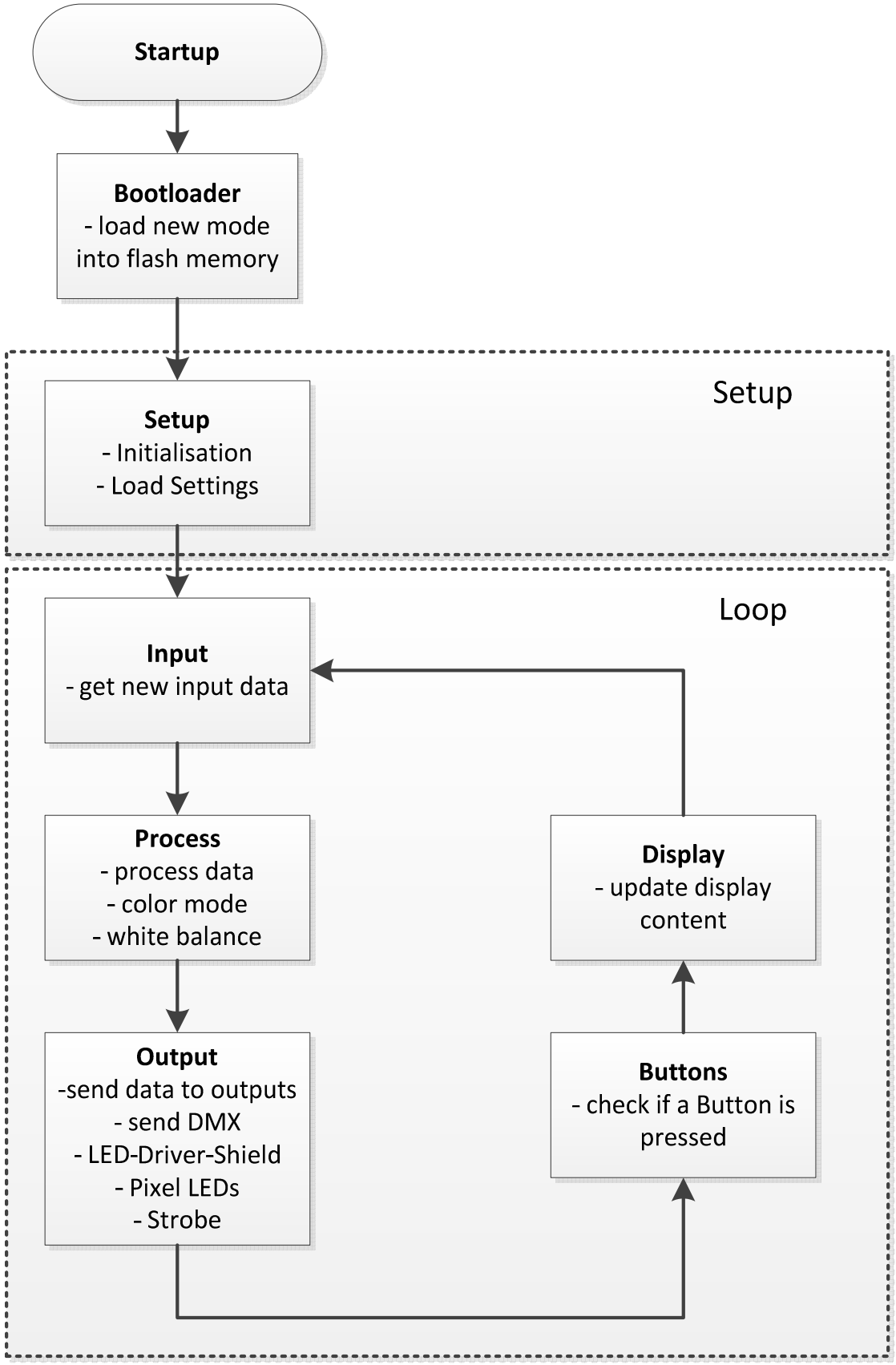
Doku Firmware ZHDK

Inhalt

Software Flow Chart



Modes

Artnet Mode

Control LED-Driver-Shield and DMX output with Artnet over Ethernet

Input Data:	Artnet node
Recorder:	Record input data Playback recorded data (ignore input data)
Data processing:	Colour mode Bit-Mode White balance
Output Data:	LED-Driver-Shield (optional with strobe) Pixel LED DMX out

DMX IN

Control LED-Driver-Shield with a DMX input signal.

