

Instruction Manual Rosendahl bonsaiLAN

bonsaiLAN is a Gigabit Ethernet Module for the Rosendahl bonsaiDRIVE video and audio multitrack harddisk recorder.



ROSENDAHL

www.bonsaidrive.com



Declaration of Conformity

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herewith confirms that the product:
Type: Harddisk Video Recorder
Model: bonsaiDRIVE

meets the requirements of the council of the European communities relating to electromagnetic compatibility (Council Directive 89/336/EEC)

Technical Data: CENELEC EN 55 103-1 + 2 1997-06
CENELEC EN 61000-4 - 5 12/2001

The CE symbol is awarded to high-quality appliances which comply with the European Directive 89/336/EEC or the EMVG (law relating to electromagnetic compatibility of appliances) and which offer the following significant benefits:

- *Simultaneous and interference-free operation of adjoining appliances
- *No unpermitted interference signals
- *High resistance to electro-smog



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Household users should contact either the retailer where they purchased this product or their local government office for details of where and how they can take this item for environmentally safe recycling.

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Contents

1. Ethernet	page	4
2. IP Address	page	6
3. FTP	page	9
4. Quick Time	page	12
4. Menu Settings	page	14

1. Ethernet

A computer network connection consists of several layers, where the first or lowest layer is called the physical layer. The ethernet standard (IEEE 802.3) defines the physical connection as well as the basic framing of a computer network.

The bonsaiLAN module provides a 1000BASE-T Gigabit Ethernet port and must consequently be connected with CAT-5 cables to a computer or switch which also supports 1000BASE-T Gigabit Ethernet.

A "switch" is a unit with multiple ethernet ports which is used to connect several ethernet ports together to a network.

CAT-5 is a standard which specifies ethernet cables.

10 or 100BASE-T Ethernet modes are not supported by the bonsaiLAN module.

Make sure the cables you are using conform to the CAT-5 standard and your computer or switch also supports the 1000BASE-T Gigabit Ethernet standard.

Note: Cable length for the 1000BASE-T standard is limited to a maximum of 100 metres.

Most ethernet switches indicate valid connections and activity using several LEDs.

A computer shows the status of the ethernet network adapters in the properties of the adapters. When you connect the bonsaiLAN port to a switch or computer a valid 1000BASE-T connection must be indicated just after a few seconds. See MENU 040 "LAN STATUS".

The physical connection must always appear independent of further software settings regarding IP, TCP protocols.

Ethernet data transmission is organised in so called frames. The standard maximum size for ethernet frames is 1500 bytes per frame. For faster data transmission an extended frame size of up to 9000 bytes per frame, so called jumbo frames, has been established.

The used switches and ethernet cards must support these jumbo frames to achieve sufficient transfer rates for uncompressed video.

We made good experience with the INTEL PRO/1000GT Desktop Ethernet Adapter featuring Intel 82541PI Gigabit Controller.

In the advanced settings of your ethernet card you should configure jumbo frames and also offloading of RX and TX checksum calculations when available.

It is possible to connect your bonsaiLAN port direct to a computer without a switch or crossover cable because the bonsaiLAN module supports automatic crossover and polarity correction.

Each bonsaiLAN module gets its individual ethernet MAC address assigned automatically according to the serial number of the bonsaiDRIVE in which the module is installed. The MAC address is fixed and can not be changed by the user.

2. IP Address

On top of the physical ethernet layer follows a software layer called IP (internet protocol).

IP is used to address individual members or groups inside a computer network.

Each computer in a local network must have its own, unique IP address.

Two computers with the same IP address within a local network will cause a network collision.

An IP address consists of four bytes (w.x.y.z), each in the range from 0 to 255. The first two bytes (w.x) are typically 172.16 or 192.168 indicating private nets, followed by a constant (100 for example) and the numbers 0..255 addressing the individual computers inside the network.

The IP addresses 255.255.255.255 and 0.0.0.0 are reserved and must not be used.

All computers inside a LAN (local area network) must have a common part of the IP address and an individual part of the address. Therefore a so called subnet mask defines the common part of the address (a value of 255 masks the whole byte).

