# MaNima Interface

*The State of the Art LED Interface*

# Manual V2.0.4

## Live mode

The MaNima LED interface can send live data with ArtNet to a digital LED strip or one or both DMX ports.

## Custom API

We can connect your system with the MaNima Interface by custom-made APIs.

## Controlling scenes

The recorded scenes can be started by external inputs, DMX; 4-20mA or 0-10V, UDP and HMI.

## Art-Net

The MaNima LED interface can be controlled via ArtNet V1.4. The interface is easy to find and use thanks to the ArtPoll system to configure.

## Standalone mode

In Stand-Alone mode, the MaNima LED interface plays a recorded scene from the SD card. The scene can be recorded through Art-Net according to the WYSIWYG principle.

## Easy-to-use GUI

The settings of the MaNima LED interface can easily be changed by a user via the MaNima LED interface configurator.

## External inputs

Scenes can be started via external inputs. These are digital inputs or analogue inputs; 4-20mA or 0-10V.

## Synchronization

Multiple MaNima led interfaces synchronize when playing scenes through a master and slave setup.

## Multiple protocols at once

Due to the available multiple ports, there is also the possibility of sending different protocols over different ports.

# Table of Contents

First of all, thank you for using the MaNima Interface!

The MaNima Interface is a very powerful product. With the ability of recording and playing up to 26 universes at once (depending on your license), it is the most powerful LED Interface on the market.

This manual has been made for any of the MaNima Interfaces. It is important that anyone, who has to work with the MaNima Interface, has read this manual.

It is important to keep the model and license of your MaNima Interface in mind while reading through this manual. Not all chapters of this manual will apply to you, if you have a certain licence. To see which chapter apply to your licence/model, visit the ´MaNima Interface Models´ chapter.

MaNima Technologies

To make sure the product is properly handled, these precautions and safety instructions must be followed:

- Read the entire manual before installing the MaNima Interface.
- These instructions should be handed out to the technicians/end-users responsible for installing and/or operating this product.
- The installations of this product should only be carried out by certified personal.
- Do not repair this device. Any unapproved modifications or reparations conducted by anyone other than MaNima Technologies B.V., will void product warranty.
- Do not connect the wiring to this product in any other manner than described in this manual.
- Never use this product when it is damaged, has visible damage, does not work correctly or when the product shows any other questionable behaviour that is out of the ordinary with electrical devices.
- Make sure the power source has no short-circuit.
- Make sure the input voltage is between 12-48VDC when power is turned on. Higher voltages might damage the product.
- Do not use more than one power source for the MaNima Interface.
- To turn-off the MaNima Interface, it must be disconnected from the power source.
- The MaNima Interface must be protected against wet environments. Any moist will damage the product.

# Technical Specifications

| | |
|---|---|
| **Weight** | *360 Gr* |
| **Dimensions** | *90 x 159 x 58 mm* |
| **Mounting** | *Din rail* |
| **IP class** | *IP10* |
| **Wiring** | *Max. 2.5mm2 \| 14 AWG* |
| **Connectors** | *Power: 12-48 VDC terminal connector, Art-Net terminal connector:RJ45 bus, IO port 5- input/ Output terminal connector, analogue 6-pin terminal connector, +1- volt terminal connector.* |
| **Input voltage** | *12-48V DC 200mA max* |
| **Max. power consumption** | *9.6W* |
| **Channels** | *13.312 Art-Net and/or up to 1024 DMX channels* |
| **Ethernet** | *RJ45 compatible, for 10/100 Base-TX Ethernet with Static IP address or DHCP* |
| **Input** | *DMX512 (2 Inputs)\| Art-Net \| MaNima Configurator \| 5 Digital Inputs \| 6 Analogue Inputs \| UDP \| Custom APIs* |
| **Output** | *47+ SPI protocols (supported ICs list) \| DMX512 (2 outputs) \| SPI (6 outputs) \| Art-Net* |
| **Directives** | *CE, RoHs* |
| **Operating temperature** | *10°C ~ 60°C* |
| **Storage temperature** | *10°C ~ 60°C* |
| **Warranty** | *5 Years* |
| **Gui** | *MaNima Configurator* |

# The MaNima Configurator

In this chapter there will be everything you need to know about The MaNima Configurator.

**The MaNima Configurator**

The MC (MaNima Configurator) is the program used by the operator to configure the MaNima Interface. The MC must be installed on a computer on the same network where the MaNima Interface is installed on. To work with the MC it is recommended to first install and connect the MaNima Interface to the network, since most (if not all) options won't be available without a connection between the computer and the MaNima Interface.

The MC is opened by adding the "GUI" file to the computer. In this file the user will find all of the files needed to use this program. You can place the "GUI" in any file, but for this manual, the file will be placed in the desktop.

The computer on which the MC will be installed on, needs the newest version of Java. Java can be downloaded on: https://www.java.com/en/

