Radius PDR

Long Range Wireless Modems

Automation solutions for power distributors

- Wide Area Coverage
- Collision Avoidance Technology
- Forward Error Correction
- 128-Bit Encryption - Optional
- Remote Diagnostics and Programming
- Remote Tx Power Change
- Exceptional Receiver Sensitivity
- Remote Frequency Change
- Message Routing
- Real-Time Radio System Monitoring
- Ethernet Port (TCP/IP, UDP/IP, SNMP)

NETCONTROL
Energy Network Automation

Radius PDR

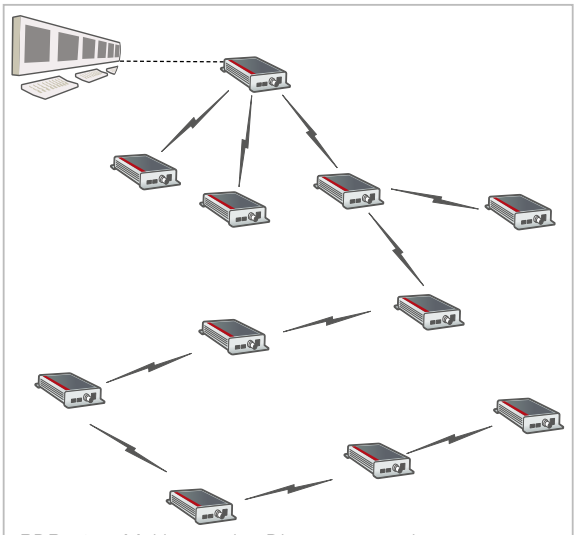
Advanced Digital Radio fo

The Radius PDR is an advanced VHF/UHF digital radio designed for wide area remote monitoring and control applications, encompassing point to multi-point communication with peer-to-peer compatibility. The PDR is available in either a transparent or a protocol decoding version with standard or high power options available.

With increasing demands on companies to have greater, more reliable and secure control of their remote equipment, simple point-to-point data communications links are no longer meeting the needs of the user. To meet these increased demands Radius has developed a digital data radio with exceptional signal recovery in order to transmit data over large distances. But since that alone is not enough, each digital data radio can retransmit a message to any other data radio in order to greatly increase area coverage.

PDR 121 - Protocol Routing Mode

The PDR 121 incorporates many of the standard communications protocols, but because there are so many available there is also an option to configure the radio for other open or proprietary protocols.

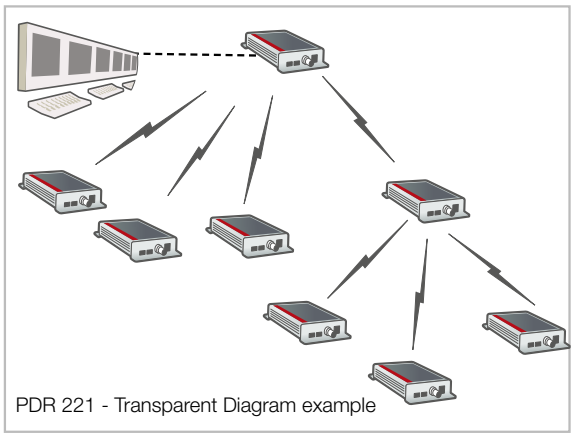


PDR 121 - Multi-repeating Diagram example

PDR 121 has a unique repeating technology which allows up to 6 hops, i.e. 7 radios in any 1 chain, giving the ability of real wide area coverage to overcome the problems of difficult terrain.

PDR 221 - Transparent Mode

The PDR 221 has all of the same features as the PDR 121, except for only 1 repeater per system. But because it is transparent it has the advantage of very low latency (no buffer) so it provides even faster data turnaround and is ideal for any system requiring point-to-multi-point, peer-to-peer or even an all-informed network.



PDR 221 - Transparent Diagram example

A PDR 221 network can have up to 254 slaves and 1 master and you decide via the simple configuration menus which unit does which job.

Communication Range

The distance between any two devices is based on the data rate, the frequency utilised, the type of antennas employed and the reliability required. As an example we have working systems in the VHF spectrum communicating up to 50km and in the UHF spectrum up to 30km. Given that the PDR 121 unit can forward data messages to it's neighbours it is conceivable to have an area coverage of several 1,000km^2. Since the PDR has outstanding receiver sensitivity it is able to communicate over distances not achievable by other wireless devices.

Security & Reliability

Each radio has an option in the menu to invoke 128bit encryption over-the-air and all PDR radios also carry unique radio identities so that you can be confident that no-one can listen to or be interfered with by your wireless data radio system. The PDR also features Forward Error Correction with interleaving in order to increase immunity to interference, often recovering data packets with 30% or less corruption.

Data Interface

The PDR supports dual RS232 ports and an Ethernet port. This allows a variety of interfaces to the central system and the slave devices as well as the possibility to mix host systems. There is a possibility to use the PDR 121 also as a bridge to an RS232 device from a central IP based host.

