

MaNima Interface

The State of the Art LED Interface



Manual V2.1

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.



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Foreword

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



Safety Instructions

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



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.

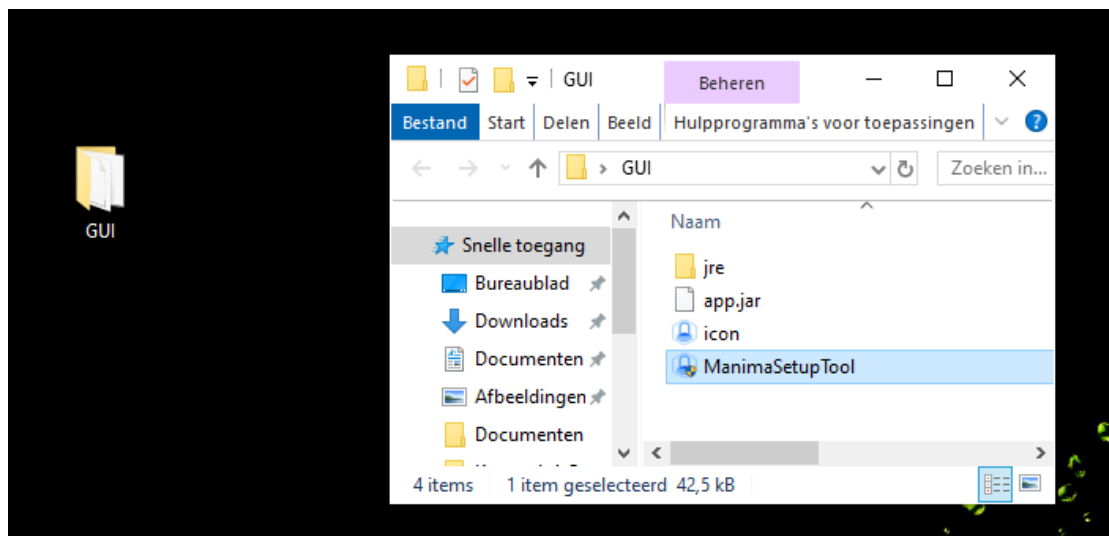


The MaNima Configurator - Opening the MC

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/>

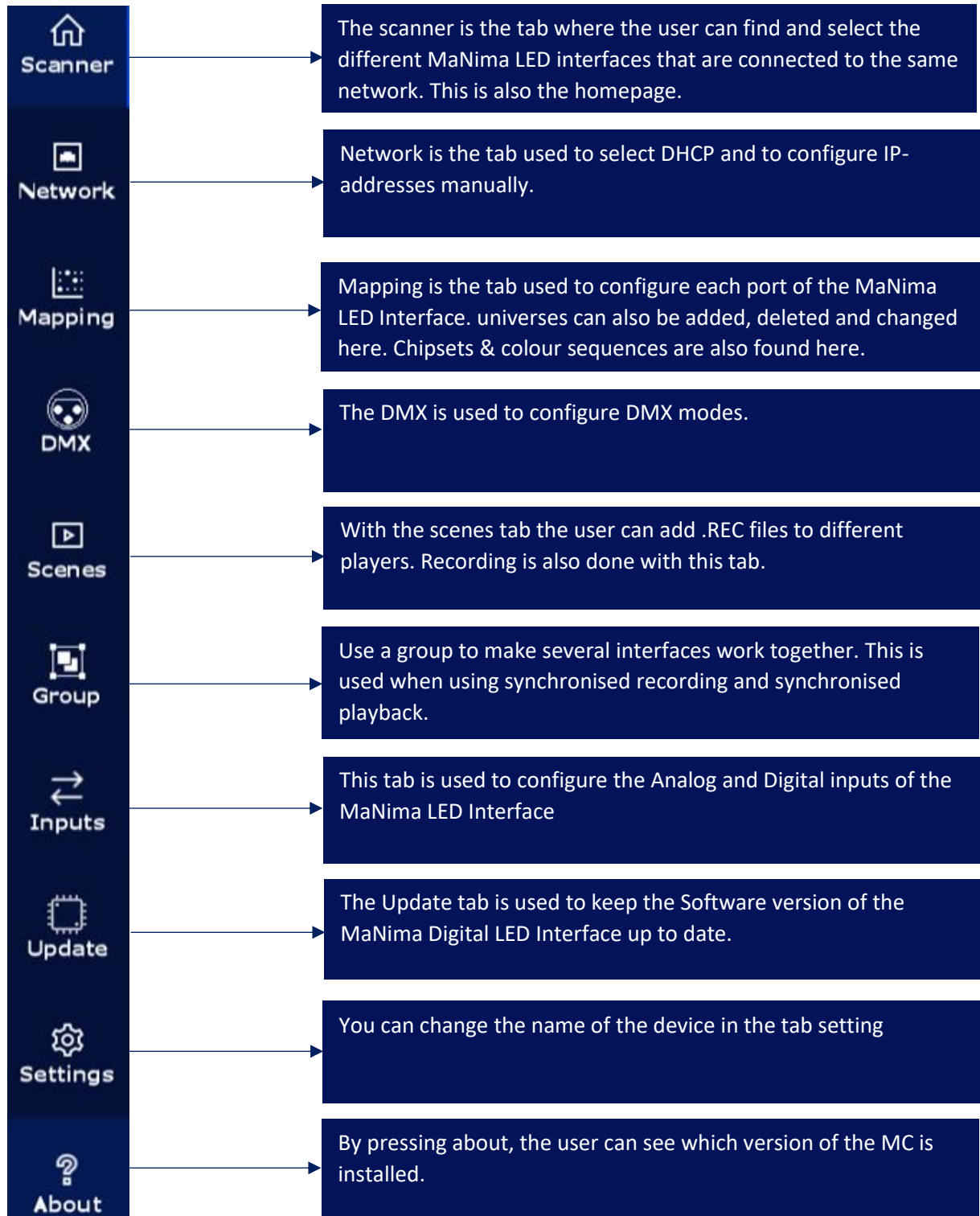
- **Open the file with the left mouse button and double click on “ManimaSetupTool” (Highlighted blue on the image below)**