- **Open the file with the left mouse button and double click on "ManimaSetupTool" (Highlighted blue on the image below)**
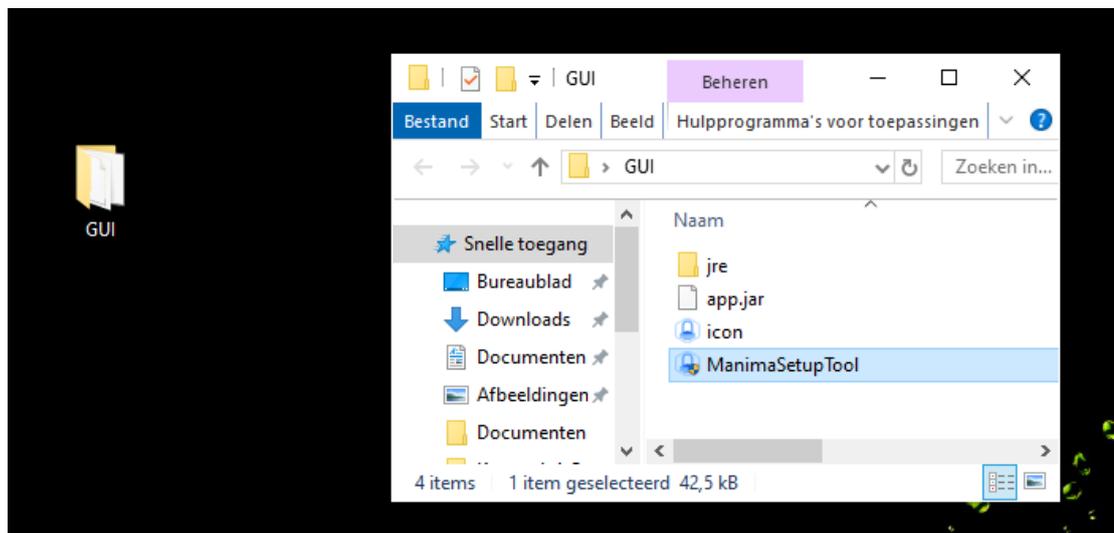


- **To open the MC directly from your desktop, you can create a shortcut using the right mouse button on the "ManimaSetupTool" file**. The "ManimaSetupTool" can't be placed outside the file, if done so, the MC will have an error.

# The MaNima Configurator- The UI (User Interface)

On the left side of The MC window there are multiple tabs which are used to configure the MaNima LED Interface. A short explanation is given to each tab below:

**Scanner**

The scanner is the tab where the user can find and select the different MaNima LED interfaces that are connected to the same network. This is also the homepage.

**Network**

Network is the tab used to select DHCP and to configure IP-addresses manually.

**Led output**

Mapping is the tab used to configure each port of the MaNima LED Interface. universes can also be added, deleted and changed here. Chipsets & colour sequences are also found here.

**Inputs**

The DMX is used to configure DMX modes.

**DMX**

With the scenes tab the user can add .REC files to different players. Recording is also done with this tab.

**Scenes**

Use a group to make several interfaces work together. This is used when using synchronised recording and synchronised playback.

**Group**

This tab is used to configure the Analog and Digital inputs of the MaNima LED Interface

**Update**

The Update tab is used to keep the Software version of the MaNima Digital LED Interface up to date.

**Settings**

Here it is possible to change the name of the device, perform a (factory)reset and to change the global dimming.

**About**

By pressing about, the user can see which version of the MC is installed.

The Scanner is the tab used to search for different MaNima LED Interfaces. Follow the instructions below to configure your own device.

**Make sure your computer and MaNima LED Interface are connected to the same Ethernet/Wi-Fi network! The Interface should be in the scanner no matter what IP-adress it has.**

**Scanner**  **Currently editing: ManimaInterface (192.168.1.185)**

| Device name | IP Address | MAC | Version | Software Version | Identify |
|---|---|---|---|---|---|
| ManimaInterface | 192.168.1.185 | 70:B3:D5:DD:90:30 | Magnus 8 | V 2.0.7 | |
| ManimaInterface | 192.168.1.186 | 70:B3:D5:DD:90:22 | Magnus 8 | V 2.0.7 | |

*The IP-Address is the number given to a device. Using this address the user will know which device is which.! Multiple devices can have the same IP!*

*This shows the version of the used hardware in the MaNima LED Interface.*

*If identify is switched on you can see which LED is controlled by that device.*

*Device name is the name given to a device. The user will know which device is which. You can change the device name in the "settings" Tab.*

*The MAC address is the name given to the MaNima LED Interface by the manufacturer. MAC addresses are, unlike IP addresses, never identical to each other.*

*This shows the software version of the connected MaNima LED Interface.*

*This shows which device is currently being edited.*

**To connect to The MaNima LED Interface, Left click on the Interface.** If the connection is successful, there should be "Currently editing: (IP-address)" instead of "Currently editing: None".

**Failure to Connect**

If the MC is unable to find the MaNima LED Interface, there are multiple things that may have gone wrong. So, make sure the following are correct:

1. The Connected MaNima LED Interface is connected to the same network as the computer.
2. The network has a DHCP.
3. The IP-address is in the IP-address range of The MC.
4. The MaNima LED Interface is powered or has the correct voltage.

## Error Warning

The error warning is shown when the Interface has encountered a problem. In the example given here, the Interface has encountered a problem where there are to many universes in a port. This can be fixed by lowering the FPS in the live playing software.



When such an error occurs, but it isn't noticeable in real life, you can press 'clear errors' and keep the program playing.

When the errors are noticeable in real life, follow the instructions in the 'Error window'.
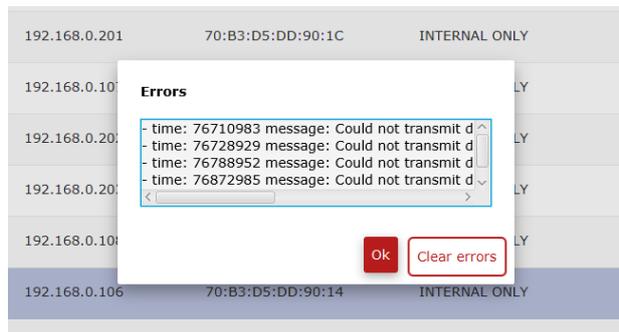
# The MaNima Configurator - Network Configurator

