NETCON PDR 300

Next generation multipurpose radio modem

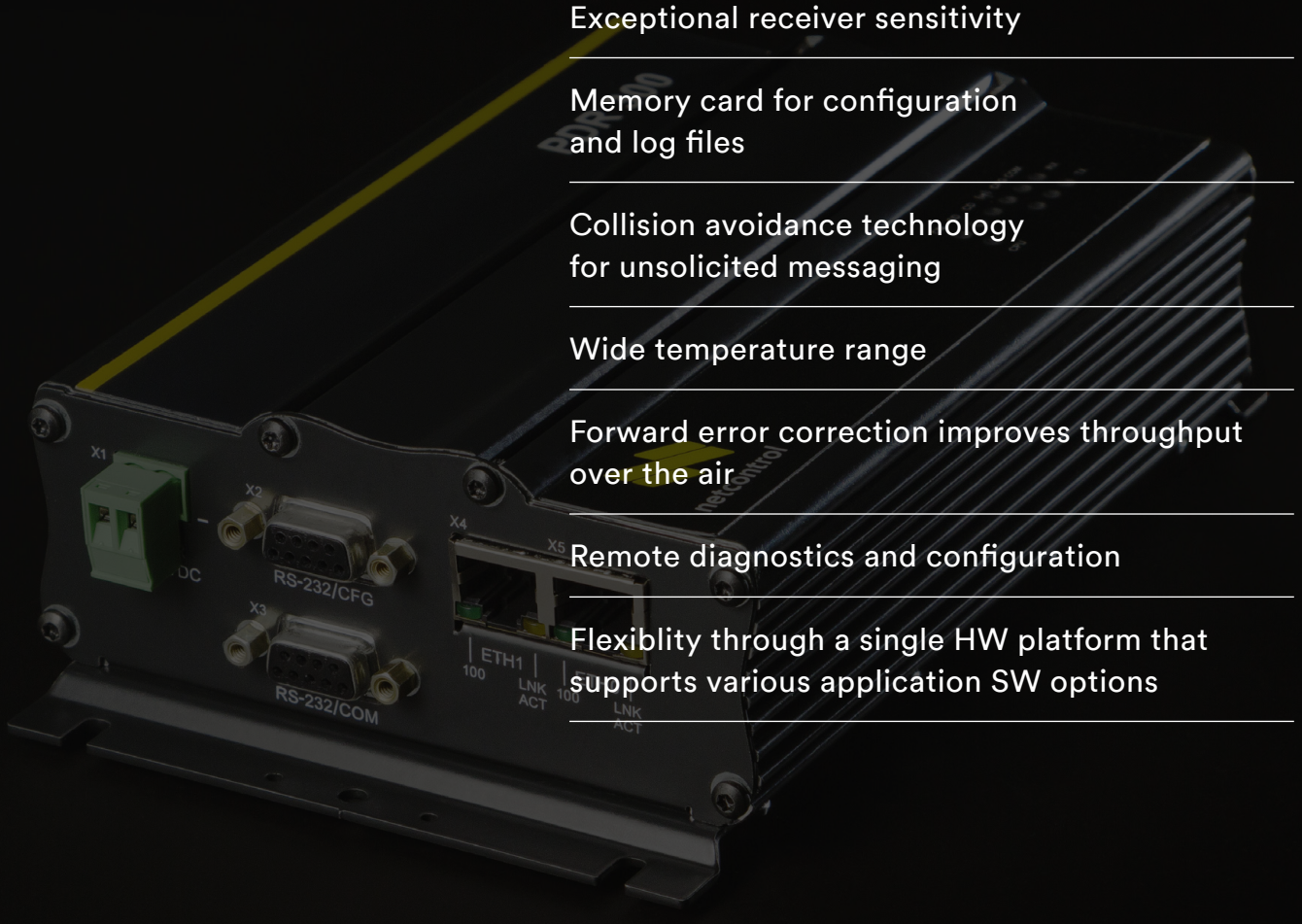
Energy automation solutions for power distributors

NETCON PDR 300

Next generation multipurpose radio modem

FEATURES

- Wide area coverage with multi-hop message routing
- Dual RS-232 and Ethernet ports
- 128-bit encryption
- Exceptional receiver sensitivity
- Memory card for configuration and log files
- Collision avoidance technology for unsolicited messaging
- Wide temperature range
- Forward error correction improves throughput over the air
- Remote diagnostics and configuration
- Flexiblity through a single HW platform that supports various application SW options



Advanced digital radio for wide area communication

The Netcon PDR 300 is Netcontrol's next generation VHF/UHF digital radio for remote monitoring and control applications over large areas. The PDR 300 is capable of point-to-multipoint and peer-to-peer communication.