- **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:



The MaNima Configurator- Scanner

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: 192.168.0.106

Device name	IP Address	MAC	Version	Software Version	Identify
ManimaInterface	192.168.0.106	70:B3:D5:DD:90:1C	INTERNAL ONLY 0x...	V 1.0.10	<input checked="" type="checkbox"/>
NEWwand	192.168.0.102	70:B3:D5:DD:90:13	INTERNAL ONLY 0x...	V 1.0.10	<input type="checkbox"/>
ManimaInterface	192.168.0.103	70:B3:D5:DD:90:12	INTERNAL ONLY 0x...	V 1.0.9 RC3	<input type="checkbox"/>
VerticaleLEDlijnen	192.168.0.101	70:B3:D5:DD:90:11	INTERNAL ONLY 0x...	V 1.0.10	<input type="checkbox"/>
ManimaInterface	192.168.0.185	70:B3:D5:DD:90:1A	Standalone 14U 0x1003	V 1.0.9 RC3	<input type="checkbox"/>

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 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!

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 version of the used hardware in the MaNima LED Interface.

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

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

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

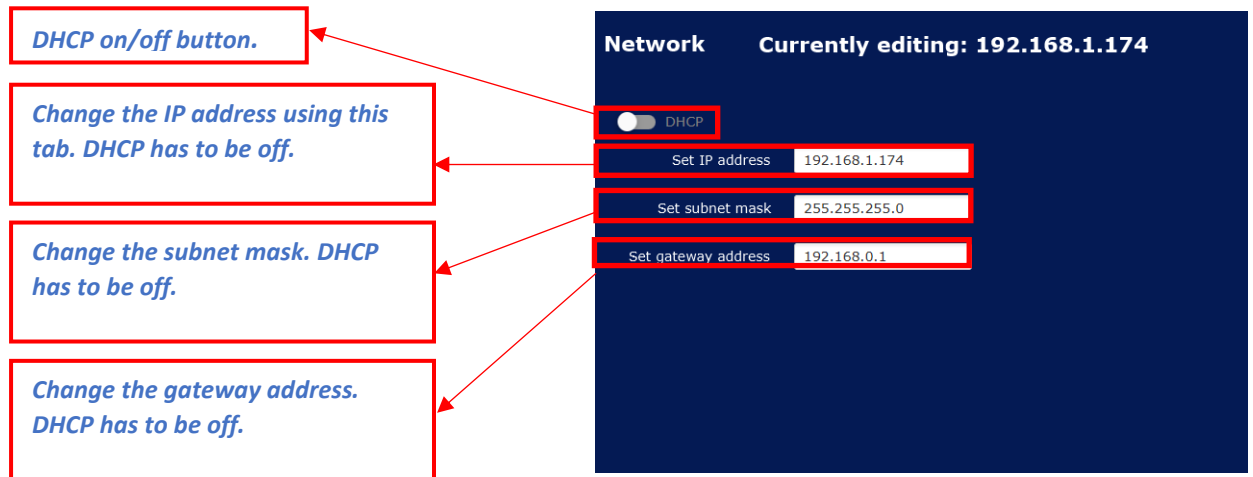
If the MC is unable to find the MaNima LED Interface, there are multiple things that may have gone wrong. So, make sure the following are correct:

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.



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.

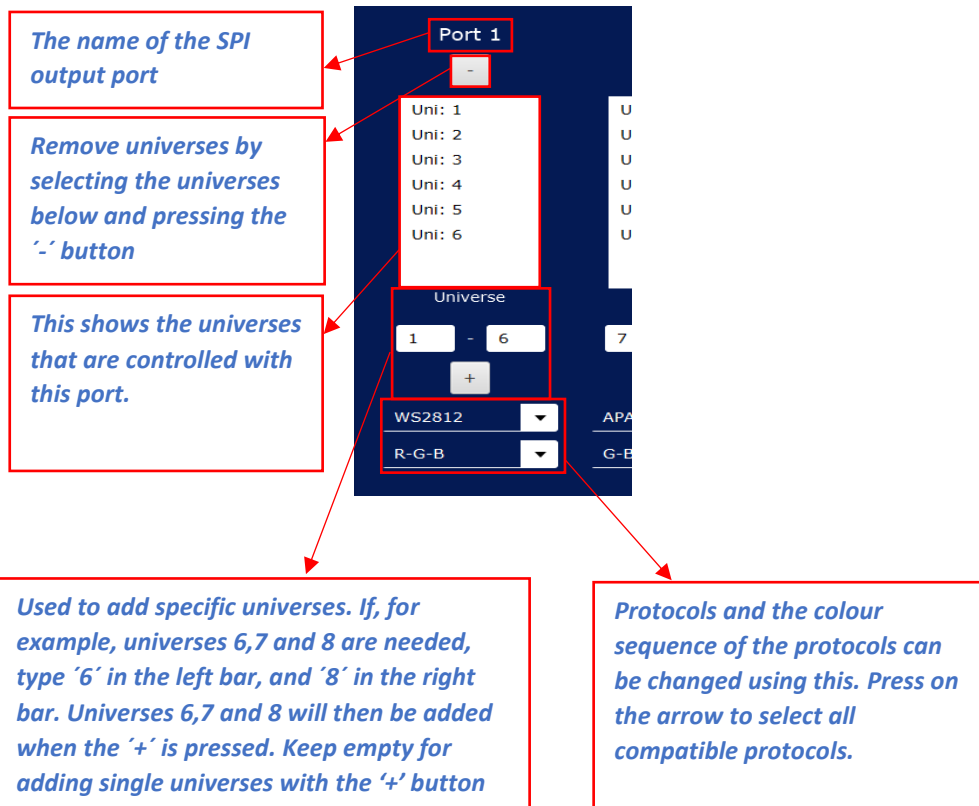


The screenshot shows the 'Network' configuration interface. At the top, it says 'Network' and 'Currently editing: 192.168.1.174'. Below this, there is a 'DHCP' toggle switch, which is currently turned off. Underneath the toggle are three input fields: 'Set IP address' with the value '192.168.1.174', 'Set subnet mask' with the value '255.255.255.0', and 'Set gateway address' with the value '192.168.0.1'. Red callout boxes on the left side of the image point to these elements with the following instructions:

