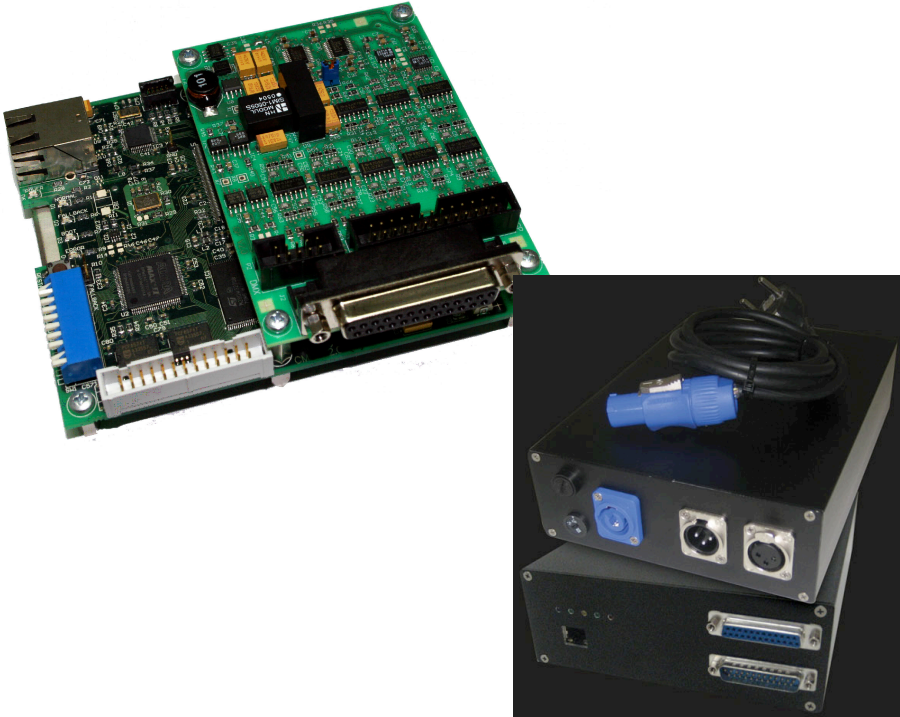


PHOENIX-Net Interface®
Ethernet Output Board with ILDA-, TTL- & DMX Connection

Operation Manual



Current Release: 01. January, 2010

This unit is an optionally available output interface for the PHOENIX Showcontroller software package

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1 General

The PHOENIX Net output board allows the control of ILDA compatible lasershow projectors using a variety of show software via a network connection. Even the parallel operation of PHOENIX-LIVE and PHOENIX-PRO is possible.

Thus it does not require the fitting of plug-in cards into the PC and notebooks can be used for the replay of lasershow, too.

The network medium allows long distance data transmission.

Using the TCP/IP protocols allows the adoption to all operating systems.

The universally applicable driver DLL with an openly documented API makes it possible to access the board with your own show software.

The board features an ILDA standard data link with symmetrical outputs.

1.1 Features

- IEEE 802.3u 100BASE-TX Full Duplex Ethernet Interface
- Supports TCP/IP protocol and UDP
- Supports Auto MDI/MDIX
- Supports Auto-IP (APIPA) and DHCP
- Supports UPnP
- High Performance System on Chip with a 32 bit CPU
- 32 Megabyte RAM on board
- Maximum frame size 16,000 pixels
- Dual frame buffer for uninterrupted shows
- Jitter-free playing for optimal, highly stable output
- X/Y outputs 14 bit, totally 260 millions image coordinates
- 6 colour outputs and Intensity each 8 bits, 16 millions colour variants
- Switchable colour signal level 5 V / 10 V
- Output speed up to 150,000 picture points per second (150K pps)
- 16-bit Digital Out (3,3V logic)
- Fixed IP address adjustable with DIP-switch (16 device addresses and 2 sub networks)
- Variable IP-address via web interface adjustable as required.
- Easy power supply 9 – 12 V DC /400 mA with reverse polarity protection
- ILDA standard data link fully symmetrical
- Up to 10 PHOENIX Net cards can be operated simultaneously with one PC
- DMX support for 512 channels input and output potential-free
- Firmware updates possible via network
- Ready for integrated Subpoint-Colorshifting in the microsecond region
- Integrated SD-card slot for standalone player functions
- Art-Net in and out for DMX and TTL
- DMX, Art-Net and TTL Routing in/out

Important:

PHOENIX Net supports **one** output channel for **one** laser projector.

Several projectors can be simultaneously connected to the ILDA connecting plug and play the **same** content of the show (e.g. so-called satellites).

In the case that **several projectors** shall display **different contents** (channels) of a show edition further PHOENIX Net-cards are required, each of them receiving its own output content (channel). Furthermore the software licence has to be capable to support several output devices (output channels). (PHOENIX-LIVE and PHOENIX PROplus – but not PHOENIX PRO)

2 Getting started

Only use controlled voltage sources as power supply for the device.

The device tolerates voltages between 8 and 14 Volt at ca. 500 mA. The variants with a frame can be operated with 90 – 250 V. (Please pay attention to the switchable supply voltage!) It is recommended to use power supplies that are non-sensitive against mains power failures or to operate them at power outlets with an integrated mains filter. For an increased operation stability you should use a high quality CAT5 cable. Inadequate cables might negatively influence the operation stability of hardware and software. When operating within a wireless network you should pay attention to a very good and uninterruptible network communication. In case of doubt you should preferably use a cable connection.

The cards should be operated in a separate network for the lasershow operation and not together with other network users that might put load on the transmission bandwidth. If there are other PCs or devices within the same network this might lead to dropouts or jerking.

Due to the fact that the interface acts as a network device no installation is required. PHOENIX automatically detects the cards connected to the network. Afterwards they can be easily assigned to the timelines in the scanner mapping.

2.1 Handling instructions for the board version (OEM version)

If the device is used as an open board version (OEM), we expressly point out that it is a sensitive object that might be damaged by electrostatic discharge or other external influences. The board might also be damaged by external voltage, wrong wiring or manipulation. Hence you should pay special attention to the handling, the correct connection and the correct mounting into your own constructional systems. The device is operating at a very low voltage of only 3,3 Volt and 1,2 Volt internally. Over-voltage might quickly destroy the sensitive elements.

The manufacturer expressly rejects any warranty claims if the damages can be traced back to incorrect handling or incorrect operation!

2.2 Step by Step Set up of PHOENIX Net (manual IP address)

In principle the PHOENIX-Net interface features two possibilities for setting an IP address. Fixed IP, set by DIP switch or variable IP address, set by the web interface. Additionally there is the possibility of Auto-IP (DHCP). It is up to the user, which one he selects. We recommend the fixed IP setting by DIP switch for fixed installations in which the user is not permitted to make any changes. The web interface might be changed at any time even by users not knowing what they are doing - whereby the further operation possibly cannot be ensured.

The Setting for a fixed DIP switch IP:

The PC must feature a network card with 100 Mbit (100BASE-TX) or faster.

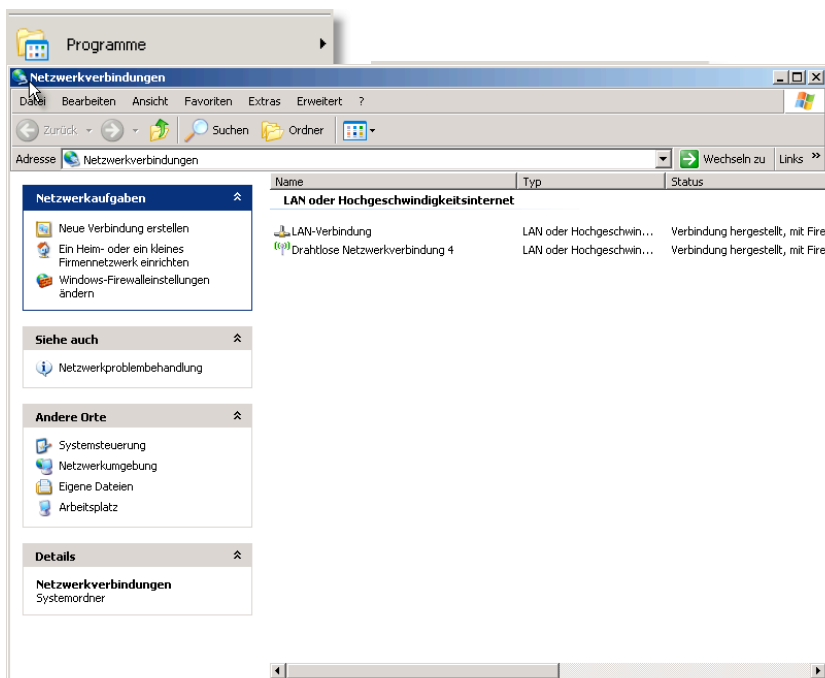
When operating in a wireless network a Wireless Access Point is required. The minimum speed is 54 MBits/sec.

By default PHOENIX Net is set to the manual IP address 192.168.1.100.

At first connect PHOENIX Net. You can use both normal CAT5 patch cables and cross over cables (for Peer-to-Peer connections), as PHOENIX Net automatically recognises the cable configuration (Auto MDI/MDIX).

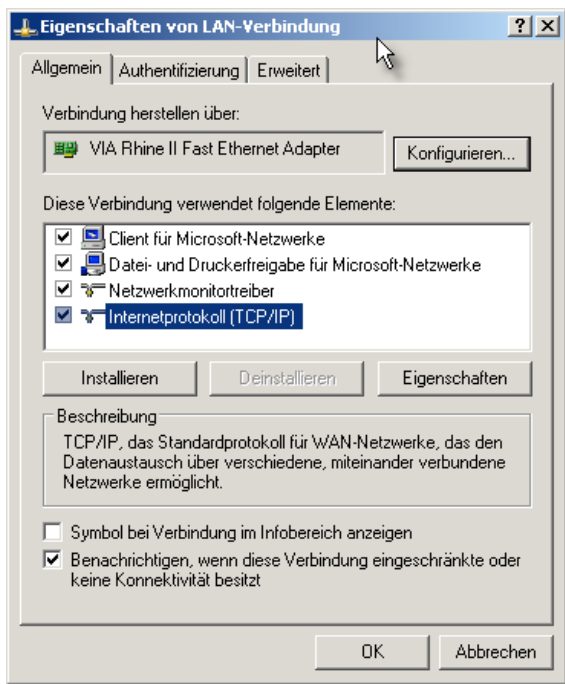
Then you have to set up the network connection on your PC.