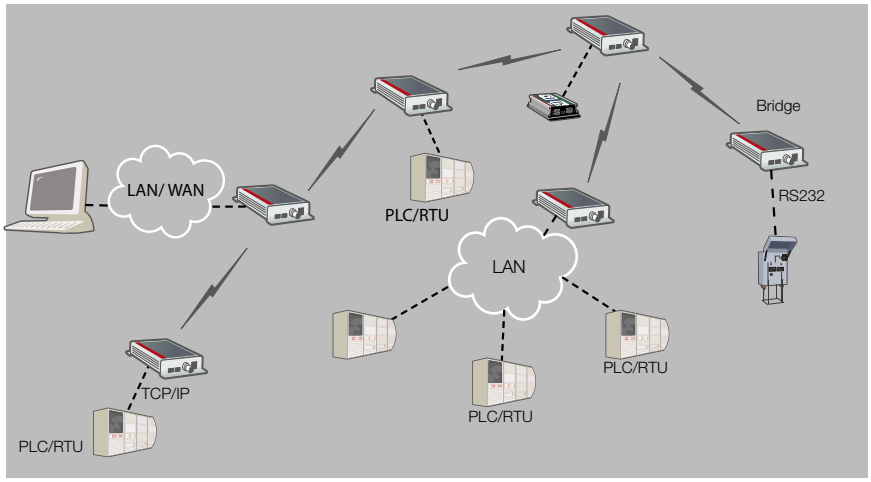
NETC

Radiu

or Wide Area Communication

Diagnostics & Over Air Programming

Each PDR comes with a comprehensive menu system that allows the user to very easily perform measurements of their wireless network. This includes data on the signal strength and power output of each device in the network and a Bit Error Rate between any given units.



Furthermore remote devices can be configured over the air from the master. Parameters such as power levels and frequency can be changed without ever having to visit the remote device.

Flexibility

The tuning range of the radio is 40MHz, allowing users to easily migrate frequency within band and to employ duplex frequencies with a very wide separation. Power output can be set from a few milliwatts to 5W via the user interface. Signal strength can also be adjusted to suit noisy environments. Lastly the PDR is designed so that you do not need a costly central unit, since any device can be set up to act as master or slave.

Data Rates & Collision Avoidance

On air data rates up to 19.2kbps, before compression. After data compression the effective data rate can be much higher. The PDR also supports a configurable collision avoidance technique to optimise channel usage and minimise data turnaround.

Set-up

Configuration is via standard terminal software from built-in menus, all features are available in all radios and all radios are identical so there is no need to buy separate base stations, outstations and repeaters. You decide what features are enabled and what job you want the PDR 121 to do, and at the same time reduce your service spares holdings.

PDM

The PDM has been designed with both the PDR 121 v2 and PDR 221 v2 in mind. It is based on the same hardware and however it is oriented into a 19" rack for easy installation. This means it can be utilized as a slave, repeater or it's main use as a master.

ONTROL
Energy Network Automation
us PDR

Radius PDR - Advanced digital radio for wide area communication

Radio Transceiver

Data Rates: 4800/9600 @ 12.5 KHz
9600/19200 @ 25 KHz

Frequency Range: UHF 470 to 510 MHz
UHF 435 to 470 Mhz
UHF 395 to 430 MHz
UHF 360 TO 390 Mhz
UHF 330 to 350 MHz
VHF 140 to 174 MHz
VHF 66 to 88 MHz
Other bands available on request

Operation Modes: Half duplex, Simplex

Modulation: 4 LFSK

Forward Error Correction: Yes, interleaving functionality

Collision Avoidance: Yes, configurable

Repeating: PDR 121 - Multi-repeating, up to 6 repeaters on one link
PDR 221 - 1 repeater per system

No. of Remote Radios/Master: PDR 121 - 99
PDR 221 - 255

Encryption: 128-bit key XTEA cypher 32 character encryption key (PDR 121 only)

Radio Transmitter

Tx Power: 10 mW to 5.0 W adjustable

Radio Receiver

Sensitivity: -110 to -118 dBm @ BER $<10^{-6}$ Depending on data rate, channel spacing and frequency

CCRR: (Co-Channel Rejection Ratio) Better than -8 dB

Remote Diagnostics

PDR 121 & 221: Software package Radius RND 100 gives RSSI, temperature etc.

Environmental

Temperature Operating Range: -25°C to +75°C (-13°F to +167°F)

Physical Dimensions

Size PDR 121 & PDR 221: H40 x W193 x D115 mm
H1.6 x W7.6 x D4.5 inch

Weight: 800 g (1.76 lb)

Housing Material: Aluminium

Size PDM: H43.6 (1U) x W488 x D255 mm
H1.7 x W19.2 x D10 inch

Housing Material: Aluminium, Alu Zinc

Size HSC: H43.6 (1U) x W488 x D255 mm
H1.7 x W19.2 x D10 inch

Connectors

Main Power Supply: 2 pole, female

Battery Supply: 2 pole, female

Electric Current Requirement: 2000 mA at 2W Tx
2500 mA at 5W Tx

Antenna: BNC, female

Serial Ports: 2 x RS232 DB9 female, wired as DCE (modem)
Data Rates 600 to 57600 bps
Flow Control RTS/CTS, DCD selectable

Ethernet Port: TCP/IP, UDP/IP, SNMP

Configuration: via RS232 port

Indications (LED)

LED Indicators: Main PWR, Radio Rx, Radio Tx, RS232 Rx
RS232 Tx, Configuration Mode, Carrier Detect, System Detect

Protocols

PDR 121: DNP3, IEC870, RP570, COMLI, Modbus, Cooper/PG&E 2179, Telegyr 8979, DCSI, Hunt, Exoline, Cactus, PRIP, Aquacom.
Other protocols are available upon request.

PDR 221: Transparent. Manage nearly all current data protocols.

Configuration Interface

Configuration Software: Standard Windows Terminal Software

Data Rate: Selectable 1200/9600/57600 bps

NETCONTROL
Energy Network Automation

www.netcontrol.com

M00107-BR-EN-1 © Netcontrol Group 2012