- DHCP on/off button.** (points to the DHCP toggle)
- Change the IP address using this tab. DHCP has to be off.** (points to the Set IP address field)
- Change the subnet mask. DHCP has to be off.** (points to the Set subnet mask field)
- Change the gateway address. DHCP has to be off.** (points to the Set gateway address field)

The MaNima Configurator – Port Configurator

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



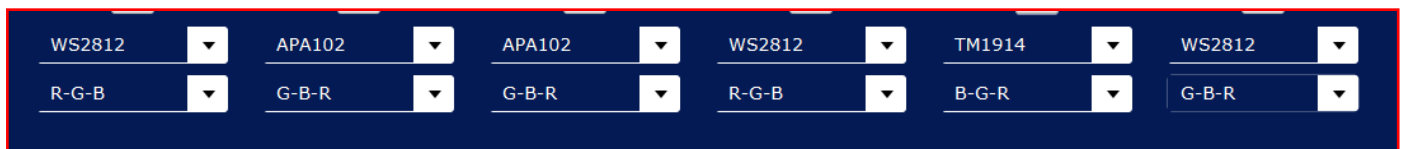
The screenshot shows the 'Port 1' configuration screen. It includes a list of universes (Uni: 1 to 6), a 'Universe' section with a range selector (1-6) and a '+' button, and two dropdown menus for protocol (WS2812) and colour sequence (R-G-B). Red callout boxes provide instructions: 'The name of the SPI output port' points to 'Port 1'; 'Remove universes by selecting the universes below and pressing the '-' button' points to the '-' button; 'This shows the universes that are controlled with this port.' points to the 'Uni:' list; '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' points to the '1' and '6' input fields; 'Protocols and the colour sequence of the protocols can be changed using this. Press on the arrow to select all compatible protocols.' points to the protocol and colour sequence dropdowns.

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.



The MaNima Configurator – DMX Input / Output

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

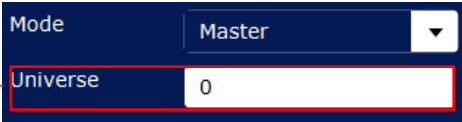
Disabled: The Interface will not be or be affected by different Interfaces and will operate by itself.

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: 0

Set the right universe in here.

Slave Mode:



Set the right Channel in here.

Select the action that must take place when the DMX-channel is activated.

Delete a Channel using this icon.

Press this to open a drop-down menu with different actions for players.

This is the selected action, that is currently in the player.

Select the right player for the action

Select the right action here

Ch	Channel Name	Action	Delete
280	Player 0 stop/pauz...	Player 0 stop/pauze/start	
281	Player 1 stop/pauz...	Player 1 stop/pauze/start	
282	Player 3 stop/pauz...	Player 3 stop/pauze/start	
283	Global dimming	Player 0 stop/pauze/start	

Global dimming

- Player 0 stop/pauze/start
- Player 0 speed
- Player 1 stop/pauze/start
- Player 1 speed
- Player 2 stop/pauze/start
- Player 2 speed
- Player 3 stop/pauze/start
- Player 3 speed
- Player 4 stop/pauze/start

Add channel

The MaNima Configurator - Scenes

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.

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"

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

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

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. This can be done by copy and pasting existing scenes on to the SD-card, or by creating scenes with the use of 3rd party LED editing programs.

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.

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 Function

The MaNima Configurator has a built in 'loop function', this function is used to make seamless repeats in a scene. The MC searches for two of the same frames and cuts the scene there. This way the scene has no visible stuttering when repeating a scene.

To use the loop function, make sure the scene has two of the same frames.

To perform a 'autoloop scan' press the 'Start autoloop scan' button. Note that this option is only available if the player is actively playing a scene. When there is no scene being played, the option will remain unavailable.



Autoloop scans can also be performed with Master-Slave scenes. Just make sure that the scene has been recorded with all the MaNima Digital Interfaces synchronised.

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 to configure.

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.



The screenshot shows the 'Group' configuration page for 'Currently editing: 192.168.0.106'. It features a table titled 'Interfaces in group 0' with columns for IP Address, Name, and GroupNumber. The table contains five rows of interface data. Red boxes highlight the 'Name' and 'GroupNumber' columns, with red arrows pointing to explanatory text boxes below.

