

Command Line Interface



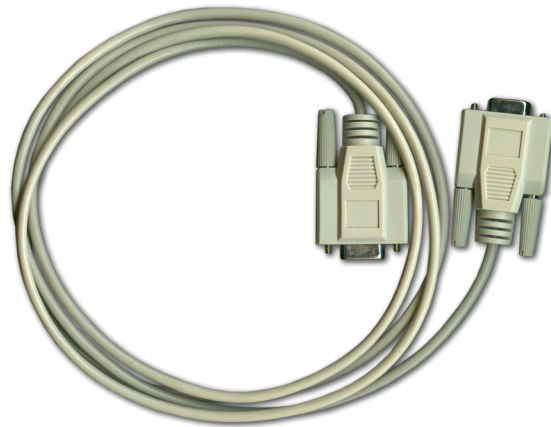
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Command line interface

The Oregon RFID reader can be operated over a serial link using Hyperterminal (WinXP), Putty (Vista or Win7), Terminal (OSX) or other terminal emulator software.

The reader is supplied with a DB9 serial cable (F-F null modem). It plugs into the reader and connects with a computer serial port or a USB-to-Serial adapter.



For machines that have USB ports, a standard USB cable can be used. The software drivers can be downloaded from:

<http://www.ftdichip.com>

In Windows, the virtual serial port driver adds a COMxx: port that uses the PC USB connection. On OSX, Linux and Unix the driver adds a device that can be seen with the “ls /dev/” command.

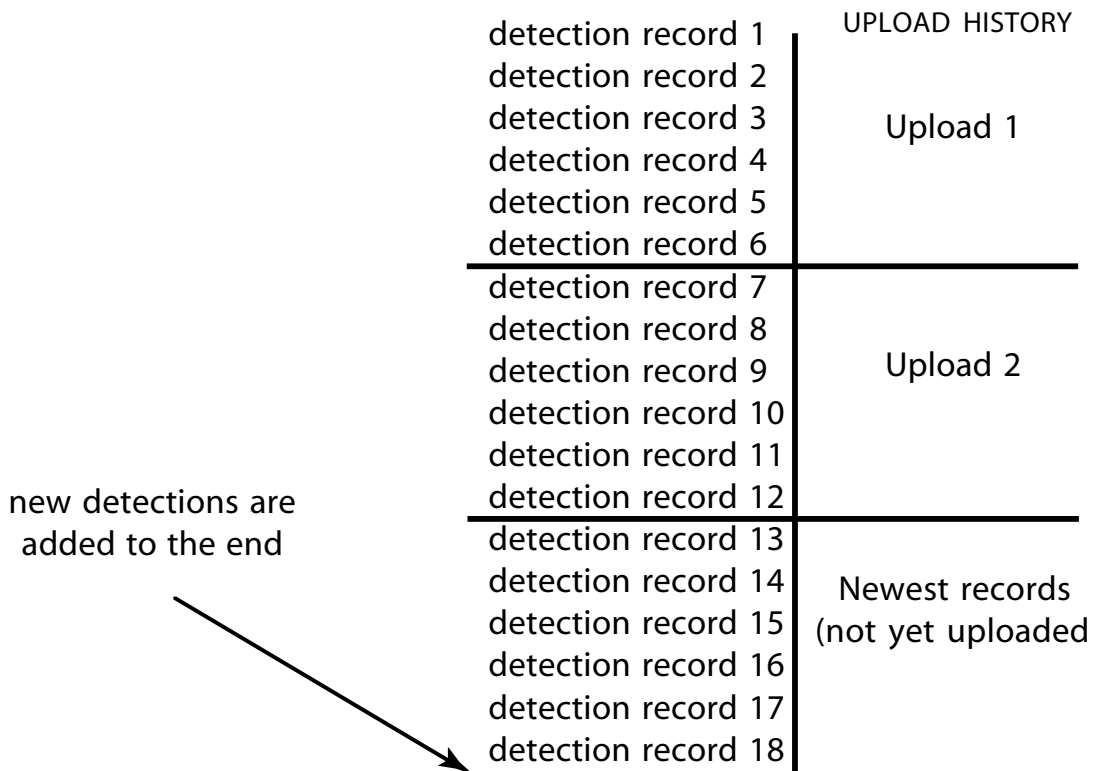
The USB port on the datalogger will disconnect when the reader is turned off.

