6, 9, 12 or 15U. The case itself is weatherproof and constructed from high-density polyethylene with reinforced walls. The case has recessed handles, smooth latches, anodized valences and a pressure relief valve. The rack is shock mounted and the lid gasket is watertight. Racks can be mounted inside the front and back of the case. Daniels subracks can be mounted back to back on both front and back racks. Optional duplexers can also be mounted inside the case. The 6U ET-1 case weighs approximately 20 lb. (9.1 Kg) empty.

## Aluminum (ET-3)

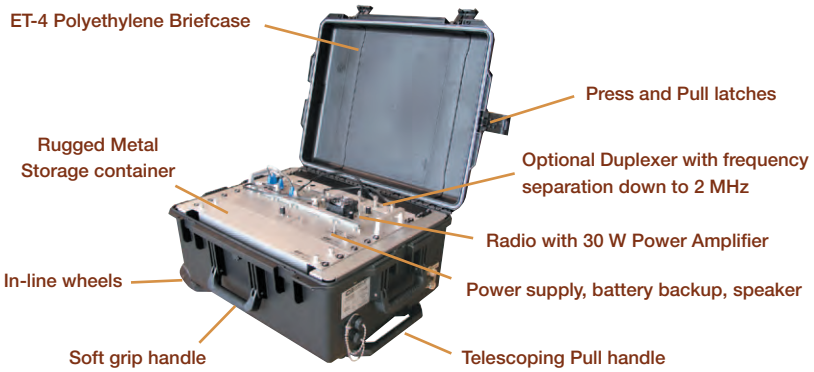
The Daniels ET-3 case is a rugged, pressurized, waterproof, aluminum 19" transportable case accommodating one subrack. It features spring-retracted handles, smooth lockable latches, a pressure-relief valve, desiccant and is available in either orange or black. Any standard 19" Daniels Electronics subrack can be mounted inside. In addition to the space for a 3U high subrack, the transportable case has 2U of free space for optional modules. The lid has a steel plate to magnetically mount an antenna. There are two optional versions of the lid to accommodate either an Iridium or Inmarsat satellite telephone interface.


Daniels Electronics has developed a Transportable Repeater Planning Guide to assist customers in understanding the applications for transportable repeaters, the range of options available in the industry and the selection criteria associated with each aspect of a transportable repeater system: radio, enclosure, power, antenna. The guide is available on the Daniels website in the library.

www.danelec.com/pdfs/MKT%20117%20Transportable%20Repeater%20Guide%20V3.0.pdf

## Polyethylene Briefcase (ET-4)

The Daniels Briefcase Repeater is a compact case that accommodates standard Daniels radio modules as well as an optional battery backup and duplexer. An interface connection on the side of the case provides access to the RF, DC and AC inputs. The case is rugged, waterproof, and easily deployed by one person. The case itself is constructed from high-density polyethylene with reinforced walls. It has fold-down handles and anodized valences.




## Briefcase Package (ET-4-A09-01) includes:

### Polyethylene Briefcase (ET-4-A09-00)

Rugged case with 9 RU of space, wheels, telescoping handle, and an interface connection on the side to provide access to RF, DC and AC inputs.

### Accessory Storage Box (ET-4-A-ACC-BOX)

A 2 RU optional accessory case is available that provides storage space for cables and any tools (microphones, screwdrivers, procedure manual, etc) you may desire to include in your rapid response package.

### Power Module (PSA-12-09-RB-20)

- 6W Speaker
- Integral AC-DC power converter and battery charger. The power converter accepts 90-260 VAC and provides a trickle charge for the integral battery cell.
- AGM battery (PSB-P-12V10A502) providing 10.5 AH backup at a 10% duty cycle that equates to approximately 12 hours of operation. An external battery pack can also be connected.

## ET-5 Tactical Repeater

NEW!

The Daniels ET-5 Tactical Repeater is a smaller version of the Daniels ET-4 Briefcase Repeater. Both units are shown below true to scale for comparison.

The ET-5 provides a lightweight 20 lb (9 Kg) compact package 14” x 11” x 6 (36 x 29 x 16 cm) ideally suited for undercover and surveillance applications, as well as shipboard vessel inspections where repeating of encrypted P25 communications in a compact enclosure is vital to the operation.

Available for any Public Safety frequency band (VHF, UHF, 700 or 800 MHz and deployable in minutes the ET-5 Tactical Repeater can provide up to 19 hours of operation with D-Cell alkaline batteries.