The Network tab is used to edit the IP-address of the device. The IP-address can be edited manually by disabling the DHCP, or automatically by enabling the DHCP.
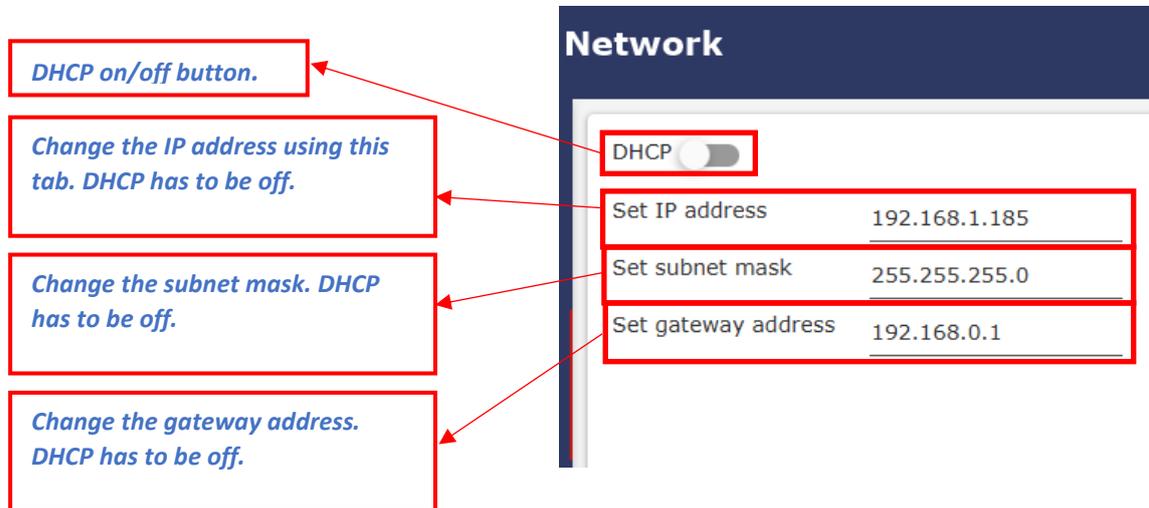
*DHCP on/off button.*

*Change the IP address using this tab. DHCP has to be off.*

*Change the subnet mask. DHCP has to be off.*

*Change the gateway address. DHCP has to be off.*

**Network**

DHCP ⬜

Set IP address      192.168.1.185

Set subnet mask      255.255.255.0

Set gateway address      192.168.0.1

The Mapping tab is used to configure the SPI-output ports on the MaNima LED Interface.
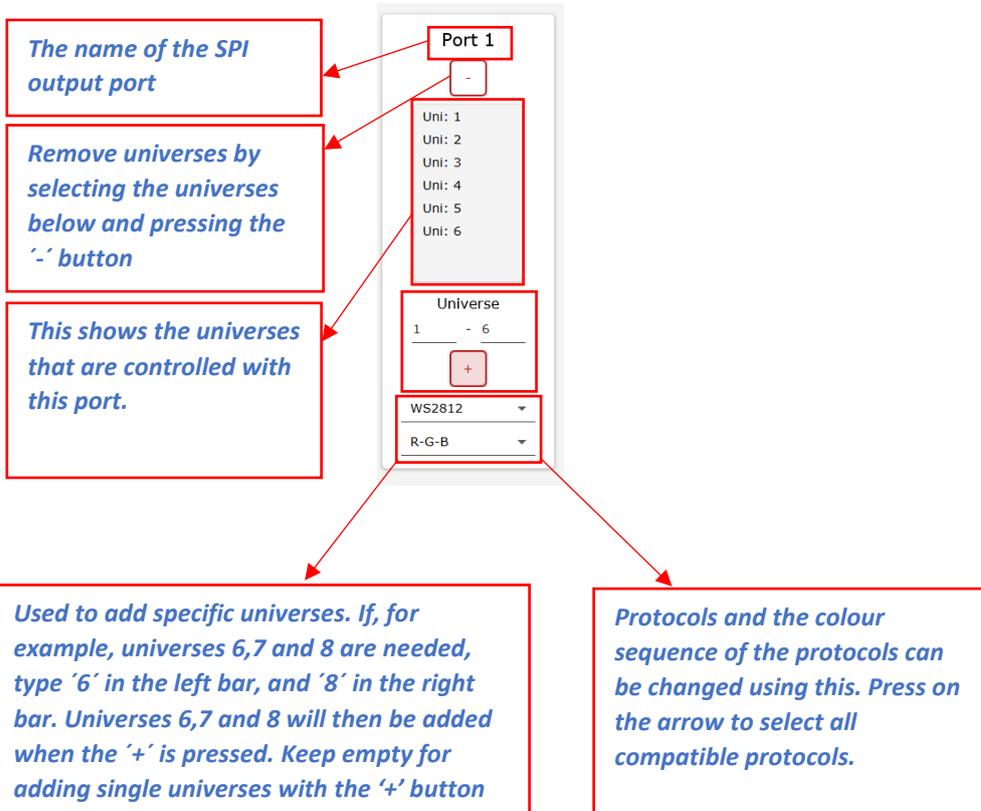
**The name of the SPI output port**

**Remove universes by selecting the universes below and pressing the ´-´ button**

**This shows the universes that are controlled with this port.**

Port 1

-

Uni: 1
Uni: 2
Uni: 3
Uni: 4
Uni: 5
Uni: 6

Universe
1    -  6
+

WS2812
R-G-B

**Used to add specific universes. If, for example, universes 6,7 and 8 are needed, type ´6´ in the left bar, and ´8´ in the right bar. Universes 6,7 and 8 will then be added when the ´+´ is pressed. Keep empty for adding single universes with the '+' button**

**Protocols and the colour sequence of the protocols can be changed using this. Press on the arrow to select all compatible protocols.**

**Multiple protocols at once**

Due to the multiple available ports, there is also the possibility of sending different protocols over different ports. This is done by selecting a different protocol for each port.

**Colour sequence**

You have the possibility to change the colour sequence of the protocols.

| WS2812 | WS2812 | WS2812 | WS2812 | WS2812 | WS2812 |
|--------|--------|--------|--------|--------|--------|
| R-G-B  | R-G-B  | R-G-B  | R-G-B  | R-G-B  | R-G-B  |

*The DMX tab is used to configure the Interface between three different DMX-modes. These modes are:*

Disabled: The Interface will not be or be affected by different Interfaces and will operate by itself.