Select "Start"->"Settings"->"Network Connections".

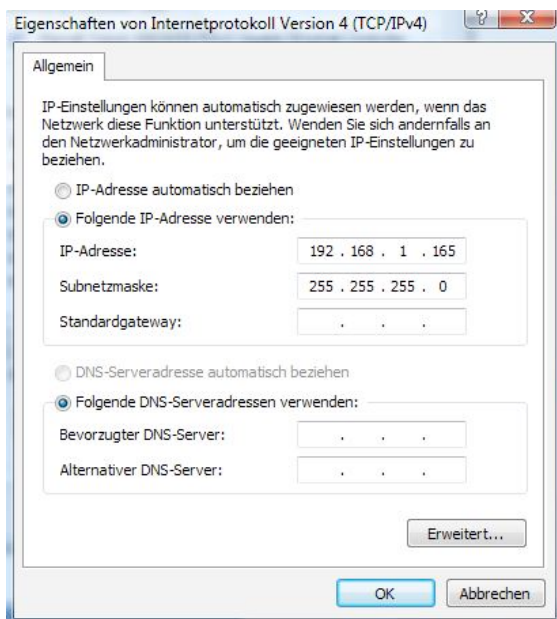


The available network connection possibilities on this computer are displayed.

Select the connection for your network adaptor (here: LAN connection).
If no connection is defined you can create a new connection with "Create New Connection".



Select "Internet protocol(TCP/IP)" and select "Properties"



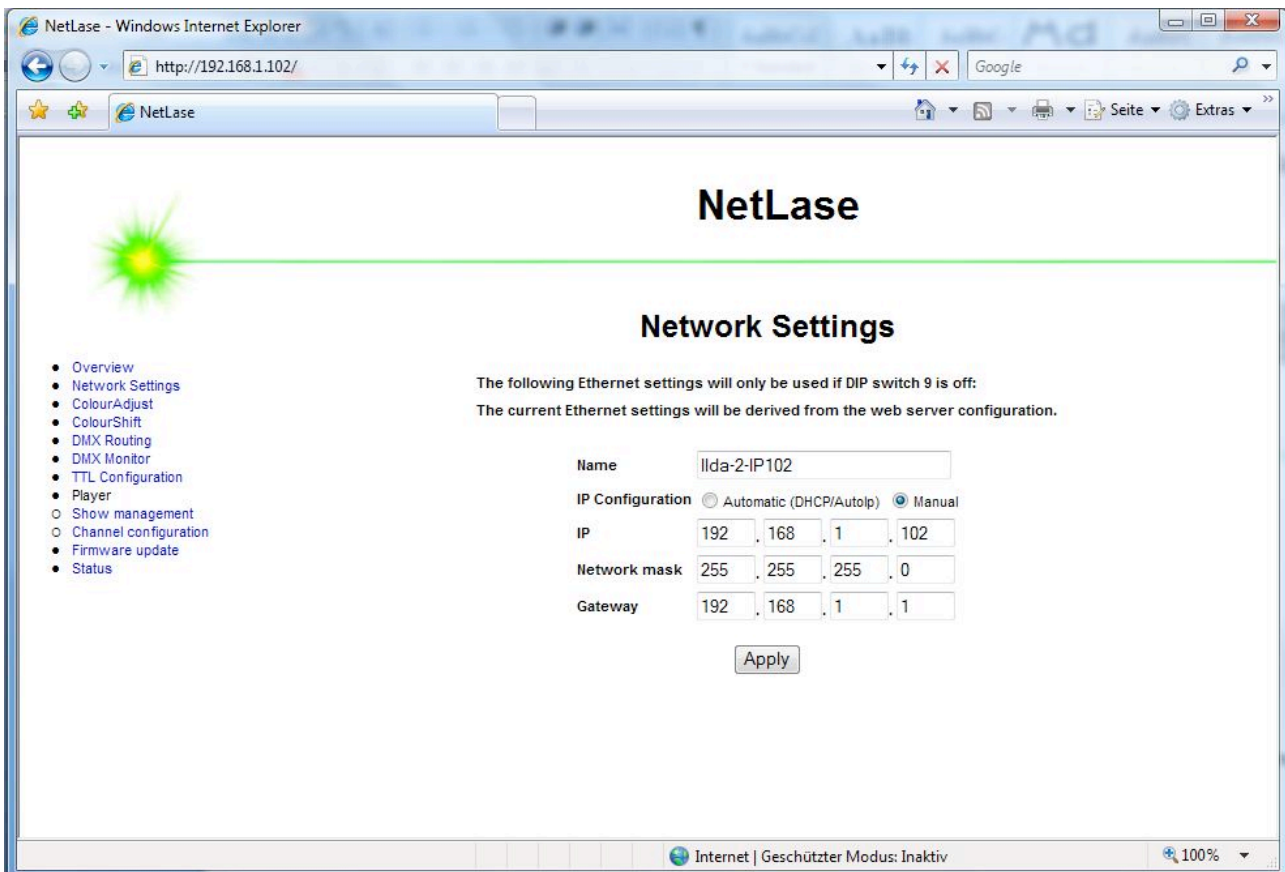
Select "Use the following IP address", **not** "Use Automatic IP Addressing"!
For the first installation you should not select the AutoIP / DHCP mode of PHOENIX Net. (You can change to this setting at a later time)

Enter for example 192.168.1. and IP address and a value **smaller** than 100 or **bigger** than 115.
The first two network addresses 192.168. are pre-set by PHOENIX-Net and cannot be altered.
The third figure (subnet) may be 0 or 1. This can be set at the PHOENIX-Net's DIP switch. As the fourth figure (device address) PHOENIX Net allows 100 to 115. Hence this value may not be set on the PC (host), as otherwise there will be no communication.
The network mask should be: 255.255.255.0.
The values for "Gateway" as well as the DNS server addresses are not relevant.

Important: PHOENIX Net analyses the IP address (DIP switch) only upon being switched on. Therefore the IP has to be set **before** switching on the card. Ensure that the setting of the subnet address (3. figure of the IP address) 0 or 1 is the same for both PHOENIX Net and the host settings! Otherwise you cannot establish a connection to PHOENIX Net.

2.3 Test of the connection to PHOENIX Net

To ascertain whether PHOENIX Net has been recognised by the PC, start your internet browser and enter the PHOENIX Net IP address into the address bar.



You should then see the card's homepage with information about the network address and the card's firmware.

If the homepage will not be displayed or if you run another operating system you also can access the card on the command level.

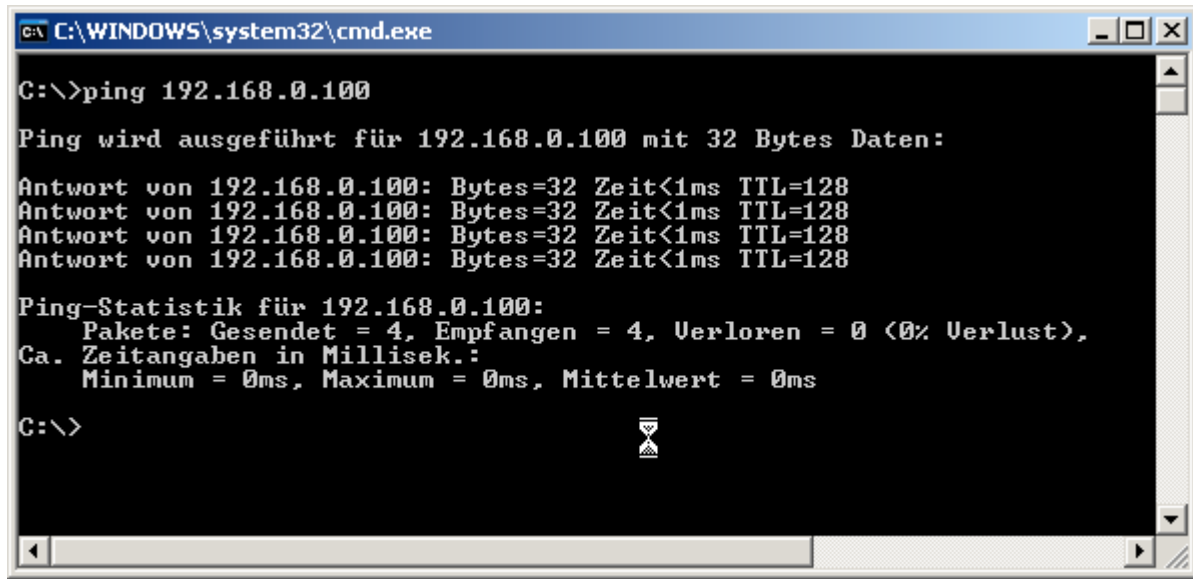
Therefore enter: **ping 192.168.0 (or 1).** and the desired **card address 100 to 115** and confirm with **<Return>**:

You should now see the card's response.

If "timeout" appears, you should verify the card settings (DIP switch) and the communication settings on the PC, as well as the network wiring.

Depending on the PC and the operating system the recognition of connected cards may take a few seconds. Therefore do not start the card inquiry directly after you connected PHOENIX Net to the PC, but if necessary wait a few seconds. The connection firstly has to be established.

