

# Command Line Interface



Oregon RFID  
4246 SE Ogden St  
Portland, OR 97206  
(503) 788-4380  
(866) 484-3174 toll free  
(866) 611-7087 toll free fax  
*<http://www.oregonrfid.com>*  
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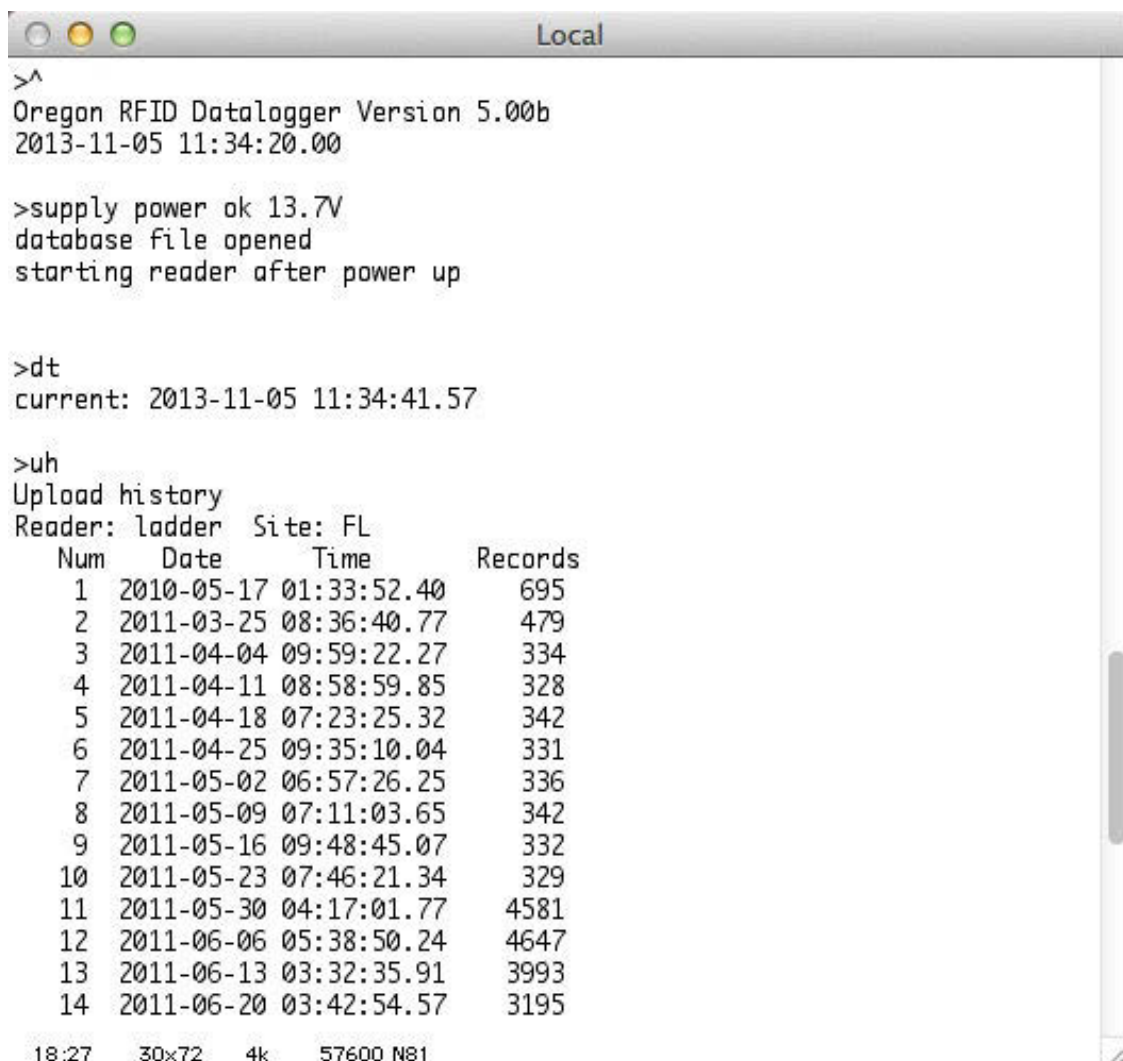
# Command line interface

The Oregon RFID reader can be operated over a serial link using terminal emulator software that sends keystrokes and displays the characters that are returned. The command line interface is useful for remote access over radio modems and cell data links.

Windows: Hyperterminal, Tera Term, Putty

MacOS: Terminal, XTerm, Putty

Linux: Terminal, Putty



```
>^
Oregon RFID Datalogger Version 5.00b
2013-11-05 11:34:20.00

>supply power ok 13.7V
database file opened
starting reader after power up

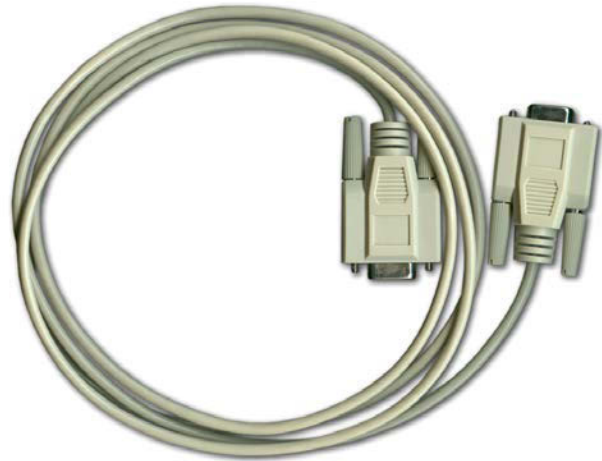
>dt
current: 2013-11-05 11:34:41.57

>uh
Upload history
Reader: ladder Site: FL
  Num   Date      Time      Records
  1  2010-05-17 01:33:52.40    695
  2  2011-03-25 08:36:40.77    479
  3  2011-04-04 09:59:22.27    334
  4  2011-04-11 08:58:59.85    328
  5  2011-04-18 07:23:25.32    342
  6  2011-04-25 09:35:10.04    331
  7  2011-05-02 06:57:26.25    336
  8  2011-05-09 07:11:03.65    342
  9  2011-05-16 09:48:45.07    332
 10  2011-05-23 07:46:21.34    329
 11  2011-05-30 04:17:01.77   4581
 12  2011-06-06 05:38:50.24   4647
 13  2011-06-13 03:32:35.91   3993
 14  2011-06-20 03:42:54.57   3195

18:27  30x72  4k  57600 N81
```