Example 1:

Your computer network connection has been configured manually to the IP address 192.168.100.10 with the subnet address 255.255.255.0.

All other computers in this LAN now also must use the common (masked) address part 192.168.100 (w.x.y).

The lowest byte of the address in this example 10 (z) is then the individual, unique IP address part of your computer network adapter.

If you want to connect a bonsaiLAN port to that computer you must set the IP address also to 192.168.100 together with an individual low

byte which can be set to any value except 10, because this is already used by the computer. In our Example we set the bonsaidrive to 192.168.100.20.

To configure the bonsaiLAN IP address select MENU 041 to 044 "LAN IP ADDRESS" to set the four IP address bytes (w.x.y.z) using the +/- keys.

Note: Network settings in MENU 040 and following are only displayed when a bonsaiLAN module is installed.

On a windows computer you can configure the IP address manually as follows:

1. Click Start, click Control Panel, click Network and Internet Connections, and then click Network Connections.
2. Right-click the network connection that you want to configure, and then click Properties.
3. On the General tab (for a local area connection click Internet Protocol (TCP/IP)), and then click Properties.
4. Click use the following IP address and set the IP address (in our example to 192.168.100.10) and the subnet mask typically to 255.255.255.0

If your computer is set to "Obtain an IP address automatically" it receives its IP address from a so called DHCP server which assigns IP addresses automatically. In most cases this is handled by a DSL router.

To get the currently used IP address and subnet mask you must go to Start , then Run , and type in CMD. In the CMD window type in ipconfig and press enter.

When using a DHCP server you must set the bonsaiLAN IP address according to the DHCP address range and the used subnet mask as described already in example 1. Make sure that the individual IP address part (typically byte z) is outside of the DHCP range.

To avoid IP conflicts we recommend to set IP addresses in your LAN manually and not to use DHCP servers.

On a MAC computer running OSX you must click System Preferences, click Network and select show: Ethernet. On the TCP/IP tab you can configure Ipv4 = Manually and then the IP Address and Subnet Mask. Press the Apply Now button to execute your new settings.

On the Ethernet tab set Configure: Manually, Speed: Autoselect and Maximum Packet Size: Jumbo (9000). Apply now.

3. FTP

The standardised **F**ile **T**ransfer **P**rotocol is used to transfer files from the bonsaiLAN module and a computer.

A FTP connection consists of a FTP server and a FTP client. The bonsaiLAN module is a FTP server and the computer acts as FTP client.

FTP client programs are available as freeware for all operating systems. We recommend to use a freeware program called cyberduck www.cyberduck.ch for Apple OSX operating systems and the FTP Commander or Smart FTP for Windows.

Even the Windows Explorer works as an FTP client (just type in the address line <ftp://192.168.100.10> in our example), but unfortunately with a file size limitation of maximum 4Gbytes which is only 4 minutes of uncompressed QuickTime video.

To get access to your bonsaiDRIVE with a FTP client program you must set up a new connection with the IP address of your bonsaiDRIVE. Most programs name this entry field Server or Host.

Type in the IP address with dots between the four bytes. In our example 1 is this 192.168.100.20

In addition to the IP address you must specify the TCP port of the control connection which is predefined port 21 for FTP. Most programs show this already as default.

FTP requires a login procedure at the start of each connection. The bonsaiLAN module accepts only anonymous logins, password is ignored.

Set the user to anonymous without password. On most programs you can just mark "anonymous" mode, alternative you have to type in the user name "anonymous" without a password.

FTP differs active and passive modes to open a data port. The bonsaiLAN FTP server supports both methods.

When you have configured your connection please connect to the bonsaiLAN FTP server.

A list of quicktime files of all clips recorded on your bonsaiDRIVE with filesize as uncompressed quicktime movie will appear. Since the bonsaiDRIVE does not have a realtime clock as a computer it is not possible to timestamp recordings. Therefore all files are shown with the default date (01.01.2008).