2.4 The MAC Address and the ARP Cache



```
C:\WINDOWS\system32\cmd.exe
C:\>ping 192.168.0.100

Ping wird ausgeführt für 192.168.0.100 mit 32 Bytes Daten:

Antwort von 192.168.0.100: Bytes=32 Zeit<1ms TTL=128
Antwort von 192.168.0.100: Bytes=32 Zeit<1ms TTL=128
Antwort von 192.168.0.100: Bytes=32 Zeit<1ms TTL=128
Antwort von 192.168.0.100: Bytes=32 Zeit<1ms TTL=128

Ping-Statistik für 192.168.0.100:
    Pakete: Gesendet = 4, Empfangen = 4, Verloren = 0 (0% Verlust),
    Ca. Zeitangaben in Millisek.:
        Minimum = 0ms, Maximum = 0ms, Mittelwert = 0ms

C:\>
```

The MAC Address is fixedly programmed in PHOENIX Net. It is a globally unique address that clearly identifies PHOENIX Net.

The PC will "memorise" the MAC address and the corresponding IP address in this connection, as soon as a device has been connected. The information will be stored in the so-called ARP table or in the ARP cache and can remain there until the next boot process or even longer.

A problem may arise from the following:

If you set a new IP address on the PHOENIX Net card, the PC cannot assign it, as it does not match with the MAC address formerly stored.

Hence it may appear, that cards with altered IP addresses are not recognised.

To avoid this problem you should delete the ARP cache after each alteration of the card's IP address.

On the command level you can delete the ARP cache with the following command:

arp -d 192.169.0(bzw.1). and the card's address 100 to 115 <Return>

There will be no reply to this command unless there is no corresponding entry in the cache.

If you now reconnect PHOENIX Net, the PC will recognise it again.

2.5 Using the internal IP address of PHOENIX Net

In addition to the manual IP via DIP switch you also can enter another IP address. This address is not fixed to 192.168 but may be defined within the complete IP address range. You can enter the address in the network settings of your web browser.

NetLase - Windows Internet Explorer

http://192.168.1.102/

NetLase

NetLase

Network Settings

- Overview
- Network Settings
- ColourAdjust
- ColourShift
- DMX Routing
- DMX Monitor
- TTL Configuration
- Player
- Show management
- Channel configuration
- Firmware update
- Status

The following Ethernet settings will only be used if DIP switch 9 is off:
The current Ethernet settings will be derived from the web server configuration.

Name: lida-2-IP102

IP Configuration: ☐ Automatic (DHCP/Autolp) ☒ Manual

IP: 192 . 168 . 1 . 102

Network mask: 255 . 255 . 255 . 0

Gateway: 192 . 168 . 1 . 1

Apply

Internet | Geschützter Modus: Inaktiv 100%

ATTENTION:

The values entered here are only valid if DIP switch no. 9 is set to OFF.
If the switch is ON (in the lower position) the address of the DIP switch will be taken by default.
Do not forget to keep in mind the set address for accessing the card via web browser.

2.6 Using AutoIP / DHCP /UPnP

Should your network require an automatic configuration you can activate the automatic mode in the settings. Therefore select IP Configuration "Automatic" and confirm with "Apply".

After this change the card has to be restarted (after your PC also has been set to automatic IP address).

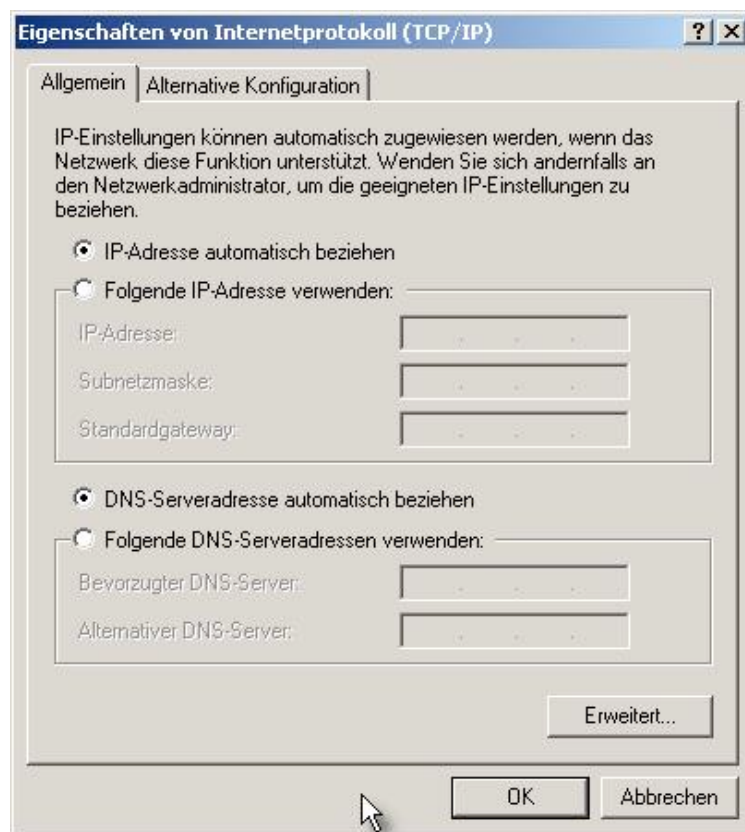
As the current IP of PHOENIX Net now is unknown you cannot access the card via web browser. If you wish to do so you must go back to the manual mode by means of DIP switch no.9.

PHOENIX Net can automatically establish the connection to the PC.

It is also possible to use UPnP. UPnP facilitates the access to PHOENIX Net via web browser without knowing the card's IP address.

Automatic operation without using UPnP

1. All DIP switches to position OFF (slides in upper position)
2. Set everything to Automatic in the network settings of your PC



3. Connect PHOENIX Net to the network and switch it on.

Depending on the system It may take a few minutes until the card will be recognised.

Windows may possibly notify restricted connectivity which is of no interest for the operation of PHOENIX Net .



PHOENIX Net should have been already recognised by PHOENIX.

To access PHOENIX Net via web browser without knowing the dynamic IP address you should use UPnP.

UPnP is effective by default in Windows, but often it is deactivated in the initial state (e.g. Windows XP SP2).

The following describes how to activate UPnP.

Please leave PHOENIX Net switched off until all required settings on the PC have been made!

2.6.1 Activating UPnP under Windows XP SP2

Open "Network connections".

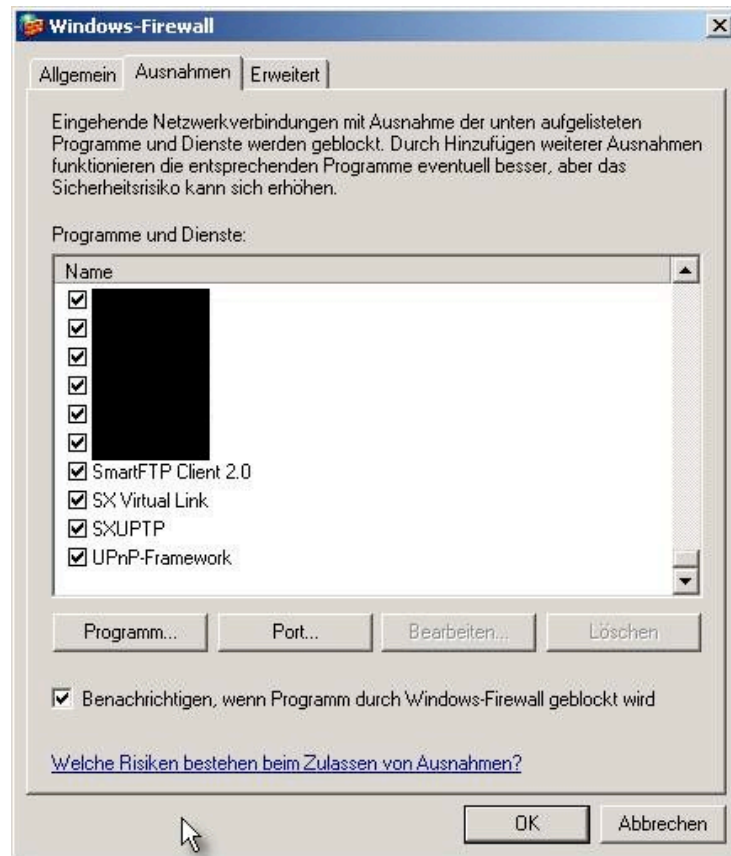
If UPnP is not yet activated you will find "Show Symbols for Network-UPnP-Devices" on the right side under "Network tasks".

Click on this menu entry and Windows will automatically install UPnP.

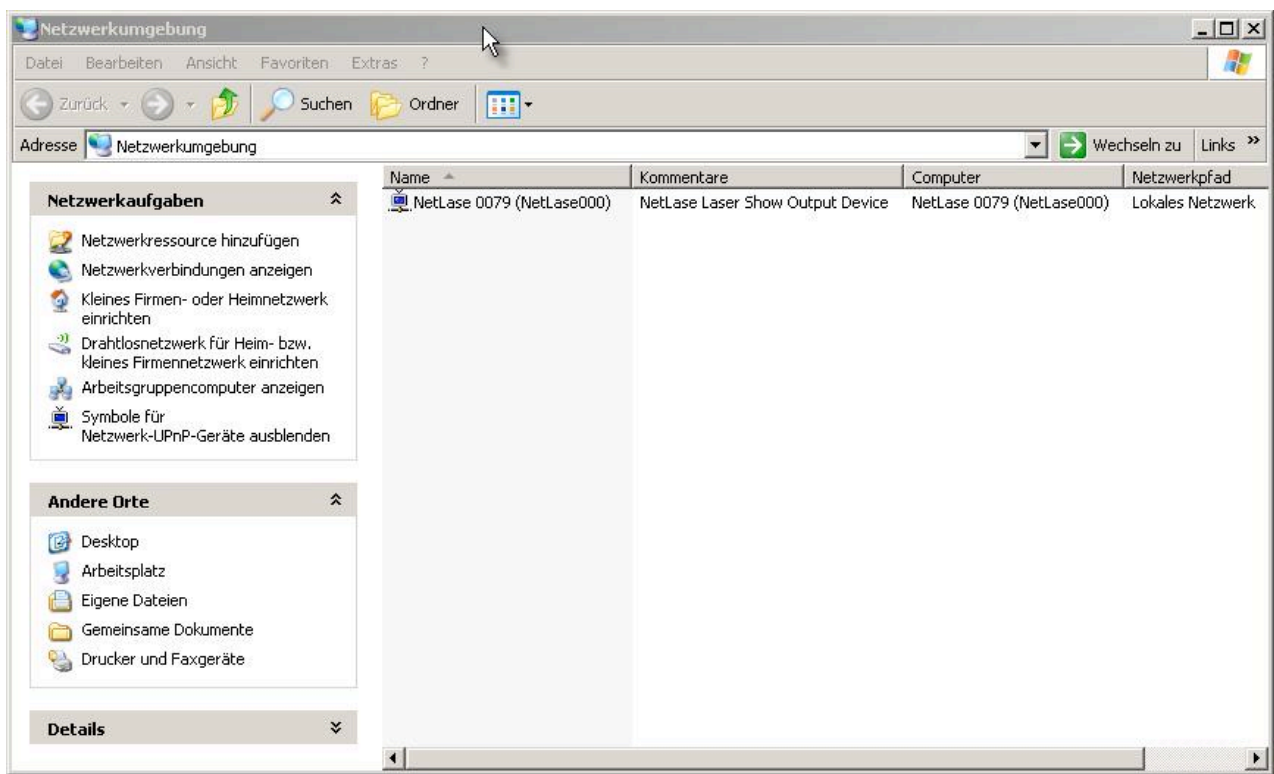
Upon completion of the installation the display should change to "Hide Symbols for Network-UPnP-Devices".