IP Address	Name	GroupNumber
192.168.0.185	ManimaInterface	0
192.168.0.106	ManimaInterface	0
192.168.0.101	VerticaleLEDlijnen	0
192.168.0.102	NEWwand	0
192.168.0.103	ManimaInterface	0

Name of the device or computer

In these boxes you fill in the number at the devices you want to use together.

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.

The MaNima Configurator – Analog/digital Inputs/Outputs

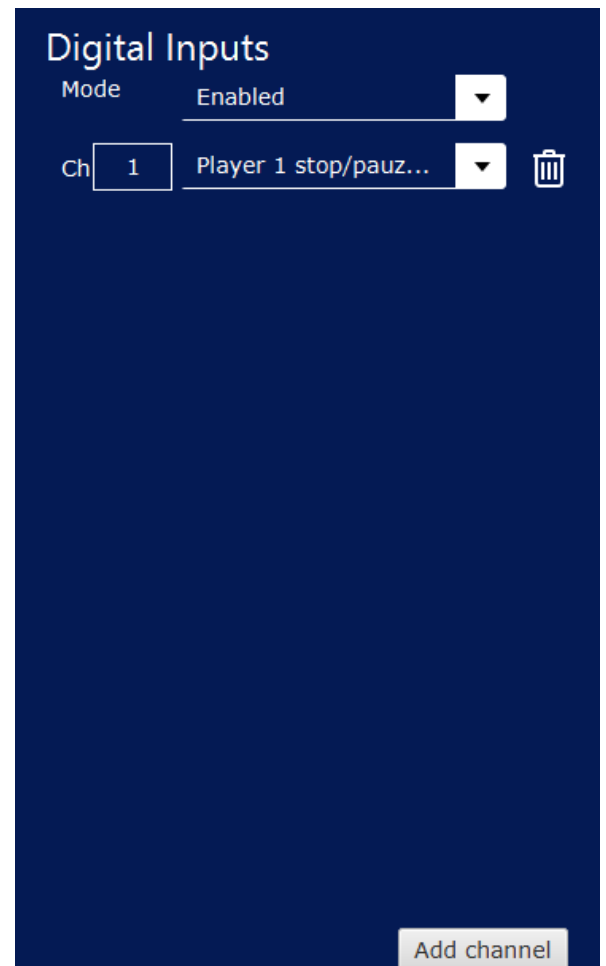
Scenes can be started via external inputs. There are digital or analogue inputs; 4-20mA or 0-10V.

The Digital and Analog inputs can be configured 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

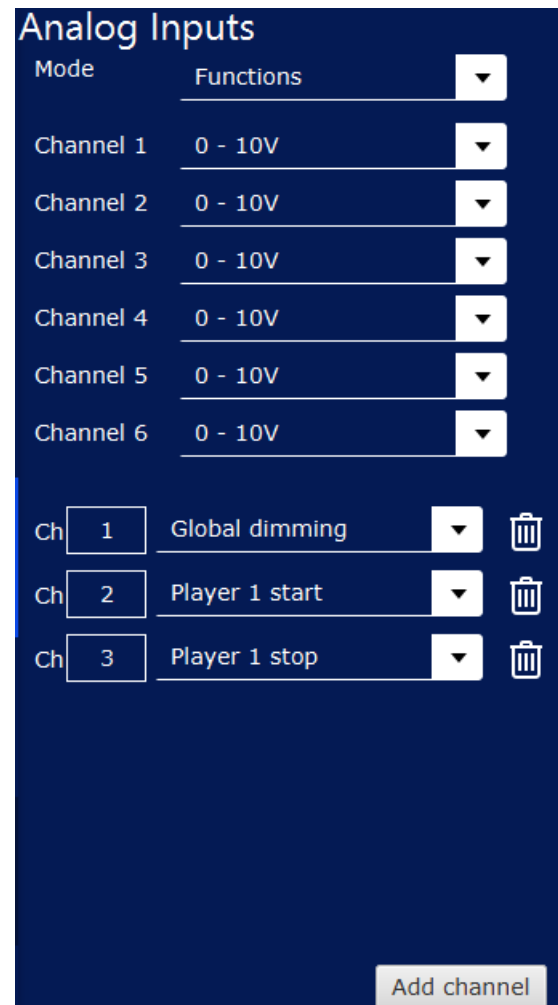
There are three different modes for the Analog Inputs. These are:

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.