Master: Master mode will enable the output of the DMX connections. This has to be enabled to send DMX protocols to devices.

Slave: This mode will enable the DMX input channels on the Interface. Using this, the interface can be commanded with DMX.

**Master Mode:**

The master mode sets the DMX port as an output to be connected to other devices.

| Mode | Master |
|------|--------|
| Universe | 1 |

*Set the right universe in here.*

**Slave Mode:**

Dmx 2

| Mode | Slave |
|------|-------|
| Ch 1 | Player 1 start |
| Ch 2 | Player 1 stop |
| Ch 3 | Player 2 start |
| Ch 4 | Player 2 stop |

*Select the mode*

*Delete a Channel using this icon.*

*This is the selected action, that is currently paired with the channel.*

*This is the current channel. These can be changed by changing the number.*

Add channel
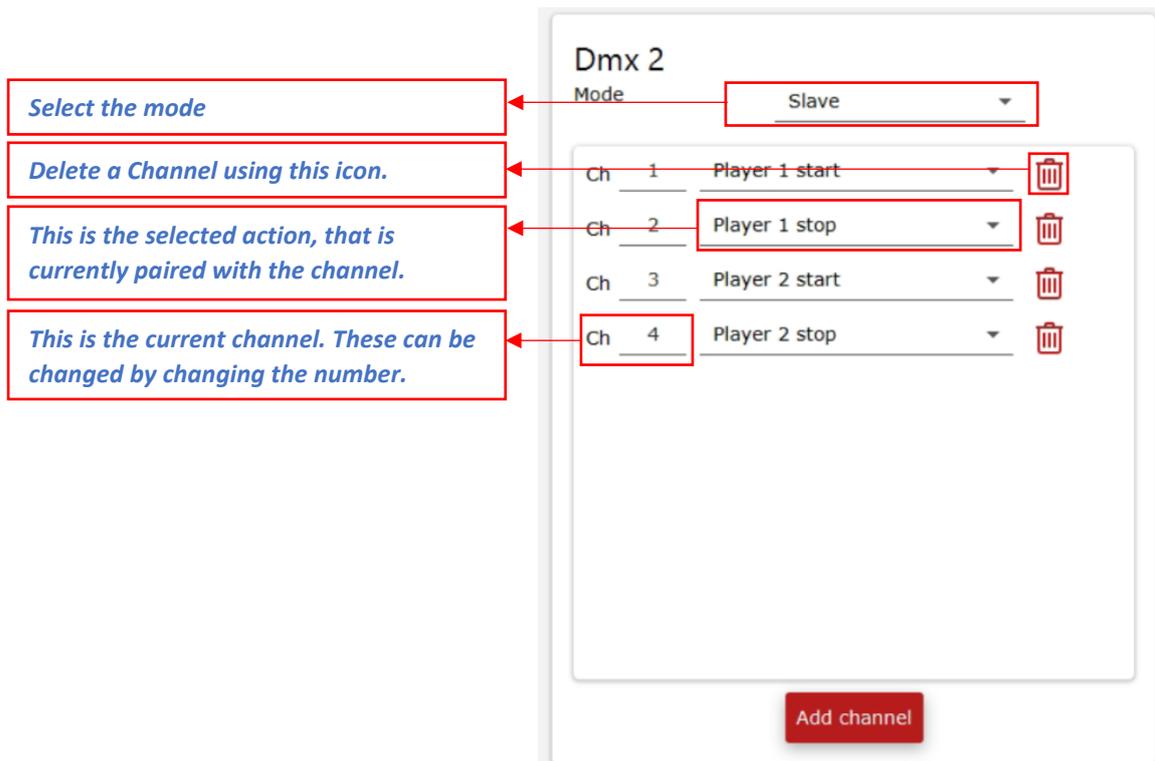
*With scenes .REC files can be recorded on the MaNima LED Interface.*
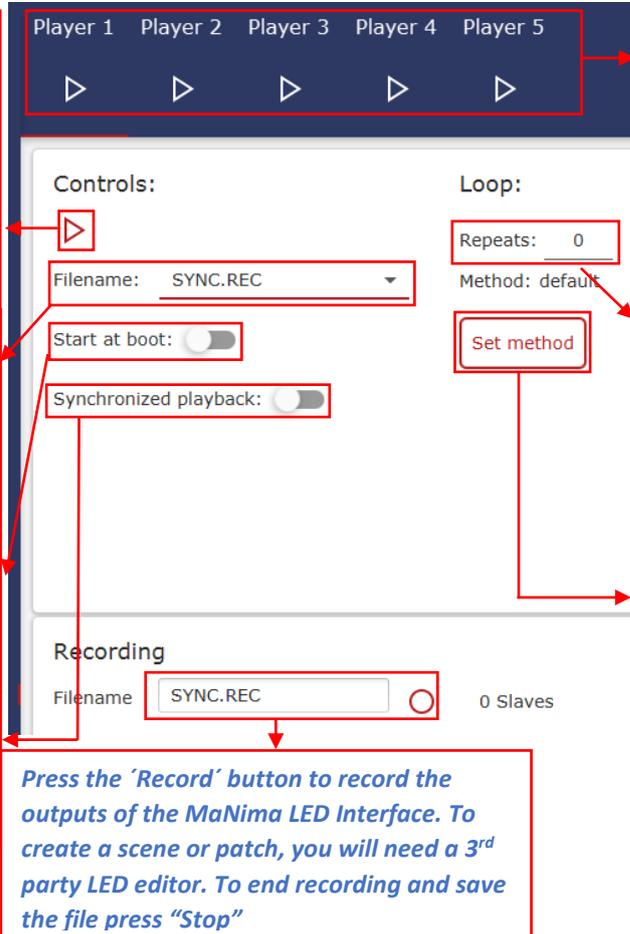