To copy a file from the bonsaiDRIVE and your computer, some FTP client programs allow just “drag & drop,” others use two directory windows with move buttons in-between.

The bonsaiLAN module works completely independently and can upload or download QuickTime files while the bonsaiDRIVE is recording or playing back the same or any other clip on the shared harddisk.

The bonsaiDRIVE playback or record process thereby has a higher priority to ensure the machine behaves exactly the same as without simultaneous file import/ export.

So if you are using the bonsaiDRIVE in operation modes which require high disk performance (as fast forward for example) this can slow down the file transfer process which shares the harddisk of course.

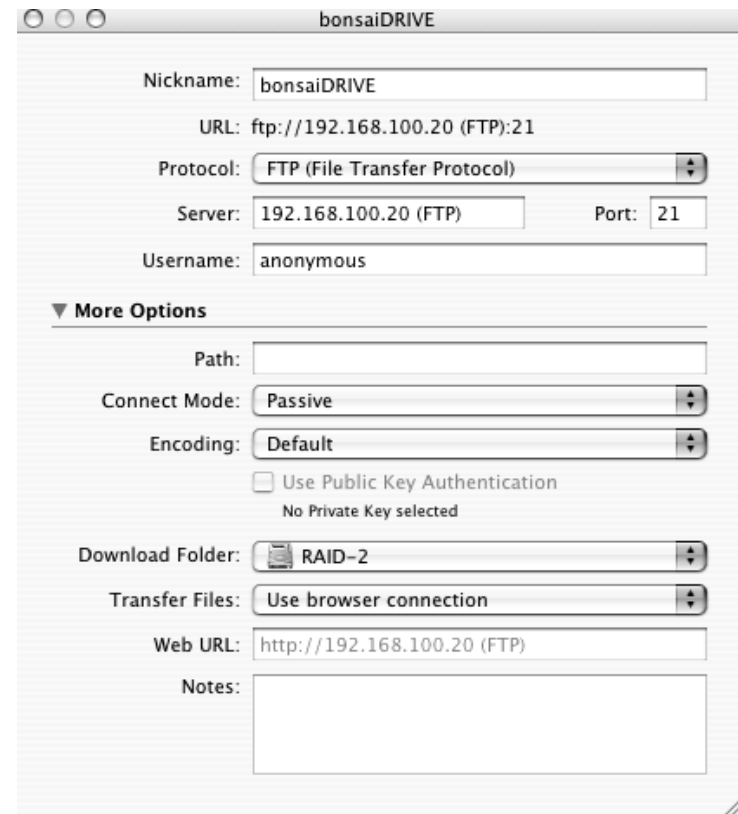
Simultaneous standard play operation will not much speed down the file transfer process.

Because of these limited capabilities of the harddisk the bonsaiLAN module does simultaneously allow only one user in the network to get access to the FTP server.

Some FTP client programs try to open a second control connection (like a second user) when you start a file transfer which is not possible with the bonsaiLAN server.

Therefore you have to configure the cyberduck program for example to “Use browser connection” instead of “Open new connection”.

Example 2: configure a new connection in cyberduck



4. Quicktime

Quicktime is a multimedia architecture developed by Apple and is available for MAC and Windows operating systems.

You can download the free QuickTime player software for MAC OSX or Windows at <http://www.apple.com/quicktime/>

Several video and audio codecs are available for QuickTime and are installed as so called QuickTime Components.

To convert QuickTime movies into other formats you need to buy the QuickTime PRO version for around USD 30,--. Some professional video editing systems are based on the QuickTime API and include a PRO license already.

The bonsaiDRIVE is an 8-bit uncompressed video machine and the bonsaiLAN module exports accordingly Uncompressed 8-bit 4:2:2 QuickTime files together with 24 bit PCM audio.

To import QuickTime files into the bonsaiDRIVE the video format must also be Uncompressed 8-bit and uncompressed 16 or 24 bit PCM audio @ 48kHz. Size for PAL video is fixed to 720 x 576 and 720 x 486 pixels for NTSC.