## Serial cable

The reader is supplied with a DB9 serial cable (F-F null modem). This will plug into a 9 pin male DB9 connector



## USB to Serial adapter

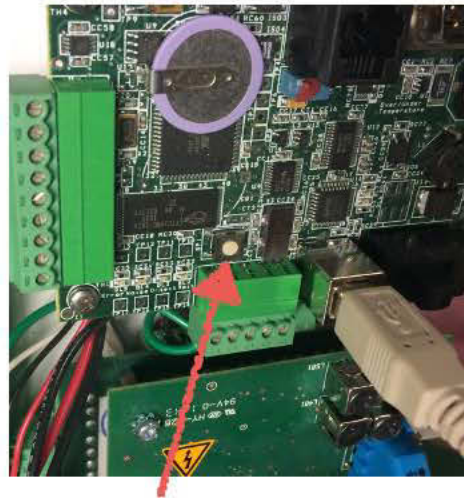
Modern computers do not have RS232 serial port and so a USB-to-Serial adapter is necessary. In Windows the virtual serial port driver adds a new COM: port. The Device Manager (XP, Vista) or Devices and Printers (Win 7) will show the number.

Under OSX, Linux and Unix the driver adds a new device that can be listed with the “ls /dev/” command.



# USB cable

A standard USB cable can also be used for the serial link. However the reader must be on to use it. Whenever the reader is turned off, the USB port will disconnect and possibly cause an error message to any programs that were using it.



USB drivers for Windows, Mac and Linux can be downloaded from:

<http://www.ftdichip.com>

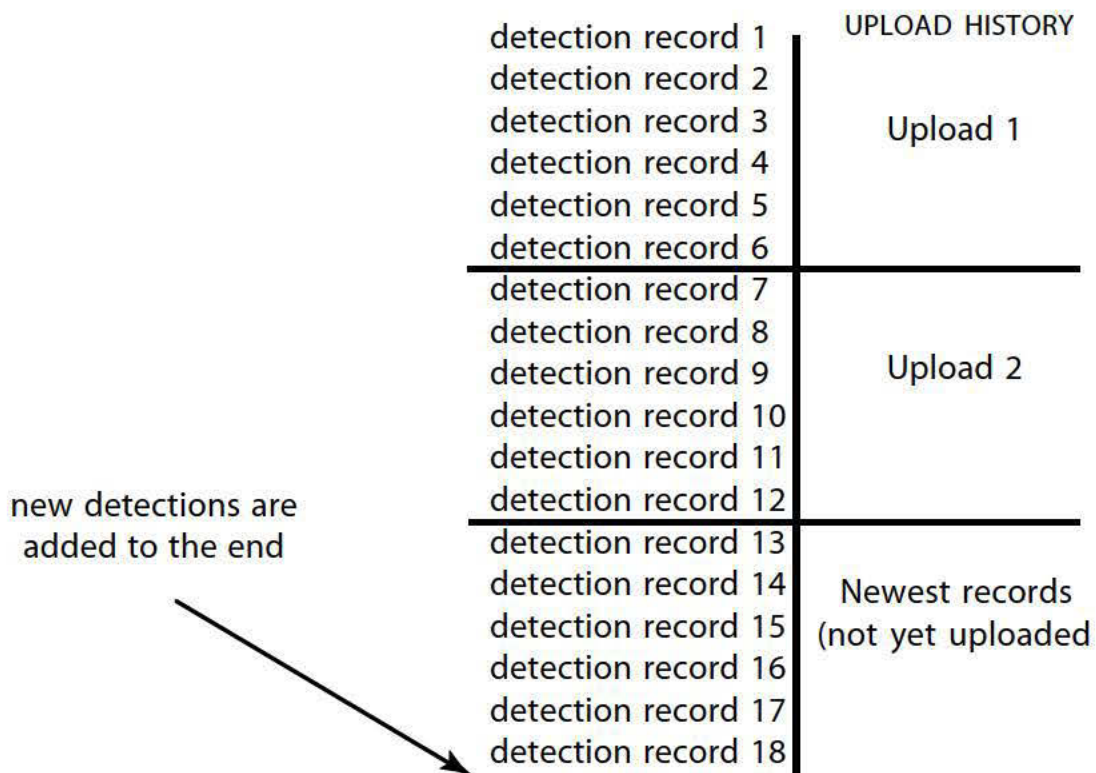
The USB port is powered by the datalogger and will disconnect when the reader power is turned off. To restart the reader without turning it off, press the small white button on the datalogger board (see arrow above). This allows starting a firmware update using a USB cable.

# Detection history

The Oregon RFID reader timestamps tag detections and stores them on a flash memory card. Event messages are also stored which include parameter changes and system exceptions such as low voltage.

There is room in the history file for nearly 10 million records along with time-based records every minute for 10 years.

To organize these records, the datalogger segments the data into uploads that are shown in a list of **upload histories**. An upload is added to the history list after new data is retrieved. The upload is numbered to allow retrieving the same records again later on.





# Commands

The Hyperterminal interface to the internal datalogger uses 2 letter commands to configure the reader and upload detection log files.

Commands are typed at the '>' prompt. This example shows the command to enter the date. All dates are entered and displayed in ISO 8601 format: YYYY-MM-DD.

```
>DT 2014-1-15
```

## UP - Upload data

The Upload (UP) command retrieves records stored in the datalogger.

```
>up
upload 06/14/2008 23:58:09.99      255
----- upload start -----
2008-06-14 23:58:09.99 upload complete
2008-06-14 23:58:44.05 parameter change: mux sequence '1234'
2008-06-14 23:58:46.88 00:00:00.66 R 0000_00000000114023569 A1      3      168
2008-06-14 23:58:49.30 00:00:01.08 R 0000_00000000114023569 A2      4      168
2008-06-14 23:58:52.70 00:00:00.49 R 0000_00000000114023569 A4      3      167
2008-06-14 00:00:41.99 00:00:00.33 R 0000_00000000140626231 A4      2       76
2008-06-14 19:56:48.99 00:00:00.64 R 0000_00000000132145563 A2      3     111
2008-06-14 20:06:47.99 00:00:01.77 R 0000_00000000140626232 A3      5       10
2008-06-14 20:10:40.99 00:00:01.30 R 0000_00000000142620537 A2      4     157
2008-06-14 20:23:31.99 00:00:02.19 R 0000_00000000101569184 A4      6     216
2008-06-14 23:00:36.70 00:00:02.21 R 0000_00000000138421586 A2      6       37
----- upload done -----
```

After the successful completion of an UP command, a new entry is created in the Upload History list.