**Pressing the ´Play´ button will activate the .REC file. If the MaNima LED Interface is connected to LEDs, they should play the scene immediately. To stop the scene, press the "Stop" button.**

**Scenes that have been recorded with this tab will be saved on the SD-card on the MaNima LED Interface and will show up in here. Scenes can be selected here.**

**Enable ´start at boot´ if the scene needs to play when the MaNima LED Interface turns on.**

**Enable the 'Synchronized playback' option when using grouped Interfaces.**

**Players are individual tabs of controls where the user can quickly switch between scenes.**

**Change the number of repeats of the scene. If "Repeat=0" the scene will play**

**This opens a menu in which you can select different loop methods.**

**Press the ´Record´ button to record the outputs of the MaNima LED Interface. To create a scene or patch, you will need a 3rd party LED editor. To end recording and save the file press "Stop"**

**Recording scenes**
If a scene must be recorded, there needs to be an output signal going through the SPI or DMX outputs of the MaNima LED Interface. Universes must be added in the 'LED Output' or 'DMX' tab before sending data through the SPI or DMX ports. When a scene is playing, press record.

**Live recording with 3rd party LED editing software**
Using 3rd party software which is compatible with the MaNima LED Interface is important. Follow the instructions of the LED editing software to ´live edit´ the LEDs that are to be programmed. Make sure the used universes are in the mapping of the MC. All LED editing software that uses ART-NET is compatible with the MC and Interface.

**If the LEDs are being controlled with the 3rd party software through the MaNima LED Interface, you can name the file and press "record" on The MC and press ´Stop´ to save the file.**
The filename must be written with capital letters and cannot exceed 7 symbols.
**The file is now saved on the SD-card of the MaNima Interface and can be selected.** To test if the file is working, **select the file in the player and press ´Start´. (Instructions for synchronised recording and playing, visit the Master-Slave function chapter)**

## Loop Functions

The MaNima Configurator has built in 'loop functions', these functions are used to make smooth transitions between the start and end of a scene.

To use loop functions, click on 'Set method' when having a scene selected:

**Loop:**

Repeats:      0

Method: default

Set method

A window pops up in which you can select the effect you want to use:

**Set loop effect**

Select effect
- ⦿ Default
- ◯ Autoloop
- ◯ Bounce
- ◯ Fader
- ◯ Fade and Bounce

Previous   Next   Cancel   Finish

## Autoloop:

**Set loop effect**

Enter effect parameters:

Duration _____
Minimum time to find loop

Equality _____
How equal must the frame be in percentage

Previous   Next   Cancel   Finish

The autoloop effect is an effect where the MaNima Configurator searches for nearly identical frames. When the MaNima Configurator has found the nearly identical frames, it cuts the recording there. If the end frame and the start frame are the same, it is nearly impossible to spot the beginning of a new recording.

The duration parameter sets the time until the IF may start searching for an identical frame.

The equality parameter gives the minimum frame equality between the two frames. If the IF can't find an equal frame, set a lower parameter.

## Bounce:

The bounce effect is an effect in which the recording will be reversed at the end of the scene.

## Fade:



The fade effect is an effect which will slowly dim the recording at the beginning and/or end.

## Fade and Bounce:

The fade effect is an effect where the ending and/or beginning of a scene are fading in/out. After the fading, the scene will be reversed.

**Controlling scenes**

The recorded scenes can be started by external inputs or DMX channels configured as an DMX port input.

**ArtNet**

The MaNima LED interface can be controlled via ArtNet V1.4. The interface is easy to find and use thanks to the ArtPoll system.

**Live Playing**

The MaNima LED interface can send live data with a third-party program using ArtNet to a digital LED strip or one or both DMX ports.

**Standalone mode**

In Stand-Alone mode, the MaNima LED interface plays a recorded scene from the SD card. The scene can be recorded through Art-Net according to the WYSIWYG principle.

## Group configuration
*Use a group to make several interfaces work together. This is used when using synchronised recording and synchronised playback.*

If you want to work with multiple interfaces at the same time, you can do this via the "Group" tab. In the box '' Group Number '' you fill in the number at the devices you want to use together. Also enter the number you entered in the other device that you want to use together.



**Set a group here. Only grouped Interfaces are able to see each other**

### Synchronized master-slave groups

If you want multiple groups of master-slave setups, and don't want to interfere with other groups of Interfaces when using synchronised recording or playing, use the 'group' function. When a certain set of Interfaces is set under a certain group, a synchronised recording won't allow for other Interfaces (outside the group) to be recording.

*Scenes can be started via external inputs. There are digital or analogue inputs; 4-20mA or 0-10V.*

The Digital and Analog inputs can be configurated with the inputs tab.

**Digital Inputs:**

To set the Digital Inputs, follow the steps below:

1. Set the Digital inputs mode to 'Enabled'.
2. Press ´Add channel´ on the bottom of the screen.
3. Set the channel to the corresponding connector. (see chapter 'Installation and wiring - port descriptions')
4. Select the action you want to happen when the input is triggered.
5. Done.
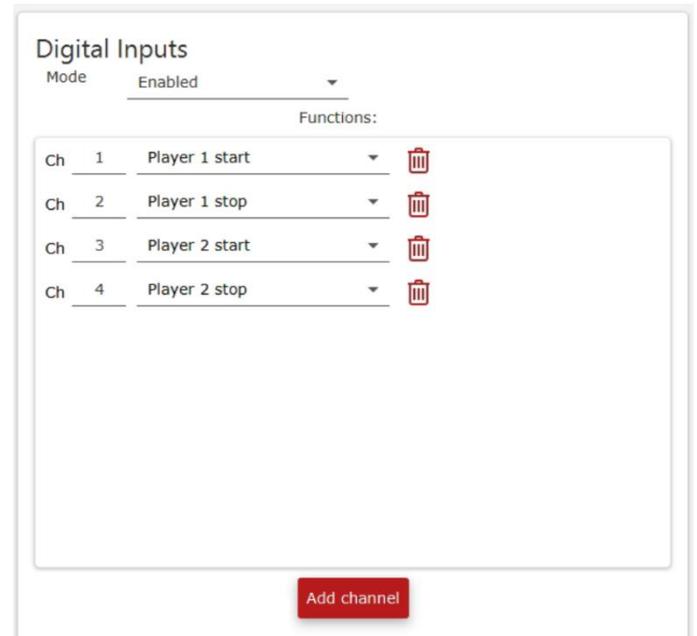
## Analog Inputs

