PUBLICATION NW4000-60

Issue 1.4

VOYAGE DATA RECORDER

AUTHORITY ACCESS INSTRUCTION MANUAL

NW4000-series VDR & (S)VDR

CONFORMITY STATEMENT

This equipment has been designed to comply with IMO regulations and the relevant IEC Performance Standards.

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Technical details contained in this publication are subject to change without notice.

Amendment Record

When an amendment is incorporated into this publication, the details should be recorded below. Where the equipment has been modified, the modification number shown on the Amendment Instruction Sheet is also to be recorded.

Amendement Nbr	Date	Updated by

Important Notices

HEALTH AND SAFETY

All personnel are required to study these notices and familiarise themselves with all applicable safety precautions and bring them to the attention of others in the vicinity.

HIGH VOLTAGE WARNING

LETHAL HIGH VOLTAGES ARE PRESENT IN THE VOYAGE DATA RECORDER

A current of 100 mA passing through the human body for one second can kill. This can occur at voltages as low as 35V AC or 50V DC. Some equipment in the system uses electrical power that can be lethal. Whenever practical, before carrying out installation, maintenance or repair, personnel involved must:

(1) Isolate the equipment from the electrical supply.
(2) Make tests to verify that the isolation is complete.
(3) Ensure that power cannot be accidentally reconnected.

DO NOT OPEN ANY OF THE UNITS WHEN THE VOYAGE DATA RECORDER IS OPERATIONAL UNLESS FULLY QUALIFIED TO DO SO.

If it is essential to work on the equipment with power connected, work must only be undertaken by qualified personnel who are fully aware of the danger involved and who have taken adequate safety precautions to avoid contact with dangerous voltages.

HEALTH HAZARD

- This equipment contains materials which produce toxic fumes when ignited.

- The inhalation of dust and fumes or any contact with lubricants when cleaning the equipment may be temporarily harmful to health, depending on individual allergic reactions. Components which are broken or overheated may release toxic fumes or dust and must be treated with caution. Do not inhale the fumes and ensure that the dust and debris do not enter open cuts or abrasions. It is prudent to regard all damaged components as being potentially toxic, requiring careful handling and appropriate disposal.

PERSONAL PROTECTION

Personal protection must be used whenever the possibility of an uncontrolled hazard exists. For example, a suitable face visor, gloves and a body apron should be worn when handling cathode ray tubes, as a precaution against injury in the event of breakage.

OBSERVE PRECAUTIONS FOR HANDLING ELECTROSTATIC SENSITIVE DEVICES

CAUTION : Handling of Electrostatic-Sensitive Semiconductor Devices

Certain semiconductor devices used in the equipment are liable to damage due to static voltage. Observe the following precautions when handling these devices in their unterminated state, or sub-units containing these devices:

- Persons removing sub-units from any equipment using these devices must be earthed by a wrist strap and a resistor at the point provided on the equipment.
- Soldering irons used during the repair operations must be low voltage types with earthed tips and isolated from the mains voltage by a double insulated transformer.
- Outer clothing worn must be unable to generate static charges.
- Printed Circuit Boards (PCBs) fitted with these devices must be stored and transported in anti-static bags.

List Of Abbreviations

API	Application Program Interface
ARPA	Automatic Radar Plotting Aid
BCU	Bridge Control Unit
CCTV	Closed Circuit Television
CD ROM	Compact Disk Read Only Memory
COG	Course Over Ground
EBL	Electronic Bearing Line
ECDIS	Electronic Chart Display Information System
EPFS	Electronic Position Fixing System
EPIRB	Emergency Position Indicating Radio Beacon
FSP	Field Service Program
GPS	Global Positioning System
HSS	Hardened Storage Server
IEC	International Electro technical Commission
IMO	International Maritime Organization
INS	Integrated Navigation System
IP	Internet Protocol
LCD	Liquid Crystal Display
LED	Light Emitting Diode
NMEA	National Marine Electronic Association
PC	Personal Computer
PMC	Protective Memory Capsule
PRF	Pulse Repetition Frequency
PSU	Power Supply & Switch Unit
RIP	Radar Interlay Processor
ROM	Read Only Memory
ROV	Remotely Operated Vehicle
SINAD	Signal to Noise And Distortion
SNTP	Standard Time Network Protocol
SOG	Speed Over Ground
SOLAS	Safety Of Life At Sea
STW	Speed Through Water
TFTP	Text File Transfer Protocol
ULB	Underwater Locator Beacon
UPS	Uninterruptible Power Supply
USB	Universal Serial Bus
UTC	Universal Time Constant
VCR	Video Cassette Recorder
VDR	Voyage Data Recorder
VESA	Video Electronics Standards Association
VHF	Very High Frequency
VRM	Variable Range Marker
WAM	WaveNet Adaptor Module
WIM	WaveNet Interface Module

List Of Specifications

IEC 61996:1999 Shipborne Voyage Data Recorder - Performance requirements – methods of testing and required test results.

IEC PAS 61996-2 Part 2: (2005-07) Simplified voyage data recorder (S-VDR) – Performance requirements – Methods of testing and required test results

IMO A.658(16): Use and fitting of retro-reflective materials on life-saving appliances

IMO A.662(16): Performance standards for float-free release and activation arrangements for emergency radio equipment

IMO A.694(17): General requirements for shipborne radio equipment forming part of the Global Maritime Distress and Safety System (GMDSS) and for electronic navigational aids

IMO A.810(19): Performance standards for float-free satellite emergency position-indicating radio beacons (EPIRBs) operating on 406 MHz

IMO A.830(19):1995, Code on alarms and indicators

IMO A.861(20): Performance standards for shipborne voyage data recorders (VDRs)

IMO MSC.81(70): Testing of life-saving appliances

IMO MSC.163(78): Performance standards for shipborne simplified voyage data recorders(S-VDR).