Introduction

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

Records are stored consecutively and not deleted. When the database reaches the end it wraps around to write over the oldest records. Using a 512MB card there's room for around 8 million records, so this may take a few years.

To organize this chronological list of records, the datalogger keeps a list of **upload histories**. An upload is when the latest records are retrieved from the database. This is recorded in the history list 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.

A list of commands is listed at the end of this manual. A few are described here in detail

Upload Datalog Files

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

```
>UH
Upload history
  num    date      time          numrecs
  1  02/26/2007  22:36:20.99      1
  2  02/26/2007  22:36:20.99      3
  3  02/26/2007  22:39:03.97      1
  4  02/26/2007  22:36:20.99      5
  5  02/26/2007  22:36:20.99      6
  6  02/26/2007  22:42:42.49      1
  7  02/26/2007  22:56:41.61      4
  8  02/26/2007  23:18:25.84      8
NEW 02/28/2007  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.

```
>up
upload 06/14/2008 23:58:09.99      255
----- upload start -----
06/14/2008 23:58:09.99 upload complete
06/14/2008 23:58:44.05 parameter change: mux sequence '1234'
06/14/2008 23:58:46.88 00:00:00.66 R 0000_0000000114023569 A1    3    168
06/14/2008 23:58:49.30 00:00:01.08 R 0000_0000000114023569 A2    4    168
06/14/2008 23:58:52.70 00:00:00.49 R 0000_0000000114023569 A4    3    167
06/15/2008 00:00:41.99 00:00:00.33 R 0000_0000000140626231 A4    2     76
06/15/2008 19:56:48.99 00:00:00.64 R 0000_0000000132145563 A2    3    111
06/15/2008 20:06:47.99 00:00:01.77 R 0000_0000000140626232 A3    5     10
06/15/2008 20:10:40.99 00:00:01.30 R 0000_0000000142620537 A2    4    157
06/15/2008 20:23:31.99 00:00:02.19 R 0000_0000000101569184 A4    6    216
06/15/2008 23:00:36.70 00:00:02.21 R 0000_0000000138421586 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”.

Reader configuration

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
CGD0  display mode: split decimal
```

Single readers are configured with ``CGA0".

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".

```
>MX0
custom mux sequence disabled
>MX1234
>MX121314
```

Scans per second can be displayed with the SS command. One line of values is written each 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.

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 mis-read the tag, causing a new datalogger record. This can result in hundreds or thousands of records to be written which can take a long time to upload.

A maximum scan gap parameter can be specified to define how many scans the tag can be missed and yet be considered one continuous scan.

The following command defines the maximum gap to be 5 scans. As long as a tag is redetected within 5 scans of the last detection, the gap will be ignored.

```
>MG 5
```

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.

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.

Reader 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
```

Real Time Detections

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	02/28/2007	10:56:07.89	00:00:00.00	1	23	
W	0018	0920735923817967	A1	02/28/2007	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	02/28/2007	10:55:55.62	00:00:00.00	1	12	
W	0018	0920735923817967	A1	02/28/2007	10:55:55.62	00:00:00.45	2		
W	0018	0920735923817967	A1	02/28/2007	10:55:55.62	00:00:00.88	3		
W	0018	0920735923817967	A1	02/28/2007	10:55:55.62	00:00:01.32	4		
W	0018	0920735923817967	A1	02/28/2007	10:55:55.62	00:00:01.77	5		
W	0018	0920735923817967	A1	02/28/2007	10:55:55.62	00:00:01.77	5	12	DETECT