There are three different modes for the Analog Inputs. These are:

**Disabled:** This disables the Analog Inputs. Set this mode to disabled when not using the analog inputs.

**Functions:** With functions, you can set the required input signal to a voltage signal or a current signal for the required channel.

Channels can be added at the bottom of the screen by pressing 'Add channel'.

The channels can be configured by changing the number. The action of the channel can be changed by pressing the arrow, which will show a dropdown menu with all the possible actions.



## LED Data:

When mode 'LED data' is selected, the analog inputs will be coupled with a universe. When this has happened, you can control digital LEDs with the SPI or DMX ports (depending on the configurations of the universe)

Every input correspondents with one channel. This means that 6 channels or 2 RGB LEDs can be controlled with all the Analog Inputs together.

The amount of light depends on the amount of volt or ampere, with 0V being 0% light (0/255) and 7V being 70% (179/255) light.

# The MaNima Configurator - Update

Because MaNima Technologies B.V. is constantly improving their products, there is an update tab available which allows the user to update the software version of the Interface without needing access to the physical Interface. This is only possible if there is an ethernet connection to the Interface.

**Step by step:**

1. Download the latest (or required) update from the MaNima website: http://manima-technologies.com/software.
2. Select the downloaded file by pressing the 'Select file' button.
3. Make sure the correct file is selected, then press 'Start update'.
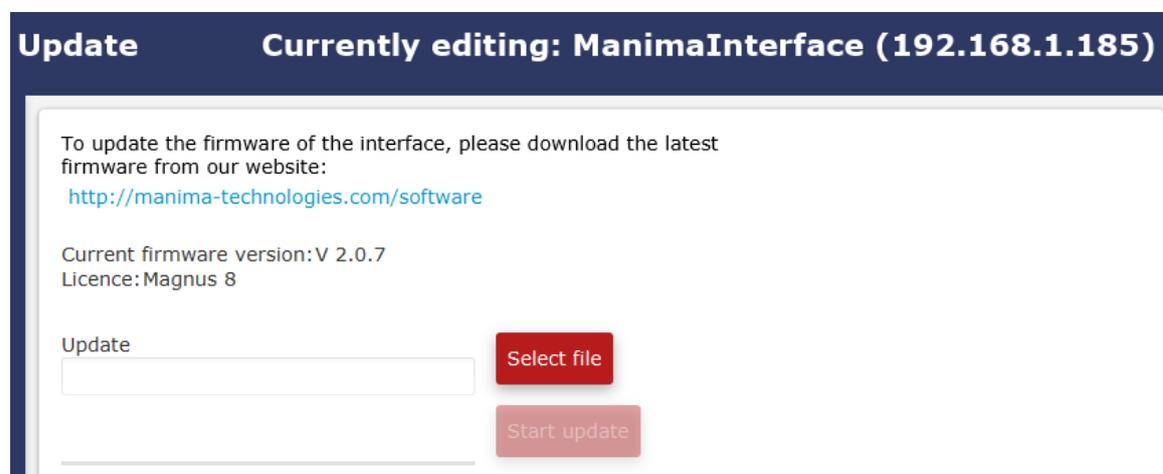


When encountering problems during your use of the MaNima Interface, make sure the latest update of the software is downloaded on the MaNima Interface. Also make sure the latest version of the MaNima Configurator is installed.

Make sure that the downloaded update file has the correct license. A standalone14u update file can't be used on a standalone 8u file.

*In this chapter there will be a description about every available port on the MaNima.*

