Moncha.NET User Manual

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1. Introduction

Moncha.NET is latest Ethernet laser show controller from Showtacle. It is a perfect solution for laser show hobbyists, but also for professional users, who don't require high scan rate for professional graphics. Moncha.NET is distributed as OEM board with display integrated into your laser system or as a box version.

Moncha.NET works in four modes:

- **Ethernet mode** –Moncha.NET is completely controlled by Moncha.NET software.
- **ArtNET mode** – Moncha.NET is controlled over popular ArtNET protocol.
- **DMX mode** – Moncha.NET is able to play preprogrammed effects and complete laser shows and you can use DMX to trigger them.
- **Stand-alone mode** – you can let Moncha.NET play any show or effect or animation stored on SD-card even without any computer or DMX controller. It's perfect for advertisement purposes.

2. Moncha.NET Box Device

2.1 Front view

There are several connectors and LED diodes on the front side:

Moncha.NET device front view

DMX IN is used for DMX signal input, Ethernet for LAN cable. SD-Card supports FAT and also FAT32 file system with maximal capacity up to 32GB.
There are control LEDs located on this side as well:

Red	There is some image at laser output
Blue	Device is in Ethernet mode
Yellow	Device is in DMX mode
Green	Device is ON

2.2 Rear view

There is ILDA output for laser and DMX output on the rear side of the Moncha.NET device.

3. Control modes

Moncha works in 4 modes:

1. **Ethernet mode**
2. **ArtNET mode (since 2.5)**
3. **DMX mode**
4. **Stand-alone mode**

3.1 Ethernet mode

Ethernet mode is active when the Moncha.NET software is connected. It is highest priority mode. The DMX or Stand-alone mode is turned off when Moncha.NET software connects to Moncha.NET over Ethernet cable.

Moncha.NET uses IP address 192.168.1.X, where X is set in main menu (please check Main menu section below). IP address can be changed only when Moncha.NET software is *not* connected to Moncha.NET device.

3.2 ArtNET mode

Moncha.NET can be controlled over standard ArtNET protocol since version 2.5 of the firmware. It uses exactly the same DMX channels as DMX mode. It's just more convenient to use Ethernet cable than DMX (it allows you to run the Moncha/Fiesta software to upload your animations and then control complete show over ArtNET).

3.3 DMX mode and DMX channels

If there's no Ethernet connected and DMX cable is connected, Moncha.NET works in DMX mode. DMX address is set by DIP switch – it uses switches 1 to 9 (0 to 512 value range).

When Moncha.NET is in DMX or ArtNET mode, it receives DMX channels and plays all the shows from SD-card. Following DMX channels are used:

1	Position X	128 - middle
2	Position Y	128 - middle
3	Rotation	0 (0 degree) – 255 (360 degree)
4	Size X	0 (0%) – 255 (100%)
5	Size Y	0 (0%) – 255 (100%)
6	Brightness	0 (0%) – 255 (100%)
7	Scan rate	0 (default), 1 (slowest) – 255 (fastest)
8	Animation	0 (none), 1 – 255 (animation from SD-card)
9	Animation Speed	0 (0% - stop) – 128 (100%) – 255 (300%)
10	Animation Direction	0 – 127 (normal direction), 128 – 255 (opposite) – this is working only for files up to 255 frames

11	Red	0 – default, 1 (0%) – 255 (100%)
12	Green	0 – default, 1 (0%) – 255 (100%)
13	Blue	0 – default, 1 (0%) – 255 (100%)
14	Dark Blue	0 – default, 1 (0%) – 255 (100%)
15	Position X Fine	Fine position for X
16	Position Y Fine	Fine position for Y
17	Rotation Fine	Fine rotation

Since version 2.5 you can use extended DMX channels for Moncha.NET or even define order of DMX channel functions.

3.4 Stand-alone mode

Stand-alone mode is the lowest priority mode. In Stand-alone mode you can play any show stored on SD-card. You can also adjust device drawing settings using practical menu on display for display versions. Check **Display and settings** section.

3.5 Stand-alone mode for DIP switch version

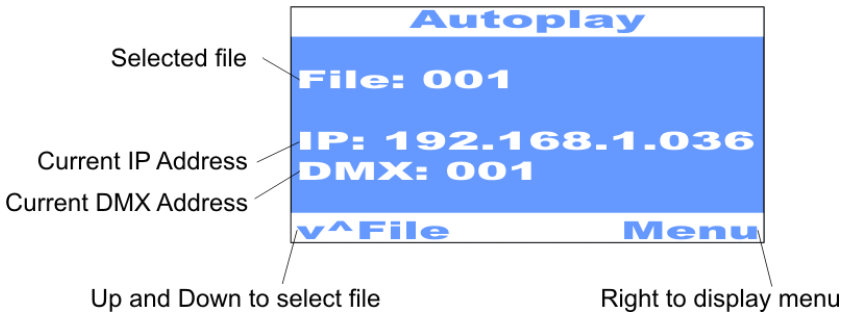
With DIP switch you set which show to play (switches 1 – 8) and you start your show using DIP switch 10.

Notes:

1. When switch 10 is in off position, stand-alone is not working.
2. If DMX or Ethernet has been used, Stand-alone mode is disabled. It's protection in case of loss of DMX or Ethernet signal.
3. It is possible to set size, position and all the remaining drawing settings using **autoplay.txt** file stored on the card.

4. Display and settings

Basic stand-alone screen contains following information:



You can use up and down arrows to select file to play from SD-card. With right button you can display **Main menu**.

4.1 Main menu

There are following options in Main menu:

Laser settings	Here you can define drawing size, position, invert and brightness for all modes (Ethernet, DMX or stand-alone).
Draw settings	Allows you to display draw settings for Stand-alone mode (Size, Position, …)
Play All	Plays all files from SD-card. It's perfect for disco, if you use supplied SD-card with many complete laser shows.
Default file	Sets default file, which will start to play after Moncha.NET is turned on.
IP Address	Set IP address of the device
DMX Address	Set DMX address of the device
Display test	Displays single white beam at the laser output
Load settings	Loads Stand-alone mode settings from internal memory
Save settings	Store stand-alone mode settings into device internal memory
Reset settings	Reset settings to default state
Advanced >>	Advanced menu
About …	Display basic information about Moncha.NET device (Version, Run hours, Serial number, …)

You can select specific settings using right button.