Eurocae: ED56A – Minimum operational performance specification (MOPS) for cockpit voice recorder system

VESA:1996, Video electronics standards association – Discrete monitor timings standard 1.0, Revision 0.7 (DMTS)

SAE AS8045:1988, Engineering society for advancing mobility land, sea, air, and space – Minimum performance standard for underwater locating devices – Acoustic-self-powered

IEC 60068-2-27:1987, Environmental testing – Part 2: Tests – Test Ea and guidance: Shock

IEC 60268:1998, Sound system equipment – Part 16: Objective rating of speech intelligibility by speech transmission index

IEC 60936-1:1999, Maritime navigation and radiocommunication equipment and systems – Radar – Part 1: Shipborne radar – Performance requirements – Methods of testing and required test results

IEC 60936-3: Maritime navigation and radiocommunication equipment and systems – Radar – Part 3: Shipborne radar with chart facilities – Methods of testing and required test results

IEC 60945:2002, Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results

IEC 61097-2: 2002, Global maritime distress and safety system (GMDSS) – Part 2: COSPAS SARSAT EPIRB – Satellite emergency position-indicating radio beacon operating on 406 MHz – Operational and performance requirements, methods of testing and required test results

IEC 61097-7:1996, Global maritime distress and safety system (GMDSS) – Part 7: Shipborne VHF radiotelephone transmitter and receiver – Operational and performance requirements, methods of testing and required test results

IEC 61162 (all parts), Maritime navigation and radiocommunication equipment and systems – Digital interfaces

IEC 61260:Electroacoustics – Octave-band and fractional-octave-band filters

IEC 61672 (all parts), Electroacoustics – Sound level meters

IEC 61993-2, Maritime navigation and radiocommunication equipment and systems – Automatic identification systems (AIS) – Part 2: Class A shipborne equipment of the universal automatic identification systems (AIS) – Operational and performance requirements, methods of test and required test results

VESA: 1996 Video electronics standards association - Discrete monitor timings standard 1.0, Revision 0.7 (DMTS)

1.0 Introduction

The Voyage Data Recorder (furthermore referred to as VDR), records the outputs from sensors (connected external equipment) and ultimately passes the data to a protective capsule for storage.

This data is stored for a rolling 12 hour minimum period so that in the event of an accident the capsule can be recovered and an analysis of the events leading up to the incident may be conducted.

All available data is recorded until ship's power to the VDR fails, and from then only selected data (bridge audio) is recorded for a further two hours after which recording stops automatically.

The following data is recorded when the system is deployed as an S-VDR;

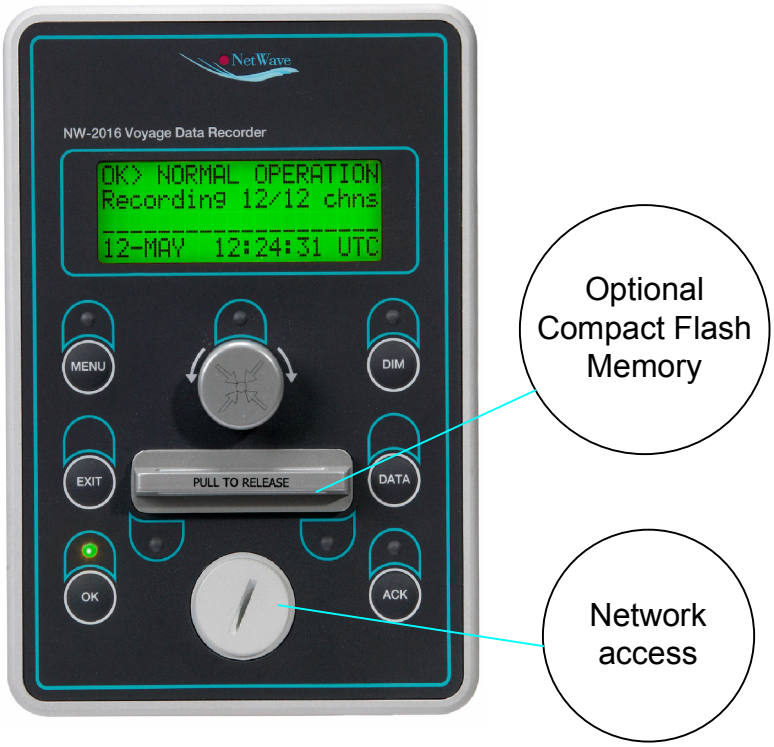
- Date and time from a source external to the ship, e.g. GPS
- Ship's position from a designated electronic positioning system, e.g. GPS
- Speed through the water and/or over the ground longitudinal and transverse from the Log
- Heading from the ship's designated compass
- Bridge audio via the VDR microphones.
- Communications audio from a designated VHF.
- Displayed video image from a single designated X or S band radar display, or – alternatively – an AIS in the event a radar interface possibility is not feasible.
- Depth under keel from the echo sounder.

Additionally recording of the following data is required when the system is deployed as a VDR:

- Mandatory main alarms.
- Rudder order and response.
- Engine order and response.
- Status of watertight doors as mandated by the IMO.
- Wind speed and direction, relative or absolute.
- Hull stress monitoring data, where such a system is fitted.