You must mark the check-box "UPnP-Framework" in the firewall settings -> exceptions (System -> Windows-Firewall).



If now PHOENIX Net will be connected to the PC a new entry will appear in "Network connections" after a short time



Double-click this device entry in network connections. The web browser will open and will be connected with the card.

Right-click -> Properties to see the IP address if required.



2.6.2 Alternative access to PHOENIX Net via web browser

In case of automatic IP address setting **without UPnP** you cannot see the IP address. Here is another method for accessing the card via web browser.

If UPnP does not work, open the command shell ("Start - Execute - cmd") and enter:

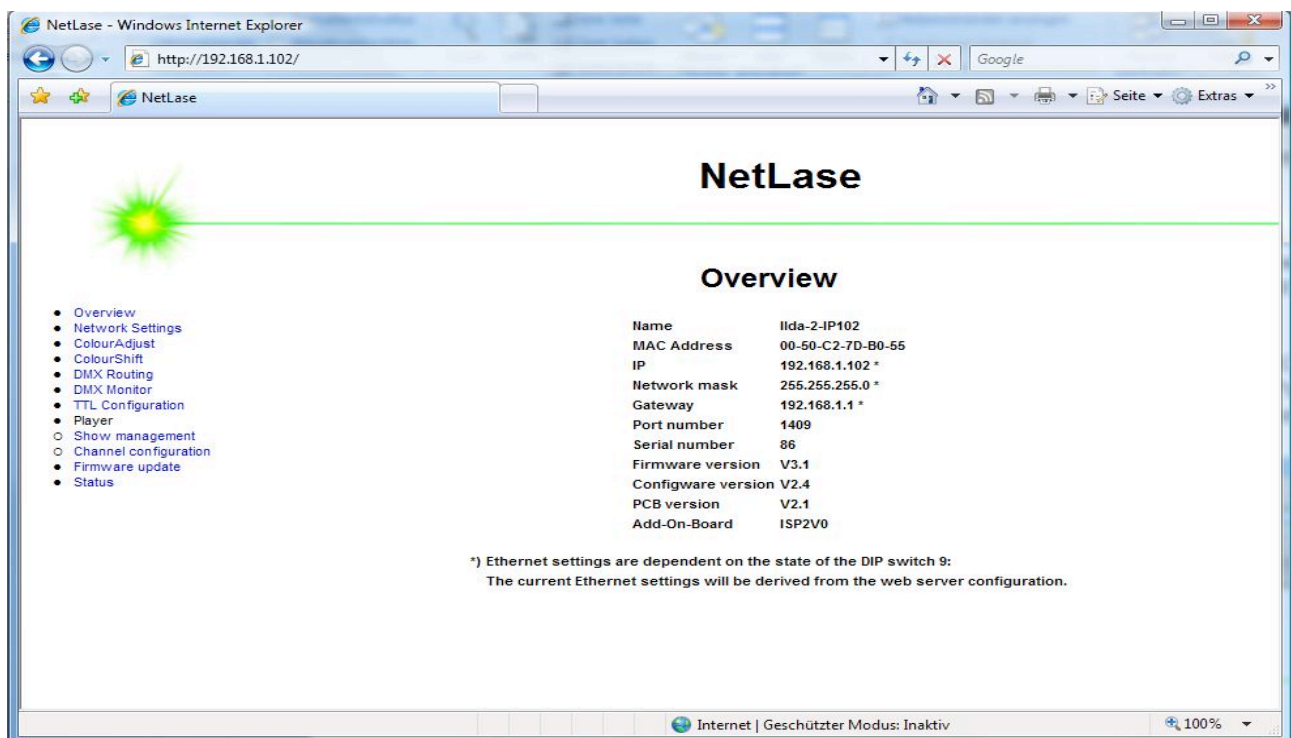
arp /a



The connected devices will appear. If several devices are connected you can recognise the PHOENIX Net by the corresponding MAC address) which is printed at the bottom of each board. The corresponding IP address in the display is the currently used address.

Enter this address in the web browser to access the PHOENIX Net.

If several device entries are displayed and the PHOENIX Net's MAC address is unknown you possibly have to try all IPs in the browser. Don't worry. Nothing can happen! If the connection to PHOENIX Net has been established the start window will be displayed in the browser.



ATTENTION: When you change the network connections or when you add or remove devices the dynamic IP address possibly will be modified. If the access via web browser is not possible check the entry again with the command in the command line.

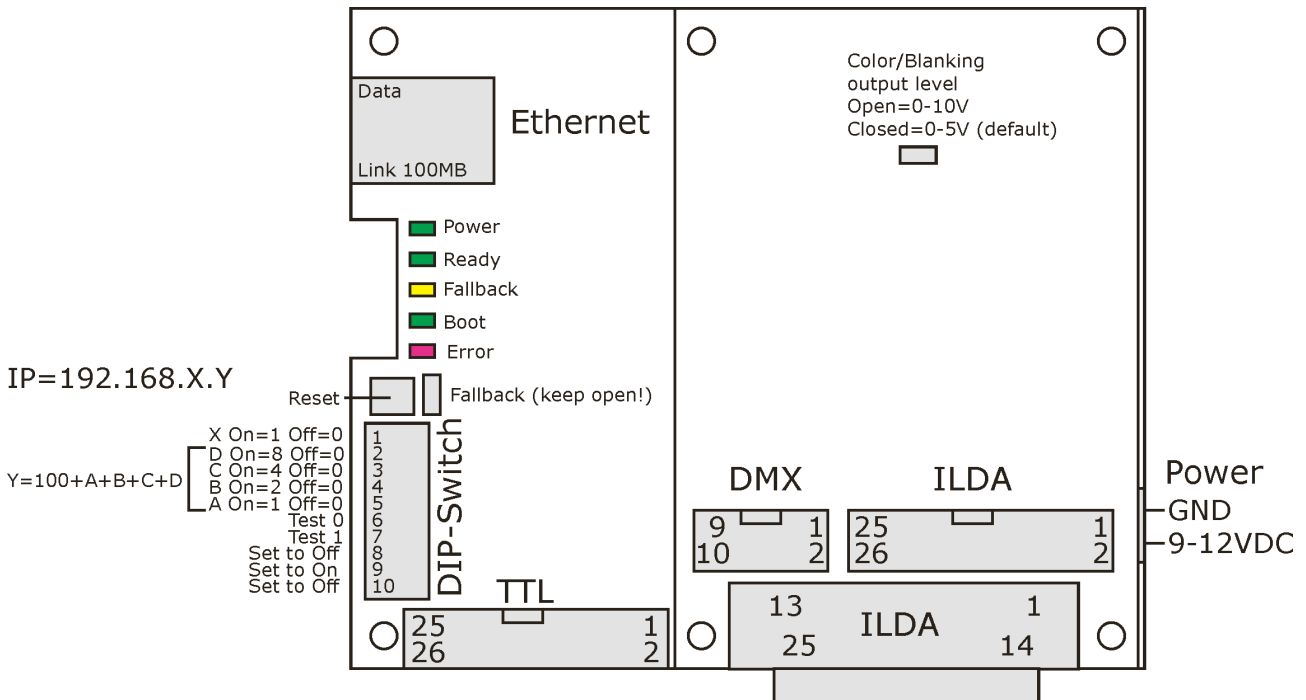
REMARK: PHOENIX Net exchanges a new IP address with the PC only after a restart.

Once connected (even with a wrong device) the connection will last for circa one hour until a new connection will be established.

If PHOENIX Net has established a connection to a router or another device in the network by mistake it is not sufficient to simply unplug and plug the network cable. To ensure that the process of recognition takes place newly switch off and on PHOENIX Net!

3 Signal Taps and Operating Elements

3.1 Board layout



3.2 Setting the IP address (DIP-switch)

This manual IP address is only active, when the DIP switch no. 9 is switched on!

Switch no. 1 defines the subnet number 0 or 1, i.e. the third figure of the IP address.

The first two addresses 192.168 are fixed.

Hence you can select from 192.168.0 or 192.168.1.

The device address (last figure of the IP address) is set via four switches in binary coding whereas you have to add 100 to the set value.

Switch no. 2 has the value 8, switch no. 3 has the value 4, switch no. 4 has the value 2 and switch no. 5 has the value 1.

So, to set the value 1, switch no. 5 has to be ON all other switches have to be OFF.

To set the value 12, switch no. 2 must be ON, switch no. 3 must be ON, all other switches must be OFF.