A previous upload can be repeated by typing “UPn” where n is the upload number from the history list. For the first/oldest upload in the database, type “UP 1”.

Negative indexes count from the end of the list upward. To see the most recent upload, use “UP -1”.

All records can be uploaded with the “UP\*” command



## UH - Show upload history

The Upload History (UH) command displays the previous uploads that are stored in the datalogger.

```
>UH
Upload history
  num    date      time      numrecs
  1  2007-02-26  22:36:20.99      1
  2  2007-02-26  22:36:20.99      3
  3  2007-02-26  22:39:03.97      1
  4  2007-02-26  22:36:20.99      5
  5  2007-02-26  22:36:20.99      6
  6  2007-02-26  22:42:42.49      1
  7  2007-02-26  22:56:41.61      4
  8  2007-02-26  23:18:25.84      8
NEW  2007-02-26  00:36:50.84      7
```

The “NEW” entry at the end shows the records that are in the datalogger that haven't been uploaded. The NEW upload is obtained with the “UP” command.

## **CG - Change reader settings**

Reader settings are changed with the ``CG" command. The reader will momentarily stop so the new values can be written to the internal EEPROM.

```
>CG
reader settings
CGA4  mux with 4 antennas
CGC50 charge period 50ms
CGP50 duty cycle pause 50ms
CGS0  synch mode: none
```

Single readers are configured with ``CGA0".

## **MX - Set antenna multiplexer scan sequence**

The multiplexer scan sequence is determined with "MX". Type just "MX" to see the current sequence. If the multiplexer sequence is disabled ("MX0"), the number of antennas will determine the scan sequence. So with "CGA2", the sequence would be "12".

```
>MX1234
>MX 2
>MX121314
```

Antennas must be selected one at a time for tuning.

The last sequence example will cause antenna 1 to be read twice as fast as 2, 3 and 4.

## TF - Select tag format

Tags can be displayed in different formats.

```
>TFD  
Display format changed to: Decimal
```

Two decimal numbers, the manufacturer code and the unique identifier.

```
900_226000054795
```

```
>TFH  
Display format changed to: Hexadecimal
```

Sixteen digits in base 16 (0-9, A-F) representing the raw 8 byte tag message.

```
8000E1349EA72A0B
```

The topmost bit (8) indicates if it is an animal tag or not. For animal tags, the manufacturer code is in bits 16-25 and the identifier is in bits 26-63. For non-animal tags (0 in top bit) the application code is in bits 1-11 and the identifier in bits 12-63.

```
>TFB  
Display format changed to: Bi-Hex
```

Decimal format converted into two separate hexadecimal numbers (384 hex = 900 decimal).

```
384.349EA72A0B
```

## SS - Show scan speed and noise level

Scans per second and noise level can be displayed with the SS command. A line of values is written per second until a character is typed.

```
>SS
```

```
0.8 scans/second,  0.2 0.2 0.2 0.2 Tx51/Rx58ms (46% on) noise: 0 2 0 0
0.8 scans/second,  0.2 0.2 0.2 0.2 Tx51/Rx58ms (46% on) noise: 0 0 0 0
0.8 scans/second,  0.2 0.2 0.2 0.2 Tx52/Rx57ms (47% on) noise: 0 0 0 0
0.8 scans/second,  0.2 0.2 0.2 0.2 Tx52/Rx57ms (47% on) noise: 0 0 0 0
```

The above output from a multiplexer shows the total scans per second, the scans per second by antenna, the widths of the transmit and receive pulses and the percent duty cycle, followed by the noise by antenna.

## MG - Maximum scan gap parameter

Each time the tag leaves the scan zone, a record is created in the datalogger with the tag number and duration in the field. If a tag is placed at the outer limit of the read range it can occasionally miss the tag which writes a new detection record. This can result in hundreds or thousands of records to be written for the same tag which can take a long time to upload.

The MG command defines the maximum size of gap to ignore. For example if the maximum gap is 5 scans., any missed scans will be ignored as long as the same tag is detected again within 5 scans. When the tag leaves more than 5 scans the total duration without the small gaps will be written to the database file.

```
>MG 5
```

## AD - Reader status

The datalogger can measure the supply voltage and amperage. These values are displayed twice a second with the AD command.

```
>AD
supply  supply clock
amps volts volts
Rx 0.19 A1 1.35          A3 0.38 A4 0.38    13.4 V    2.8 V    09:48:41.32
Rx 0.19 A1 1.34 A2 0.38 A3 0.38 A4 0.38    13.4 V    2.8 V    09:48:41.83
Rx 0.19 A1 1.34 A2 0.38 A3 0.39 A4 0.38    13.4 V    2.8 V    09:48:42.36
Rx 0.19 A1 1.34 A2 0.38 A3 0.38 A4 0.38    13.4 V    2.8 V    09:48:42.87
Rx 0.20 A1 1.34 A2 0.38 A3 0.40 A4 0.38    13.4 V    2.8 V    09:48:43.38
```

This shows the receiver amperage, amps by antenna, supply voltage and the voltage of the rechargeable battery used to keep the clock running when the reader is turned off.

## AV - Voltmeter calibration

The voltmeter is calibrated by measuring the voltage at the datalogger input terminals. Enter the value in millivolts with the “AV” command.

```
>AV 13400
AD reading = 28975
calibration factor = 473
```

The calibration factor for the value entered and the A/D reading is calculated and stored in EEPROM.

## ON - Reader on/off timer

The reader has a timer to turn itself on and off at selected times.

```
>ON 7:00 19:00
On at 7:00, Off at 19:00
```

```
>ON 0
Timer disabled.
On at 0:00, Off at 0:00
```

## UD - Upload records by date

Upload data for today (no date) or a specific date

```
>UD 2013-11-05
>UD
```

Date	Time	Supply	RX	TX	EA	TX	RX	Temp	Noise
2013-11-05	00:00	12.8V	0.14A	0.75A	0.48A	49ms/	50ms	26C	0N
2013-11-05	00:01	12.8V	0.14A	0.75A	0.48A	49ms/	50ms	26C	0N
2013-11-05	00:02	12.8V	0.14A	0.75A	0.48A	49ms/	50ms	26C	0N
2013-11-05	00:03	12.8V	0.14A	0.75A	0.48A	49ms/	50ms	26C	0N
2013-11-05	00:04	12.8V	0.14A	0.75A	0.49A	50ms/	50ms	26C	0N
2013-11-05	00:05	12.8V	0.14A	0.75A	0.48A	49ms/	50ms	26C	0N
2013-11-05	00:06	12.8V	0.14A	0.75A	0.48A	49ms/	50ms	26C	0N