This manual provides information on how to have access to the recorded data.

2.0 Access to the VDR via the Bridge Control Unit



2. 1 Obtaining network connection with the VDR

The BCU is a console mountable display & control unit and is the primary user-interaction device. The BCU also serves to monitor the status of the VDR and functions as the primary alarm unit.

An alphanumeric display, together with pushbuttons and LED indication is provided on the front of the BCU to allow easy access and control of specific user-functions.

Additionally the BCU provides an RJ-45 user-access Ethernet port to be connected to a (laptop/notebook) PC for VDR system access (service and maintenance) as well as data retrieval of recorded data.

The PSU also has an independent data-switch incorporated, reason for which a laptop computer may also be connected to the network ports provided.

By means of the Ethernet cable (with two male RJ-45 jacks), connect a Laptop Computer or PC to the Ethernet port in the BCU by opening the round access hole with a coin.

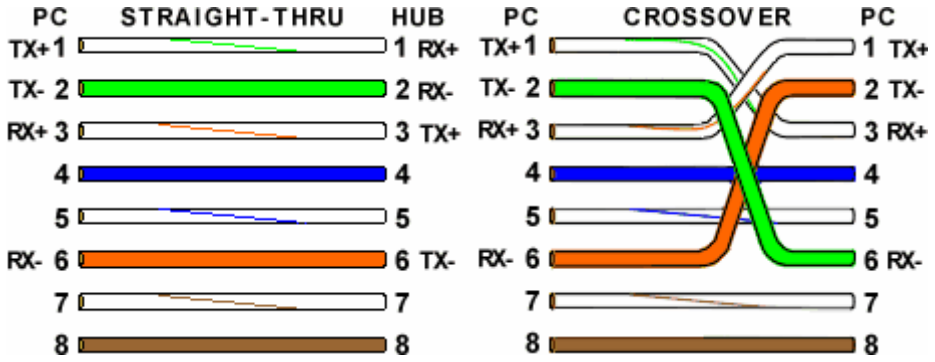
Alternatively; by means of the Ethernet cable (with two male RJ-45 jacks), connect a Laptop Computer or PC to the Ethernet NET8 port in the PSU.

2.2 Network cabling

The VDR's Ethernet ports are auto-sensing and you should not have to change your Ethernet cable, however, if you encounter problems obtaining access to the VDR server, check the following:

a. the Ethernet cable between the PC(Laptop, notebook computer) and the BCU or PSU should be a standard, ready made patch-type cable to overcome potential straight-thru vs. crossover Ethernet cabling issues. Change the cable if required.

- A straight-thru cable has identical ends.
- A crossover cable has different ends.
- A straight-thru is used as a patch cord in Ethernet connections.
- A crossover is used to connect two Ethernet devices without a hub or for connecting two hubs.
- A crossover has one end with the Orange set of wires switched with the Green set.
- Odd numbered pins are always striped, even numbered pins are always solid coloured.
- Looking at the RJ-45 with the clip facing away from you, Brown is always on the right, and pin 1 is on the left.
- No more than 1/2" of the Ethernet cable should be untwisted otherwise it will be susceptible to crosstalk.



b. if connected to the BCU (Ethernet), check that the BCU is connected to the PSU and that the BCU is functioning properly when the VDR is powered up by the BCU showing the acquisition of an IP-adress in the range 192.2.168.xx and the BCU screen showing functional messages .

c. if the BCU is not connected properly or dysfunctional, connect to the Ethernet port [NET8] provided at the PSU, this port's functionality is similar to the port provided on the BCU until the problem is resolved.

d. Check and correct your computer's LAN settings to be supporting the TCP/IP protocol (as normally used for Internet access)

e. Make sure the pc/laptop does not have a fixed IP-adress by checking the properties in the TCP/IP settings. (please refer to section 9.1 of the NW-4000 Ships and Operator Manual to change IP settings in your PC/laptop)

2.3 Obtaining access to the VDR

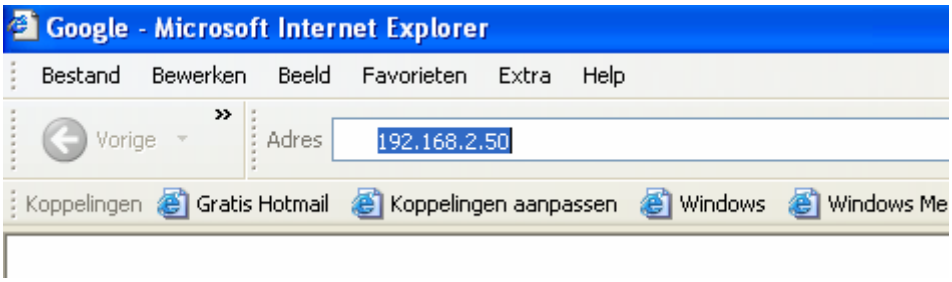
General

The VDR contains a unique IP-address thru which it may be contacted.

Internet Protocol (IP) Addresses are numerical codes that are used to identify the unique address of each host (device, in this case the VDR) that's attached to the Internet or, in some cases like with the VDR, a local area network (LAN) that support the Internet Protocol. In some cases, IP addresses are assigned on a dynamic basis (each time a computer connects to the network, it is assigned a new address).

At the PC, open the browser utility (Internet Explorer, Mozilla Firefox, etc.) and in the address-bar of the browser, enter the IP-address of the NetWave VDR system and press “Enter.