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
CGD0 display mode: split decimal
```

Writing Tags

The Write Tag (WR) command is used to write a 16 digit hexadecimal value to a writable 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 “00000000000002A3” 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 date and time

DT

(cr) Show date and time
mm/dd/yyyy hh:mm:ss

Show stored detections

UP

(cr) Send all since last upload
n By upload history list number
-n For nth previous upload
Type control-c to stop

Show stored time records

UT

(cr) Send all since last upload
n By upload history list number
-n For nth previous upload
Type control-c to stop

Show detection upload history list

UH

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

Show scans per second, charge pulse timings

SS

(cr) Average of last few seconds
Runs until any character typed

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)
Dn ID display mode
0=split decimal (manufacturer code plus ID)
1=hexadecimal
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)
0 Clears sequence, uses 1 to number of antennas

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. 15)
Reader restarts when value *d* volts above *v*

Set maximum scan gap size

MG a

(cr) Show current setting
a Enter number of missing scans to ignore

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

Reset datalogger and reader to factory settings

FR

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

Interactive mode with reader serial port

TI

Type control-Z to exit

Enter comments into log file

CO text

Enter one line of text into log file

Appendix 2

Terminal emulators

Configuring Hyperterminal for Windows

Start Hyperterminal and name a new connection.



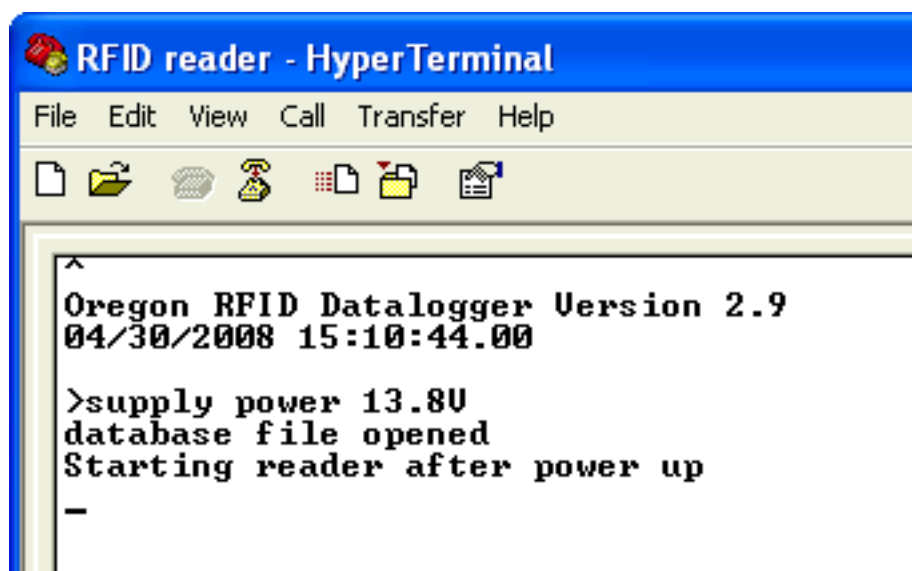
