ProFlex500 PDL Radios - preparing for field work

Confirm that PDLCONF and either GNSS Solutions or Evaluate are installed on your computer.

The PDLCONF software is available from the Pacific Crest web page at

http://www.paccrst.com/

GNSS Solutions and Evaluate are both available from the Magellan ftp server at

ftp.promagellangps.com

This document will depend on use of the manuals for the hardware and software illustrated and are not intended to replace those instructions. The WinComm software used to illustrate these instructions is a tool included in GNSS Solutions. See appendix B of the GNSS Solutions Reference Manual for details.

Configure the Rover Radio

Restore all the factory settings on the ProFlex500 rover using Power+Log+Scroll as described in the ProFlex500 getting started manual.

Connect the serial interface cable to port A on the ProFlex500 rover.



Connect the serial interface cable to a com port on the PC. The photo illustrates how that was done with a computer that does not have nine pin serial ports using a USB-to-Serial adaptor.



Sometimes it is hard to know what com port number is assigned to the USB-to-Serial adapter. Start WinComm and look at the list of com ports before the adapter is connected to the PC.

🧏 WinComm		×
Command	Send Simple GPS Recorder Advanced	Settings Help
- Display	Communication Settings	Editing
	Comm : Auto Configure Receiver Type : COM12 COM3 COM3 COM3 COM3 Stop bits : 1 Load Settings Save Settings OK Cancel 	percx\mn
▲ Pause	Clear View Print View	Start Recording

Close WinComm, connect the USB-to-serial adapter, start WinComm, and check the list of com ports. The com port added to the list is the USB-to-serial adapter. In this example the new port is COM4.

VinComm	Send Simple GPS Recorder Advanced	Settings Help
Display	- Cimple Cas Resorder	
	Comm : COM4 _ Auto Configure	Editing
I Pause	Clear View Print View	Start Recording

With the correct port selected all is ready. Click OK to make the connection.

🍠 WinComm		×
Command	Send Send Advanced Mode Simple GPS Recorder Programmable GPS Recorder	Settings Help
- Display	Communication Settings	Editing 🧫
	Comm : COM4 Image: Auto Configure Speed : 19200 Image: Receiver Type : Data bits : 8 Image: Receiver Type : Data bits : 8 Image: Receiver Type : Stop bits : 1 Image: Receiver Type : Load Settings Save Settings OK	percx\mn
▲ Pause	Clear View Print View	Start Recording

Verify the connection to the ProFlex500 by sending the query

\$PASHQ,RID

Verify the \$PASHR response before going to the next step.

🍠 WinComm : Com 4, 19200, 8,	No, 1
Command	
\$PASHQ,RID	Send
·	Advanced
- Display	ð
\$PASHR, RID, PF, 30, S224Gg1	19, FKSZ, , 200

A series of commands follows. Each command and the response to watch for is illustrated as follows:

\$PASHS,CTS,A,OFF

🍠 WinComm : Com 4, 19200, 8, No	o, 1
Command	
\$PASHS,CTS,A,OFF	Send
•	Advanced
Display	51
\$PASHR, RID, PF, 30, S224Gg19, \$PASHR, ACK*3D	,FKSZ,,200 🖲

\$PASHS,DSY,D,A

WinComm : Com 4	I, 19200, 8, N	lo, 1
\$PASHS,DSY,D,A	.	Send
		Advanced
Display		81
\$PASHR, RID, PF, 3 \$PASHR, ACK*3D	30,S224Gg19	
\$PASHR, ACK*3D		

\$PASHS,DSY,A,D

WinComm : Com Command	4, 19200, 8, No, 1
\$PASHS,DSY,A,D	▼ Send
	Advanced
Display	Ē
SPASHE BID PE	, 30, S224Gg19, FKSZ, , 200 🖌

Close WinComm, leave the ProFlex500 connected to the PC, and start the PDLCONF software.



A left click on the little PDL button in the top left corner of the PDLCONF software window will reveal a menu. Set the capture method to Soft Break.