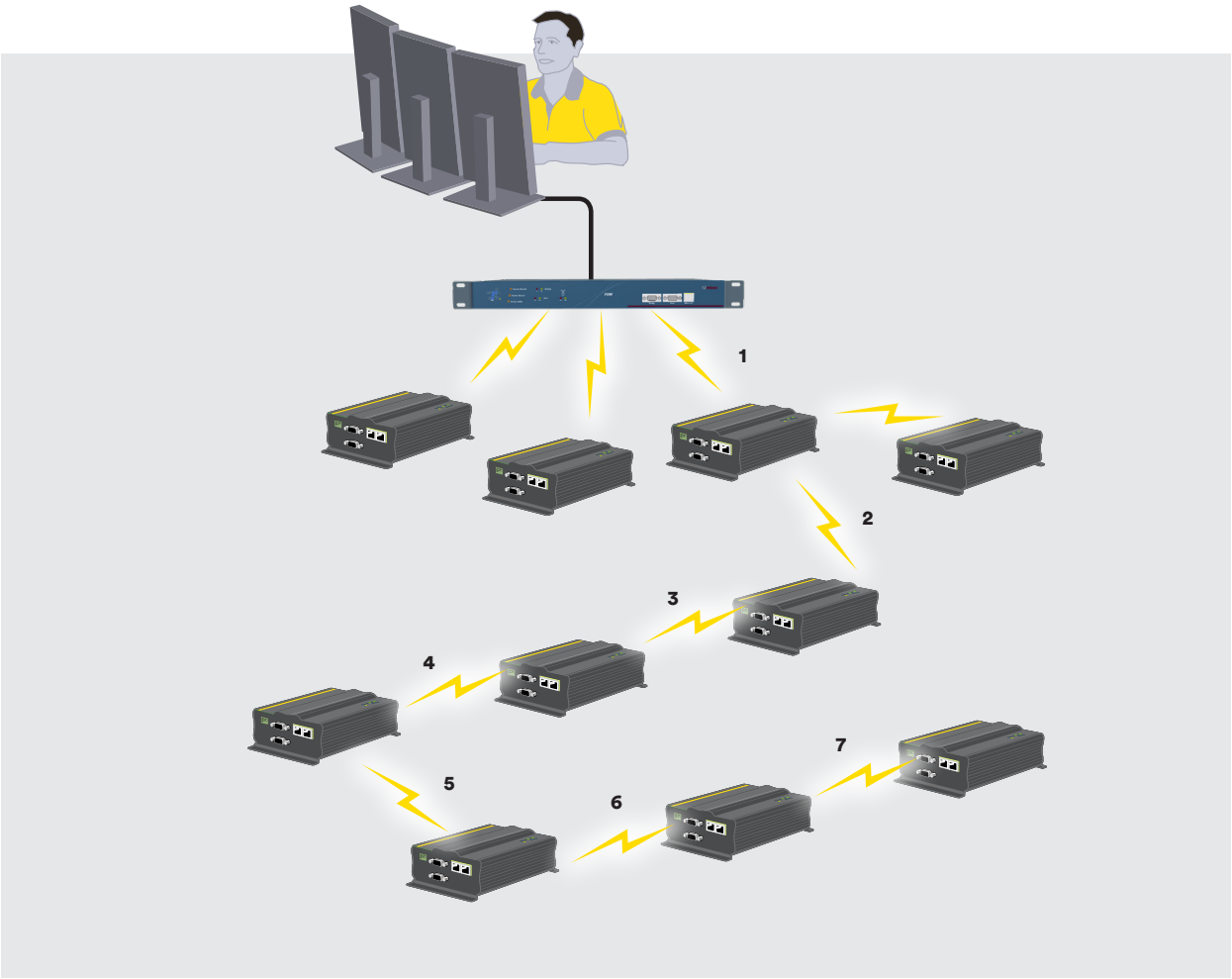
RELIABLE LONG-DISTANCE DATA RADIO

With demands for greater, more reliable and more secure control of remote automation equipment, simple point-to-point data communication links are no longer meeting users' needs. To face up to these new demands Netcontrol offers a robust digital data radio that can transmit data reliably over long distances.

Protocol routing expands area coverage

The PDR 300 is capable of routing messages to remote locations on the basis of protocol addresses. It supports a wide variety of standard SCADA protocols, and can also route proprietary protocols.

The PDR 300 has a unique repeating technology which allows up to 7 hops, i.e. 8 radios in any 1 chain, giving the real wide-area coverage that can overcome the problems posed by difficult terrain.



The feasible distance between any two radios depends on:

- the data rate
- the frequency used
- the type of antennas
- the reliability required.