When you have installed a SDI video card on your computer the Uncompressed 8-bit Quicktime Codec Component will have been installed together with the drivers of the card. Otherwise you can get this Apple Codecs provided from several manufacturers as free download.

Just google 2vuy download to get the uncompressed-8bit Codec for Mac OSX or Windows.

2vuy is the codec identifier used in the header. 2Vuy is a manufacturer modified version and should not be used.

A Quicktime movie file consists of a movie header (MOOV) and the movie data (MDAT) where the header describes the structure and the

format of the movie and the movie data contains the raw audio and video data segments.

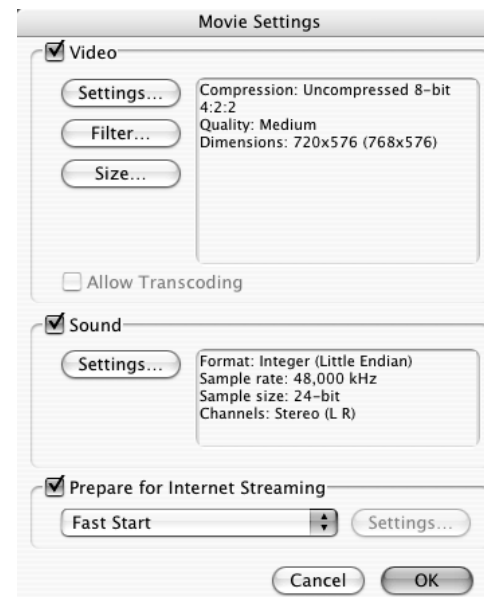
The bonsaiLAN module expects the quicktime header at the beginning of the quicktime file.

Therefore when you export a quicktime movie file using quicktime PRO you must enable "Prepare for Internet Streaming" to create a file with the movie header at the beginning of the file.

Otherwise you can open a Quicktime movie in Quicktime PRO and save as separated Reference File, which is just the movie header inside a small file.

Now you can transfer this Reference File to the bonsaiLAN module first and then the large original movie file.

Menu 040 "LAN STATUS" indicates the expected movie file after uploading a reference file. "WAITING FOR DATA FILE..."



In summary: Files you want to import using bonsaiLAN must fulfil the following conditions:

- Video codec is Uncompressed 8-bit 4:2:2 format (2uvy)
- Audio codec is 16 or 24 bit PCM audio, big or little endian
- Leading Quicktime header, prepared for internet streaming or combined with a Reference File
- Picture size of 720 x 576 for PAL or 720 x 486 pixels for NTSC

5. MENU Settings

The menu appearing on screen can be activated by pressing the [MENU] key. The menus can be navigated by using the [▶] and [◀] buttons and parameters changed by using the [+] and [-] buttons

Network settings in MENU 040 and higher are only displayed when a bonsaiLAN module is installed.

Each time your bonsaiDRIVE boots up the serial number, current firmware version and detected SDI and bonsaiLAN options will be displayed. BonsaiLAN is indicated as OPTION 2: ETHERNET.

MENU 040 LAN STATUS

The status of the bonsaiLAN module is shown in menu 040. Valid Ethernet and FTP connections as well as the progress of up/downloads are shown.

First line shows Ethernet status:

ETHERNET NOT CONNECTED or ETHERNET 1000BASE-T

Second line indicates FTP status:

FTP CLIENT NOT CONNECTED or FTP CLIENT CONNECTED

Lines 3 and 4 indicate the last FTP event:

PROCESSING HEADER, UPLOADIND, DOWNLOADING, TRANSFER COMPLETED, TRANSFER ABORTED, WAITING FOR DATA FILE, NO VALID QT-FILE, NO LEADING QT-HEADER....

MENU 041..044 IP ADDRESS

MENU 041, 042, 043 and 044 allows you to configure the IP address of your bonsaiLAN module.

Use the +/- keys to set bytes w.x.y and z accordingly in menus 41, 42, 43 and 44. During a file transfer a change of the IP address will be ignored until finishing of the process.