-	Move Minimize	Radio Link Seria	al Interface
<	Close A	It+F4 formation	
	Select Serial Port Set Capture Method	Power On Capture	Frequency Range:
	Upgrade modem firmware	✓ Soft Break	Power:
	About PDLCONF	Modem ID:	Channel Bandwidth:
	Program		
	Close	Serial Number:	Call Sign:
		Owner:	
	Print		
	Exit	Undo Chang	es Factory Defaults

Select Serial Port...

Move Minimize		Radio Link Ser	ial Interface	
< Close	Alt+F4	formation		
Select Serial Port. Set Capture Metho	1997	Model:	Frequency Range:]
Upgrade modem fi	irmware	Revision:	Power:	1
About PDLCONF		Modem ID:	Channel Bandwidth:]
Program	Se	erial Number:	Call Sign:	_
Close	Owne	er:	- ,	_
Print				

Choose the Serial Port (COM) for the ProFlex500 connection.

•••	Identification	Radio Link Serial Interf	ace	
shtec	1			
SION PRODUC	Soloct Soria	ıl Port		
		Choose an available po	e:	
Help	Serial Port	Status	er:	
	4	Available	h: [
Load	9 10	Available Available	×	
Program	1			
Close	ОК		Cancel n:	
CIOSE	Owner:			
Print	Owner.	1		
1-1015		9		

	1 1	Interface	
	nformation		
PRODUCT	Model:	Frequency Range:	
Firmware	e Revision:		
	Modem ID:	Channel Bandwidth:	
am Connect to the moder	m and read its setting	JS	
Seria	al Number:		
Owner:			
d am Connect to the moder Seria	, m and read its setting ial Number:		

Click on the Load button to read the current settings in the PDL radio.

Examine the Identification tab information. Edit the Owner field as appropriate. Verify the firmware version and frequency range. Compare the channel bandwidth with the base radio to be used. Make note of the serial number for company records if needed.

PdlConf for Thales	Navigation - End User	
Ashtech PRECISION PRODUCT	Identification Radio Link Serial Interface Model Information Model: PDL RXO Frequency Range: 450-470	MHz
Help Load	Firmware Revision: 2.58 Modem ID: 974-7 Channel Bandwidth: 25 K	
Program Close	Serial Number: 08457135 Owner: Your company name	
Print		
Exit	Undo Changes Factory Defaults]

The Radio Link tab has several settings that will determine whether the radios will work together.

Matching frequency tables are essential. Compare the rover frequency table with the base radio frequency table and the radio license to ensure compliance with regulations. If the channel tables are not correct request assistance from a dealer or radio service company who has the dealer version of PDLCONF.

Modify all other settings to match the screen shot on this page with the objective of making the rover radio work with the base radio.

In a high RFI (Radio Frequency Interference) environment a Digisquelch set to Moderate may give more dependable performance at short ranges. It will limit the maximum range of the radios but range limitations may already be imposed by the RFI. Digisquelch set to High is appropriate whenever there is uncertainty about the environment. If RFI prevents success with the radios switch to the Moderate setting.

PdlConf for Thales	Navigation - End User	
Ashtech PRECISION PRODUCT	Identification Radio Link Serial Interface Channel Select Manual: Channel OD AutoRover: C	TX RX 464.7500 V
Load	Link Rate: 9600 - Modulation Type: GMSK -	Forward Error Correction: 🔽 Scrambling: 🔽 CSMA Monitor: 🔽
Program	Digisquelch: High 🗨	Local Address: 0
Print Exit	Undo Changes	Factory Defaults

The Serial Interface tab includes a baud rate selection that must be 38400 for success with the ProFlex500 rover. Any other setting for the baud rate will make the radio so it will not work with the ProFlex500. Match the Serial Interface settings with the screen shot on this page.

Baud Rate: 38400

A alata ala	ntification Radio Link Serial Inter	face
Precision Product: Help	Port Baud Rate: 38400 V Parity: None V	Soft Break Enabled: 🔽 Data Security Code: 00000000
Program	Protocol Mode: Transparent w/EOT Time	BREAK to Command:
Print Exit	EOT Count:	Digipeater Delay:

Click the Program button to program the changes into the rover radio.