Moncha.NET has internal memory, where it can store all Draw settings, Default file, IP and DMX address. You can Load/Save/Reset these settings using menu commands.

4.2 Draw and laser settings

Laser Settings menu is applied for all 3 modes of Moncha.NET – Ethernet, DMX and Stand-alone. You can adjust drawing settings of the laser output for stand-alone mode using this **Draw menu**. It's good to select some file to play and adjust these settings while playing. There are following properties to set in both menus:

Size X	Set horizontal size
Size Y	Set vertical size
Position X	Horizontal position
Position Y	Vertical position
Rotation	Rotate picture around depth axis (Z), it's practical when laser is placed on uneven surface

In Laser Settings you can also set following properties:

Invert X	Invert horizontal axis
Invert Y	Invert vertical axis
Red, Green, Blue 1, Blue 2	Set intensity of each of 4 color channels.
Safe card is On	Allows you to turn on/off safe card (special for Kvant lasers).
Safety type	You can set type of safety algorithm using this settings (for Kvant lasers only).

In DMX Draw Settings you can set following settings:

Rotation	Rotate picture around depth axis (Z), it's practical when laser is placed on uneven surface
Scan-rate	Set scan-rate for the images: 0-default scan-rate 1-1% of required scan-rate 255-100% of required scan-rate
Animation speed	Speed of played animation: 0-Stop 128 – 100% speed 255 – 300% speed
Color	Allows you to recolor whole image using one color
Repeat	If checked, played animation or show is repeated when it ends

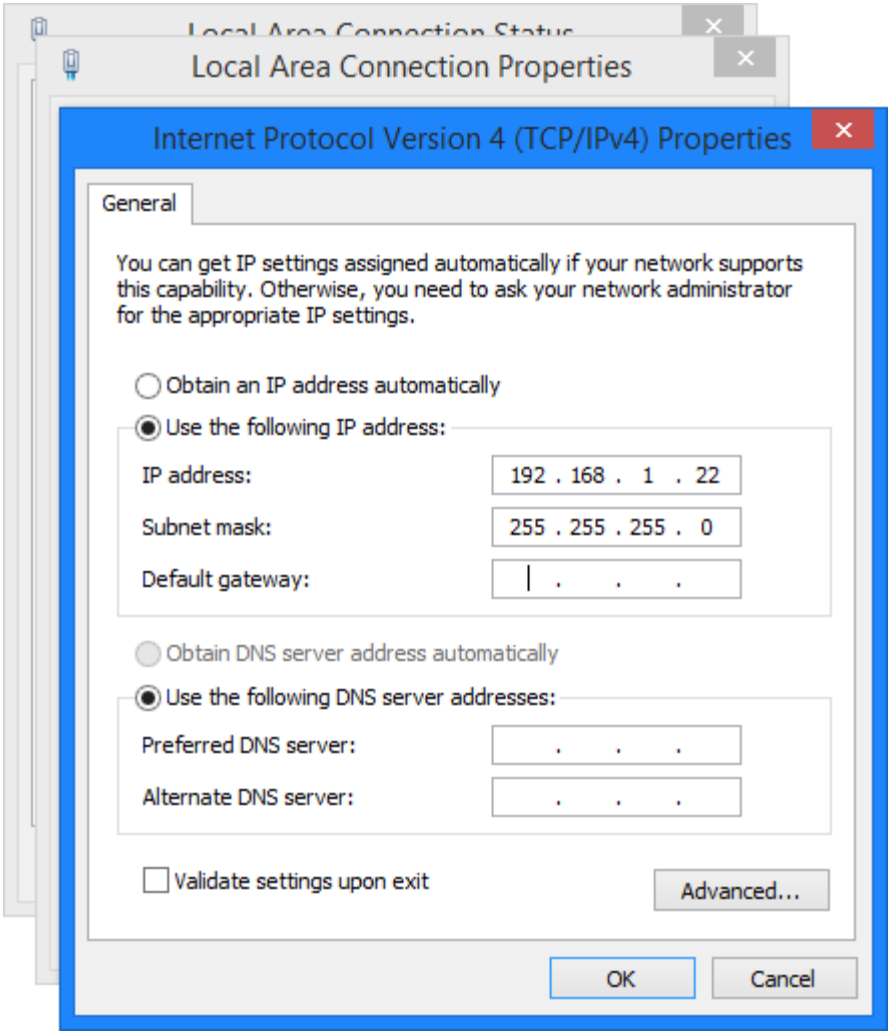
4.3 Advanced menu

Contains following items and tools:

Display Test	Allows you to display test patterns on your laser. It's good to check if your laser is working properly.
Settings Priority	Allows you to set, if the Laser Settings should be read from: • Moncha Device - internal memory of Moncha.NET • SD-card – from autoplay.txt file on SD-card
Play All Start	If this is checked, the device will start playing all the shows on SD-card after startup. This is perfect for small clubs, where you just need to play some laser scenes after the laser turns on.

5. Computer IP address

Your computer IP address must be set to 192.168.1.X, where X is arbitrary (but different than any of Moncha.NET devices) by default. But if you require to use different IP address family, since firmware version 2.5 this is possible.



