

PDL Base

Radio Modem User's Guide

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Contents

Contents.....	ii
Getting Acquainted.....	1
Introduction	1
Main Components	2
Compliance	6
Electrical Considerations	8
Power Supply	8
Data Interface	8
Appendix A - Cables and Connectors	9
Data/Power Connector	9
Appendix B - Technical Specifications.....	10
General.....	10
Radio Transceiver	10
Modem.....	11
Environmental	11

Getting Acquainted

Introduction

Radio modems provide wireless data communication between remote systems in situations where wireline communication is difficult or impossible. For field operations such as remote monitoring and control, DGPS, and data telemetry, the radio modem provides the ideal link between remote computers, instruments and other RS-232 devices.

The PDL Base is a high-speed, radio modem designed for field, mobile or office operation. At the heart of the PDL is a high quality, multi-channel telemetry radio engineered specifically for data communications. Using a simple 3-wire RS-232 interface, the PDL can easily be connected to most computers and instruments to provide an efficient and reliable data link.

To meet the needs of a variety of applications, the PDL can be configured with an IBM-PC compatible computer. Operating parameters such as data transmission rate, mode, and others can be configured quickly without having to modify the modem hardware.

Pacific Crest Corporation stands behind its products by providing comprehensive customer support with quick and efficient service. We understand that your success in using our products is key. For this reason, our toll-free number is available for sales and service questions (U.S. and Canada). Additional customer service options are available to assure that your radio modem products are properly maintained, and to assure minimum downtime should a problem occur.

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Main Components

This section will acquaint you with the physical attributes of the PDL Base radio modem. Figures 1 and 2 show the standard PDL Base unit.

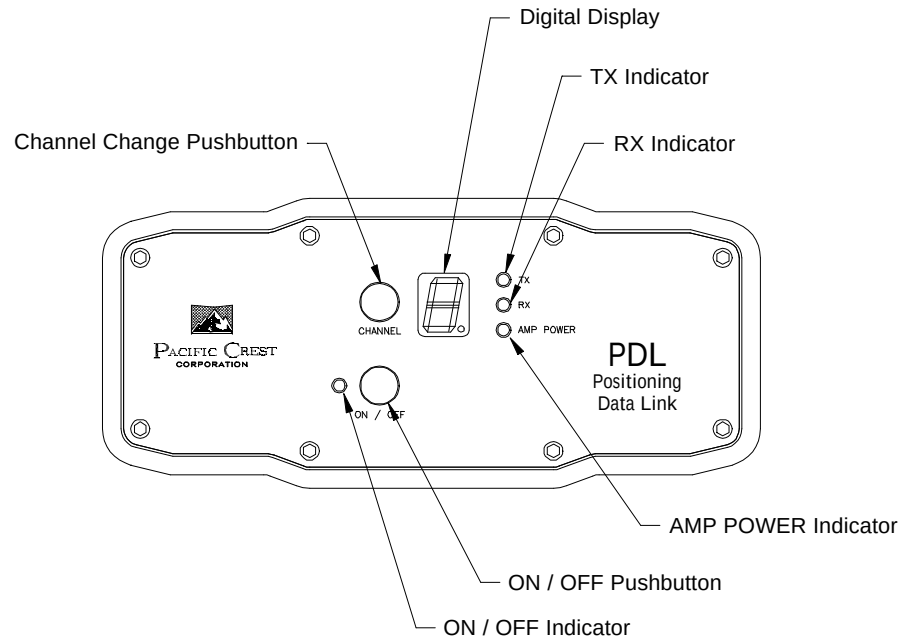


Figure 1 – PDL Base: Front View

PDL Base Front Panel Features

ON / OFF Pushbutton – An environmentally sealed pushbutton switch used for turning the unit on and off.

ON / OFF Indicator – An LED indicator used to show the unit is powered up.

Channel Change Pushbutton – An environmentally sealed pushbutton switch used to select among the preprogrammed channels.

Digital Display – A seven-segment LED used to indicate channel status and other diagnostic information.

TX Indicator – An LED indicator which will light when the unit is transmitting data.

RX Indicator – An LED indicator which will light when the unit is receiving data.

AMP POWER Indicator – An LED indicator which shows the selected RF output level. The desired level is selected with the Amp Power Selector Switch located on the back panel. The LED is off when the "LO" (2 Watt) position is selected, and on when the "HI" (35 Watt) position is selected.

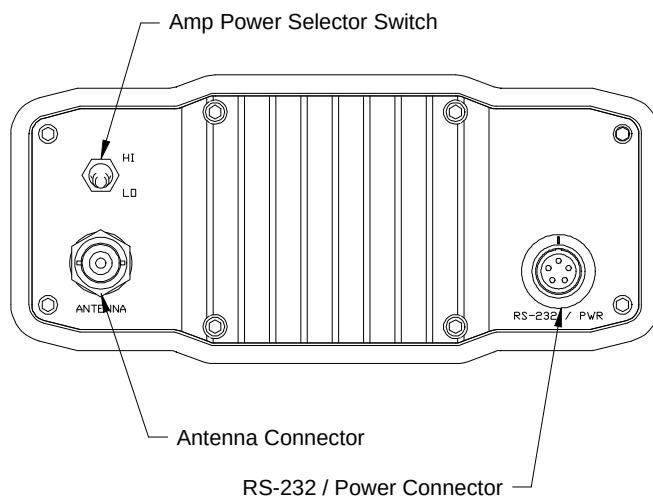


Figure 2 – PDL Base: Back View

PDL Base Back Panel Features

Amp Power Selector Switch – An environmentally sealed toggle switch used for selecting the desired RF output level. The output power is 2 Watts when the switch is in the “LO” position, and 35 Watts when in the “HI” position.