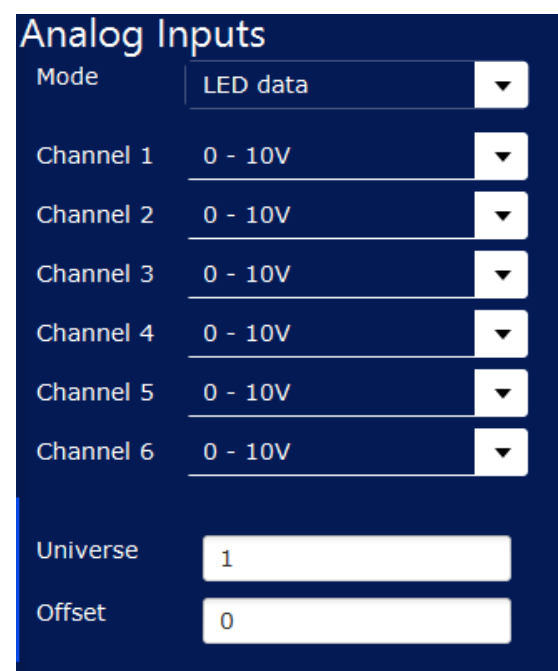


LED Data:

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 corresponds 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.

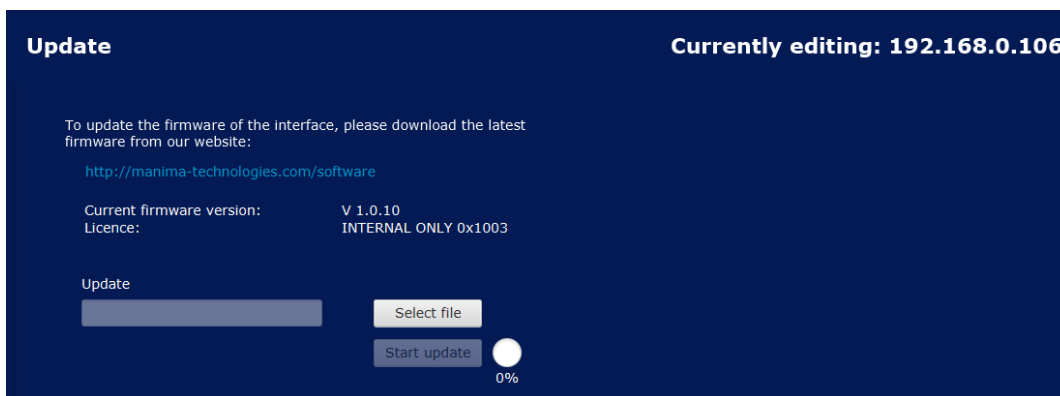


The MaNima Configurator - Update

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.