## RC - Upload records by number

Upload data by record number where 0 is the first one written.

```
>RC 145323
```

## **CS - Set column separator for reports**

Detection records can be uploaded with fields separated by commas, tabs or columnated with spaces.

```
>CS1  
Column separator changed to spaces
```

```
>CS2  
Column separator changed to tab
```

```
>CS3  
Column separator changed to comma
```

## **RB - Reboot system**

The software can be restarted with the reboot command.

```
>RB  
Are you sure? Y
```

## **SC - Enter site code**

The site code is a multiple character identifier used to label reader locations in upload reports. It is also used as a prefix on file names automatically generated by the PDA.

```
>SC GP13
```

## **RN - Enter reader name**

A reader name can be assigned that is displayed in upload reports. Spaces cannot be used.

```
>RN Smith-Creek04
```



## DM - Display real time detection data

The tag identifier will always be written to the database, but the tag will also be announced on the serial port. The format is determined with the “DM” command.

Three stages of detection can be selected for display: Initial, Consecutive and Final. There is one Initial and one Final record. Multiple consecutive readings are sent as long as the tag is in the field

Selecting all stages with “DMA” will cause every scan to be shown. The sequential scan number is shown on the right along with the duration so far. The final detection is the summary record that is written to the database.

>DMIF

W	0018	0920735923817967	A1	2007-02-28	10:56:07.89	00:00:00.00	1	23	
W	0018	0920735923817967	A1	2007-02-28	10:56:07.89	00:00:03.52	9	23	DETECT

Consecutive records can be skipped with “DMI” so that one record appears when the tag is first detected and a second one after it leaves the field.

>DMA

W	0018	0920735923817967	A1	2007-02-28	10:55:55.62	00:00:00.00	1	12	
W	0018	0920735923817967	A1	2007-02-28	10:55:55.62	00:00:00.45	2		
W	0018	0920735923817967	A1	2007-02-28	10:55:55.62	00:00:00.88	3		
W	0018	0920735923817967	A1	2007-02-28	10:55:55.62	00:00:01.32	4		
W	0018	0920735923817967	A1	2007-02-28	10:55:55.62	00:00:01.77	5		
W	0018	0920735923817967	A1	2007-02-28	10:55:55.62	00:00:01.77	5	12	DETECT

## FR - Factory reset

The Factory Reset commands are used to initialize the database and/or the RFID reader settings.

```
>FR
factory reset
FRD erase database on SD card
FRR reset reader to factory settings
FRA reset all
```

The database can be cleared if needed with the “FRD” command. This deletes all records.

```
>FRD
THIS ERASES ALL DATA ON THE SD CARD
AND INITIALIZES THE READER SETTINGS
Are you sure? Yes
Initializing SD card..
creating 450mb database file...
creating database
```

“FRR” resets the reader pulse width, listen time, synchronization and display modes to the initial settings. This can be useful if the reader seems hopelessly lost.

```
>FRR
reset reader to factory settings
```

The default setting is for a single reader. Enable multiplexer mode with the CGA1 command. Define custom multiplexer sequences with “MX”.

```
>CGA1
1 antenna
mux sequence: 1
changing settings..
reader settings
CGA1 mux with 1 antenna
CGC50 charge period 50ms
CGP50 duty cycle pause 50ms
CGS0 synch mode: none
```

## **WR - Write number to writeable tags**

The Write Tag (WR) command is used to write a 16 digit hexadecimal value to a writeable tag.

The number is a 16 character hexadecimal string that will be left-filled with zeroes. So the command:

```
>WR 2A3
```

will write the number “000000000000002A3” to the tag.

After the tag is written, the value is read back. If they are the same, the message “Verified OK” will be displayed.

# **Appendix 1**

## **Command list**

# Terminal Commands

Set the date and time

**DT**  
(cr) Show date and time  
YYYY-MM-DD hh:mm:ss

Upload detections

**UP n**  
(cr) Send all since last upload  
n By upload history list number  
-n For nth previous upload  
\* All records from all uploads  
Type control-c to stop

Upload reader history for date

**UD**  
(cr) Show for current date  
YYYY-MM-DD

Show detection upload history list

**UH n**  
(cr) Show detection history  
n Start with nth entry  
-n Start with nth entry from end  
n m Start with nth entry from end for m items  
-n m Start with nth entry from end for m items  
Type control-c to stop

Select tag display format

**TF n**  
(cr) Show current setting  
1 Decimal  
2 Hexadecimal  
3 Bi-hex

Set column format

**CS n**  
(cr) Show current setting  
1 Spaces  
2 Tab  
3 Comma

Change reader settings

**CG**  
(cr) Show current settings  
An Number of antennas  
Cn Charge period (15 to 255 ms)  
Pn Pause to read tag (20 to 16384 ms)  
Sn Synchron mode  
0=None  
1=Wired  
2=Wired  
3=Wired/wireless  
4=Master  
5=Slave  
I Full reader EEPROM initialization

Multiplexer scan sequence

**MX**  
(cr) Show current sequence  
dddd Sequence of up to 16 digits (1..4)

Set minimum voltage before shutdown

**MV v d**  
(cr) Show current setting  
v Enter value in tenth volts (e.g. 100)  
d Difference to startup (e.g. 20)  
Reader restarts when value d volts above v

Show scans per second, charge pulse timings

**SS**  
(cr) Average of last few seconds  
Runs until any character typed  
Set maximum scan gap size  
**MG a**  
(cr) Show current setting  
a Enter number of empty scans to ignore

Set automatic on/off time

**ON**  
H1:M1 H2:M2

Select detection messages (see other side)

**DM**  
(cr) Show current setting  
I Send initial detection  
C Send consecutive detections  
F Send final detection  
E Send event messages  
A All  
0 None

Show analog values once per second

**AD**  
(cr) Show supply and clock battery  
voltages, transmit and receive  
amperages (by antenna on mux)  
Runs until any character typed

Set voltage calibration

**AV**  
(cr) Enter voltage in millivolts

Reset datalogger and reader to factory settings

**FR**  
D Erase SD card, initialize database file  
R Reset reader EEPROM settings  
A All

Enter comments into log file

**CO comment**

Restart

**RB**

Enter site code

**SC code**

Enter reader name

**RN name**



## **Appendix 2**

### **Terminal emulators**

# Configuring Hyperterminal for Windows

Start Hyperterminal and name a new connection.