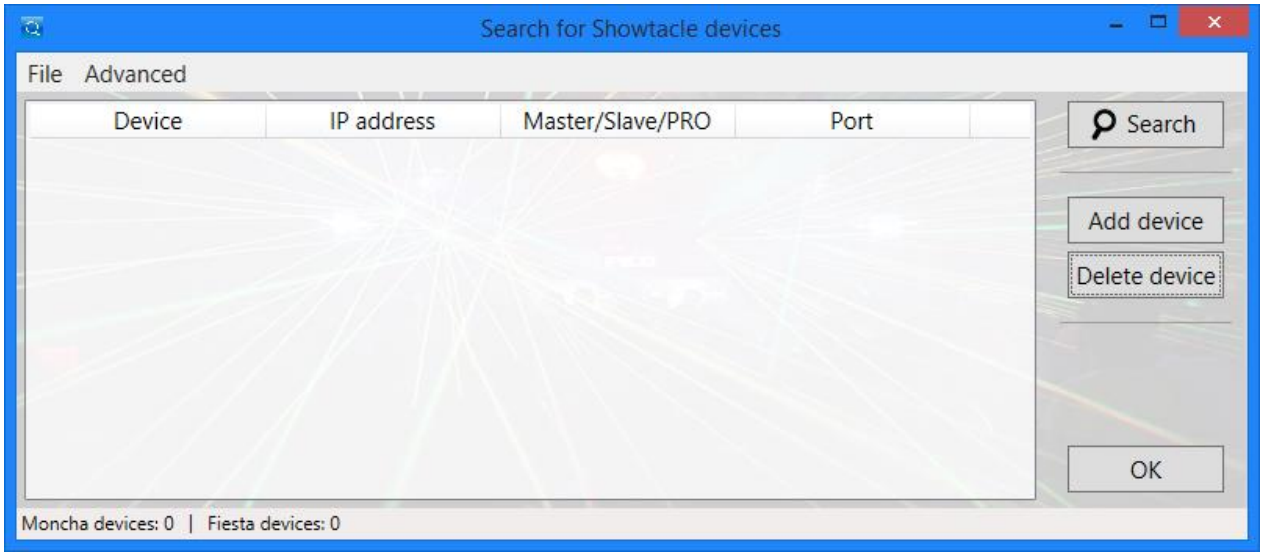
IP address of your computer can be set in Local Area Connection Properties

We have a convention of using IP address 192.168.1.22 for the computer. And we recommend to set IP address of Moncha.NET devices to 192.168.1.100 and more. This way you prevent setting the same IP address of two devices.

The easiest way to find out how to change your computer IP address exactly please watch our quick tutorial at https://www.youtube.com/watch?v=Rp-rOzRmrPQ.

6. Locating Moncha.NET devices over Network

Before you start Moncha or Fiesta software, you have to use “Search for Laser Devices” tool. This one is installed together with Moncha or Fiesta software.



Search for Showtacle devices will locate Moncha.NET devices automatically

After the program is started, you can just press **Search** and the software will find all connected Moncha.NET (or Fiesta.NET) devices.

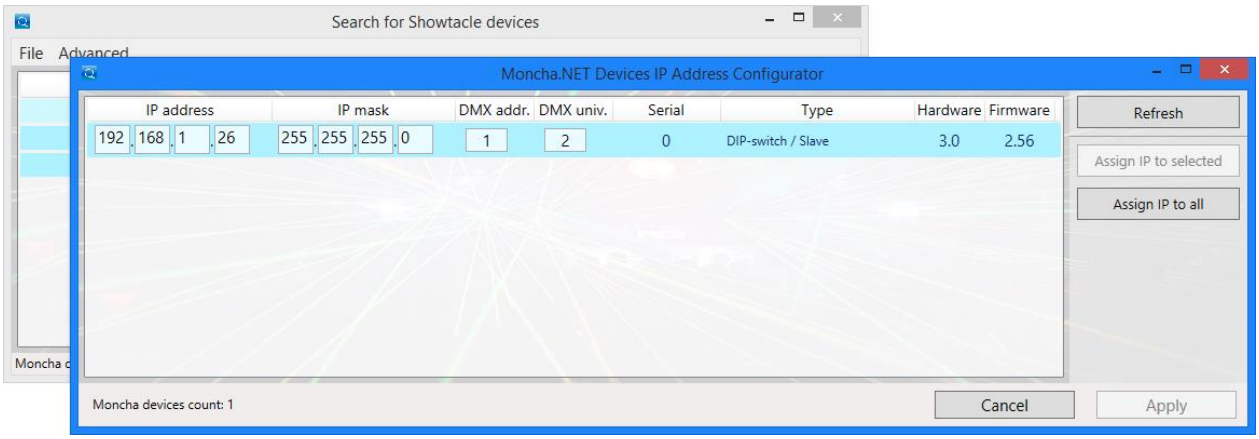
Located Moncha.NET and Fiesta.NET devices

Now you can just press OK and the software will save the device configuration. And you can now start your Moncha or Fiesta software. In case the software hasn't found any device, your computer IP address is probably not set. Please read section Computer IP Address.

The software also allows you to manually **Add device**. Or in case you don't want to use some device in the software, you can use **Delete device**.

6.1 Setting Moncha.NET IP address, DMX address and ArtNET Universe remotely

Latest version of Search tool allows you to set IP address, DMX address and ArtNET universe of the Moncha.NET device remotely. Just click **Advanced->Set IP Moncha.NET Address** from menu.



Setting the Moncha.NET IP, DMX and Universe

In the Moncha.NET Devices IP Address Configurator you can define full **IPv4 address**, **IP mask**, **DMX address** and **DMX universe** remotely from your computer. This saves a lot of work especially at huge laser show events with more than 3 lasers.

The tool will first find all connected Moncha.NET devices. Then you can set every property of each device. After you've finished the setting, just click **Apply** and all the devices remember the settings in their internal memory.

7. Moncha.NET SD card text files configuration

Moncha.NET allows you to configure following settings:

1. Brightness maps using **map.txt** file.
2. Color balance using **balance.txt** file.
3. Color fade curves using **fades.txt** file.
4. Stand-alone mode start settings using **autoplay.txt**.

All the files must be stored in card's root directory! You can use ';' to make notes in the files – all the text behind ';' is ignored. It's easier to generate first 3 files using Moncha.NET software.

7.1 Configure Brightness Maps

Moncha.NET allows you to define up to 8 independent rectangular brightness areas. They are defined in **map.txt** file:

```
[Area]
Left = -100
Right = 100
Bottom = -100
Top = 0
BrightnessLeft = 0
BrightnessRight = 100
BrightnessTop = 100
BrightnessBottom = 0
;Brightness = 100
```

There can be more [Area] sections in the file. Left, Right, Bottom and Top defines area size and position. All 4 values are from -100 to 100.

