	<b>Technical note</b>	07/01/2008
Subject	Use of PDL radios with PrMark3 RTK	

## 1- Introduction

In some cases the licence free radio provided by Magellan in the ProMark3 RTK kits has not enough range. In order to increase the base line length it is possible to use Pacific Crest PDL radios both for the base and for the rover.



With ProMark3 RTK this is the low power model which is used (see table below)

	High Power Base	Low Power Base	Rover
DTE – DCE Interface	3-Wire, RS-232, 38.4k Baud Maximum		
User Interface	On/Off Button* ("Auto Power On" enabled when connected to power source) Channel Button with AutoBase™ and AutoRover™ Digital Display Modem/Power Status Indicators RF Power Select Toggle Switch	On/Off Button* ("Auto Power On" enabled when connected to power source) Channel Button with AutoBase™ and AutoRover™ Digital Display Modem/Power Status Indicators	On/Off Button Channel Button with AutoRover™ Digital Display Modem/Power Status Indicators
External	9 – 16 VDC		
Internal Battery	N/A	N/A	Lithium Ion Battery Pack
During TX (maximum)	110 Watts (35W)	11 Watts (2W)	N/A
During RX (maximum)	1.9 Watts	0.9 Watts	0.3 Watts
External	50 Ohm, BNC	50 Ohm, NMO	50 Ohm, NMO
Link Rate/Modulation	19,200 bps/4 Level FSK (25 kHz) 9600 bps/4 Level FSK (12.5 kHz) 9600 bps/GMSK (25 kHz) 4800 bps/GMSK (12.5 kHz)		
Link Protocols	Transparent, Packet Switched, Digipeater, TRIMTALK™	Transparent, Packet Switched, Digipeater, TRIMTALK™	Transparent, Packet Switched, TRIMTALK™
Forward Error Correction	Yes		
Frequency Bands	Refer to price list for available frequency bands.		
Frequency Control	Synthesized 12.5 kHz Resolution ±2.5 ppm Stability		
RF Power Select	Low/High	Factory Programmable	N/A
RF Transmitter Output	3/35 Watts Maximum	0.5 – 2 Watts	0 Watt (Receive Only)
Sensitivity	-110 dBm BER 10 <sup>-5</sup>		
Adjacent Channel Selectivity	>65 dB (25 kHz), >55 dB (12.5 kHz)	>65 dB (25 kHz), >55 dB (12.5 kHz)	>60 dB (25 kHz), >50 dB (12.5 kHz)
Type Certification	All models are type accepted and certified for operation in the U.S. and Canada. For detailed information concerning your country's type certification, please contact your sales representative.		
Operating Temperature	-22° to +140° F (-30° to +60° C)		-4° to +140° F (-20° to +60° C)
Storage Temperature	-67° to +185° F (-55° to +85° C)		-4° to +185° F (-20° to +85° C)
Vibration/Shock	ANSI/ASAE EP455		
Enclosure	IEC 144/855420 I.P. 66 Watertight and Dustproof		
Dimensions	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)	8.25" L x 2.40" Diameter (21.0 cm L x 6.1 cm Diameter)	8.25" L x 2.40" Diameter (21.0 cm L x 6.1 cm Diameter)
Weight	2.96 lbs. (1.34 Kg)	0.65 lbs. (0.30 Kg)	0.75 lbs. (0.34 Kg)
Data/Power Connector	5 Pin LEMO #1 Shell	5 Pin LEMO #0 Shell	5 Pin LEMO #0 Shell
Mount	Tripod Bracket	5/8" – 11 Range Pole	5/8" – 11 Range Pole

The rover version differs from the base version in the fact that the battery is included. The base version need an external battery (12 V).

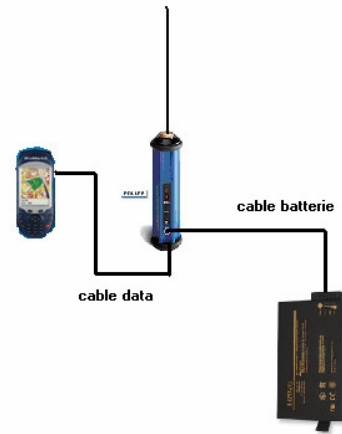
## 2- Radios configurations:

The PDL radios must be configured with:

- transmitting mode “transparent with time out”
- serial link at 9600 bps

### 3- Base

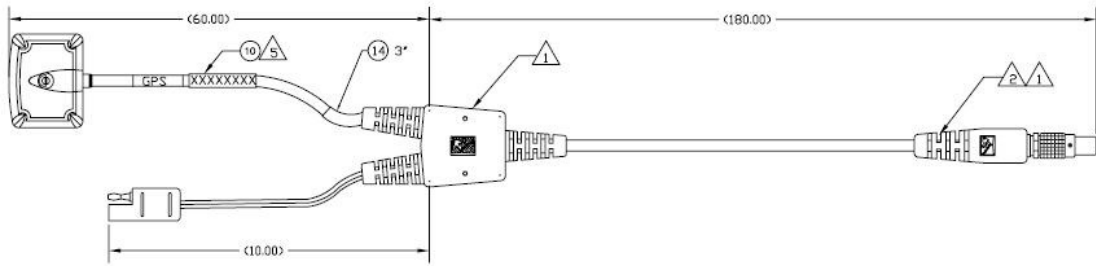
#### *Equipment configuration*



On the emitting side (base) an external battery is needed. Any 12V battery could be convenient and a good option is a Magellan Z Extrem battery (12V, 6000mAh) which could offer 8/9 hours autonomy.

The data cable to be used between ProMark3 and the PDL is coming from Pac Crest:

<i>Description</i>		<i>Part #</i>	<i>List Price</i>
PM3-to-PDL interface cable		A02559	\$208



### ***PM3 configuration:***

This configuration is exactly the same as for the licence free radios. After having selected UHF in the radio configuration menu, just select “base” in the surveying application

## **3- Rover**

### ***Equipment configuration***



The external battery is not needed as the PDL rover has an internal battery. So the only connection is between the PDL and the ProMark3 using same Pac Crest cable as for the base. (Pac Crest p/n: A02559)

### ***PM3 configuration:***

Same as for the base: after having selected UHF in the radio configuration menu, just select the required “survey mode” in the surveying application

Equipment configuration:

In order to install on the same tripod the ProMark3 and the PDL it could be usefull to use the initialization bar as described below



## **4- Field tests**

Test have been done in Magellan Nantes Office

Up to 500 m the base station in a suburban type of environment with small building both radios worked fine. Age of correction remain low (2 to 3 seconds) . When the distance to the

base increase more than 500m the Magellan licence free radio only works in static mode and age of correction increases (loss of data) as soon as the rover moves, and initialization is lost.

Over 500 m from the base station the Pac Crest radio which is much more power-full (2W instead of 0,5 W for the Magellan licence free) continue to keep good connection up to 1,5 km in this environment. Of course radio performances are very dependant from the environment and could be very different in an other place.