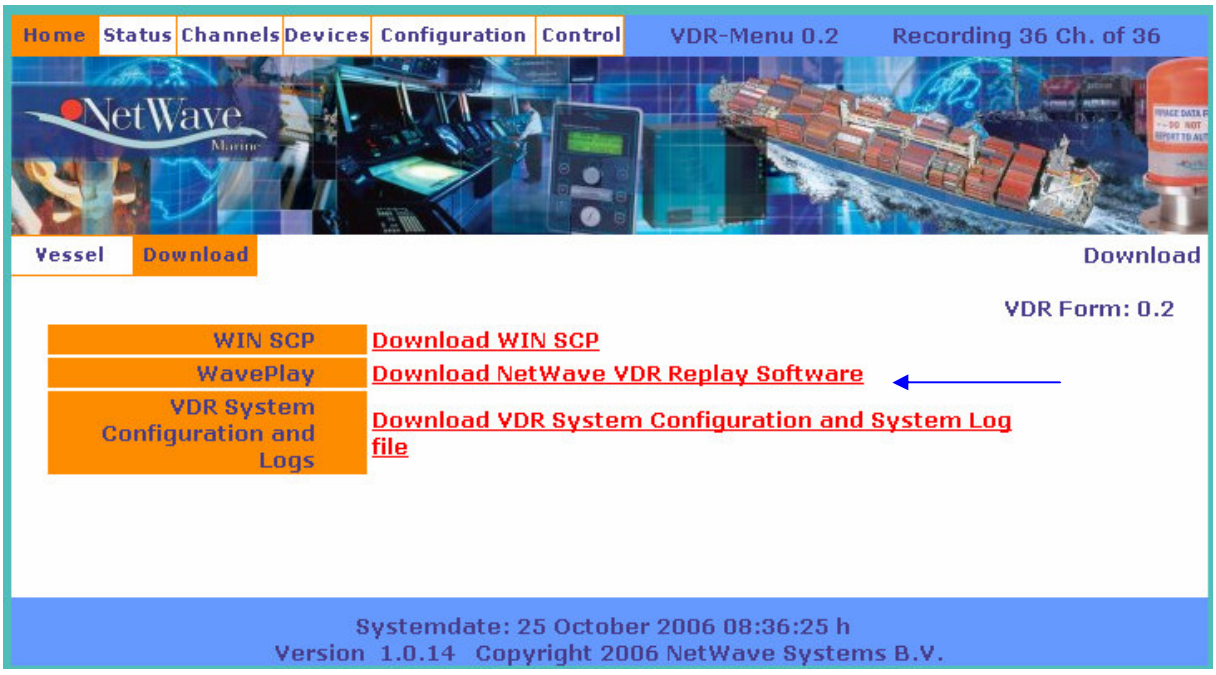
192.168.2.50



You will arrive at Form 0.0, the ‘HOME-page” of the VDR

3. 0 Downloading WavePlay replay software

Refer to the Page Home>Download



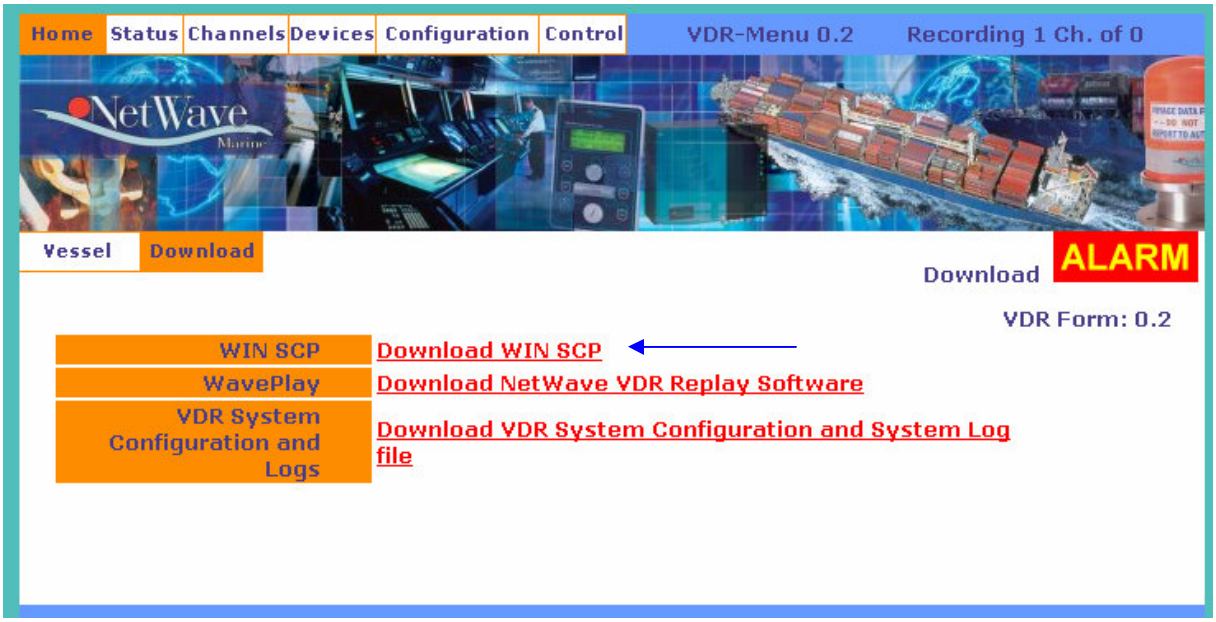
Choose to “Download NetWave VDR Replay software”

Execute the file, the software will install automatically on the connected PC/laptop.