ET-4 ET-5

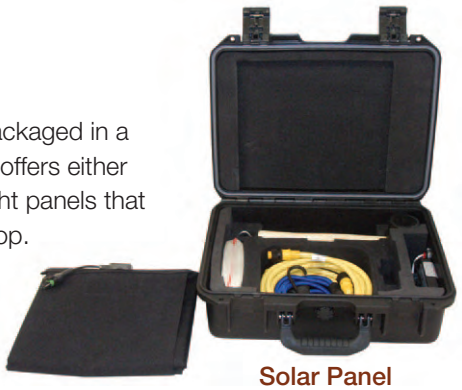
## ET-6 30 Watt Stealth Repeater

The Daniels ET-6 30 Watt Stealth Repeater is the newest addition to the Daniels Family of transportable cases. Its size is between the ET-4 and ET-5. Like its two brothers it supports standard Daniels radio modules (VHF, UHF) along with a 30W PA and duplexer. The ET-6 can be configured for either repeater or base station operation.

A key difference of the ET-6 compared with the ET-4 and ET-5 is there are optionally no external connectors or markings making this a truly stealthy case for police surveillance operations. All connections (RF, DC, AC) are optionally located inside the case on an easy to access connection panel. The case is rugged, waterproof, and easily deployed by one person with a fully loaded weight of less then 40 lbs. The case itself is constructed from high-density polyethylene with reinforced walls. It has fold-down handles and anodized valences.


## Solar Panel Package

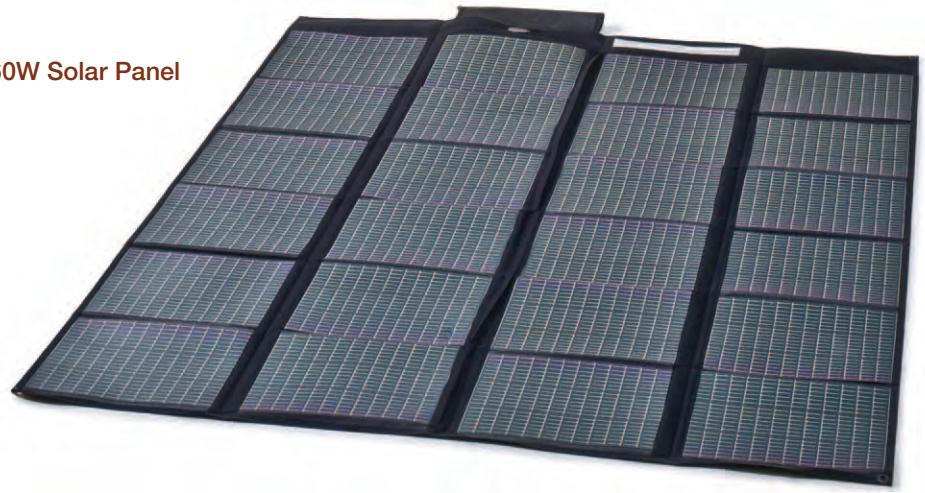
Daniels has introduced a new version of its popular solar panel package. Packaged in a compact polyethylene case the solar panel is lightweight, easy to carry and offers either 60 or 120 Watts of power. The Solar panels are rugged, compact, lightweight panels that unfold to a size of 6' x 4' yet fold up into a package that is the size of a laptop.



Solar Panel carrying case (houses charge controller)

35 Ah or 100 Ah Battery Case

60W Solar Panel



## Accessories available

### Tactical Antenna

The Daniels VHF Tactical Antenna is a broadband 1/2 wave antenna which provides 2.0 dB of gain. No ground plane is needed. It is corrosion and weather resistant. O-ring seals keep moisture out of the antenna.

Tactical Antenna

### Battery Backup Systems

An additional 35 or 100 AH external battery is available for all transportable repeaters to provide extended operation on batteries. External batteries are housed in separate cases as shown to the right. An interconnect cable (provided) is then used to interface to the transportable repeaters.

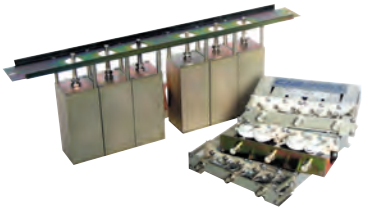
Battery Backup

### Anti-Vibration Module Fastener System

The Anti-Vibration kit includes threaded inserts for each module in the Daniels subrack to replace the standard spring loaded fasteners. This provides protection against modules becoming unscrewed from the subrack due to vibration.