Input Data:	DMX
Recorder:	Record input data Playback recorded data (ignore input data)
Data processing:	Colour mode Bit-Mode White balance
Output Data:	LED-Driver-Shield (optional with strobe) DMX out (only DMX through from input)

SD Player

Plays show files from SD card. The files can be generated by mini stage console software.
http://www.chromakinetics.com/DMX/miniStageConsoleWin.html
http://www.chromakinetics.com/DMX/miniStageConsoleMac.html

Input Data:	Show files stored on SD card
Data processing:	Colour mode Bit-Mode White balance
Output Data:	LED-Driver-Shield (optional with strobe) DMX out

Mini Stage Console

Control LED-Driver-Shield and DMX output with mini stage console over USB.

http://www.chromakinetics.com/DMX/miniStageConsoleWin.html
http://www.chromakinetics.com/DMX/miniStageConsoleMac.html

Input Data:	mini stage console software over USB
Recorder:	Record input data Playback recorded data (ignore input data)
Data processing:	Colour mode Bit-Mode White balance
Output Data:	LED-Driver-Shield (optional with strobe) DMX out (only with strobe disabled)

FTP Client

Get firmware- and show-files from a FTP Server on the network and store them on the internal SD card on the controller.

Please refer to the tutorial *install ftp server* on www.openmediacontroller.com to set up a FTP server.

FTP Server

Make a FTP server to browse the internal SD card and transfer files using standard FTP client software.
Use following settings to connect to the controller:

IP: IP of the controller which is displayed on the home screen.
Port: 21 (default port for FTP connections)
User: OMC
Password: OMC

In addition make sure, that your ftp client software only allows one active connection at the time. There should be a setting somewhere in the client software properties (single connection mode).

The FTP server mode has been tested with: FileZilla, Cyberduck and FTP Rush.

Menu

Menu structure

Level 0	Level 1	Level 2	Level 3
Home Screen			
	1 Select Mode		
		1 Artnet Node	
		2 DMX IN	
		3 SD Player	
		4 Mini Stage Console	
		5 FTP Client	
		6 FTP Server	
	2 Utils		
		1 Bit Mode	default: 8-Bit
			8-Bit Mode
			16-Bit Mode
		2 Colour Mode	default: RGB
			RGB
			HSB
		3 White Balance	default: reseted
			Set
			Reset
		4 Factory Reset	
			reset Settings
		5 FW Version	
	3 Network		default
		1 set IP	default: 192.168.100.199
		2 set Subnet	default: 255.255.255.0
		3 set Gateway	default: 192.168.100.1
		4 Broadcast Adr	default: 192.168.100.255
	4 Artnet		
		1 Start Address	default: 1
		2 Universe	default: 0
		3 Net	default: 0
		4 Subnet	default: 0
	5 Strobe		
		1 Strobe Enable	default: Disabled
			Enabled
			Disabled
		2 Active Channels	default: 3
		3 Group Size	default: 3
		4 Subgroup Size	default: 1
		5 Pause Enable	default: enabled
			Enabled
			Disabled

		6 Frequency Setting	default: 1
	6 DMX		
		1 Start Address	default: 1
		2 Start Address Out	default: 1
	7 SD Card		
		1 File Number	default: 1
	8 FTP Client		
		1 FW Files	
			Get FW Files
		2 SHOW Files	
			Get SHOW Files
		3 FTP Server IP	default: 192.168.100.250
	9 Pixel LED		
		1 Pixel Enable	default: Disabled
		2 Type	default: WS2801
			WS2801
			WS2811
			WS2812
			WS2812B
			NEOPIXEL
			WS2811_400
		3 Pixel Count	default: 160
	10 Recorder		
		1 Record	
			Start Recording
			Stop Recording
		2 Play	
			File Selection < >
			Start Playing
			Stop Playing
		3 Repeat Enable	default: Disabled
			Enabled
			Disabled
		4 Auto Play	default: Disabled
			Enabled
			Disabled
		5 Auto Play File	
			File Selection < >
	11 User Params		
		1-10 User Param	
			default: 0

Menu Navigation

The controller starts up with on the home screen. Using the three buttons you can scroll through the menu as follows:

Button 1 (square)

Short press: Move one Level up in menu structure (Level1 to level2).
On level 3 select next digits to change.

Long press: Move one level down/back in menu structure.
On level 3 this will cancel any changes you made to the current setting.