4.0 Downloading data from the VDR

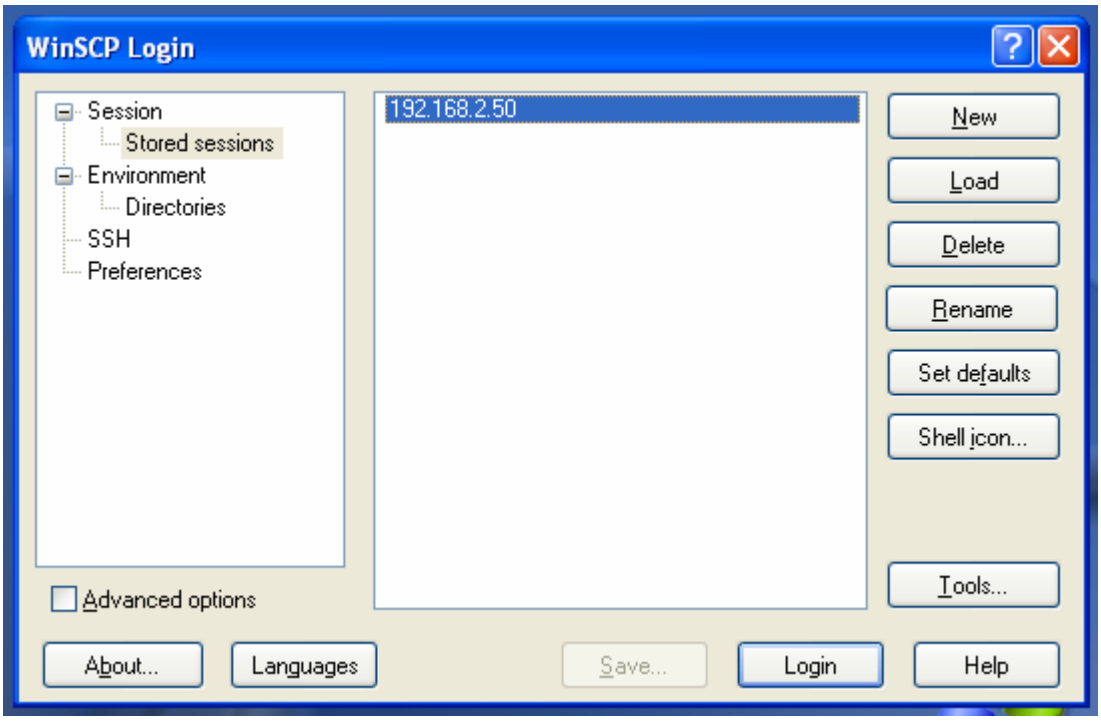
Before you can do any Replay activities, you need to transfer the data from the VDR onto the PC/laptop.

To download recorded data from the VDR, you need to use an installable program called “WinSCP” which is also to be downloaded from the HOME>DOWNLOAD page.

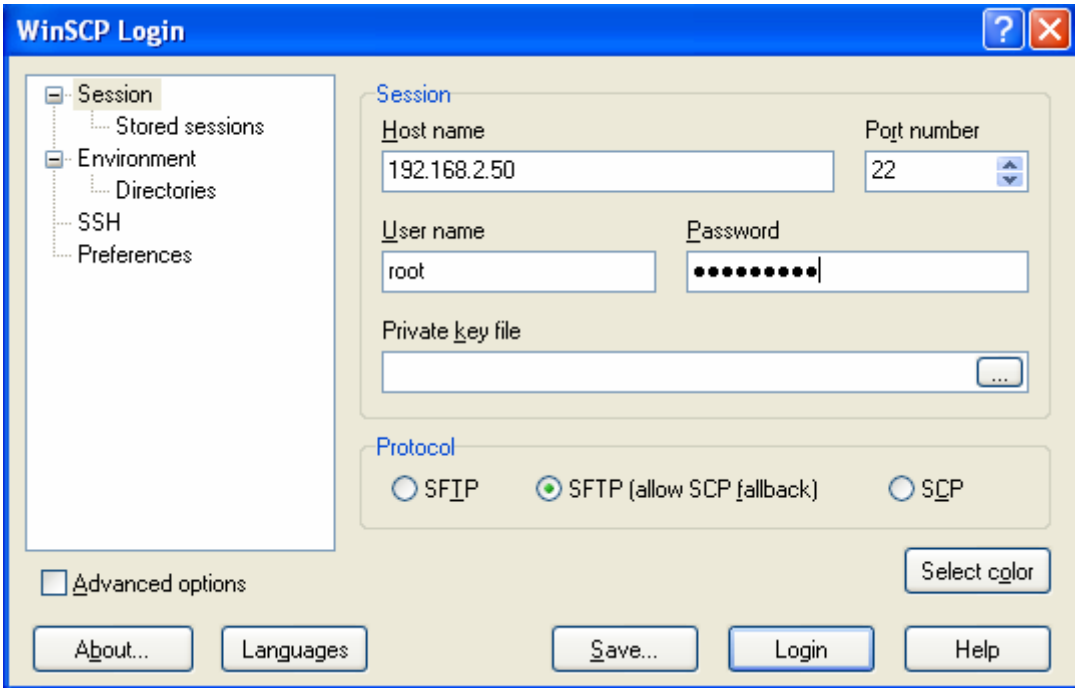


Download and execute this program by choosing “Download WIN SCP” from the HOME>DOWNLOAD page.