Brightness of the area can be defined in two ways:

- Using Brightness setting – all the area will use same brightness from 0 to 100
- Using Brightness Left, Right, Top or Bottom – defines intensity of the image on left, right, top or bottom area edge. E.g. when BrightnessBottom is 0 and BrightnessTop is 100, Moncha.NET will fluently fade image from top to bottom.

7.2 Configure Color Balance

Use **balance.txt** file to define color balance of the colors. There are 7 colors used: White, Red, Green, Blue, Magenta, Cyan and Yellow and you can define color channel levels for every one of these colors. So e.g. if you use RGV laser (the one with red, green and ultra-violet 405nm lasers), it is good to add a little green color to the blue (it will look more like blue).

```
[White]
Red = 255
Green = 255
Blue1 = 255
Blue2 = 255

[Red]
Red = 255
Green = 0
Blue1 = 0
Blue2 = 0

[Green]
Red = 0
Green = 255
Blue1 = 0
Blue2 = 0

[Blue]
Red = 0
Green = 0
Blue1 = 255
Blue2 = 255

[Magenta]
Red = 255
Green = 0
Blue1 = 255
Blue2 = 255

[Cyan]
Red = 0
Green = 255
Blue1 = 255
Blue2 = 255
```

```
[Yellow]
Red = 255
Green = 255
Blue1 = 0
Blue2 = 0
```

The color balance works the same as in Fiesta(.NET) software.

7.3 Configure Color Fades

Sometimes your laser turns on at e.g. 30% of the fade range and is at maximal brightness at e.g. 60% of the fade range. Then it's good to use color fade curves to enhance color fade. You can use **fades.txt** file to solve this problem:

```
[Red]
Point=0,0
Point=255, 255

[Green]
Point=0,0
Point=255, 255

[Blue1]
Point=0,0
Point=255, 255

[Blue2]
Point=0,0
Point=255, 255
```

So to solve your 30%-60% example for e.g. red color, you would need to write:

```
[Red]
Point=0,0
Point=1,76
Point=250, 153
Point=255, 255
```

(76 s approximately 30% of 0-255 range, 153 is 60% od 0-255 range).

7.4 Configure startup settings

Moncha.NET auto play settings file allows you to define DMX values (from DMX menu), which will be applied and used at start. If you need to use **autoplay.txt** file for display versions of Moncha.NET, please go to **Advanced menu -> Sett. Priority** and check **SD-card** (otherwise Moncha will use values stored in its internal memory).

All values work like using DMX controller:

```
[Autoplay]
SizeX = 255
SizeY = 255
PosX = 128
PosXFine = 0
PosY = 128
PosYFine = 0
Brightness = 255
RotZ = 0
RotZFine = 0
Scanrate = 0
AnimSpeed = 128
Red = 0
Green = 0
Blue1 = 0
Blue2 = 0
FileToPlay=1
```

Few important details:

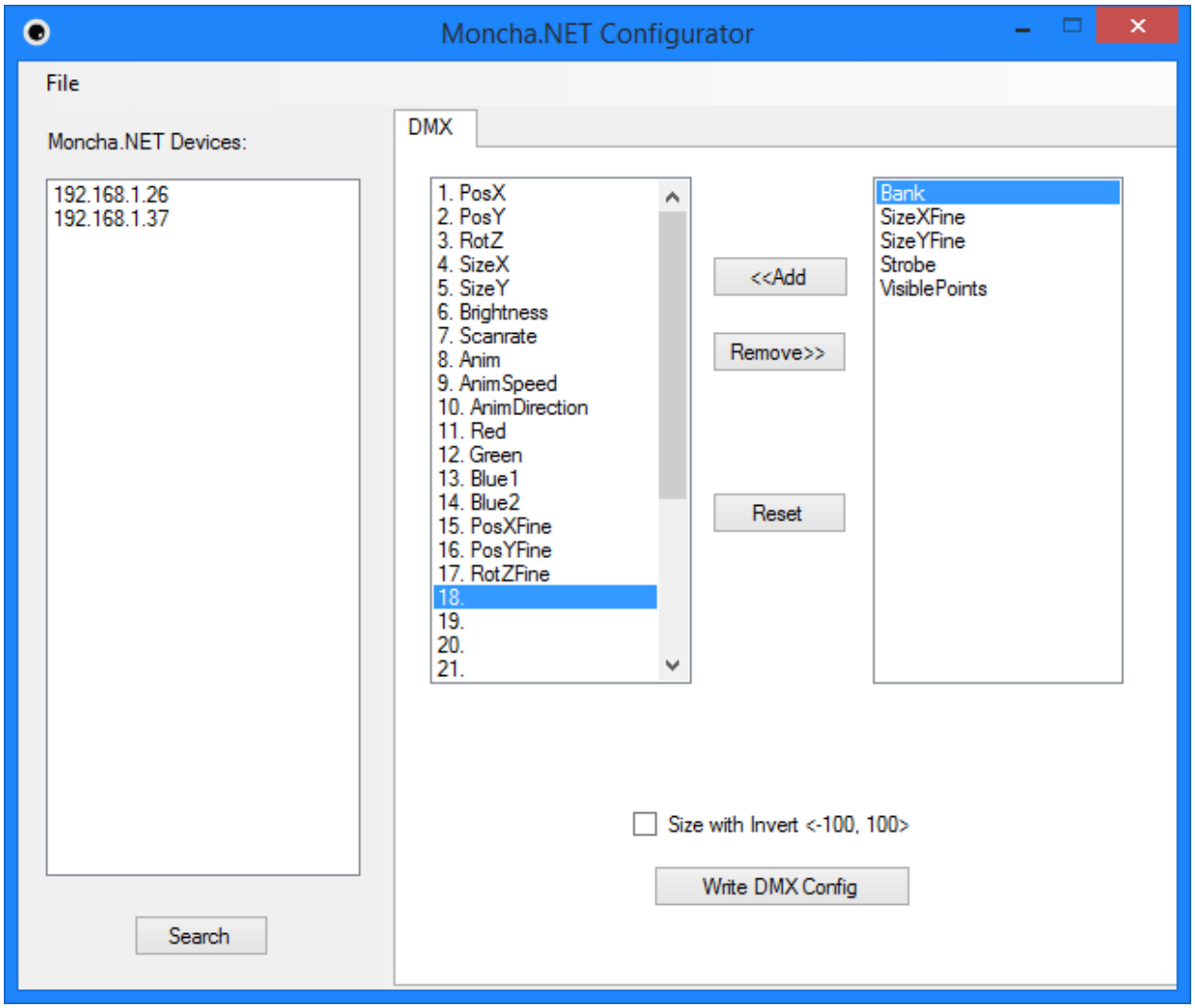
- AnimSpeed=128 is the default speed to play synchronized files
- ;AnimSpeed=255 is 4x faster
- ;FileToPlay - if it's 0, or > 255, or if it's not used and auto play uses file defined by DIP switch