Button 2 (arrow left)

Short press: Cycle through menu items on current menu level (upwards).

Long press: No function

Button 3 (arrow right)

Short press: Cycle through menu items on current menu level (downwards).

Long press: On level 3 this will confirm and save changes to the current setting and move back to level 2

Display

The LCD on the front of the controller guides you through the menu structure and displays the menu items as follows.

Level 0

Line 1: Current **mode** name
Line 2: Additional information (IP-address, DMX start address...)

Level 1

Line 1: *Menu*
Line 2: Current menu item of current menu level (level 1)

Level 2

Line 1: Parent menu item (level 1)
Line 2: Current menu item of current menu level (level 2)

Level 3

Line 1: Parent menu item (level 2), respectively name of the setting you are about to change
Line 2: Current value of the setting

1 Select Mode

You can select the mode to load into flash memory of the controller. To see all available modes, refer to the menu structure. To switch to another mode navigate to the appropriate menu item on level 2 and confirm with a long press on button 3. This will reset the controller and start up in the selected mode. To stay in the current mode and switch back to menu level 1 press long on button 1.

Switching modes will only work if a SD-card is inserted and the corresponding firmware files can be found on the card. If not, the controller will start up in the same mode.

2 Utils

2.1. Bit-Mode

Select if the input data is interpreted as 8-Bit or 16-Bit values. In 8-Bit mode each input channel (Artnet, DMX) will control one channel of the LED-Driver-Shield with 256 steps.
In 16-Bit mode always two channels will be used to control one output channel on the LED-Driver-Shield (65536 steps). First channel is interpreted as *HIGH-Byte* and second channel is *LOW-Byte*, doing the fine pitch.

2.2. Colour Mode

Select between colour modes RGB and HSB.

In RGB-Mode the input data is used to control output channels unconverted. Means input channel 1 controls output channel 1.
In HSB-Mode the input data is interpreted in the HSB colour space and converted to the RGB colour space.

Channel 1 = Hue
Channel 2 = Saturation
Channel 3 = Brightness

2.3. White Balance

If you set the white balance the controller will take the current input values and stores this as *full white* setting. For each channel a scale factor will be stored permanently. In the future the stored scale factors will apply to all input data.

!!! WARNING !!! If any input channel has value 0 while setting the white balance, it will result in a scale factor of zero. Means the channel will output zero no matter what input data is available. Use the *Reset* function in the white balance menu to get rid of the stored scale factors or set the white balance again with appropriate input values.

2.4 Factory Reset

Reset all settings to factory default.

2.5 FW version

Display the firmware version of current mode.

3. Network

Change network settings of the controller. Always start by changing the IP-Address. If you change the IP-Address the controller guesses what would be the right settings for Subnet, Gateway and Broadcast address. To be sure check the other settings before you leave the network menu. If you leave the network menu the controller will restart with new setting (if settings changed).

!!! WARNING !!! If you mess up your network settings, the controller will not be able to start up. Refer to section *Troubleshoot* to reset the settings.

4. Artnet

Change settings regarding the behaviour of the controller as an artnet node. If the controller is currently not in artnet mode the settings don't have any impact. Settings can be changed anyway and will get active as soon as the controller switches to artnet mode.

4.1. Start Address

Define the artnet start address of the controller. The controller will assume the start address as his first channel.
Example: Artnet start address = 9 → artnet channel 9 will control controller channel 1

4.2. Universe

Define the artnet universe to listen to. The controller ignores all data on other universes than the specified one.

4.3. Net

Define the artnet Net to listen to. The controller ignores all data on other nets than the specified one.

4.4. Subnet

Define the artnet Subnet to listen to. The controller ignores all data on other subnets than the specified one.

5. Strobe

Change settings of the strobe functionality. The strobe function switches the channels of the LED-Driver-Shield ON and OFF at high frequencies. The settings define the behaviour of this function. For better understanding of the principle of operation, please see the examples in section 5.7.
If strobe is enabled the input channels are mapped as follows:

Channel 1-12	Brightness of channel 1-12 when turned on by the strobe (only active channels. see section 5.2.)
Channel 13	Frequency of strobe (range depending on frequency setting, see section 5.6.)

5.1. Strobe Enable

Enable or disable the strobe function globally. Please disable the function if not needed, because it takes quite a lot of processing power.

5.2. Active Channels

Define how many channels the strobe function should affect (starting from channel 1). The other channels will still work as usually.