Run the program and you will arrive at the login screen (as shown below)



If you use this program for the first time, Select “New”” and you will arrive on the following screen:



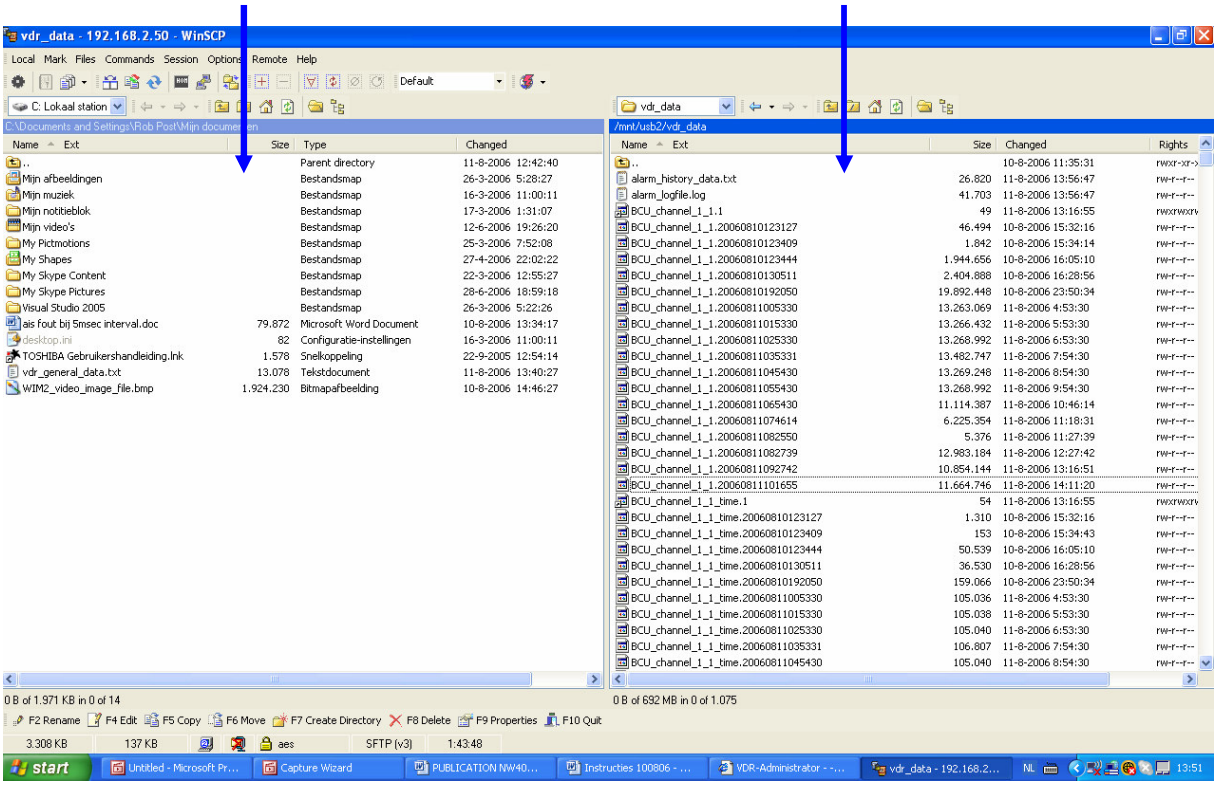
In the field “Host name”, enter the (VDR) IP address: 192.168.2.50 and provide the

User name: root
Password: nwstorage

Select “SFTP (allow SCP fallback)” as Protocol and press “Login”

You will arrive in the VDR data storage directories, which are visible on the following screen;