### Mobile Duplexers

A variety of Mobile Duplexers are available. VHF duplexers may support a frequency separation between TX and RX as close as 2 MHz.



Duplexers

### Deployable Antenna Mast System

Daniels sells a rugged collapsible antenna mast tripod which is ideal for rapid deployment. A variety of antennas may be mounted. The mast comes in a duffle bag with wheels and includes all necessary tools, pegs and guy wires. Various heights are available from 2 to 15 metres.

Collapsible Antenna Mast

Weatherproof Repeater
With Satellite interface

30 Watt Repeater

## Technical Support (Service Department)

The Daniels Technical Support team prides itself on providing timely assistance to our customers. If you should encounter any problems, Daniels' Service Department will be pleased to help to quickly resolve them. We can be reached at **(800) 664-4066 between 8:00 AM and 4:30 PM PST Monday to Friday.**

## Extended Warranty and Maintenance Contracts

The Daniels Standard Warranty is two years parts and labor. An extended warranty (up to 5 years) is also available. Daniels Maintenance Contracts can provide four services (in addition to the standard 2 year warranty) to support your installed base of Daniels radio systems. These services include:

1. Failed unit repair
2. Performance testing of radios (preventative maintenance)
3. Upgrades
4. Retuning

## Integration

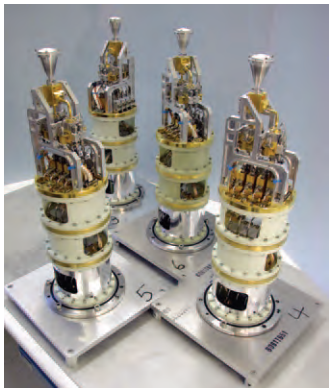
Daniels' Integration Section is responsible for qualifying and integrating third party products with our radio systems, such as power amplifiers, duplexers, controllers, power supplies, telemetry devices, telephone interconnect modules, tone remotes and adapters. The Integration Section can also design custom interfaces, wiring and cabling if required. All custom configurations are fully documented providing a complete record of the system equipment and its custom interconnection.

## Training

Daniels Electronics Ltd. offers specialized training courses on our entire product line. Our training courses range from standard two or three day tuning and maintenance courses to 1-day technology overviews. We are also happy to customize any of our courses to meet the needs of your company or agency. Any class size can easily be accommodated at the request of the customer. The courses can be held at the Daniels factory in Victoria, BC Canada or at your location. Courses include theory of operation, troubleshooting techniques, complete re-alignment programming and tuning procedures.

# CUSTOM ENGINEERING AND MANUFACTURING SERVICES

As an example, Daniels is providing custom engineering and manufacturing services to the Canadian National Research Council for the Atacama Radio Telescope. This 116 GHz receiver operates at -269°C.



Daniels Electronics works with key partners to provide custom engineering and manufacturing for specialized radio systems and assemblies.

Daniels has added a clean room to its facility to strengthen the company's ability to perform custom engineering and manufacturing for key customers. The clean room enables Daniels to offer services that meet requirements for ISO Class 7 clean room standards and MIL-STD-1686 static control standards.

Daniels is also able to provide:

1. Custom RF engineering for full product life cycle management through design, manufacturing and technical service.
2. Qualification to the ISO 9001:2008 quality standard, as well as all relevant approvals (FCC, IC, TIA, ACMA).
3. Project Management for the complete project from definition, design, prototyping and volume manufacturing. Life cycle support is also available.

Paging Transmitters

Briefcase Repeaters

P25 Trunked System

**Sales Support**

Daniels Electronics provides quotes and sells directly to self servicing end users, dealers and systems integrators. Other customers should contact their local Daniels dealer.

**Hours of operation: 8:00 am – 4:30 pm Pacific Standard Time**


**Daniels Electronics Ltd.**

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Fax: 1.250.382.6139 (international)
Web: www.danelec.com
Email: sales@danelec.com


**Government Contracts:**

Daniels Products are available for purchase on the following government contracts:

GSA – GS-35F-0420K
GSA BPA – GSC-TFMG-BPA-09-002
WSCA – 02702 WSCA
HGAC – RA01-08
DIR – DIR-SDD-119
Various state contracts

www.danelec.com

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