5.3. Group Size

The strobe function cycles through the channels step by step until the group size has been reached. Then it starts a new cycle beginning with the first channel of the group. Simultaneous it does the same for the other groups, if there is enough space for more groups in the active channels (group count = active channels / group size). While stepping through the channels the strobe considers each subgroup as a unit, which are switched at the same time (see following section).

5.4. Subgroup Size

All channels belonging to the same subgroup are handled as one unit in case off timing. The strobe starts its cycle by switching on all channels of subgroup 1 at the same time. On the next step of the cycle subgroup 1 is switched off and subgroup 2 is switched off. With subgroup = 1 each channel will be handled separately.

5.5. Pause enable

If pause is enabled the strobe adds an additional step after each step. In this step all subgroups are turned off before the next subgroup is turned on.

5.6. Frequency Setting

The frequency setting defines the frequency range which can be controlled by input channel 13. High value means bigger range but less precision.

5.7. Strobe Examples

Active Channels	6
Group Size	3
Subgroup	1
Pause	disabled

Step	Channel 1	2	3	4	5	6
1	ON	OFF	OFF	ON	OFF	OFF
2	OFF	ON	OFF	OFF	ON	OFF
3	OFF	OFF	ON	OFF	OFF	ON
4	ON	OFF	OFF	ON	OFF	OFF
5	OFF	ON	OFF	OFF	ON	OFF
6	OFF	OFF	ON	OFF	OFF	ON

Cycle

Cycle

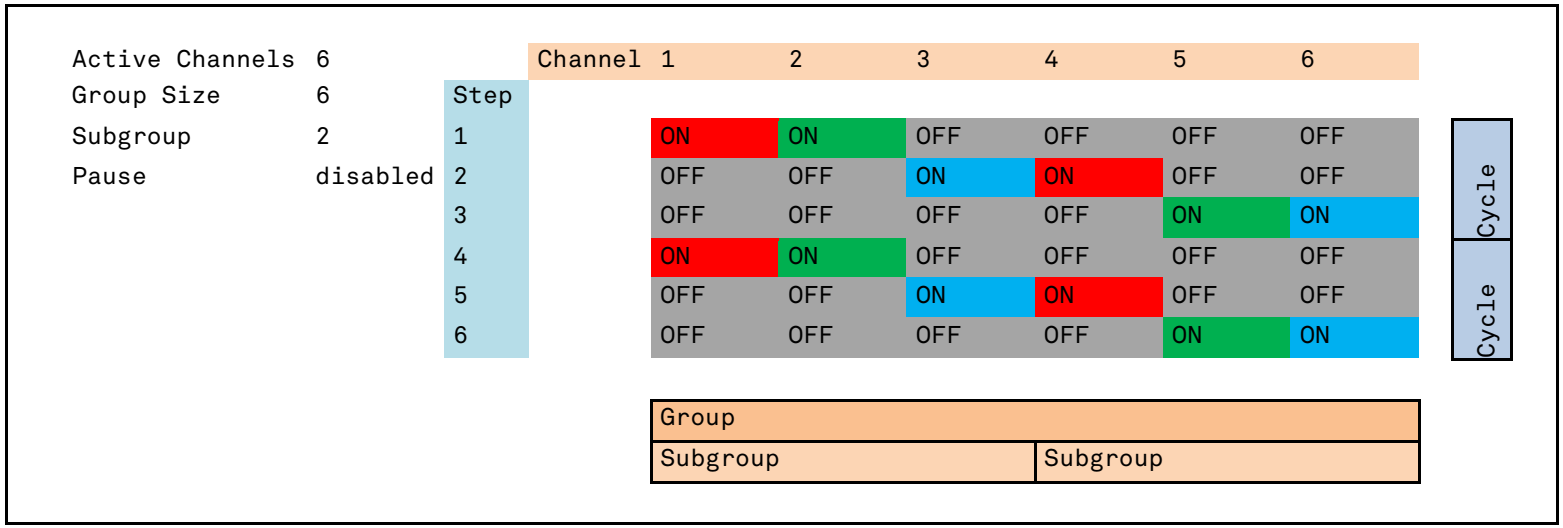
Group			Group		
Subgroup	Subgroup	Subgroup	Subgroup	Subgroup	Subgroup