There are working PDR systems in the VHF spectrum communicating over distances of up to 50 km and in the UHF spectrum reaching up to 30 km.

Thanks to its outstanding receiver sensitivity and the repeating technology already mentioned, the PDR 300 can communicate over distances not achievable by other wireless devices.

Security & reliability

The radio has optional over-the-air 128-bit encryption. In addition, all PDR radios carry unique radio IDs, which means that the wireless data radio system cannot be listened to or interfered with. The PDR 300 also features forward error correction with bit interleaving to bolster its immunity to interference. This enables it to recover data packets with up to 30% corruption.

Transceiver flexibility

The radio has a tuning range of up to 70 MHz. This gives users some leeway in the choice of the exact frequency to be employed and allows a very wide separation of duplex (separate Tx and Rx)

frequencies. The power output can be set anywhere between one milliwatt and 5 W. The sensitivity level can be adjusted to suit noisy environments, and the channel spacing can be configured to either 12.5 or 25 kHz.

Data rates & collision avoidance

The PDR 300 has an over-the-air uncompressed data rate of up to 19.2 kbps. With compression, the effective data rate can be much higher.

The PDR 300 also features a configurable collision avoidance technique, which optimises channel usage and minimises data turnaround times.

Versatile data interfaces

The PDR 300 has dual RS-232 ports and Ethernet ports. This gives flexibility in the connections to central systems and to slave devices.

Flexible set-up

Configuration is from standard terminal software over either a serial connection or Ethernet/SSH. The configuration interface has clear built-in menus.

The radios are all identical: there is no need to buy separate base stations, outstations and repeaters. Each PDR 300 can be configured to fit any application. This also reduces the need to store service spares.

Remote diagnostics & over air programming

The PDR 300 has a comprehensive menu system that enables the user to easily perform measurements on their wireless network. The measurements include:

- the signal strength
- the power output of each radio
- the bit error rate between any two radios.

Furthermore, the remote devices can be configured over the air from the master.

Network management

PDR networks can be centrally managed through Netcontrol's RND 100 software. This monitors the network performance and uses a graphical web interface to give the user real-time information about the radio network, along with the display of alarms and historical data.

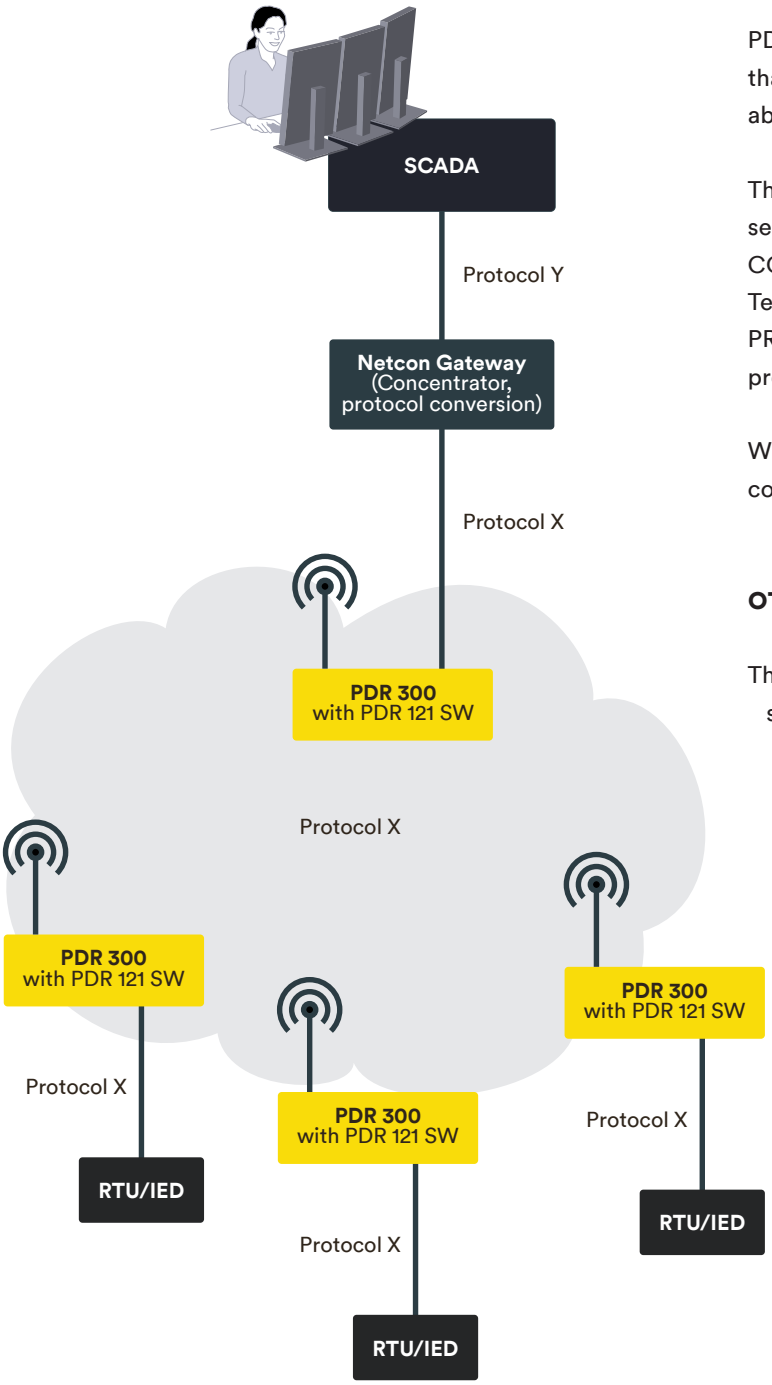
Alternatively the above-mentioned radio network data collected by the master radio can be transferred to the SCADA via Netcon Gateway devices.