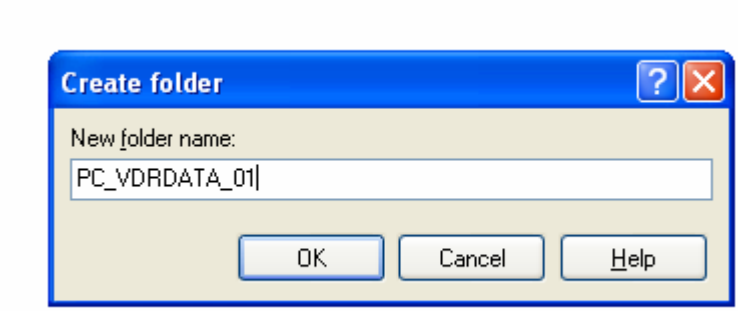
PC-side VDR-side



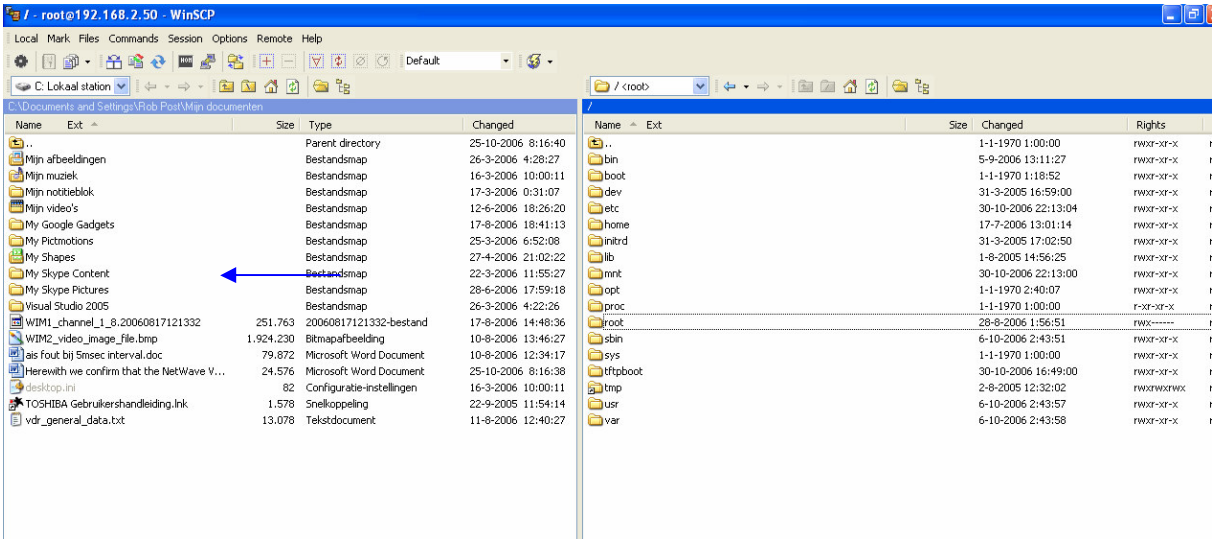
The left hand side of the screen represents your local (PC)directory, the right hand side shows the data and directory structure on the VDR.

Select the left hand side (where you see your PC’s subdirectories) by mouse-clicking anywhere into this area, and prepare a dedicated subdirectory where you will store the recorded VDR files by pressing (function-key) F7.

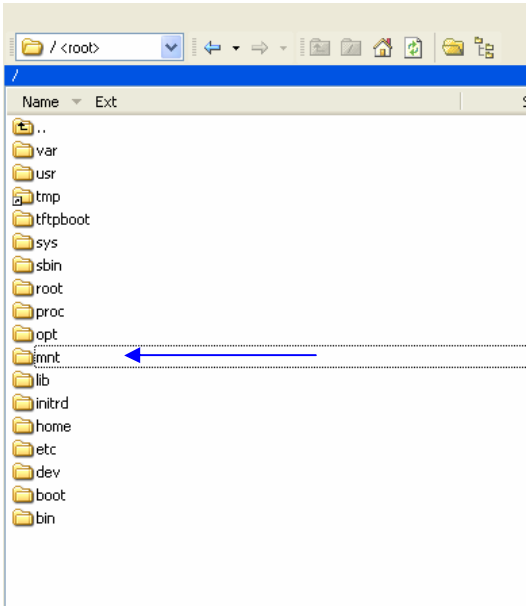
An example name could be “PC_VDRDATA_01”

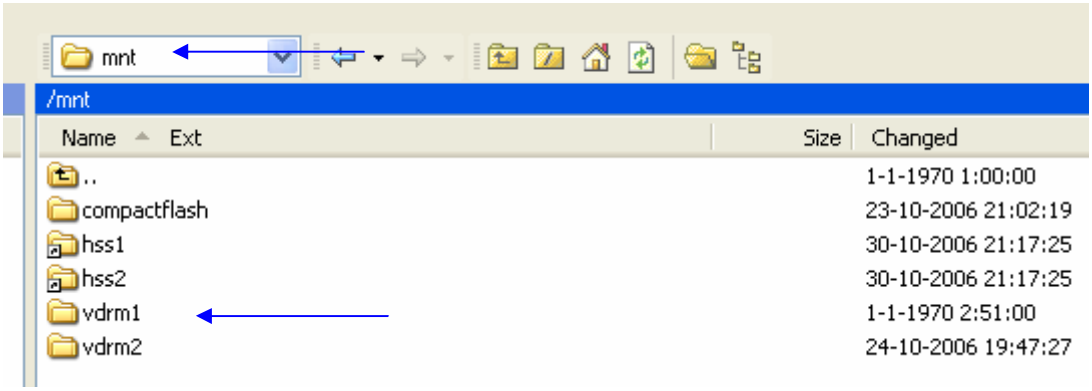


On your PC, you should now be able to see these directories.



On the (right hand) VDR screen, now select the primairy data volume which is stored in the subdirectory: **/root/mnt/vdrm1/vdr_data** by double-clicking with the mouse on the directory structure.