Select the COM port on your computer that the cable is plugged into. This can be a physical serial port or a virtual COM port connected to a USB converter.



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

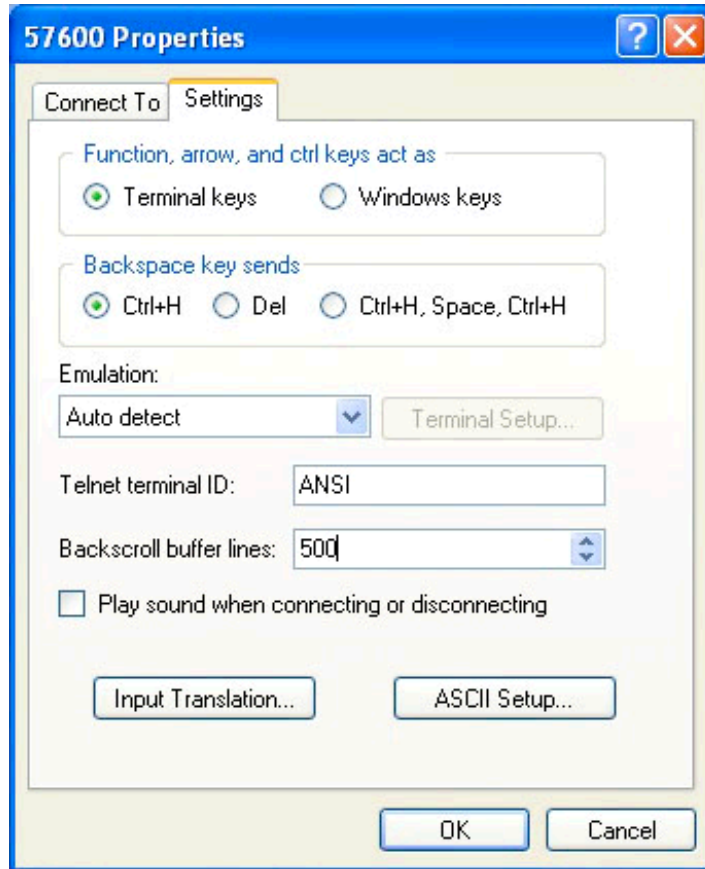


Start the reader and the greeting message will be shown.



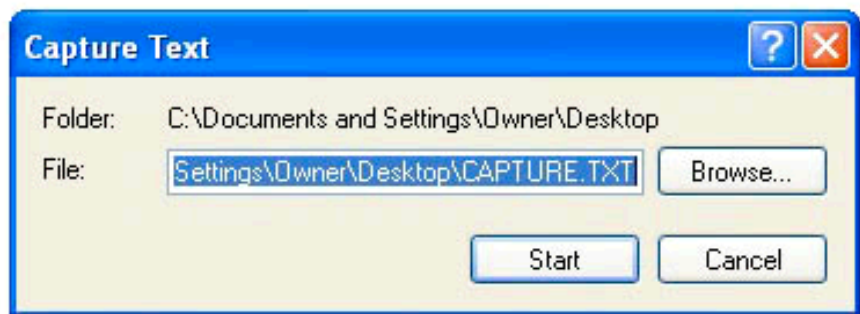
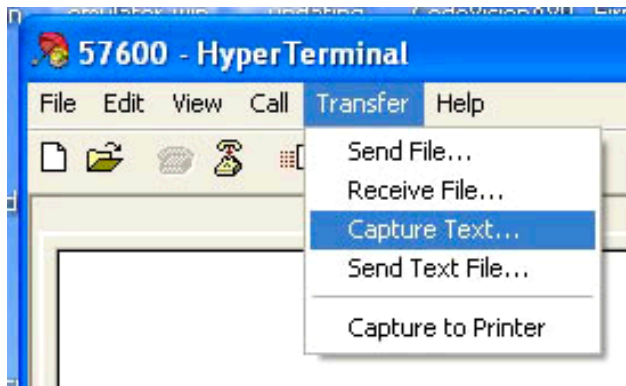
Setting the Backscroll buffer size

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.

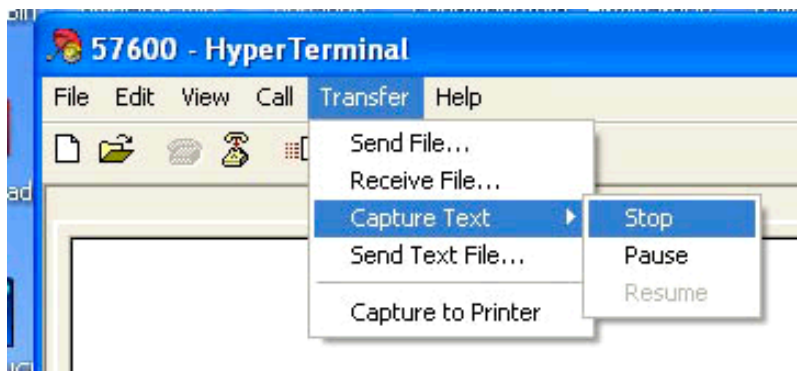


Capturing to a file

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.

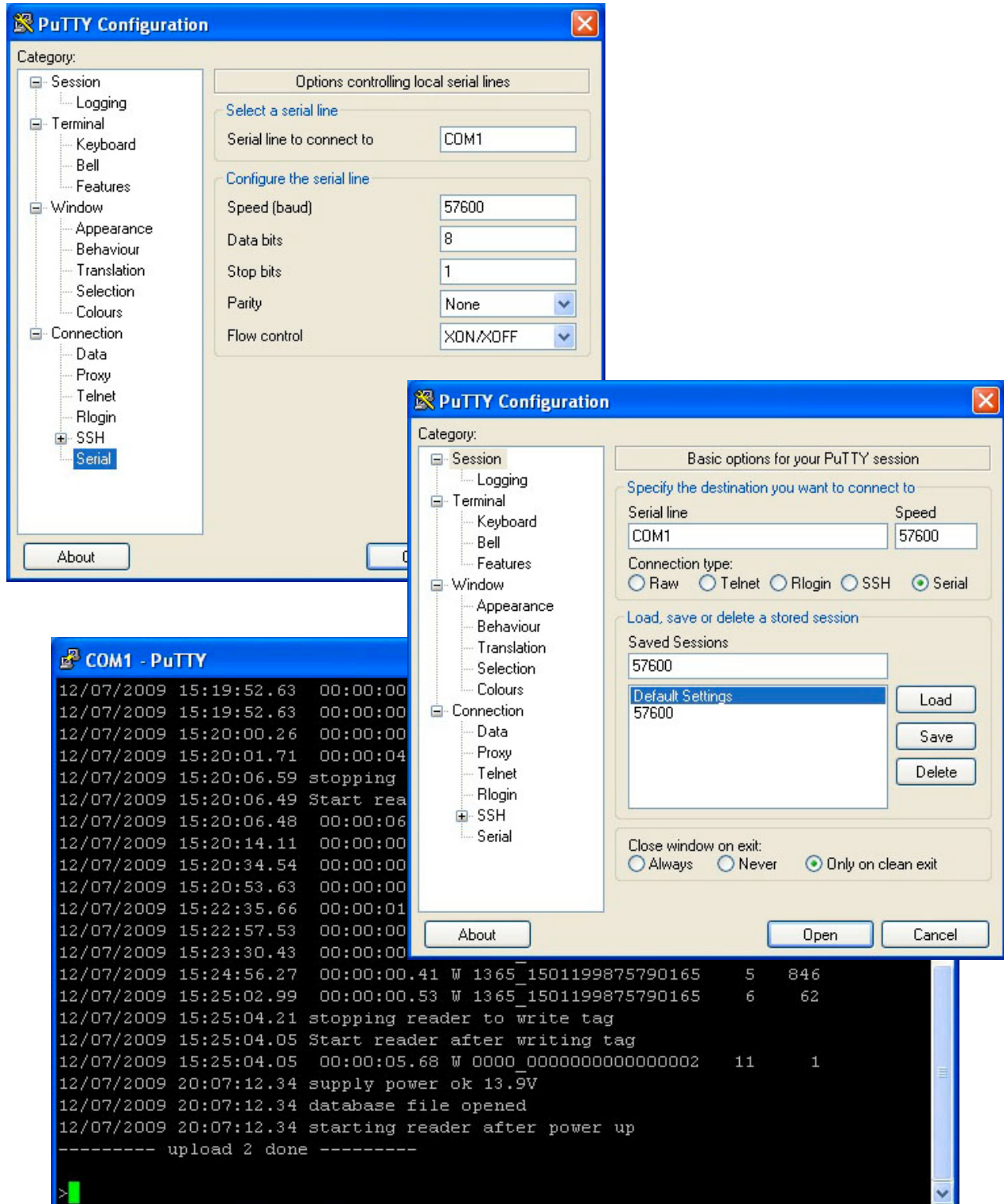


The capture file is closed using the same menu item.



Using Putty for Vista, Windows 7

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



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 following text:

```
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>