The value 0 means IP address 100 and the value 15 (all switches ON) means IP address 115.

Thus the IP addresses range from 192.168.0.100 to 192.168.0.115 **or** from 192.168.1.100 to 192.168.1.115.

3.3 Test Pattern

Switch no. 7 (Test 1) initiates the display of a test pattern (colour test pattern).

The switch must be ON before you switch on Phoenix Net.

With this function you can check the output hardware and the ILDA signals of Phoenix Net without any connection to the PC or to the lasershow software.

Important! You should leave all other DIP switches in the given position, as otherwise a trouble-free operation is not possible.

3.4 Connection of scanner and colour signals

All connections are on a 25-pin standard ILDA connector, this connector being designed either as a 25-pin D-Sub female connector or as a 26-pin protected header in case it is mounted directly in the laser projector. Attention: Different pin numeration!

The pin assignment of the protected header is arranged such that a flat cable connector with a D-Sub jack results in the same assignment as the on-board D-Sub jack. Hence the wire numeration corresponds to the pin number of the DSUB ILDA-connector (refer to the table).

The board features outputs for X and Y, RGB colours and intensity.

All outputs work symmetrical. Depending on the wiring each output can be operated in three different types:

1. symmetrical output. The contacts + and – are directly connected to the corresponding contacts of the receiving device.
To reverse the signals the two leads just have to be swapped.
2. Single ended normal. The contact is connected to 0V (GND) and the contacts + and GND are connected to the corresponding input of the receiving device.
3. Single ended inverted. The contact + is connected to 0V (GND) and the contacts - and GND are connected to the corresponding input of the receiving device.

Important! Never leave blank one half of an output signal pair.

In the single ended mode one side **must** be connected to the ground of the laser projector!

The maximum signal level of the scanner outputs X and Y are 10V differential and those of the colour outputs are in maximum 5V differential.

The flexible output wiring (each output can be connected to ground) ensures that all outputs are short-circuit proof.

DSUB-25(ISP)	IDC26 Name	Function
1	1 X+	Scanner output +
2	3 Y+	Scanner output +
3	5 Intens+	Intensity/blanking +
4	7 Interlock A	Internal connected to Interlock B
5	9 Rot + (Red)	Colour output Red +
6	11 Grün + (Green)	Colour output Green +
7	13 Blau + (Blue)	Colour output Blue +
8	15 Farbe 4 + (Colour)	Option
9	17 Farbe 5 + (Colour)	Option
10	19 Farbe 6 + (Colour)	Option
13	25 Shutter	+5V *
14	2 X-	scanner output –
15	4 Y-	scanner output –
16	6 Intens-	intensity/blanking –
17	8 Interlock B	Internal connected to Interlock A
18	10 Rot - (Red)	Colour output Red -
19	12 Grün - (Green)	Colour output Green -
20	14 Blau - (Blue)	Colour output Blue -
21	16 Farbe 4 - (Colour)	Option
22	18 Farbe 5 - (Colour)	Option
23	20 Farbe 6 - (Colour)	Option
24	21-23, 26 blank	
25	24 Ground	Device ground 0V
Shield	- Shield	high-impedance (1M) against device

* Attention: Maximum 20 mA load for the 5 V contacts!

3.5 Digital Outputs

Also on the board is a double-row 26-pin multi-pin connector featuring 16 digital outputs. The outputs are operated with 3,3 Volt!

Important: The outputs of the OEM-Version are not short-circuit proof.

Never put any voltage to these wires and avoid any electrostatic discharge at these wires. The device might be damaged.

Also you should not take any power higher than 50 mA from the 3.3 V power supply.

The TTL-connections of the frame versions (Desktop and 19" version), however, feature a stabilised 5 V signal and max. 500mA.

Pins

1	3,3V	operating voltage
2	GND	Ground
3	Data 1	Bit 1 (LSB)
4	Data 2	Bit 2
5	Data 3	Bit 3
6	Data 4	Bit 4
7	Data 5	Bit 5
8	Data 6	Bit 6
9	Data 7	Bit 7
10	Data 8	Bit 8
11	Data 9	Bit 9
12	Data 10	Bit 10
13	Data 11	Bit 11
14	Data 12	Bit 12
15	Data 13	Bit 13
16	Data 14	Bit 14
17	Data 15	Bit 15
18	Data 16	Bit 16 (MSB)
19-24	Do not use!	
25	3,3V	operating voltage
26	GND	Ground

The outputs should not be used for any wiring outside the device.

If you want to use the signals externally we recommend the usage of buffer circuits, as it is also the case with the frame versions of PHOENIX.

3.6 DMX I/O

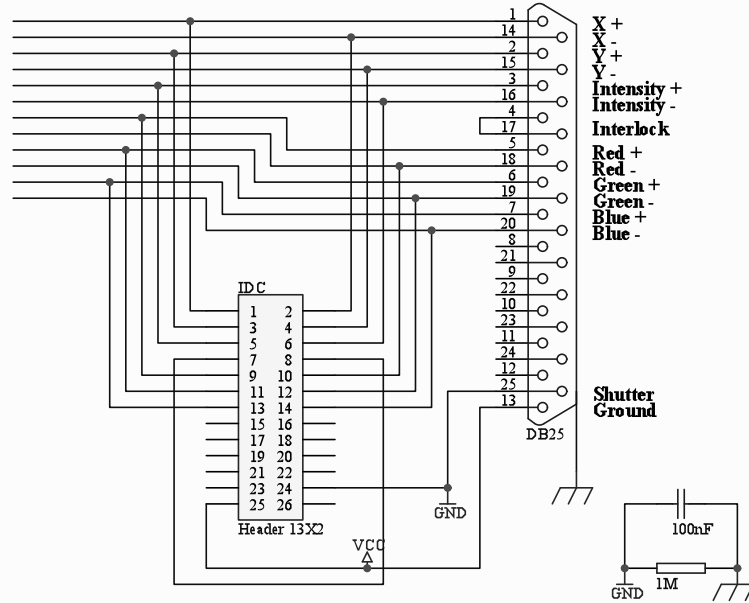
The 10-pin extension connection is intended for connecting DMX devices.

All 512 channels are supported and simultaneously output as well as read.

The DMX signals are potential-free. Thus there are no problems caused by long distance leads or potential differences.

1	idle
2	idle
3	DMX In +
4	DMX In -
5	DMX ground (isolated against the device ground!)
6	DMX ground (isolated against the device ground!)
7	DMX Out +
8	DMX Out -
9	idle
10	idle

Internal Connections IDC + DSUB ILDA



Projector Connection

Symmetrical

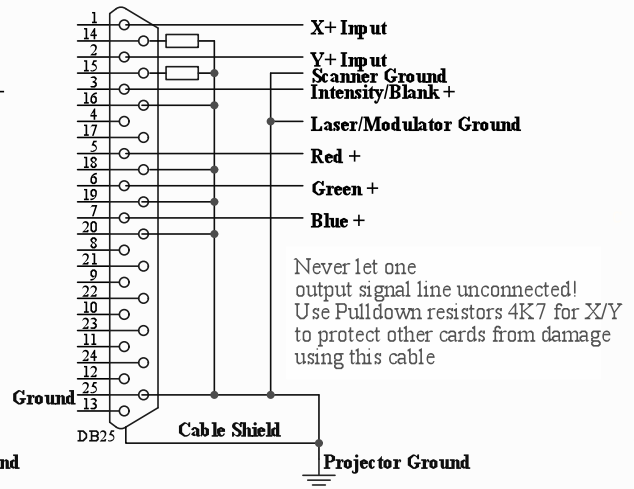
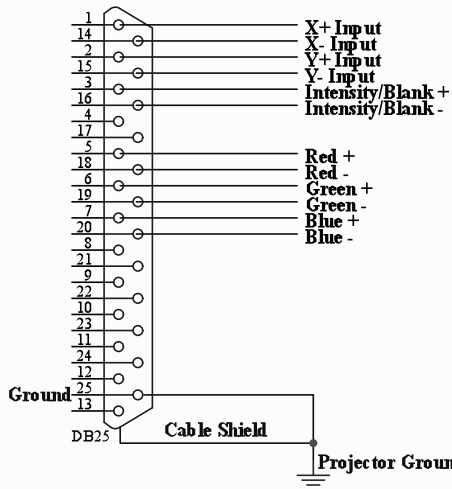
Single Ended

EasyLase ILDA-Connector

Scanner

EasyLase ILDA-Connector

Scanner



For long distance >10m use symmetrical cable only.

4. Description of the Device

The frame versions (19" built-in version and the desktop version) are identically constructed and comprise identical technology. They only differ in the structural shape.

Inside the frame is the network card and a stabilised 90-250 V power supply that is connected via a Neutrik Powercon cable. The DMX connections to the card are optically isolated. Therefore the interfaces are much less sensitive against interruptions than devices and interfaces that are not isolated.

Additionally the card's TTL signals are processed. The card's 3.3 V signal is pushed to stabilised 5 V. In addition you can switch up to 500 mW.

Following connections are available:

- 1 x 25-pin Sub D – ILDA connection (female)
- 1 x 25-pin Sub D – TTL connection (male)
- 1 x Neutrik DMX512 – out
- 1 x Neutrik DMX512 – in
- 1 x Neutrik DMX512 - through
- 1 x Neutrik PowerCon power supply
- 1 x Neutirk RJ45 LAN cable connection
- 1 x 110 / 220V selector switch
- 1 x fuse against over voltage

The front side features 5 LEDs:

- Green = Power
- Green = Ready
- Yellow = Fallback
- Green = Boot
- Red = Error

5.1 Function

PHOENIX Net features a complete player for stand-alone operation.

With this player it is possible to replay show sequences that have been stored on the internal SD card before via DMX or out of the web browser.

The shows must be available in the ILDA format (format0, 1, 2, 4 or 5) or in the .pho format (which can be exported by PHOENIX-PRO).

The player configuration and the upload of shows is executed in the web browser.