**Descriptions of ports from top left to bottom right:**
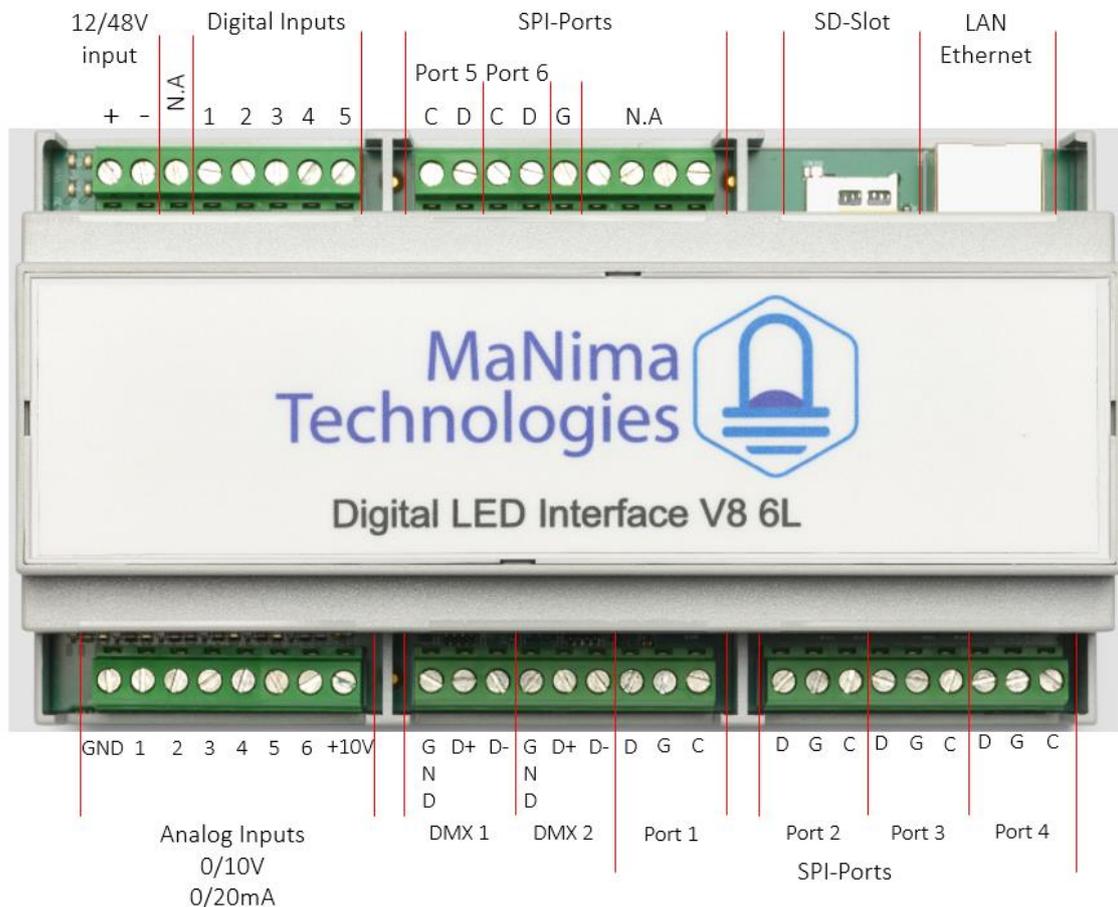


**12/48V Input:** Connect 12/48 Volts to this connector to power the MaNima Interface.

**Digital Inputs:** Digital Inputs are inputs used to control the MaNima LED Interface with voltages between +3,3V and +12V. Inputs can be configured using the 'Inputs' tab.

**SPI-ports (1-6):** These ports are used as outputs for the Data (D) Ground (G) and the Clock (C). Every port has a D, G and a C output. These ports make sure the LEDs will receive the Digital Signal.

**SD-Slot:** An SD card can be placed inside this slot. All scenes are recorded and saved here.

**LAN/Ethernet:** To connect to a network, a LAN or Ethernet cable must be connected to the MaNima LED Interface, using this port.

**Analog Inputs:** These inputs are used as Analog Channels. The +10V is used for these connections (It can also be used for the Digital inputs).

**DMX 1-2:** These ports are used for devices that need DMX signals.

There are six SPI-ports on the MaNima Interface. These ports are used as outputs for the Data (D) Ground (G) and the Clock (C). Every port has a D, G and a C output. These ports make sure the LEDs will receive the Digital Signal. If the device is using an SPI-protocol, these connectors should be used. These ports should be directly and correctly connected to the device. If there are any mistakes made, the MaNima Interface could be damaged.

Notice that ports 5-6 are different from ports 1-4. This is because the ports 5 and 6 have no Grounds in between the Clock and Data. The Ground of 5 and 6 is marked on the previous chapter with a G. Keep this in mind while connecting the ports.

There are two different DMX-ports on the MaNima Interface.

Each DMX port has three different connections:

-GND: Ground
-D+: Data +
-D-: Data –
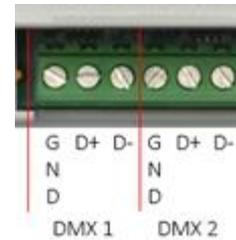


DMX connections should only be used for devices that can receive the DMX-protocol.

### Digital Inputs

Digital Inputs are used to trigger certain actions. These actions are defined in The MC (See MC Inputs).

These Digital inputs need the same positive voltage from the same power supply as the MaNima Interface. Or you can use the +10V from the Analog Input side, which is recommended.

There are five Digital inputs, all of which are configurable in The MC.
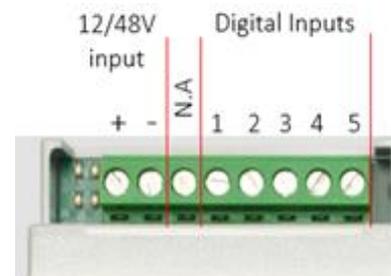
### Analog Inputs

The Analog Inputs can (just like the Digital Inputs) perform certain actions when triggered. These actions are defined in the MC. There is a total of six Analog Inputs, all of which are accessible through the MC

The Analog Inputs are activated by a voltage of 0 - +10V or by a current of 0-20 mA. Make sure to define this in the MC. The +10V can be used as a supply of +10V for the analog or digital inputs, this is also recommended.
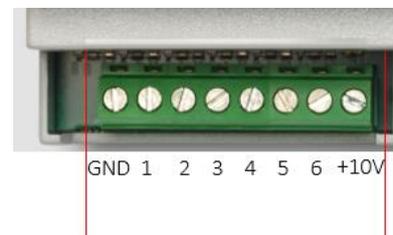
In this chapter, there will be an explanation about the various buttons and indications that are present on the PCB of the IF. To access most indications and buttons, remove the top from the casing of the IF. ONLY OPEN THE INTERFACE WHEN YOU HAVE BEEN GRANTED PERMISSION BY MANIMA TECHNOLOGIES B.V.



Use a tool like a screwdriver to remove the top by inserting it in between the top and side and lift the top off.

**Reset:**

To restart the IF, press the RESET button once for <1 sec. Only use when restarting from the MC is not possible.

**Factory Reset:**

To perform a Factory Reset of the IF. Hold the reset button down for 20 sec, until all LEDs on the right side of the RESET button are turned on.

The factory reset will return all settings (except the licence, MAC-address and recorded scenes) back to the original settings. Only use when a factory reset from the MC is not possible.