8 Configure Moncha.NET DMX Channels

Since version 2.5 of Moncha.NET firmware you can define order and also number of used DMX channels for your Moncha.NET device. In the installation directory (typically C:\Program Files (x86)\Moncha 4) you have **MonchaUsersConfigurator.exe** file.

1	Position X	128 - middle
2	Position Y	128 - middle
3	Rotation	0 (0 degree) – 255 (360 degree)
4	Size X	0 (0%) – 255 (100%) or 0 (-100%) – 255 (100%)
5	Size Y	0 (0%) – 255 (100%) or 0 (-100%) – 255 (100%)
6	Brightness	0 (0%) – 255 (100%)
7	Scan rate	0 (default), 1 (slowest) – 255 (fastest)
8	Animation	0 (none), 1 – 255 (animation from SD-card)
9	Animation Speed	0 (0% - stop) – 128 (100%) – 255 (300%)
10	Animation Direction	0 – 127 (normal direction), 128 – 255 (opposite) – this is working only for files up to 255 frames
11	Red	0 – default, 1 (0%) – 255 (100%)
12	Green	0 – default, 1 (0%) – 255 (100%)
13	Blue	0 – default, 1 (0%) – 255 (100%)
14	Dark Blue	0 – default, 1 (0%) – 255 (100%)
15	Position X Fine	Fine position for X
16	Position Y Fine	Fine position for Y
17	Rotation Fine	Fine rotation
18	Bank	0 – root directory, 1 – 255 forces to use directories named “001” to “255”
19	Size X Fine	Fine size X
20	Size Y Fine	Fine size Y
21	Strobe	0 – no strobe, 1 – 255 sets strobe speed
22	Visible points	0 (100% points visible) – 127 (0% points visible) - from the start 128 (0% points visible) -255 (100% points visible) - from the end

Complete list of available Moncha.NET DMX channels (blue are optional)



DMX configuration tool for Moncha.NET devices

In the left list you can see available Moncha.NET devices connected over Ethernet. You can click **Search** to refresh the list.

You can define type and order of the used DMX channels. There are some additional channels to standard 17 channels used by default configuration of Moncha.NET:

Bank – it's possible to use more banks on the SD card. Directory name must be 001, 002, … , 255. And you can store up to 255 files in every bank (EFF001 – EFF255.MNT). This DMX channel then allows you to choose between the different banks.

SizeXFine, SizeYFine – Moncha.NET uses 16bit precision for size. This allows you to use size from 0 to 65535 (2 bytes).

Strobe – hardware strobe effect allows you to turn on/off picture quickly. 1 – slowest strobe, 255 – fastest strobe.

Visible points – favorite visible points transformation for lasers. 0 – full picture, 127, 128 – no picture, 255 – full picture.

Size with Invert

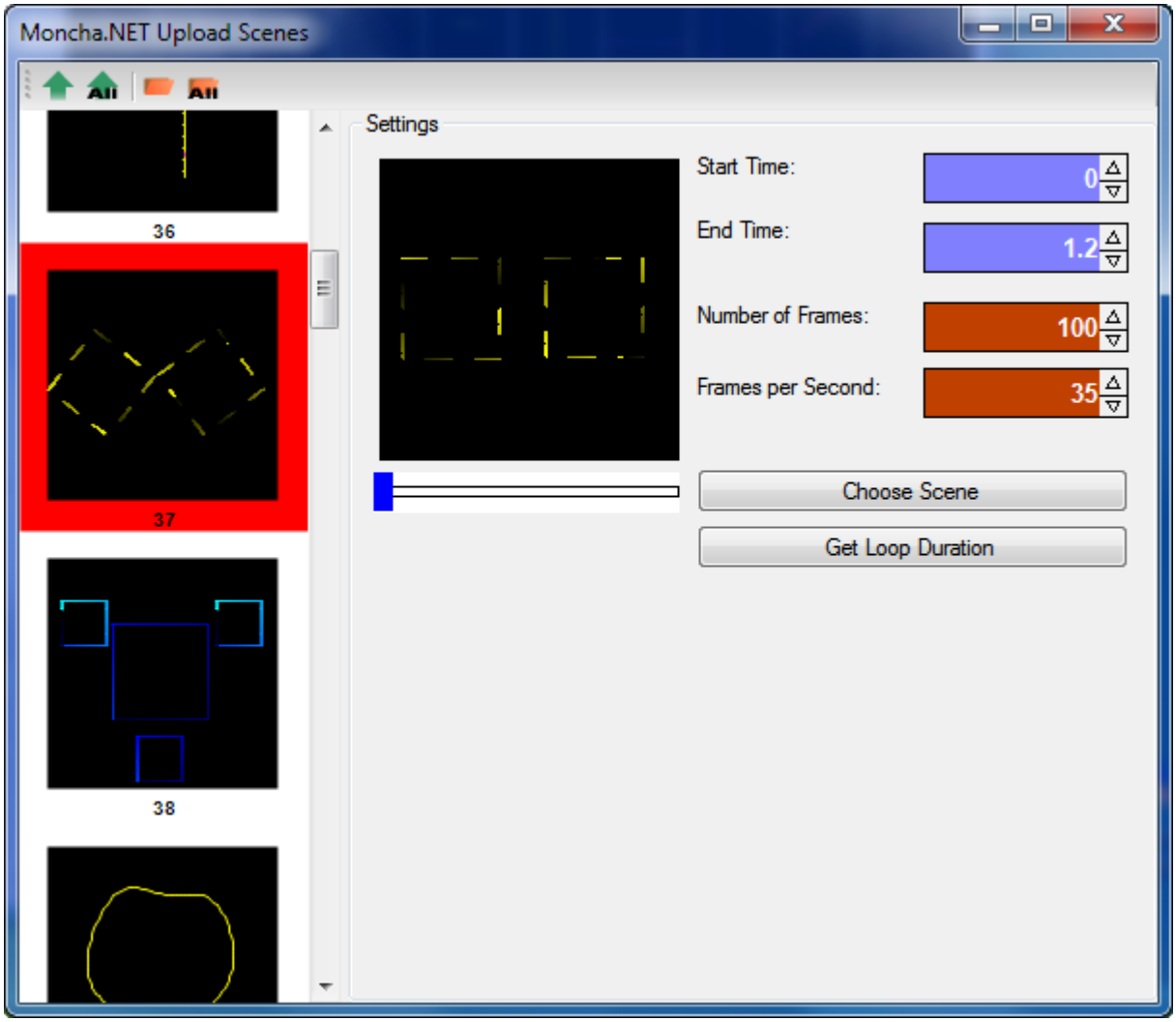
In this configuration tool you can now also define behavior of SizeX/SizeY. In case you check this, the size DMX channels can do invert too:
0-inverted maximal size (x or y), 127 – zero size, 255 – normal maximal size.