5.2 Show Management

A click on "Show management" under "Player" in the web browser's menu will open the show administration.

Player

NetLase mode:

NetLase starts in ☒ Live- / ☐ Player-Mode if the current SD-Card is inserted. Apply

Please choose an ILDA file (*.ild) to upload:

Durchsuchen...
Upload

Stop show output Stop

	DMX-Value	Filename	Speed [PPS]	Framerepeat	Displaymode	Delete	Show	
View		AMEISE.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		ANI.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		APFEL.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		BANANE.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		BÄR.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		CLAP.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		Color.ild	10000	1	loop/interruptable	☐	☐	Apply
View		DODE.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		DOG.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		EMPTY.ILD	10000	1	loop/interruptable	☐	☐	Apply
View		F5_Blue.ild	10000	1	loop/interruptable	☐	☐	Apply
View		F5_Green.ild	10000	1	loop/interruptable	☐	☐	Apply
View		F5_Red.ild	10000	1	loop/interruptable	☐	☐	Apply
View		GeoMeTry.ild	10000	1	loop/interruptable	☐	☐	Apply
View		Orient.ild	10000	1	loop/interruptable	☐	☐	Apply
View		Test30K.ild	10000	1	loop/interruptable	☐	☐	Apply
View		VASE.ILD	10000	1	loop/interruptable	☐	☐	Apply

The table shows all ILDA and .pho files, stored on the card.

An entry field is available to upload new files. With "Durchsuchen" (Browse) you can select a file on the PC and with "Upload" you can load it.

NOTICE: The upload via http is comparatively slow (approximately 150 KBytes/sec.).

The upload of files with a few Megabytes may take some minutes.

Try to avoid extremely large show files but only take short show sequences for the player. 10 MB may need approximately 10 minutes!

After the upload the new file will be displayed in the show table.

If you want to delete files, you can do so by clicking the "Delete" button next to the respective file name and confirming with the "Apply" button.

The table contains various parameters per each show file:

DMX Value

Initially the first field is empty.

Here you can enter the number (DMX position) under which this show can be selected later.

NOTICE: The number corresponds to the value of the fader designated for the show selection.

In order to facilitate the setting via DMX console two DMX channels (Fader) are applied. One for each 16 numbers that are multiplied with each other.

Thus 256 shows can be selected totally.

Please refer to **DMX Settings**.

You should not use number zero, unless you want to have a show replay when all faders are set to zero.

Replay Speed pps

As for safety reasons the replay speed cannot be remotely controlled, you have to set a value here. The default value is 10 Kpps.

You should find out the ideal value manually.

For test reasons you can start each show directly out of the web browser.

Therefore click on the "Show" button next to the entry(do not mix with "Delete"!) and confirm by "Apply" to play the show.

The show will be played in the set play speed and with the value of "Framerepeat", so that you can find out the ideal values.

To stop the show click on "Stop".

Notice: If a show is not assigned to a DMX channel (start number), the fields are reset to the default values once the show has been started(i.e. 10 Kpps).

The show must have a number in order to store the values for the play speed and the frame repeat!

Frame Repeat

Here you can set how often each frame of a file will be displayed.

1 means once, 2 means twice and so on. Hereby the play speed of an animation can be controlled.

However, if you set too many repeats, the animation will start to significantly jitter. Optionally you also can control this value via DMX.

Display Mode

Here you can set how the show will be displayed.

You can select whether the show will be repeated, once it was finished or whether it will be stopped (loop/oneshot) and whether the running show can be interrupted by selecting another show or whether a new selection shall be only possible after the current show will be finished (interruptible/complete).

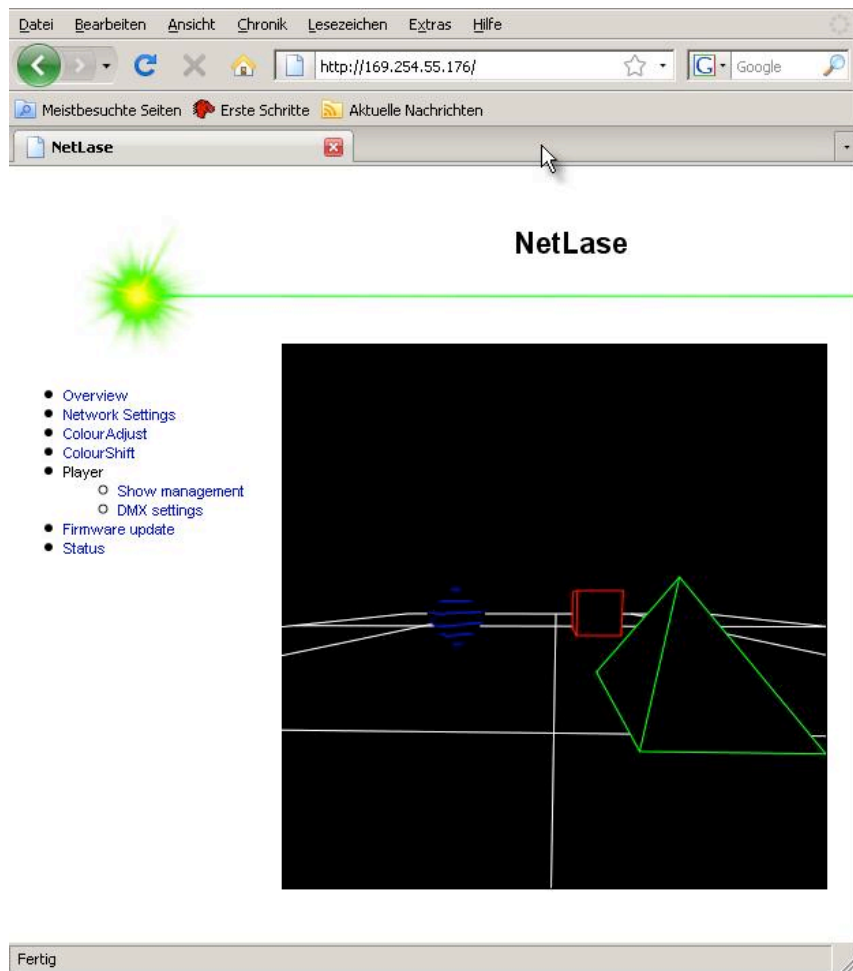
Hence you have 4 possibilities or combinations for setting:

- loop/interruptible (default setting)
- loop/complete
- oneshot/interruptible
- oneshot/complete

Image preview

Left to each show entry you will find a "View" button.

Click on it and a new page will open showing the first frame of the show as an image. This image does not have to be stored on the card but is dynamically generated by PHOENIX Net.



With the "Back" command of your browser or by clicking "Show management" you will come back to the table.

NOTICE: Only the first frame of a show can be displayed. If a show starts with a dark scene the preview will remain black.

Define the Operation Mode between Live Operation and Player

The operation mode of PHOENIX Net can be defined per selection in the upper part of the Show Management.

To control the player via DMX you have to select "PHOENIX Net starts in Player Mode".

"Apply" to confirm the setting!

Afterwards the card has to be restarted to accept the new operation mode.

This operation mode remains active until "PHOENIX Net starts in Live-Mode" will be selected.

NOTICE: You should not forget to switch the operation mode.

If you want to control PHOENIX Net via DMX without a PC on site the player mode must be activated as otherwise PHOENIX Net will not react to DMX signals!

In return PHOENIX Net does not react to software outputs of PHOENIX if the operation mode is not set to "Live".

Once all files have been set in the Showmanagement you must select the DMX channel allocation. Please refer to the following chapter.

5.3 DMX Settings

You can find the DMX default settings in the menu "Player" in the "DMX Settings". These values have to be set to enable the DMX player mode.

DMX settings

DMX base address	1																
DMX offset	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Showselect (Low)	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Showselect (High)	☐	☒	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐
Framerepeat	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none (only show 0-15)
Size	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 255
Size (X)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 255
Size (Y)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 255
Offset (X)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 127
Offset (Y)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 127
Shear (X)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 127
Shear (Y)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 127
Rotation	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 0
Keystone (X)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 127
Keystone (Y)	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 127
Intensity	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☒ none, use value 255

DMX Base Address

Here you can define, which basic address shall be assigned to the channels used by PHOENIX Net.

Default setting is 1, i.e. the channels start at the first address.

If there are already other devices defined to DMX, as e.g. light effects devices, you can change the address. Please take into consideration that the basic address plus the number of channels used by PHOENIX Net (maximum 16) may not exceed the value 512.

PHOENIX Net requires **at least one** channel and can use up to 16.

All DMX functions apart from "Showselect (Low)" can be deactivated with the "none" switch. By default only the first two "Showselect" are activated.

NOTICE: "Showselect" for selecting the show to be played comprises 2 faders to facilitate the manual setting via console.

Select the shows 1 – 16 per "Low" and select a bank of 1 – 16 per "High".

Thus you can select $16 * 6 = 256$ shows with two faders (including zero that should be empty).

If only one DMX channel is available you can deactivate "Showselect (High)". You can then select only the first 16 shows or 15 shows and Pause.

Now you can assign the particular control functions of PHOENIX Net to a channel matrix. Thereby the channel (DMX offset) at the top is from zero to 16. This offset added to the basic address results in the absolute DMX channel this function is assigned to.

NOTICE: There is no need to assign all functions to DMX channels.

For this purpose you can deactivate individual functions via the "none" switch.

If the functions are not assigned to DMX PHOENIX Net will read the value entered at the end of the line.

NOTICE: It is no problem to have several control functions on the same DMX channel!

"Size" and "Rotation" on the same channel for example can achieve an interesting effect.

However, it is not possible to define one and the same function onto several channels simultaneously.

Showselect (Low)

This channel is for selecting the show numbers 1 to 16.

This function cannot be switched off.

Showselect (High)

With this channel you can select a bank 1 to 16 for the show selection. Multiplied with the "Low" value it results in the number of the show.

Frame Repeat

If you define frame repeat to a DMX channel you can, with limits, reduce the play speed of a show. If you deactivate this function the particular value behind each show entry will be applied.