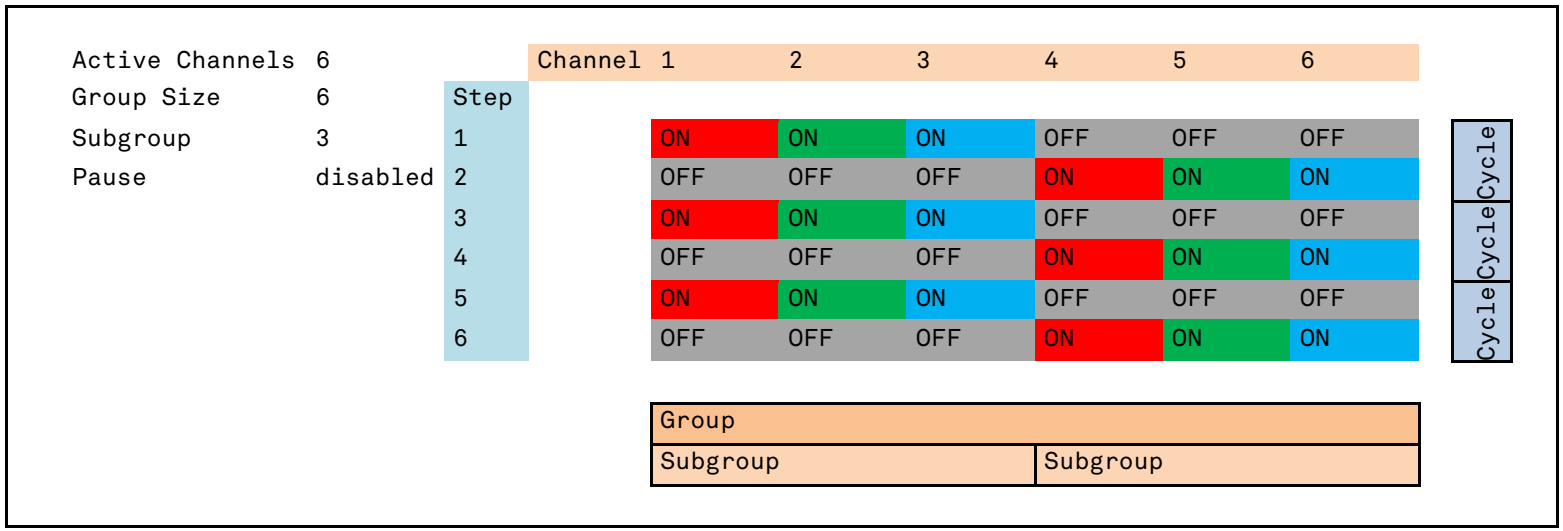
Active Channels	6
Group Size	6
Subgroup	1
Pause	disabled

Step	Channel 1	2	3	4	5	6
1	ON	OFF	OFF	OFF	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	OFF
3	OFF	OFF	ON	OFF	OFF	OFF
4	OFF	OFF	OFF	ON	OFF	OFF
5	OFF	OFF	OFF	OFF	ON	OFF
6	OFF	OFF	OFF	OFF	OFF	ON

Cycle

Group					
Subgroup	Subgroup	Subgroup	Subgroup	Subgroup	Subgroup


Active Channels 6
Group Size 6
Subgroup 2
Pause disabled
Step
Channel 1 2 3 4 5 6
1 ON ON OFF OFF OFF OFF
2 OFF OFF ON ON OFF OFF
3 OFF OFF OFF OFF ON ON
4 ON ON OFF OFF OFF OFF
5 OFF OFF ON ON OFF OFF
6 OFF OFF OFF OFF ON ON
Cycle
Cycle
Group
Subgroup
Subgroup


Active Channels 6
Group Size 6
Subgroup 3
Pause disabled
Step
Channel 1 2 3 4 5 6
1 ON ON ON OFF OFF OFF
2 OFF OFF OFF ON ON ON
3 ON ON ON OFF OFF OFF
4 OFF OFF OFF ON ON ON
5 ON ON ON OFF OFF OFF
6 OFF OFF OFF ON ON ON
Cycle
Cycle
Cycle
Group
Subgroup
Subgroup

Active Channels	6
Group Size	6
Subgroup	3
Pause	enabled

Step		Channel 1	2	3	4	5	6
1		ON	ON	ON	OFF	OFF	OFF
2	pause	OFF	OFF	OFF	OFF	OFF	OFF
3		OFF	OFF	OFF	ON	ON	ON
4	pause	OFF	OFF	OFF	OFF	OFF	OFF
5		ON	ON	ON	OFF	OFF	OFF
6	pause	OFF	OFF	OFF	OFF	OFF	OFF
7		OFF	OFF	OFF	ON	ON	ON
8	pause	OFF	OFF	OFF	OFF	OFF	OFF