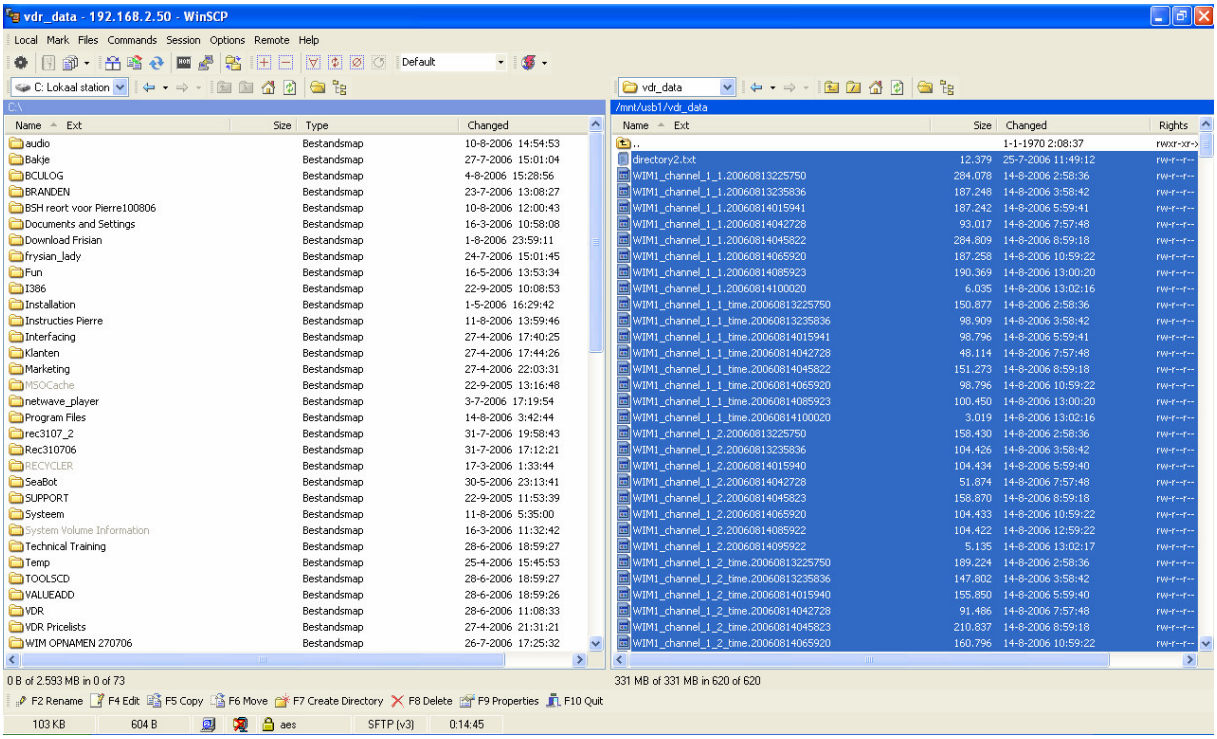




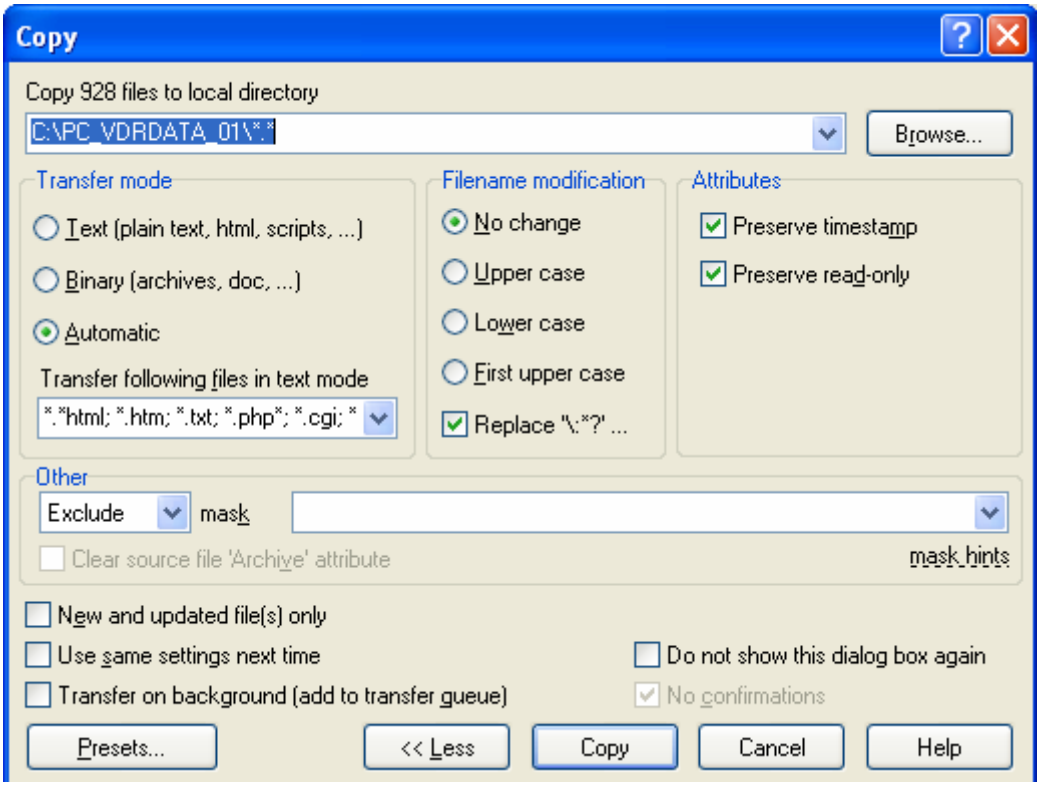
NB. You will repeat this process on the secondary data volume called **/root/mnt/vdrm2/vdr_data** later.

Once you arrive into in the subdirectory **mnt/vdrm1/vdr_data**, select **all** files at the right hand side of the screen and drag them to the left hand portion of the screen, into the new subdirectory you have created, to copy them to your local PC.

You may select **all** files from the Menu Bar by choosing Mark and Select Files



Drag all selected files (now in blue color) into the subdirectory you have created to store the VDR Data on your PC. The following screen will open, and you must select Copy to start this process.



Once the copying process, which may take up to 60 minutes, depending upon the data volume (number and characteristics of channels recorded) within the capsule is finished, you will continue by repeating these steps with the secondary volume called **/root/mnt/vdrm2/vdr_data.**

Copy this volume into the same subdirectory on the PC.
(the example: PC_VDRDATA_01)

Once you have finished both the primairy **(/root/mnt/vdrm1vdr_data)** and secondairy data volume **(/root/mnt/vdrm2/vdr_data)** from the capsule onto the PC you may start to review the data with the WavePlay replay software.

Refer to the Manual NW-4000-50 “WavePlay – VDR replay software User Manual”