Select the COM port on your computer that the cable is plugged into. This can be a physical serial port or a virtual COM port connected to a USB converter.

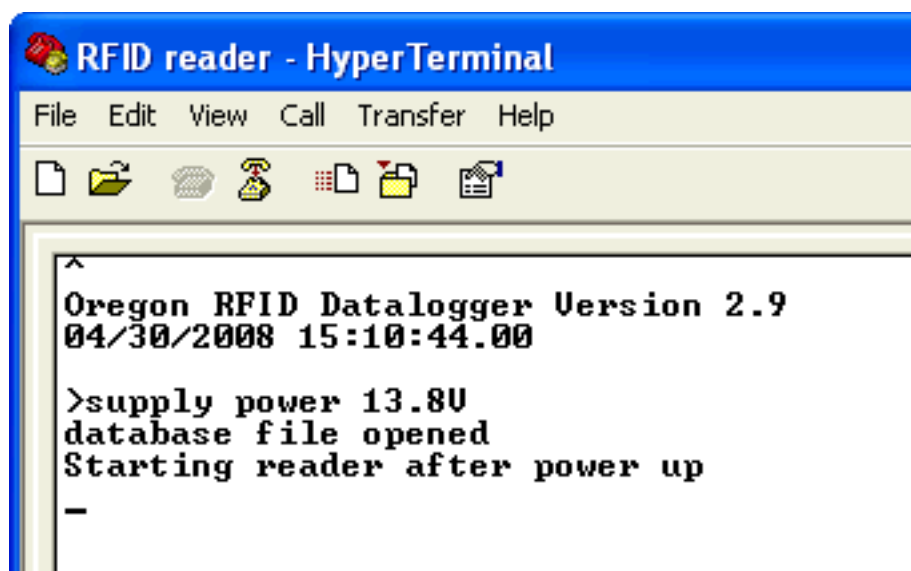




Configure the COM port to 57600 baud, 8 bits, no parity, 1 start bit and hardware flow control.

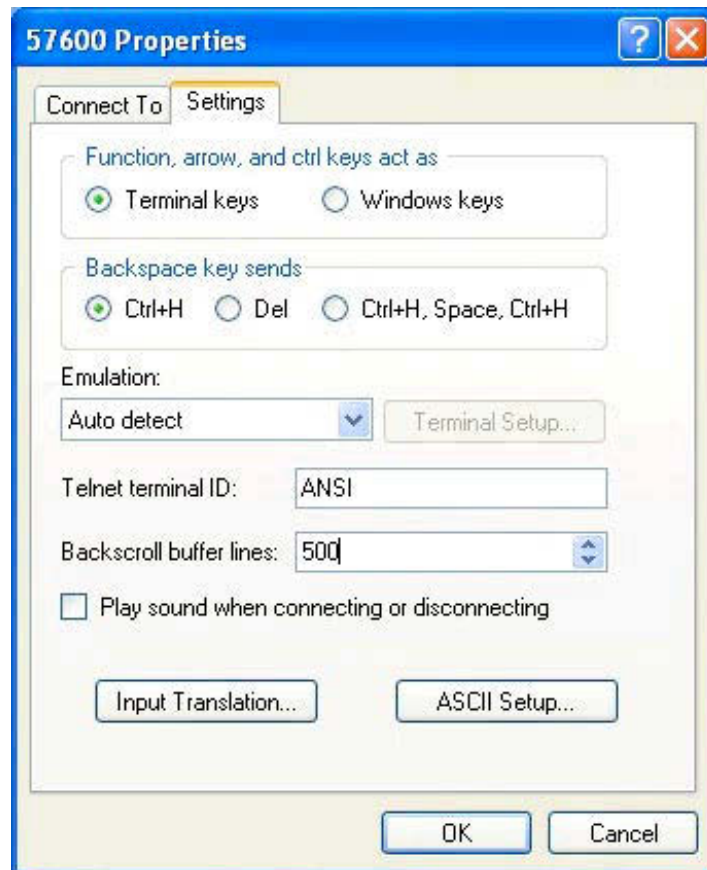


Start the reader and the greeting message will be shown.



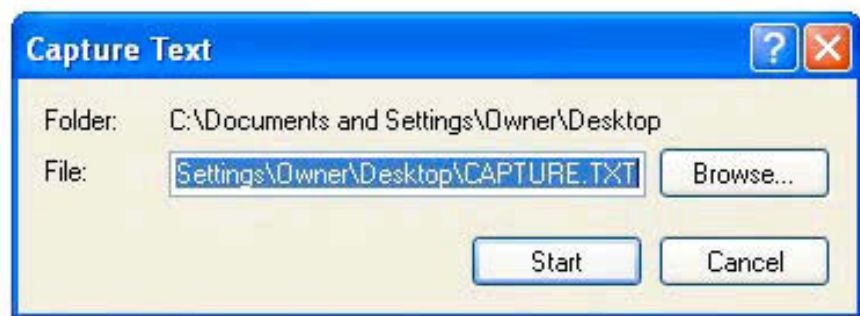
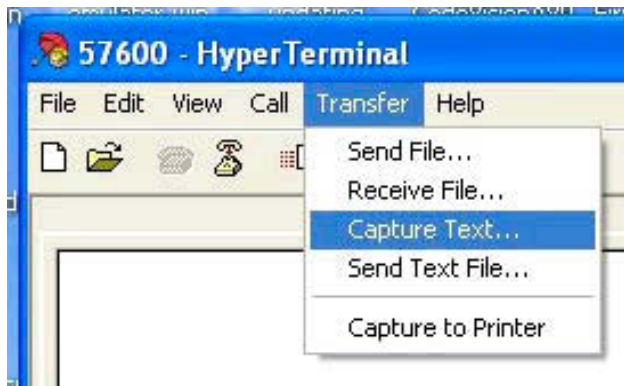
# Setting the Backscroll buffer size

Select “Properties” in the Setup menu and enter the number of lines that will be saved. These lines are viewed by scrolling the Hyperterminal window.