To store your configuration just press **Write DMX Config** button. This configuration is stored into Moncha.NET's internal memory, thus is active even if the device was turned off/on.

9. Uploading animations to Moncha.NET

You can create and upload frames to Moncha.NET SD-Card using Moncha.NET software. It is even possible to upload to more devices at once, which is very practical by DMX-controlled laser shows. Thanks to brightness maps it is even possible to make the DMX laser show safe.

You can find upload scenes dialog in **Tools->Upload scenes** in Moncha.NET software menu. Following window will be displayed:



Upload scenes dialog

On the left side you can see animations, which will be exported to SD-Card. You can change animation to any scene from your workspace. Just select **Choose Scene** and you'll be able to pick any scene from workspace.

The remaining settings can be used to prepare your animation suitable for DMX control. **Start Time** sets start time of the animation, **End Time** end of the animation. Using these settings you can make your animation loop-able.

Number of frames determines number of frames of the exported animation. It is recommended to use less than 256 frames – like this you'll be able to control direction of the animation (using channel 10).

Frames per seconds determine speed of playing of the frames. We recommend keeping it at 35, like this the animation is smooth.

When you set all your desired animations, you can export your scenes to SD-Card or to Moncha.NET devices directly. You can also export all animations or only one.

10. ArtNET for Moncha.NET

ArtNET is one of the "DMX over Ethernet" protocol. It's used by wide range of lightning consoles. You can find more information about the ArtNET at www.artisticlicence.com.

Controlling Moncha.NET over ArtNET is very convenient – you can use Ethernet cables to wire all the lasers and you can upload your scenes and shows from Moncha software remotely over the same cables. And there is another benefit – controlling Moncha.NET over ArtNET is very fluent even for animations.

ArtNET usually requires IP 2.X.X.X or 10.X.X.X IP range. Since Moncha.NET firmware version 2.5 you can set all 4 bytes of IP address of the Moncha.NET device. But in our experience, most of the ArtNET software allow you to use almost any IP address.

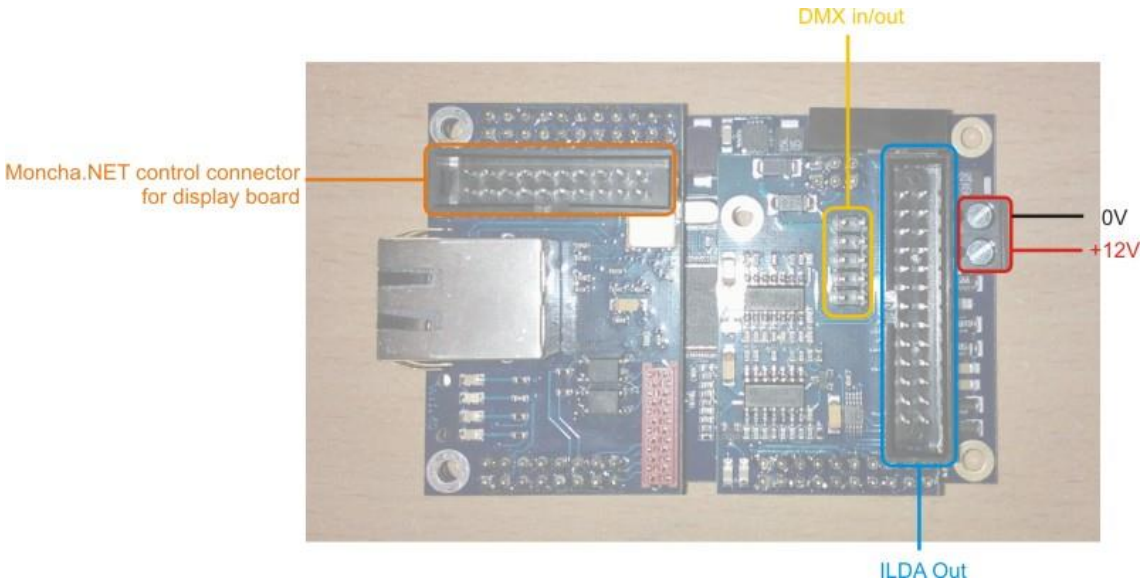
There are following important settings for ArtNET in Moncha.NET:

IP address – should be 2.X.X.X or 10.X.X.X for ArtNET (but in our experience, any IP address will work).