Antenna Connector – An environmentally sealed panel mount 50 Ohm female BNC connector for external antenna connection.

RS-232 / Power Connector – An environmentally sealed panel mount LEMO #1 shell receptacle which contains contacts for a three-wire RS-232 serial bus and input power connections. The following signals are available on the connector:

RS-232 / Power Connector – continued

- Pin 1 -- Power
- Pin 2 -- Ground
- Pin 3 -- TX Data
- Pin 4 -- Signal Ground
- Pin 5 -- RX Data

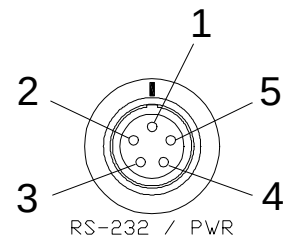


Figure 3 – PDL Base: RS-232 / Power Connector

Compliance

The PDL BASE is designed to be compliant with many worldwide regulatory requirements, including FCC CFR Title 47 Part 90 and Part 15. Changes or modifications not expressly approved by Pacific Crest Corporation could possibly void the user's authority to operate this equipment.

Note: this equipment has been tested and found to comply with the limits for a class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Part 15 Compliance (for U.S.)

The PDL Base complies with Part 15 of Title 47 of the Code of Federal Regulations. Operation is subject to the condition that this device does not cause harmful interference.

Part 90 Compliance (for U.S.)

The PDL Base is type accepted for operation under the rules and regulations of Parts 2 and 90 of Title 47 the Code of Federal Regulations. Refer to the label affixed to the unit for the FCC ID designator and other designators for international compliance.

Licensing Requirement (for U.S.)

The FCC regulates the use of the radio frequency spectrum. An FCC license of authorization must be obtained prior to operating the PDL Base radio modem. It is the responsibility of the user to maintain current knowledge of the rules and regulations to assure compliance.

Application for a license is made by submitting FCC form 600 along with evidence of frequency coordination (if required) and applicable fees to the FCC.

The FCC vigorously pursues and prosecutes those who operate unlicensed radio stations. All radio operation must be authorized and licensed by the FCC. Without the cooperation of the radio user community, the airwaves would soon become overcrowded, making operations such as data transmission impossible.

Electrical Considerations

Power Supply

The PDL Base has power supply connections on pins 1 and 2 of the RS-232 / Power connector. Supply voltages greater than 16 Volts will cause the unit to shut off. Pins 1 and 3 are connections to the power ground and RS-232 interface signal grounds respectively. Note that these pins are tied to a common point on the PDL BASE. If there is a potential for a ground path current loop due to improper power application, we recommend a fusible link be inserted in the signal ground to protect the PDL BASE.

The input regulators of the PDL BASE are designed to protect the circuit from damage due to reverse polarity (up to 20V). Transient voltage protection is also provided for circuit protection against ESD and other voltage transients.

Data Interface

The data port is a simple 3-wire RS-232 electrical interface with signals for transmitting data to and from the PDL BASE. It also provides a reference ground for the TX and RX signals.

Appendix A - Cables and Connectors

RS-232 / Power Connector

The RS-232 / Power connector is a 5 pin LEMO #1 shell receptacle. Use Pacific Crest part number A00470 as a standard programming cable.

RF Connector

The RF connector is a 50 Ohm female BNC connector.

Appendix B - Technical Specifications

General

Interface

RS-232 compatible interface configurable for 150 to 38,400 baud operation with one start, 8 data, optional parity, and one stop bit.

Power Supply

Power supplied externally through the RS-232 / Power connector (9 - 16 VDC). Typical power consumption during TX is 110 Watts and 1.9 Watts during RX.

Radio Transceiver

Frequency Ranges

Contact factory for currently available frequency ranges.

Frequency Control

Synthesized 12.5 kHz resolution, ± 2.5 ppm crystal stability standard.

Channel Spacing

Channel spacing 12.5 kHz and 25 kHz.

RF Output Power

2 Watt $\pm 20\%$ (LO power switch setting).
35 Watt $\pm 20\%$ (HI power switch setting).

Receiver

Sensitivity -116 dBm or better (12dB SINAD). Selectivity -70 dB at 25 kHz.

Modem

Link Rate and Modulation

19,200 bps and 9600 with 4 level FSK.
9600 bps and 4800 with GMSK.

Transmission Protocols

Transparent, packet switched, fast asynchronous, digipeater, TRIMTALK™.

Forward Error Correction (FEC) and Detection

Hamming code (12, 8) with data interleaving.

Environmental

Size

6.23" W x 2.77" H x 6.58" L
(15.8 cm W x 7.0 cm H x 16.7 cm L)

Weight

Standard enclosure – 2.96 lbs. (1.34 Kg)

Shock and Vibration

Per IEC 68-2-55.

Temperature Range

-22° to 140° F (-30° to 60° C) Operating
-67° to 185° F (-55° to 85° C) Non-operating