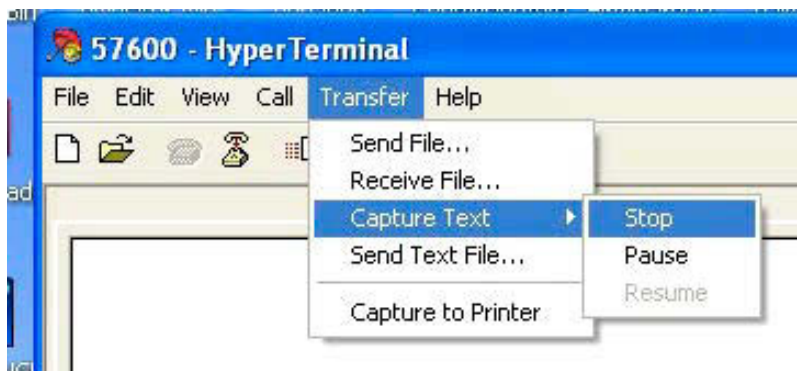


# Capturing to a file

For transfers that are longer than the 500 line limit of Hyperterminal, a capture file is used. Once open, everything typed and received is saved to the file.



The capture file is closed using the same menu item.

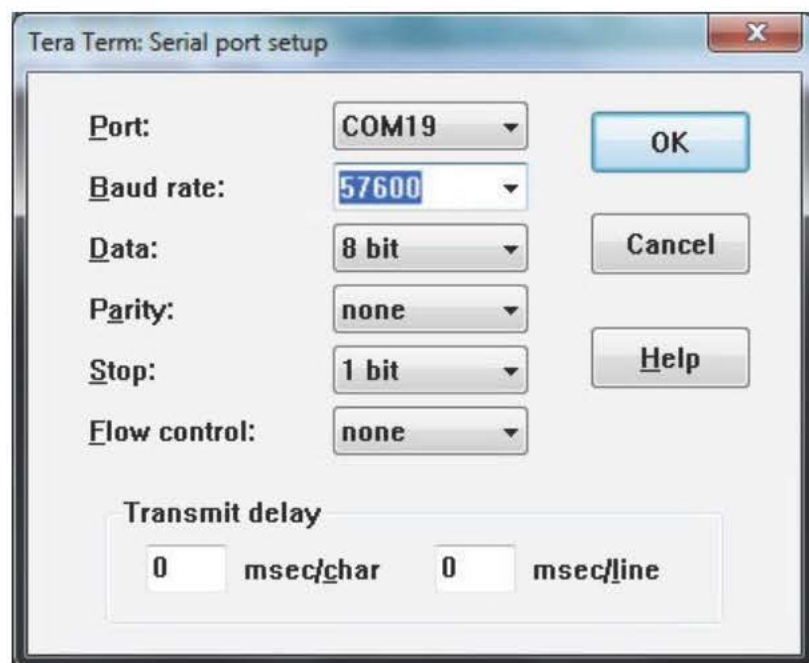


# Using Tera Term for Windows

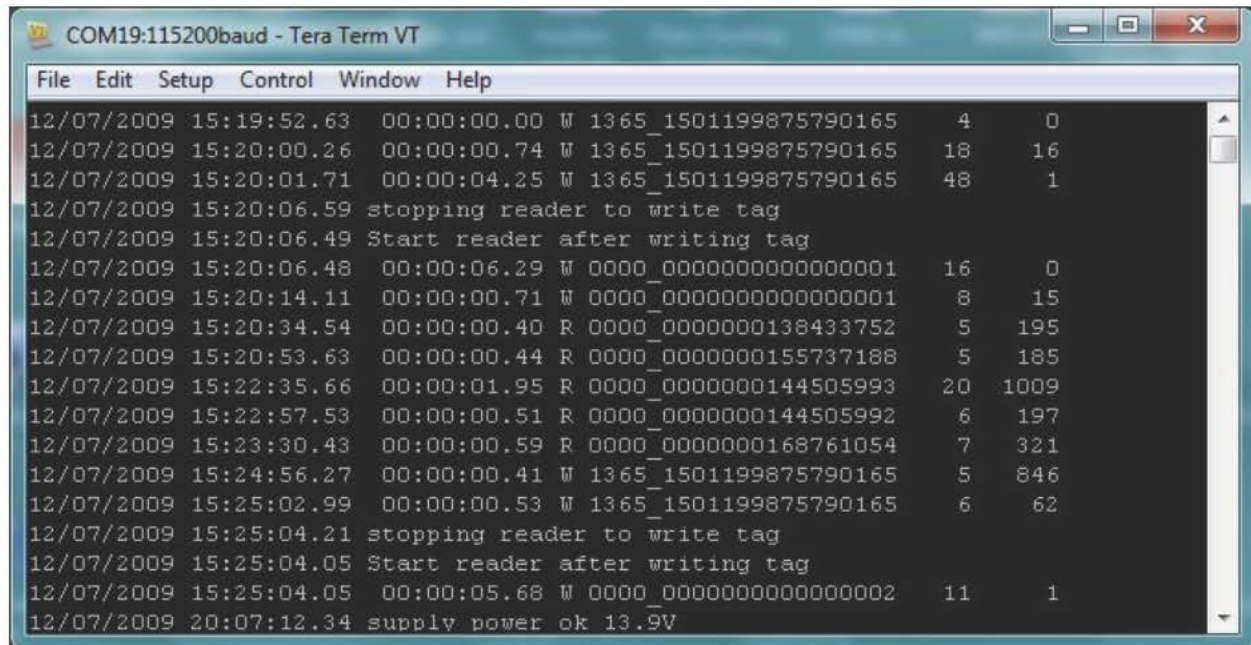
Tera Term is a free program with an interface that is easy to use.