MENU 045 LAN EXPORT FORMAT

bonsaiDRIVE clips can be exported through the bonsaiLAN module as uncompressed 8-bit QuickTime movies with 2, 4, 8 or 10 channels of 24 bit PCM audio. Select the according pair or block of audio channels you want to export in menu 45.

In addition you can select the native bonsaiDRIVE format which provides raw bonsaiDRIVE AV data in form of a QuickTime movie. This can not be played back in QuickTime without a respective bonsaiDRIVE QuickTime codec, but can be imported by other bonsaiDRIVEs. This gives you the possibility to speed up the effective transfer rates by the use of the LOSSLESS or LOW-RES compression. With LOW-RES material this can achieve up to 6 times of real time play speed.

(Note: bonsai native format is not implemented in the first bonsaiLAN firmware versions).

Rosendahl Studioteknik will public the used compression method and file structure to allow the implementation of a bonsaiDRIVE QuickTime codec.

MENU 046 LAN EXPORT ASPECT

PAL (or NTSC) video signals have always the same resolution of 720 x 576 pixels (720 x 486 for NTSC). But it is possible to use this same pixel resolution also to display 16:9 formats which is called anamorphic PAL.

Most video monitor can be configured to display PAL or NTSC video signals also as 16:9.

When you export an uncompressed PAL or NTSC movie to QuickTime you can also define the desired display mode in the QuickTime header.

Menu 046 lets you select 4:3 or 16:9 display modes.

MENU 047 LAN IMPORT FORMAT

As described in the QuickTime chapter of this manual all files which are transferred to the bonsaiLAN module must comply with the QuickTime uncompressed codec as well as the QuickTime header position.

Independent of this the bonsaiDRIVE itself can store the received video in two quality levels which are LOSSLESS or LOW-RES causing different disk space consumption.

See also bonsaiDRIVE Instruction Manual MENU 018 VIDEO RECORD FORMAT page 32 for more informations about the two bonsaiDRIVE quality levels.

MENU 045 allows you to select the bonsaiDRIVE import format for file imports independent of the RECORD FORMAT in MENU 018 which sets the format for local recordings separately.

If the QuickTime movie you import has just 2 tracks of audio it will be allocated to the bonsaiDRIVE 2TRK audio as well as to channels 1-2 of the bonsaiDRIVE 8TRK audio section. Accordingly a four, six or eight track movie will create a copy of the first two channels on the 2TRK section.

Ten QuickTime audio channels are assigned to 8TRK 1-8 and channel 9-10 to the 2TRK section.

MENU 048 IMPORT FIELD DOMINANCE

PAL and NTSC are interlaced video standards and each frame consists of two fields. Quicktime stores only complete frames where the two fields are "mixed" alternating in the odd and even lines.

NTSC defines the lower field (even lines) and PAL the upper field (odd lines) as temporary first field (default setting).

In some situations it can be necessary to swap the fields temporary. For example when you convert a PAL DV video to uncompressed it becomes lower field dominant (in the DV compression standard PAL field dominance has been defined wrong and has never been corrected to keep it downward compatible to already existing DV equipment).

Also 480 lines NTSC signals (standard is 486 lines) are sometimes upper field dominant.

A wrong field dominance creates extremely flickering video and will be detected by any viewer immediately.

MENU 049 CAPTURE WHILE RECORD

When you start a CRASH recording on the bonsaiDRIVE it is possible to upload the new created clip already while it is still recording. Therefore it is necessary to predefine the duration of the recording. Set the duration in menu 049 to the expected length.

A LIST (refresh directory) command initiated by the FTP client program will then indicate REC_clip_xxx, where xxx is the currently recording clip number. Now you can download this clip to your computer simultaneously when you are recording to the bonsaiDRIVE's internal disk.

The CRASH recording is not stopped automatically when the selected duration is reached. The duration setting affects only the length of the QuickTime file which is downloaded during record.

When you stop a CRASH recording before the duration has been reached the file transfer will be stopped as well and the QuickTime movie will be without video and audio data from that position on. The downloaded file can still be used until the point where the recording has been stopped manually.

It is recommended not to stop the recording until the selected duration has been reached to avoid producing uncompleted QuickTime files.