Size

Here you can set the image size (zoom).

For safety reasons you cannot set the size to zero. It will stay at least at approximately 10 percent!

The setting values 0-20 result in at least 10% image size, adjustable up to 100%.

Size (X) and Size (Y)

Here you can change the image size of both axes separately.

However, the setting differs from the "Size" setting to that effect that 255 represents the maximum size, 115 to 140 represent the minimum size 10 % and 0 represents the inverted maximum size.

By setting zero you can mirror the particular axis.

The following explains the range of settings:

From 255 downwards to 140 the deflection will be reduced and remains at minimum 10%.

From 139 to 128 the deflection remains at 10%.

Below 128 the axis will be mirrored and until 115 it remains mirrored at 10%.

From 115 down to 0 the output will be increased again but mirrored.

Offset (X) and Offset (Y)

Here you can adjust the middle position of both axes.

Please take into consideration that an image may be cut at maximum output size if it is moved out of the centre by means of the offset.

Shear (X) and Shear (Y)

This setting belongs to the geometrical correction settings and is defined to DMX in very rare cases only.

It is used to carry out a shear of the image.

The value 127 presents the middle position (i.e. without influence on the image), while the settings in the direction to 0 and in the direction to 255 move the axis into the one or the other direction respectively.

Rotation

Here you can rotate the image up to a complete revolution, whereas the values 0 and 255 are equal (original state of the image).

Keystone (X) and Keystone (Y)

This setting also belongs to the geometrical correction adjustments and also is defined to DMX in very rare cases only.

By means of Keystone (trapezoid distortion) you can distort each axis like a trapezoid.

Hereby you can counteract distortions appearing in transversal projections to a projection surface.

Intensity

This function is currently not used!

NOTICE: For the settings of geometrical distortions (e.g. to achieve a straight projection in case of a transversal projection) it is recommendable to define the settings to DMX channels at first. In doing so you can determine the best settings per DMX fader on the basis of a test pattern. You can then copy the values set at the DMX console into the fixed settings of PHOENIX Net (Deactivate the geometrical settings with "none").

The fixed settings for DMX functions have no effect on the live operation mode!

6 Colour Settings

6.1 Colour Adjust

With this menu item of the web surface you can adjust the maximum intensity (brightness) for each colour and for the intensity channel.

Furthermore you can set a cumulative value (Overall Intensity) that reduces all colours in equal measure.

You can set 6 colour channels plus Intensity as a maximum.

ColourAdjust

The following settings are global. They are used in player and live mode.

Red [%]	100
Green [%]	100
Blue [%]	100
Intensity/Blanking [%]	100
Violet [%]	100
Cyan [%]	100
Yellow [%]	100
Overall Intensity [%]	100

These settings serve for the white balance of the laser or for adjusting of the overall brightness (in case it is required due to safety reasons).

The settings have no effect on both the player mode and the live mode!

6.2 Colour Shift

Set a time shift for individual colours to each other with this menu item. This might be necessary if some laser colours are not simultaneously output resulting in colour distortions at the end of lines.

By setting the same value to all colours you also can achieve a complete movement of the colour output within the image with reference to the X and Y coordinates.

You can use this function for example to eliminate unwanted line ends in images

ColourShift

The following settings are global. They are used in player and live mode.

Red	0
Green	0
Blue	0
Intensity/Blanking	0



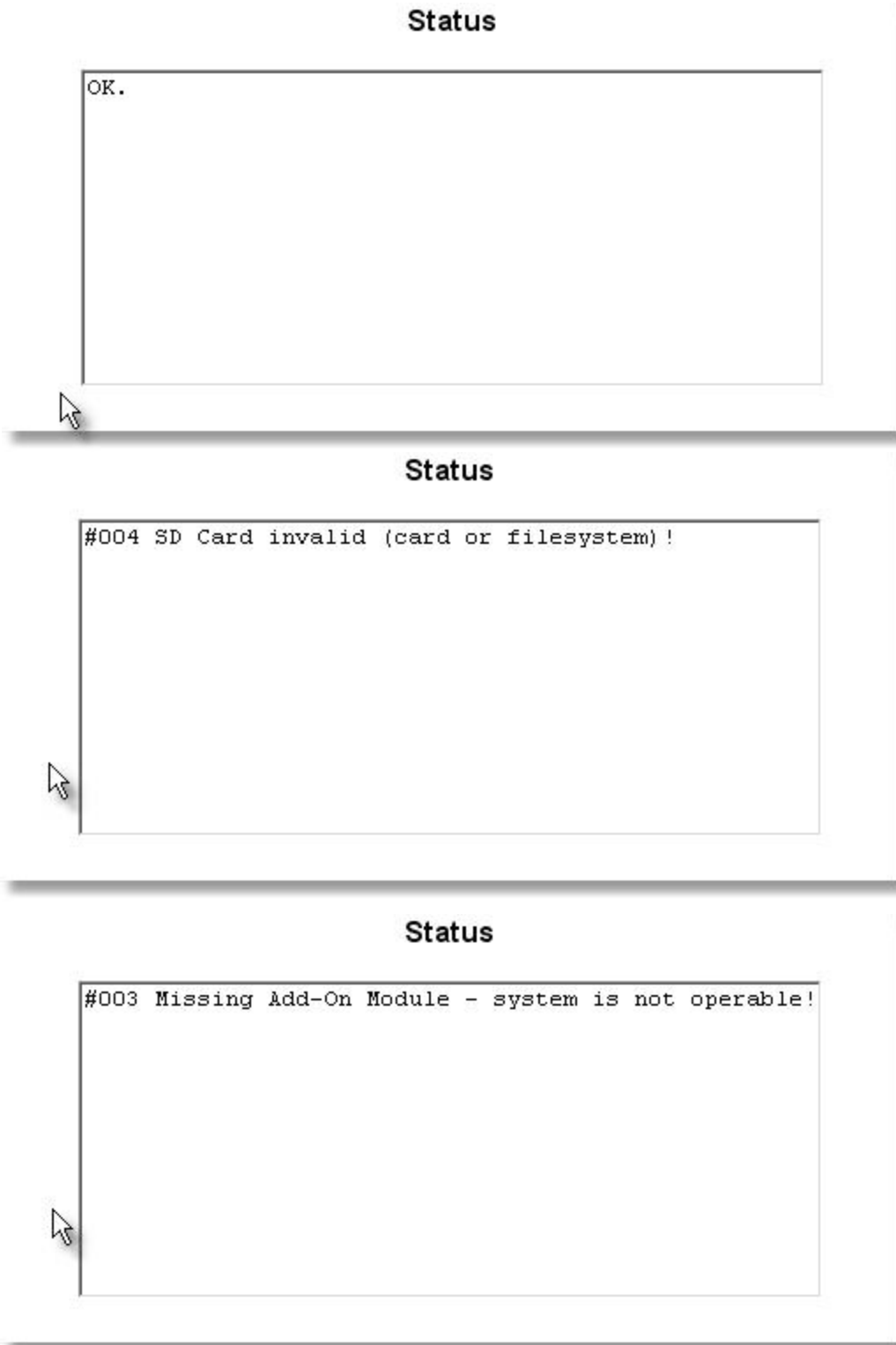
The Colour Shift works independent of the point rate pps.

PHOENIX features its own possibilities for this setting. Hence you should not use the function Colour Shift in the live operation.

7 Status Message

You can determine the operation status of PHOENIX Net at any time by means of a status window in the web surface. This status window also shows detailed information in case the red error LED lights up upon starting.

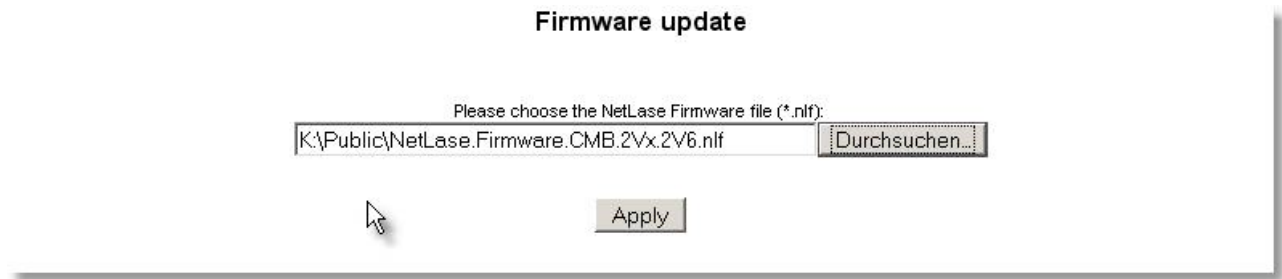
NOTICE: The live operation is still possible, even if no valid SD card is inserted.



8 Firmware Update

You can update PHOENIX Net via the web browser as soon as a newer firmware version (of the internal operating system) is available.

For an update just click the menu item "Firmware update".



Select the current update file (with the extension *.nlf) and confirm with "Apply".

The yellow LED will flash while the update is being executed. An update may need a couple of minutes.

IMPORTANT

Any firmware update is at your own risk!

In no case you should interrupt the update by for example closing the network connection or cutting the power supply of PHOENIX Net.

In case of a not completed firmware update PHOENIX Net possibly will not work any more and has to be sent to the manufacturer for new programming!

The process is completed when the green operation LED starts flashing again.

9 Art Net / Matrix Settings

PHOENIX Net features a variety of applications with Art Net and other settings in this menu. At first change to the menu "DMX/TTL Routing"

NetLase

DMX/TTL Routing

DMX Output **TTL Output** **Player** **ArtNet DMX Output** **ArtNet TTL Output**

Laser Show Software
The laser show software is the source of the DMX output signal.

ArtNet DMX Input
Universe Number (valid range: 0..255)
Channel Offset (valid range: -511..511)
The channel offset will be added to the ArtNet channel numbers before merging.