PdlConf for Thales	Navigation - End User	
Ashtech PRECISION PRODUCT	Identification Radio Link Serial Interface	Enabled: 🔽
Help	Parity: None Data Security Code:	00000000
Load	Protocol	F
Program	Mode: Transparent w/EOT Timeout	Command:
Close Progra	m the modem with the current settings EOT Count: Digipeater Dela	
Print		
Exit	Undo Changes Factory Defa	aults

•	Identification Radio Link Seria	Interface	
Shtech	Channel Select	annel TX	RX 469.7500 -
Help	Programming	t Channel	
Load	Program modem with r	No Forward	Error Correction: 🔽 Scrambling: 🔽 CSMA Monitor: 🔽
Program	Digisquelch: High		Coma monitor.
Close	Transmit Retries:	Local Ad	dress: 0
Print		Remote Ad	dress:

Confirm the decision to program the radio with a click on the Yes button.

Print a report, if needed, to provide a record of the settings in the radio with a click on the print button. Make a pdf of the report as a way to share information with technical support. Click the Close button to detach from the PDL radio. Close PDLCONF.

···.	Identification Radio Link Serial Interfac	e
shtech	Manual: 6	TX RX
ECISION PRODUCT:		469.7500 💌
Help	AutoRover: C	Import Channel Table
	Link Rate: 9600	Forward Error Correction: 🔽
Load	Modulation Type: GMSK	Scrambling:
Program	Digisquelch: Moderate	CSMA Monitor:
Close	Transmit Retries:	Local Address: 0
Detach	from the modem	Remote Address:

Power off the ProFlex500.

Restore all the factory settings on the ProFlex500 rover using Power+Log+Scroll as described in the ProFlex500 getting started manual. This will not change the radio settings just made with the PDLCONF software. It will cause the ProFlex500 to make a new connection to the PDL radio and recognize the radio configuration changes just made.

Configure the PDL high power base

Connect an antenna to the base radio. Connect the Pacific Crest programming cable and connect a power supply to the programming cable.



Connect the programming cable to the PC.



Start the PDLCONF software. Left click on the small PDL icon in the top left corner of the PDLCONF window to reveal a menu.



Set Capture Method to Soft Break.

_	Move Minimize	Radio Link Serial In	leface	
<	Close Alt+	F4 Iformation		
	Select Serial Port Set Capture Method	Model Power On Capture	Frequency Range:	
	Upgrade modem firmware	🖌 Soft Break	Power:	
	About PDLCONF	Modem ID:	Channel Bandwidth:	
	Program	Serial Number:	Call Sign:	
2	Print	Dwner:		
	Exit	Undo Changes	Factory Defaults	

Sometimes it is hard to tell what serial port number is assigned to the USB-to-serial adapter. Start PDLCONF before connecting the USB-to-serial adapter and look at the list of serial ports.

••.	_	Radio Link Serial Interface	1	
shtec	Salact Soria	l Port	e:	
		Choose an available port		
Help	Serial Port	Status	er:	
Load	9 10 11	Available Available Available	📃 h: 🗾	
Program	ОК	_	Cancel	
Close			Lancei n:	
	Owner:			
Print		,		

Close PDLCONF, connect the USB-to-serial adapter and start the PDLCONF software again. Select serial port again but this time see what additional port has been added to the list. In this example serial port COM4 was added to the list.

···	Identification	Radio Link Serial Interfac	e	
shtec	Colored Conto	il Port	e	
		Choose an available port		,
Help	Serial Port	Status	er.	·]
Load	4 9 10	Available Available Available	h.	:]
Program	ОК	-	Cancel	
Close			n:	1
	Owner:			

Click on the Load button to read the current configuration from the base radio.