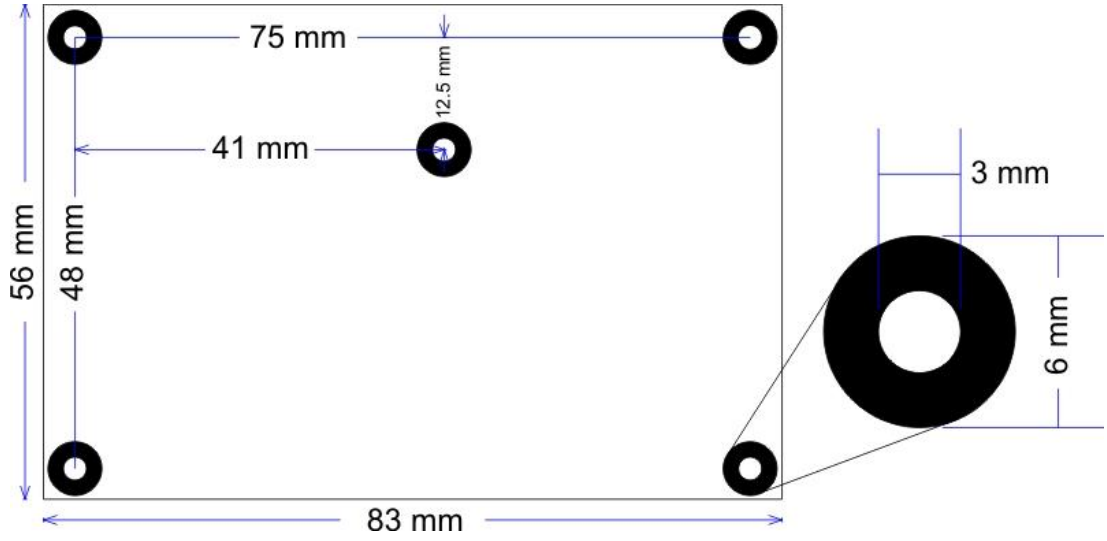
DMX address – it's the same as for DMX mode of Moncha.NET

DMX universe – ArtNET protocol can transfer multiple Universes. You can define Universe for every Moncha.NET device.

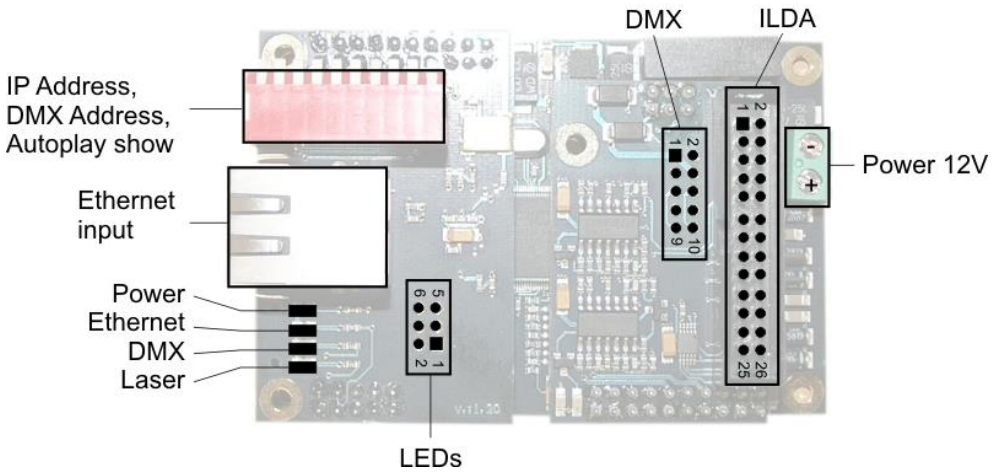
11. Moncha.NET Hardware



Moncha.NET Main Board Connectors



Moncha.NET board size



Moncha.NET board with connectors and numbering

There are following important connectors and controllers on Moncha.NET board:

- DIP switch
- Ethernet connector
- ILDA output
- DMX
- Control LEDs

11.1 Moncha.NET Main Board technical specification

Required power	12V, 0.5A
DMX connectors	IDC10
Power connector	Screw terminal
ILDA Out	IDC26
Display board connector (ILDA switch)	IDC20

11.2 ILDA OUT connector

Is used to control your laser scanners and laser color. Here is the pin description:

Pin	Function
1	AXIS X +
2	AXIS X -
3	AXIS Y +
4	AXIS Y -
5	Blank
6, 10, 12, 14, 16, 18, 20, 24, 26	GND ILDA
7	Connect to pin 7
8	Connect to pin 8
9	Red
11	Green
13	Blue
15	Dark Blue
17	Yellow
19	Cyan
21, 22, 23	Not connected
25	Shutter

11.3 DMX connector

There is one DMX input and one DMX output on the Moncha.NET device. Using DMX input you can control your Moncha.NET using any DMX-controller, or you can use Moncha.NET software to control simple DMX devices (and synchronize them with laser show).

Here is the DMX pin description for OEM versions (DIP switch or display):

Pin	Function
1	GND In
2	DMX In -
3	DMX In +
4	GND Out 1
5	DMX Out 1 -
6	DMX Out 1 +
7	GND Out 2
8	GND Out 2
9	DMX Out 2 -
10	DMX Out 2 +

DMX in and also DMX out 1 should be connected to front panel connectors. DMX Out 2 can be used to control optical effects/mirrors/gratings built **inside** laser system.

DMX Out works in a 2 ways – as THRU connector, when Moncha.NET is controlled over DMX in. And it's real OUT connector for Moncha.NET software, when used over Ethernet.

11.4 DIP Switch (for DIP switch version)

DIP switch is used in different context:

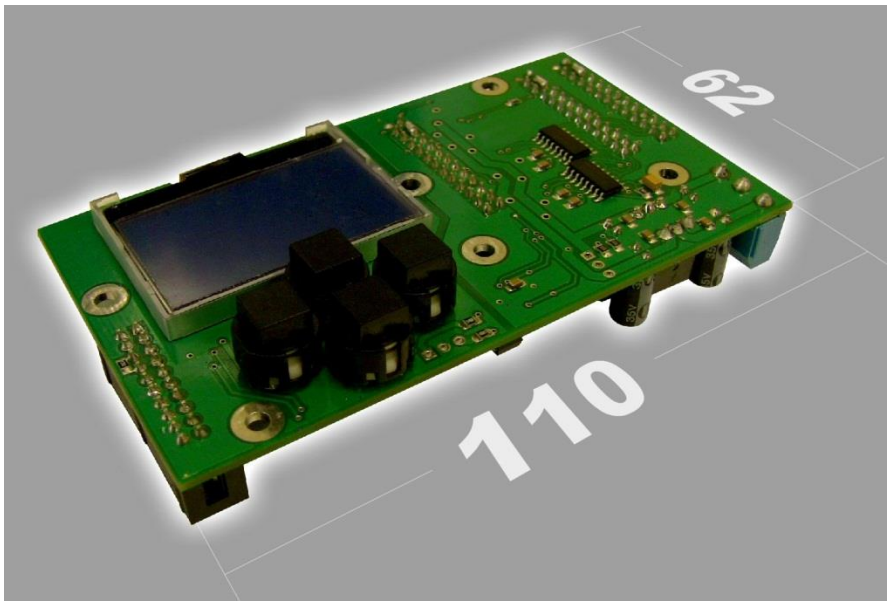
1. Sets IP address with switches 1-8.
2. Sets DMX address with switches 1-9.
3. Sets show to play in Stand-alone mode with switches 1-8 and enables playing in Stand-alone mode with switch 10.

11.5 Control LEDs

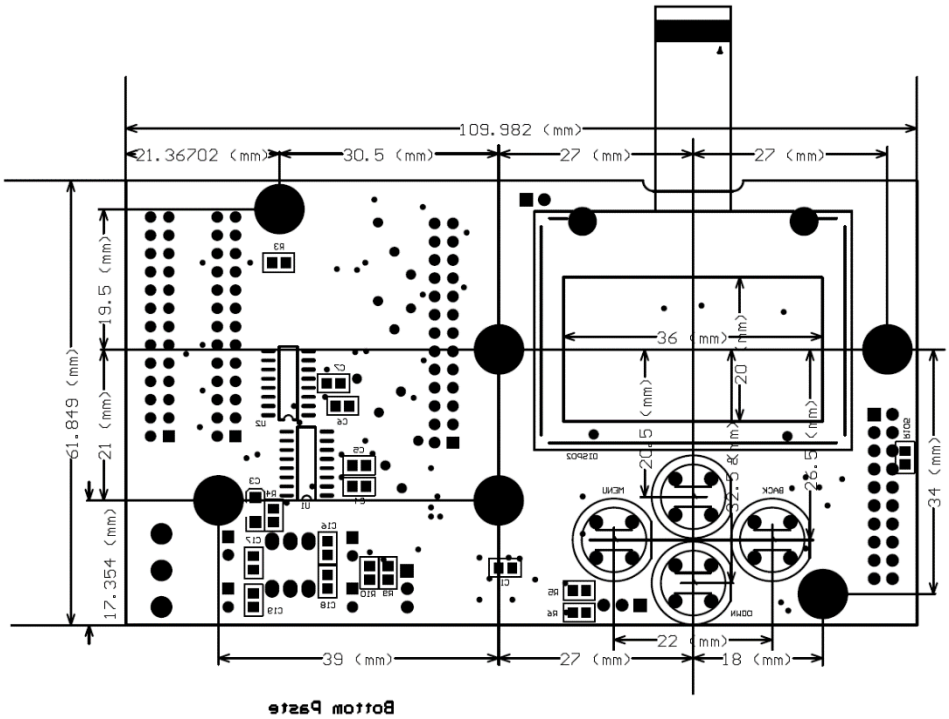
They are located on the Moncha.NET board (or Moncha.NET box), but you can also use connector to mount them on your case.

LED	**Function**
1	Laser
2	DMX
3	Ethernet
4	Power
5, 6	GND

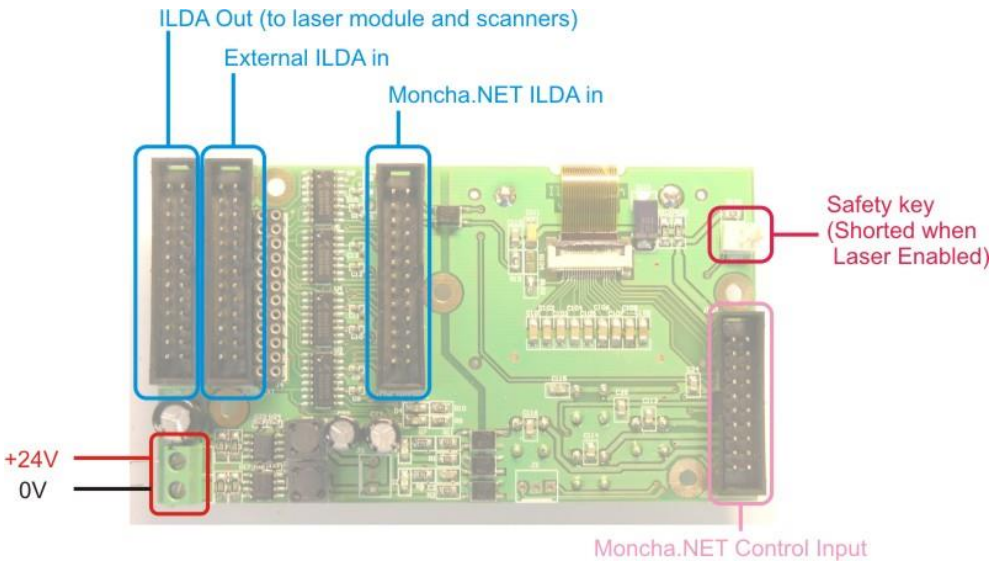
12. Moncha.NET display board



Moncha.NET Display board size



Display board detailed dimensions



Display board connectors

Display board technical details

Required Power	+24V, 150mA (usually connected from scanner power supply)
Power connector	Screw terminal
ILDA Out connector	IDC26
External ILDA in	IDC26
Moncha.NET ILDA in	IDC26
Moncha.NET Control Input	IDC20
Safety key	NSL25-02

Connector function

ILDA Out – connected to scanner drivers and laser module drivers
External ILDA in – front panel external ILDA in (used for other controllers)
Moncha.NET ILDA in – Moncha.NET ILDA out is connected to this connector
Moncha.NET Control Input – control connector for Moncha.NET main board
Safety key – when shorted, enables laser output (from Moncha.NET ILDA or External ILDA)