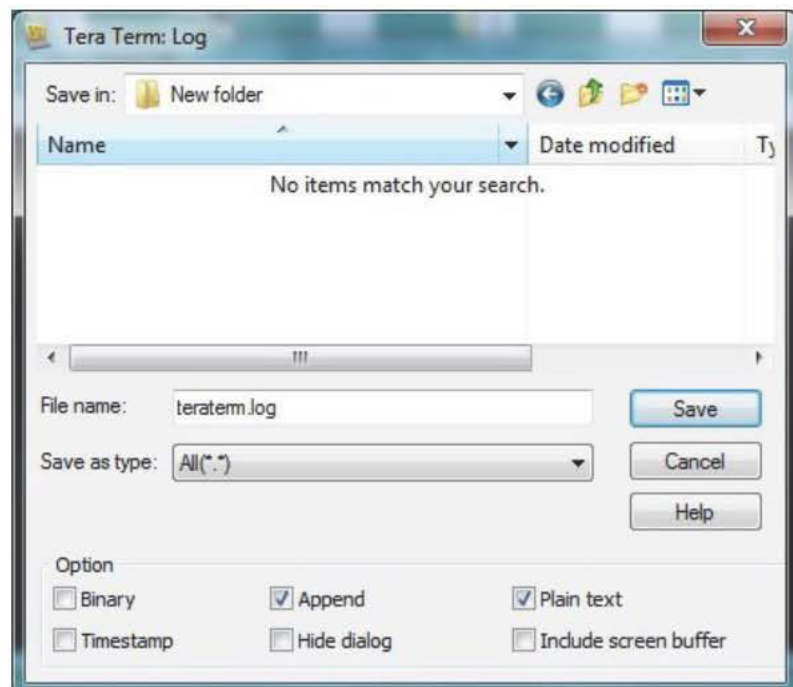
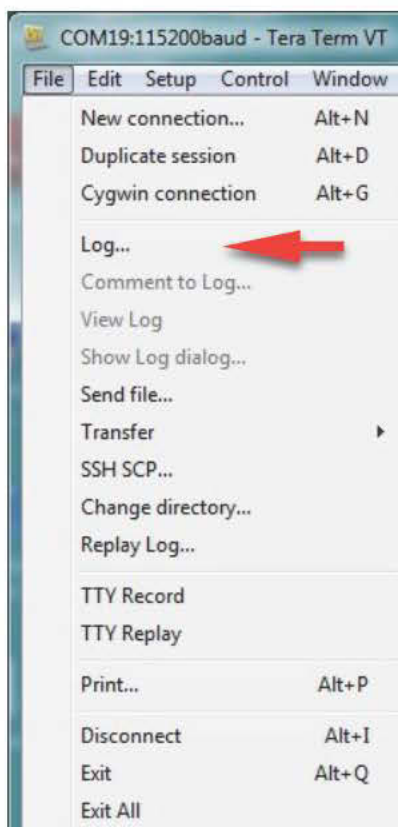
Select Serial and the port



## Using Tera Term for Windows



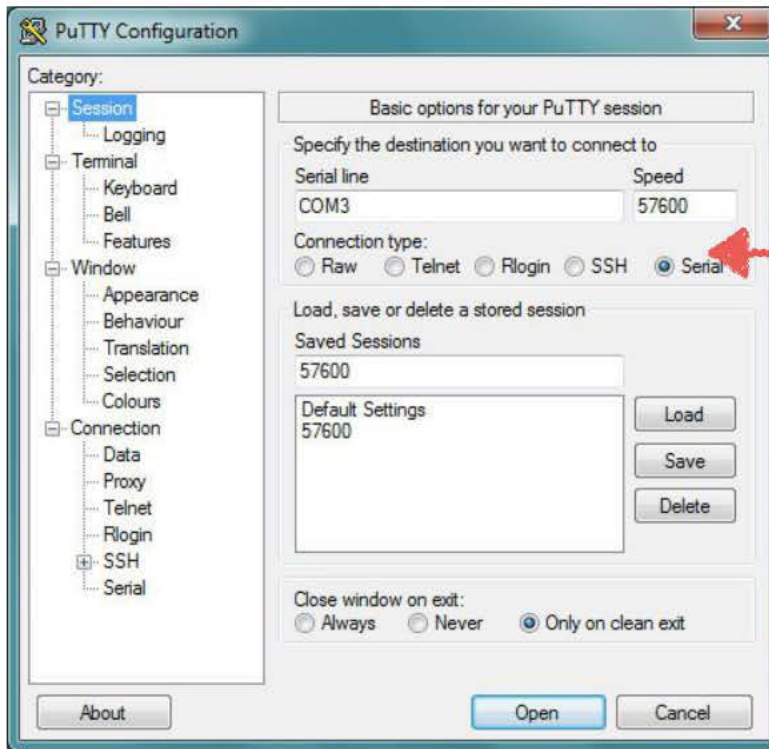
A log file is opened from the menu to save the data sent by the reader.



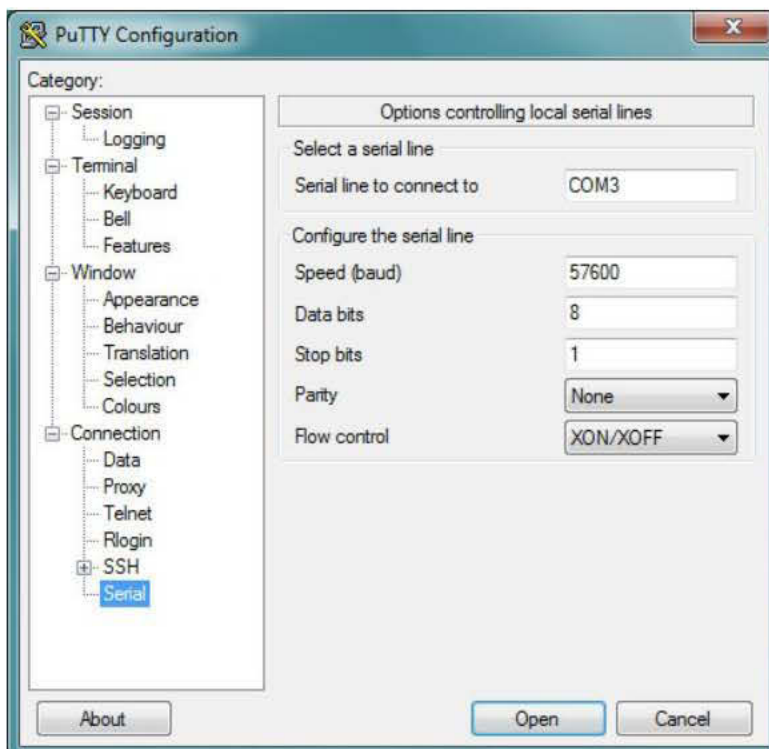


# Using Putty for Vista, Windows 7

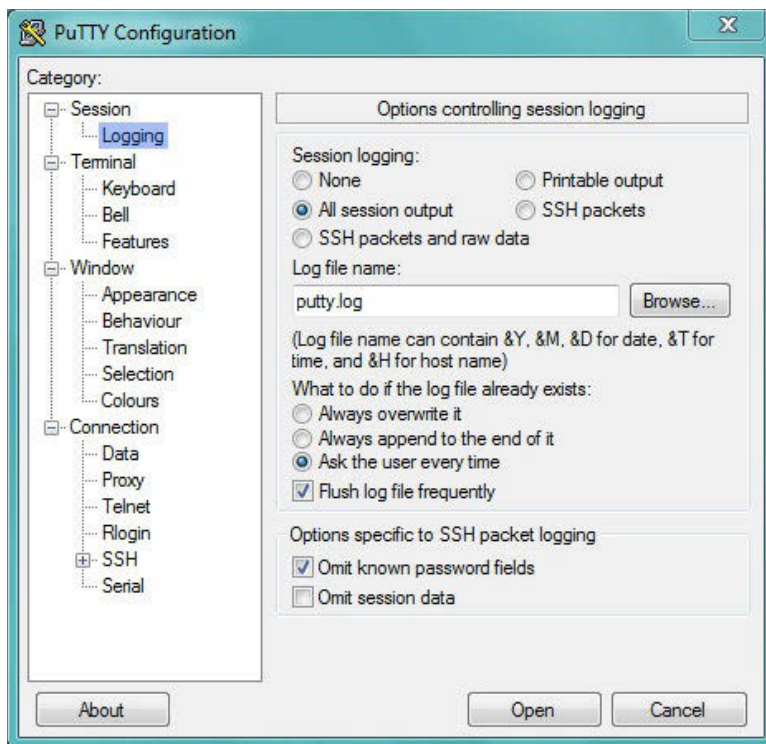
Putty is a free program available from <http://putty.nl>.