PdlConf for Thales	lavigation - End User		
Help Load	Identification Radio Link Seri Model Information Model: Firmware Revision: Modem ID:	al Interface) Frequency Range: Channel Bandwidth:	
Program Connec	to the modem and read its settin	Igs	
Close	Serial Number:		_
Print			
Exit	Undo Chang	Factory Defaults	

The Identification tab includes fields for the owner's company name and the radio call sign issued by the agency that regulates radio transmitters. In the USA the FCC issues radio license call signs appropriate for the Call Sign field. Compare the Frequency Range and Channel Bandwidth with the report from the rover radio to ensure compatibility. Note the Serial Number for company records.

shteck	Identification Radio Link Serial Interfa	ace
ecision Product	Model: PDL HP Base	Frequency Range: 450-470 MHz
Help	Firmware Revision: 2.40	Power: 35 Watts
Load	Modem ID: 938-7	Channel Bandwidth: 25 K
Program	Serial Number: 08068492	Call Sign: YOURS
Close	Senai Number: juousu+sz	Call Sign: 100005
	Owner: Your company name	

The Radio Link tab has settings that need to match the screen shot below. The Channel Table must match the rover radio channel table for communication to work. The channel table should be compared with the radio license to ensure compliance with regulations.

• • • .	Identification Radio Link	Serial Interface]	
shtec	1 I I I I	Channel	TX	RX
ecision P kobbe	AutoBase: C AutoBover: C	00	464.7500 Import Channel Ta	464.7500 💌
Help				
Load	Link Rate: 96	00 💌	Forward Erro	Scrambling:
Program	Modulation Type: GI	MSK 💌	CS	MA Monitor:
	Digisquelch:	w		
Close	Transmit Retries:	3	Local Addre	ss: 0
Print	TX ACK Timeout:	0.1	Remote Addre	ss: 255

The Serial Interface tab settings should match the ones shown here. Flexibility with the Baud Rate is possible. Remember the baud rate setting selected when setting up the base in the field. Baud rates of 9600, 19200, and 38400 all seem to work. Be consistent and remember what was set. The key to successful selection of the base station baud rate seems to have most to do with remembering what was set.

	Identification Radio Link Serial Interface
Ashtech	Port
ECISION PRODUCT	
Help	Parity: None Data Security Code: 00000000
Load	Protocol
Program	Mode: Transparent w/EOT Timeout BREAK to Command: Repeater:
Close	EOT Count: 10 Digipeater Delay: 0.00
Print	

Click the Program button to save the configuration settings to the base radio.

••••	Identification Radio Link Serial Interface				
shtech	Channel Select	Channel	TX	RX	
cision i noboci.	AutoBase: C	06	469.7500 46	59.7500 <u>-</u>	
Help	AutoRover: C		mport Channel Table		
Load	Link Rate: 9600 _		Forward Error Correction: Scrambling: CSMA Monitor:		
Program	Digisquelch:	ow 🔽	COM	THORICOL. IV	
Close Program	the modem with the current Transmit Retries:	settings 3	Local Address:	0	
Print	TX ACK Timeout:	0.1	Remote Address:	255	

•••.	Identification Radio Link	Serial Interface			
shteck	· · · · ·	Channel 06		RX .7500 -	
	C	1	469.7500 469	.7500 💌	
Help	Programming		t Channel Table		
Load	Program moder Mo Yes	Program modem with new setting		Forward Error Correction: V Scrambling: V	
Program		w v	CSMAI	Monitor: 🔽	
Close	Transmit Retries:	3	Local Address:	0	
Print	TX ACK Timeout:	0.1	Remote Address:	255	

Click Yes to confirm saving the settings to the base radio.

Close the connection to the PDL and Exit from the PDLCONF software. The PDL base station is ready for field work.

Return to the Pacific Crest web page. Find the link to the *Guide to Wireless Data Links* at the bottom left corner of their home page. Download and study that guide. Share it with everyone who will use a radio data link.

http://www.paccrst.com/

Atlas License Company offers help with the FCC license process.

http://www.alcds.com/

Please report errors found in these instructions to Phil Stevenson by email:

pstevenson@promagellangps.com

Phil Stevenson August 27, 2009