**Error LED:**

The Error LED is the 1st LED of the row of indication LEDs. The LED is turned off when the IF is functioning normally This LED is red (or starts flashing red) when the frame rate will be too high, or when the amount of data is too much for the IF to handle.

**HB LED:**

The HB (HeartBeat) LED is the 4th LED. If the HB LED is slowly blinking (like a heartbeat), the IF is healthy. If the HB doesn't blink, perform a factory reset.

**Power LEDs:**



The four LEDs next to the power supply, indicate if the IF is turned on. All four LEDs must be green if the IF is powered.

**Synchronised Recording**

If multiple MaNima Interfaces must play the same scene at the same time, it is recommended that all Interfaces are synchronised. This means that there is one scene that has recorded all interfaces.

Step by step guide:

1. Open the 'Scenes' tab.
2. Connect more than 1 MaNima Interface on the same network.
3. Go to the 'Group' tab and change the Groupnumber to anything above 0. To synchronise 2 Interfaces, they need to have the same Groupnumber.
4. Start the recording as usual, make sure the LEDs are working.
5. Stop recording to save the recording.

There should now be a file on every MaNima Interface that is on the same network and group as the master.

**Synchronised Playing**

To start a scene on multiple MaNima Interfaces at once, it is easy to use the synchronised playing option. This is done by having the synchronised recording in the player and pressing the synced playback option. If all connected devices have the same filename in their player, all of them will play the scene at the same time.

Step by step guide:

1. Open the 'Groups' tab and change the Groupnumbers according to your specifications.
2. Open the 'Scenes' tab.
3. Press Synced playback and select the correct recording.
4. Press Play, now the LEDs should play out the recording. If there are no errors, every MaNima Interface with the same filename in its SD-card should play the scene.
5. Press Stop to stop the scene.

**Synchronised Playing with groups**

If you need groups of interfaces working together on the same network, visit the 'groups' tab

# List of SPI-protocols

**In the list below you can find every supported SPI-protocol.**

APA102, APA102_8bit, APA104, APA106, HD107S

BS0901

CX808

DM412

GW6205_400kHz, GW6205_800kHz, GS8208

INK1003

LD1510, LPD6803

MBI6024, MB16120, MY9221, MY9231, MY9291

PC5XS301V0500

SK6812, SK6812RGBW, SK6822, SK8922

SM16703, SM16716, SM16726

TM1803, TM1804_400kHz, TM1804_800kHz, TM1809, TM1812, TM1814, TM1914A

UCS1903_400kHz, UCS1903_800kHz, UCS1904, UCS2903, UCS2904, UCS2912, UCS512B3, UCS5603A, UCS8904, UCS9812

WES9412, WES943

WS2803, WS2811_400kHZ, WS2811_800kHz, WS2812, WS2812B, WS2812S, WS2813, WS2818

# MaNima Interface Models

| Functions | Models | MaNima Magnus 2 | MaNima Magnus 8 | MaNima Magnus 14 | MaNima Magnus 20 | MaNima Magnus 26 |
|---|---|---|---|---|---|---|
| Record/Play 2 Universes | ✓ | ✓ | ✓ | ✓ | ✓ |
| Record/Play 8 Universes | ✗ | ✓ | ✓ | ✓ | ✓ |
| Record/Play 14 Universes | ✗ | ✗ | ✓ | ✓ | ✓ |
| Record/Play 20 Universes | ✗ | ✗ | ✗ | ✓ | ✓ |
| Record/Play 26 Universes | ✗ | ✗ | ✗ | ✗ | ✓ |
| Live playing | ✓ | ✓ | ✓ | ✓ | ✓ |
| Stand-alone playing | ✓ | ✓ | ✓ | ✓ | ✓ |
| Autoloop Scanner | ✓ | ✓ | ✓ | ✓ | ✓ |
| Interface Scanner | ✓ | ✓ | ✓ | ✓ | ✓ |
| Network Configuration | ✓ | ✓ | ✓ | ✓ | ✓ |
| Port Configuration | ✓ | ✓ | ✓ | ✓ | ✓ |
| DMX output | ✓ | ✓ | ✓ | ✓ | ✓ |
| DMX Input | ✓ | ✓ | ✓ | ✓ | ✓ |
| Group Configuration | ✓ | ✓ | ✓ | ✓ | ✓ |
| Digital Inputs | ✓ | ✓ | ✓ | ✓ | ✓ |
| Analog Inputs | ✓ | ✓ | ✓ | ✓ | ✓ |
| Digital outputs | ✓ | ✓ | ✓ | ✓ | ✓ |
| Analog outputs | ✓ | ✓ | ✓ | ✓ | ✓ |
| UDP | ✓ | ✓ | ✓ | ✓ | ✓ |
| ART-NET | ✓ | ✓ | ✓ | ✓ | ✓ |
| Ethernet IP | ✓ | ✓ | ✓ | ✓ | ✓ |
| Custom API | ✓ | ✓ | ✓ | ✓ | ✓ |
| Updating through ethernet | ✓ | ✓ | ✓ | ✓ | ✓ |
| SD-Card | ✓ | ✓ | ✓ | ✓ | ✓ |

**YouTube Tutorial links:**

[MaNima Tutorial 1 Connecting the Interface - YouTube](#)

[MaNima Tutorial 2 Mapping and Recording digital LEDs - YouTube](#)

[MaNima Tutorial 3 Synchronized recording and playing - YouTube](#)

[MaNima Tutorial 4 DMX Functions - YouTube](#)

[MaNima Tutorial 5 Digital Triggers - YouTube](#)

[MaNima Tutorial 6 Analog Triggers - YouTube](#)

[MaNima Tutorial 7 Loop Functions - YouTube](#)

[MaNima Tutorial 8 Updating with Ethernet - YouTube](#)

[MaNima Tutorial 9 Using Segments - YouTube](#)

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