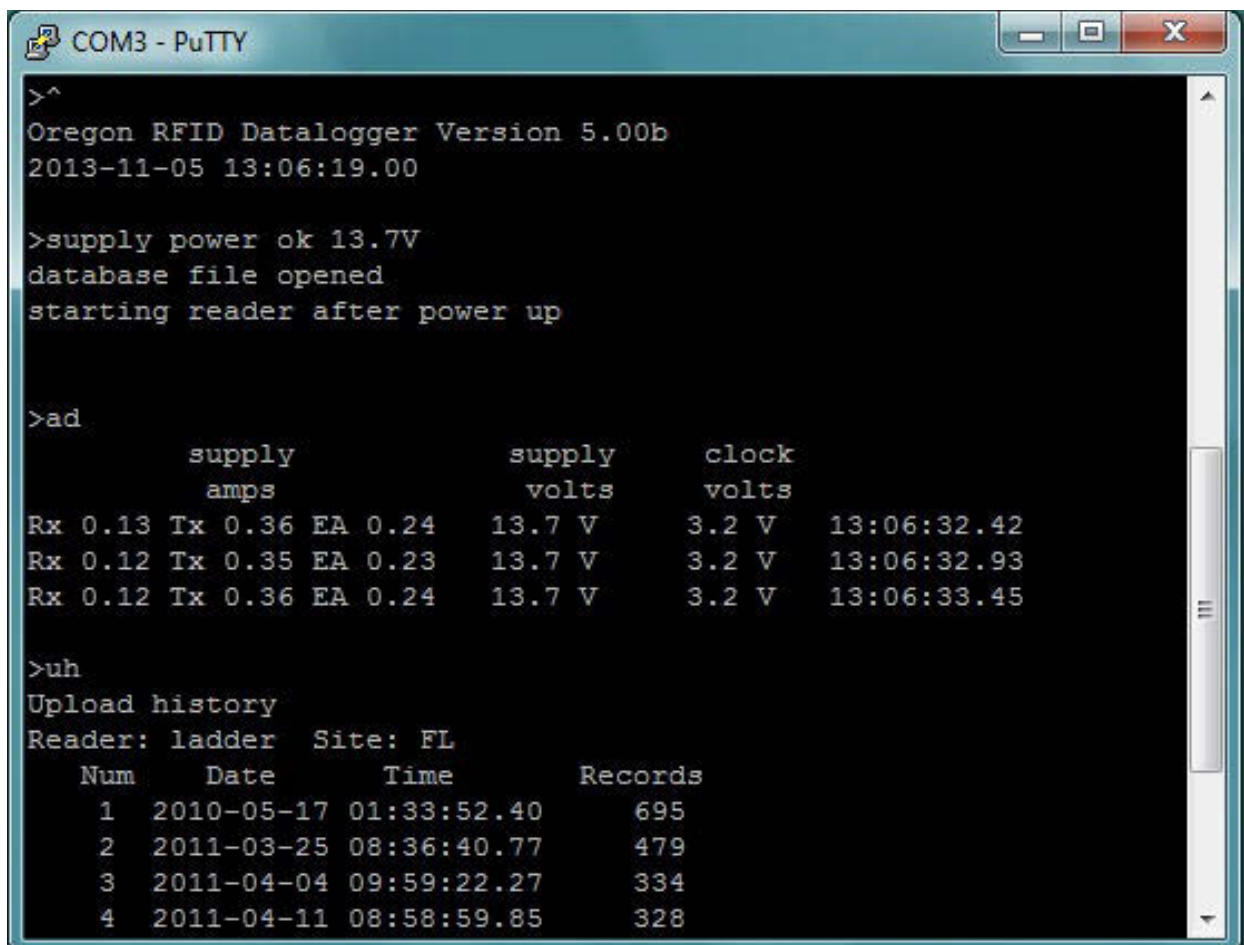
Select Session from the top of the list on the left, then the serial connection type.



Select Serial from the list on the left, then change the settings on the right as shown.



Log files are opened by selecting Logging from the categories and then "All session output" and browse to where you want to save the file.





# Using OSX, Linux or Unix terminal emulator

Macintosh and Linux computers use the screen command to connect to the serial port. The basic syntax is:

```
screen /dev/tty.xxx 57600
```

The second argument of the command is the baud.

The port name /dev/tty.xxx will depend on the host's configuration. A list of device names is displayed with this command:

```
ls /dev/tty.*
```

A screenshot of a terminal window titled "Terminal — bash — 80x24". The window shows the output of the command "ls /dev/tty.\*". The output lists several serial ports: "/dev/tty.AIRcableSMD\_v0-1", "/dev/tty.SerialPort-1", "/dev/tty.Bluetooth-Modem", and "/dev/tty.USA19Hfd113P1.1". The prompt "ORFID\$" is visible at the start of each line. The terminal also shows the command "screen /dev/tty.AIRcableSMD\_v0-1 57600" being entered at the bottom.

```
Terminal — bash — 80x24
Last login: Fri Jan 23 21:24:25 on ttys000
ORFID$ ls /dev/tty.*
/dev/tty.AIRcableSMD_v0-1      /dev/tty.SerialPort-1
/dev/tty.Bluetooth-Modem      /dev/tty.USA19Hfd113P1.1
/dev/tty.Bluetooth-PDA-Sync
ORFID$ screen /dev/tty.AIRcableSMD_v0-1 57600
```

Type the the key sequence <control-a>H to open and close a capture file. Use <control-a>\ to close the port and quit the program.

This is a good reference to all the screen commands:

<http://www.catonmat.net/download/screen.cheat.sheet.pdf>