Device server

The PDR 300 can also act as a UDP/TCP serial device server. It wraps serial traffic from the radio network into UDP or TCP packets for an IP-based host using the Ethernet, and similarly handles the unwrapping of traffic in the other direction.

Flexible software options

The PDR 300 comes with three different software options, designed to optimise its functionality for different needs. As the requirements change, an existing radio can easily be reconfigured to use a different SW than before.



PDR 121 SW: PROTOCOL ROUTING RADIO

The PDR 121 software makes the PDR 300 a transparent serial data radio. It routes messages in a given protocol according to protocol-specific addresses embedded in the messages.

PDR 121 offers extra-wide geographical coverage thanks to the repeating technology mentioned above, supporting up to 6 repeaters.

The software supports a wide variety of standard serial protocols (DNP3, IEC 60870-5-101, RP570, COMLI, Modbus, Cooper/PG&E 2179, Telegyr 8979, DCSI, Hunt, Exoline, Cactus, PRIP, Aquacom). It can route proprietary protocols as well.

With this software the PDR 300 is backward-compatible with the PDR 121 v2 and PDR 121 radios.

OTHER SW POSSIBILITIES

The PDR 300 can also be delivered with software supporting Netcontrol's System NM. This software is described in the brochure *PDR 300 for System NM*.

Technical specifications

Radio transceiver

Data rates and channel spacing	4800/9600 bps @ 12.5 kHz; 19200 bps @ 25 kHz
Frequency range options	UHF 400...470 MHz VHF 135...175 MHz
Operation modes	Half duplex, simplex
Modulation	4FSK
Forward error correction	Yes, with interleaving
Collision avoidance	Yes, configurable
Repeating	Multi-repeating, up to 6 repeaters (8 radios) per path
Number of remote radios/master	120
Supported protocols	See text
Encryption	128-bit XTEA
Tx power	Adjustable, 0.001...5.0 W
Receiver sensitivity	–100...–116 dBm @ BER < 10^{-6} depending on data rate, channel spacing and frequency
Remote diagnostics	RND 100 software gives RSSI, Tx power, temperature, main supply voltage
Compliance	Certified according to European Radio Equipment Directive (RED, 2014/53/EU)

Temperature requirements

Compliance with radio standards	–20...+55°C
Functional	–40...+75°C

Physical properties

Size	H51 × W192 × D114 mm
Weight	900 g

Power supply requirements

Voltage	Nominal 12...24 VDC (10.8...30.0 VDC)
Maximum current	1.4 A at 5 W Tx and 24 V

Connections and indicators

Main power supply	2-pole, female, 5.08 mm pitch; isolated from chassis
Antenna	BNC, female
Serial ports	2 × RS-232 DB9 female, both wired as DCE (modem), isolated from chassis
Serial port data rate	600...115200 bps
Ethernet ports	2 × 10/100Base-T
Ethernet port protocols	TCP/IP, UDP/IP
Configuration	Menu based; from standard Windows terminal software via RS-232 or Ethernet (SSH) connection
LED Indicators	CPU, Configuration mode, System Detect, Carrier Detect, Radio Tx, Radio Rx, Configuration Tx, Configuration Rx, COM Tx, COM Rx

Advanced digital radio for wide area communication

NETCON PDR 300 IN BRIEF

- Wide area coverage with multi-hop message routing
- Dual RS-232 and Ethernet ports
- 128-bit encryption
- Exceptional receiver sensitivity
- Memory card for configuration and log files
- Collision avoidance technology for unsolicited messaging
- Wide temperature range
- Forward error correction improves throughput over the air
- Remote diagnostics and configuration
- Single HW platform supports various application SW options