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

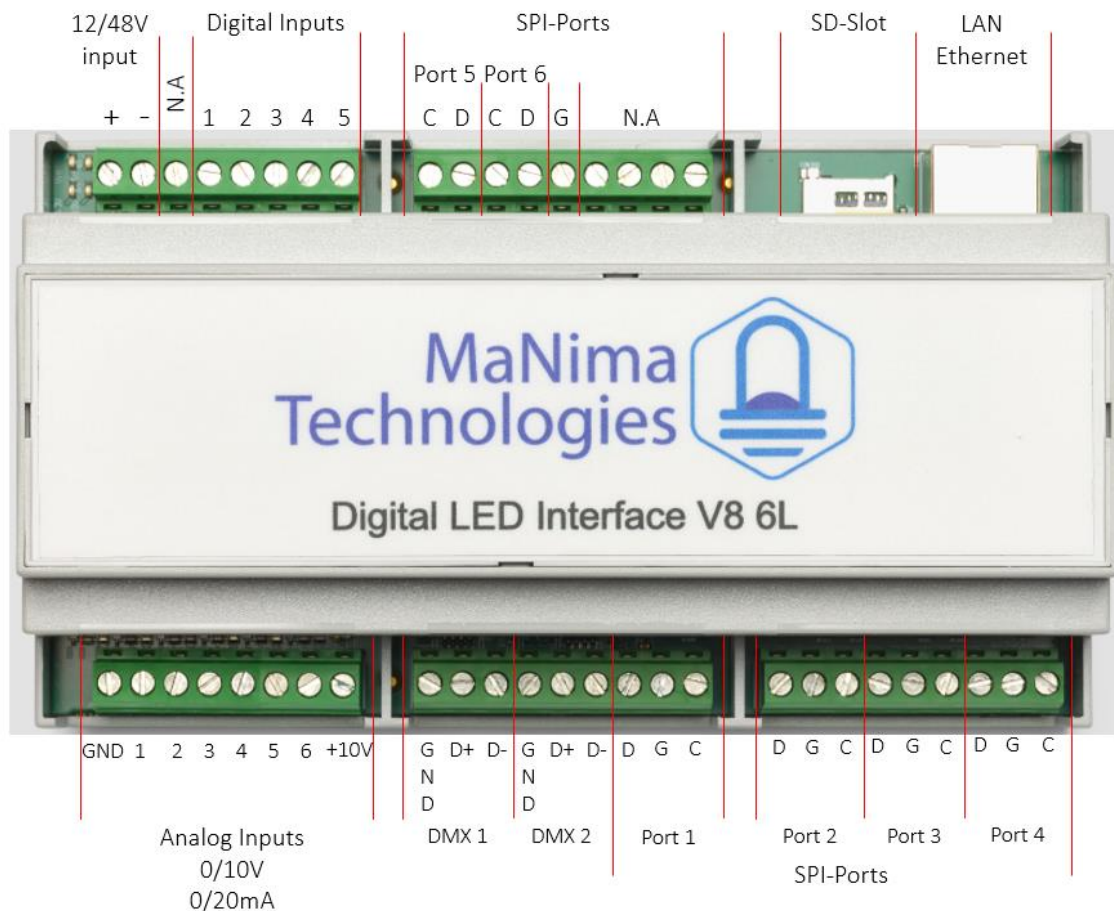
Installation & Wiring

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



Installation & Wiring - Port Descriptions

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 LEDs that need DMX signals instead of SPI-protocols.

Installation & Wiring – SPI-Ports

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.

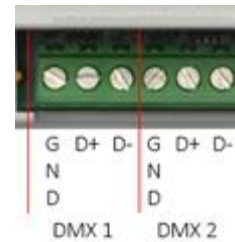


Installation & Wiring – DMX-Ports

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.

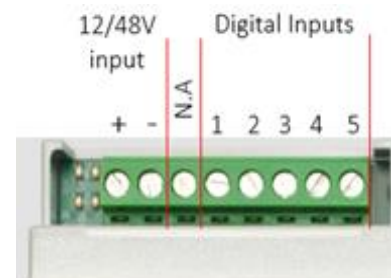
Installation & Wiring – Setting Digital/Analog Inputs

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.

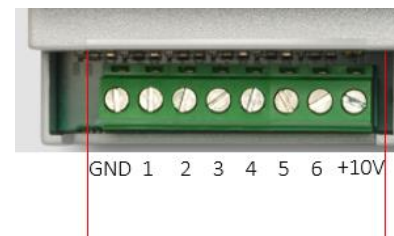
There are five Digital inputs, all of which are configurable in The MC.



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.



Analog Inputs
0/10V
0/20mA

Installation & Wiring – Reset & Indications

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.



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.

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.



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.

Master-Slave Function

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. Press 'synchronized recording' (next to record button)
4. Start the recording as usual, make sure the LEDs are working (There should also be a text that says 'Slaves: (number of slaves)', with this you can confirm the amount of slaves that need to be recorded).
5. Stop recording



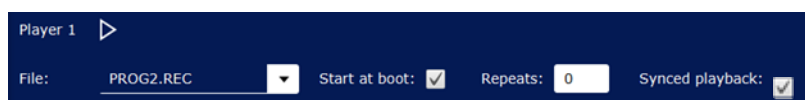
There should now be a file on every MaNima Interface that is on the same network and group as the master.

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 scene in their player, all of them will play the scene at the same time.

Step by step guide:

1. Open the 'Scenes' tab.
2. Connect the same MaNima Interfaces.
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 file 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	✓	✓	✓	✓	✓	✓

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