Merge Mode
☐ not active
ArtNet DMX data is not used for the DMX Output.
☐ merge HTP
ArtNet DMX data and the DMX data from the laser show software will be merged using the HTP (highest takes precedence) method.
☐ merge LTP
ArtNet DMX data and the DMX data from the laser show software will be merged using the LTP (least takes precedence) method.
☐ use ArtNet DMX data when laser show software is not active
ArtNet DMX data will be used only when the laser show software is not sending DMX data.
☐ override laser show software DMX output data with ArtNet DMX data
ArtNet DMX data replaces the DMX data from the laser show software starting from the specified channel offset.

DMX Input
Channel Offset (valid range: -511..511)
The channel offset will be added to the DMX input channel numbers before merging.

Merge Mode
☐ not active
The DMX input is not used for the DMX Output.
☐ merge HTP
The DMX input data and the DMX data from the laser show software and ArtNet will be merged using the HTP (highest takes precedence) method.
☐ merge LTP
The DMX input data and the DMX data from the laser show software will be merged using the LTP (least takes precedence) method.
☐ use DMX input data when laser show software and ArtNet are not active
DMX input data will be used only when the laser show software and ArtNet is not sending DMX data.
☐ override laser show software and ArtNet DMX data with DMX input data
DMX input data replaces the DMX data from the laser show software and ArtNet starting from the specified channel offset.

TTL Input
Channel Offset (valid range: -511..511)
The channel offset will be added to the TTL input channel numbers before merging.

Merge Mode
☐ not active
The TTL input is not used for the DMX Output.
☐ merge HTP
The TTL input data and the DMX data from the laser show software, ArtNet and the DMX input will be merged using the HTP (highest takes precedence) method.
☐ merge LTP
The TTL input data and the DMX data from the laser show software, ArtNet and the DMX input will be merged using the LTP (least takes precedence) method.
☐ use TTL input data when laser show software, ArtNet and DMX input are not active
TTL input data will be used only when the laser show software, ArtNet and the DMX input are not sending DMX data.
☐ override laser show software, ArtNet and DMX input DMX data with TTL input data
TTL input data replaces the DMX data from the laser show software, ArtNet and the DMX input starting from the specified channel offset.

Backup Cue
Enable ☐ Store ☐
If enabled, a backup cue will be output when all inputs that are selected for merging are not receiving data.
If store is selected, the current DMX output values will be saved as backup cue.

Apply

As it would be too voluminous in this place to list all possible functions or combination possibilities we will just describe the function of the matrix here.

In principle it is quite simple. At the very top you can see the top end of the matrix – the PHOENIX signal is transmitted via LAN cable to the network card. (In the player mode the signal is sent by the memory card.) After that DMX is added step by step or PHOENIX will utilise TTL signals. At the bottom the final signal will be sent.

Possibly the most interesting thing is the option to use PHOENIX and an external DMX controller SIMULTANEOUSLY. Thus you can, for example in a disco, execute the normal control via your conventional DMX console and when you start your show you can output the DMX signal via PHOENIX without having to plug any cable or switching anything. Depending on the setting you can select whether the LTP (Latest takes precedence) or the HTP (Highest takes precedence) DMX signal is output.

The last or lowest item in the matrix list is „**Backup Cue**“. If both check-boxes are activated the last DMX signal output will be stored and the last incoming signal as well!!! – and even after switching off and on again the power supply the DMX signal will be output.

This function is extremely important for the player function!!! For example, you can select an animation or a show from the player and store it completely via DMX (e.g. a rotating logo on a wall). Afterwards you can plug out the DMX controller. If the two check-boxes are activated all DMX values that you have set before by means of the DMX controller will be kept and the logo will always rotate – as soon as PHOENIX Net is connected to the main power...

This function was programmed especially for fixed installations and trade show presentations. The customer doesn't need another PC for controlling the laser show and he can't change your settings – making your show more secure against drop-outs

10 Troubleshooting

10.1 Laser output is distorted or no Colours/Blanking

Check the ILDA connections.

The device cannot work properly if parts of the difference signals were left open.

In some low cost projectors from Far East the (-) signals are not connected internally.

In this case you should connect the open signals to ground (pin 25) by means of a resistor.

10.2 No Function during the Operation of PHOENIX

Check, if the device is connected and ready-to-operate..

Start the PHOENIX hardware check programme. If the device is recognised and all functions work verify that you possess the required licence (PHOENIX-PRO PROplus or LIVE). The "demo version" does not allow any output. Ensure that the output is activated in PHOENIX and that the proper output hardware is selected (!).

10.3 No Connection to the Network

Set PHOENIX Net to manual IP address by means of the DIP switch (switch 9 = activated).

Set up a manual IP on your PC.

Switch OFF and ON again PHOENIX Net.

If necessary, delete the ARP cache by means of the command line.

```
arp -d *.*.*.* (The IP of the PHOENIX Net card)
```

Try a ping in the command line

```
ping *.*.*.* (IP of PHOENIX Net)
```

If you still cannot establish a connection please contact your dealer or the PHOENIX Showcontroller service.

If you only can't establish a connection out of the application software, check if a firewall (Windows or Norton) is active and if so, deactivate it tentatively.

Also check the access authorisation in the network. Mainly Windows Vista possibly can block the access to the network.

11 LwIP TCP/IP-Stack Licence Terms:

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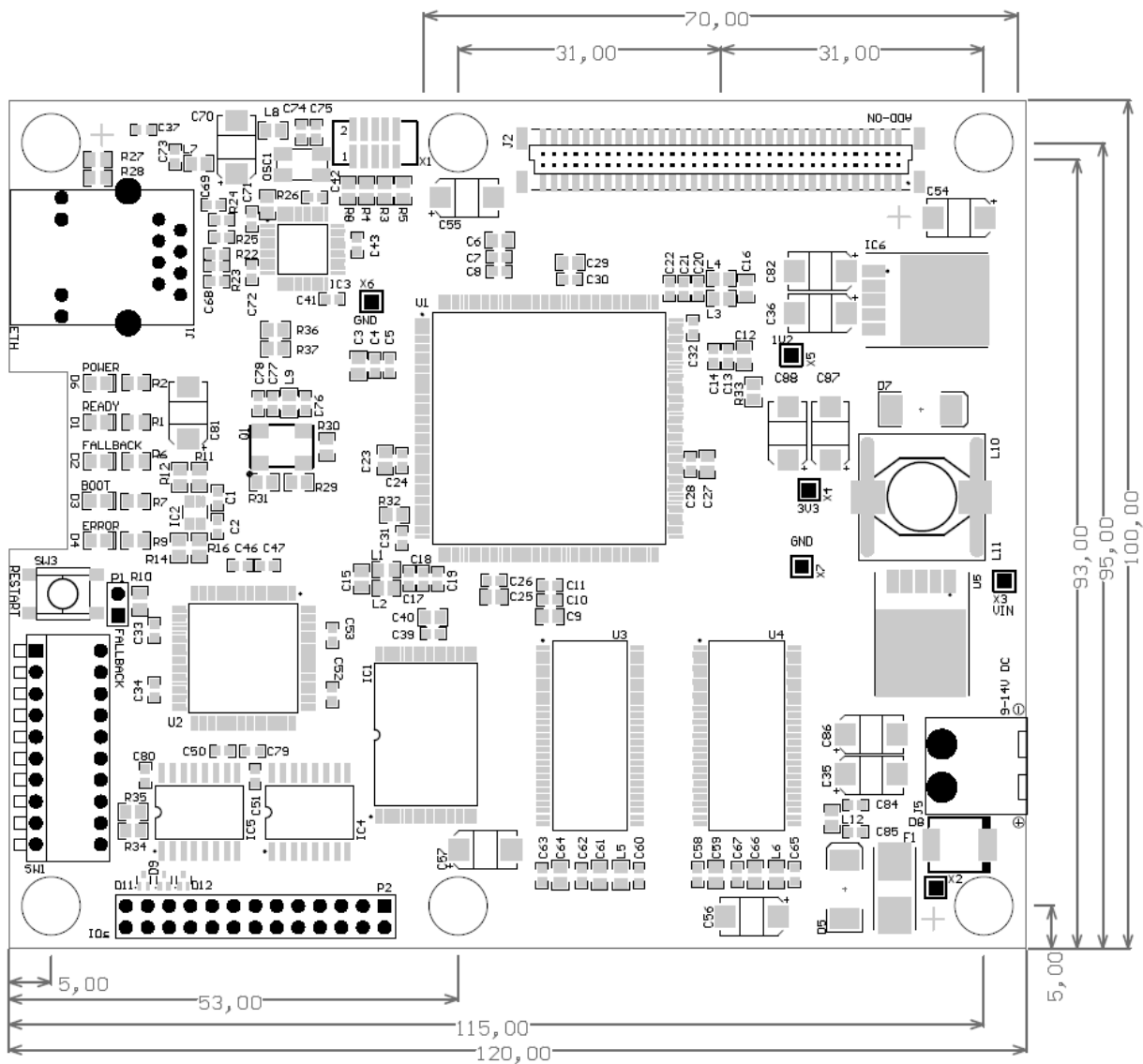
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Appendix

Mechanical dimensions main board

(all dimensions are in Millimetres)



EC Declaration of Conformity



This is to certify that the following product

PHOENIX Net Interface

is in accordance with the essential protection requirements defined in the Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility. (98/336/EWG).

The following standards were applied for the assessment of the product with respect to electromagnetic compatibility:

DIN EN 55103-1: 1996
DIN EN 55103-2: 1996
DIN EN 61000-3-2:2000 + A2: 2005
DIN EN 61000-3-3:1995 + A1: 2001

The following standards were applied for the assessment of the product with respect to EC Low-Voltage Directive 73/23/EEC and 93/68/EEC:

DIN EN 60065 : 2002

Furthermore, the product was inspected and approved according to the directive VDE 0837: laser safety classes. A further inspection of the complete assembly after installation is absolutely mandatory and must be executed in accordance with the directive VDE 0837 and the corresponding accident prevention regulation VBG 93.

This declaration is issued in the name of the manufacturer

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