Cycle

Cycle

Group	
Subgroup	Subgroup

Active Channels	6
Group Size	3
Subgroup	1
Pause	enabled

Step		Channel 1	2	3	4	5	6
1		ON	OFF	OFF	ON	OFF	OFF
2	pause	OFF	OFF	OFF	OFF	OFF	OFF
3		OFF	ON	OFF	OFF	ON	OFF
4	pause	OFF	OFF	OFF	OFF	OFF	OFF
5		OFF	OFF	ON	OFF	OFF	ON
6	pause	OFF	OFF	OFF	OFF	OFF	OFF

Cycle

Group			Group		
Subgroup	Subgroup	Subgroup	Subgroup	Subgroup	Subgroup

6. DMX

Change settings for DMX start addresses.

6.1. DMX Start Address

If the controller is in DMX mode, this defines the start address of the DMX input stream. The controller will assume the start address as his first channel.

6.2. DMX Start Address Out

This defines which channel to start with on the DMX output side. The feature is mainly used to mask out the 12 internal channels which are used by the LED-Driver-Shield.
Example 1:
DMX/Artnet Start Address = 1
DMX Start Address OUT = 13
Input channel 13 is mapped to DMX output channel 1

Example 2:
DMX/Artnet Start Address = 45
DMX Start Address OUT = 13
Input channel 58 is mapped to DMX output channel 1

7. SD Card

7.1. File Number

This setting defines which file from SD card will be played in SD Player mode. The files have to be placed in the directory *SW/* and named as follows:

SW/show1.shw
SW/show2.shw
SW/show3.shw
...

8. FTP Client

These settings control the FTP functionality. Loading the firmware files from the server only works if the controller is in FTP Client mode.

8.1. FW Files

Choose this to initialize the download of the firmware files from an available FTP server on the network.

8.2. SHOW Files

Choose this to initialize the download of the show files from an available FTP server on the network.

8.3. FTP Server IP

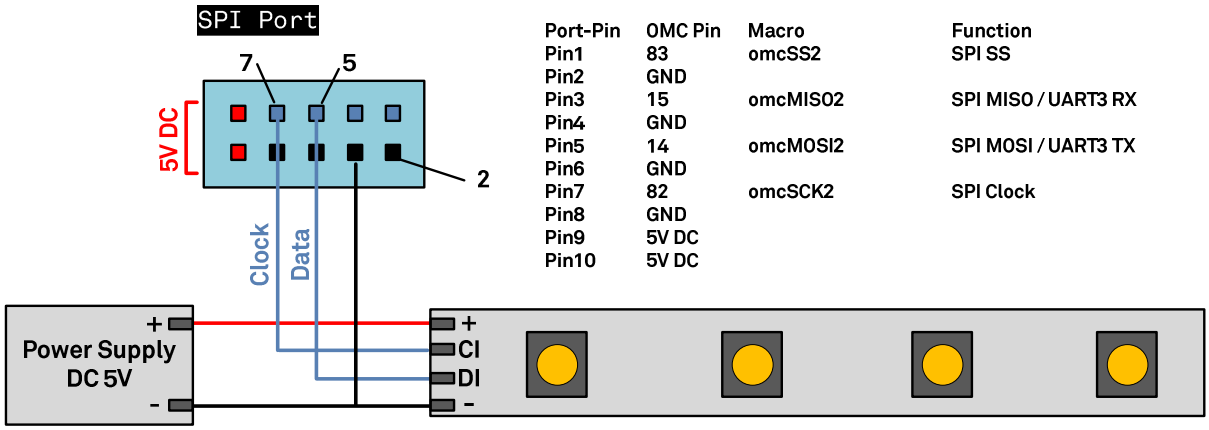
Set the IP of the FTP server on the network. Please refer to the tutorial *install ftp server* on www.openmediacontroller.com to set up a FTP server.

9. Pixel LED

Change settings of the pixel LED functionality.

9.1 Pixel Enable

Enable or disable pixel LED output globally. Please disable the function if not needed, to get a higher refresh rate on the other outputs. The pixel LEDs can be connected to the SPI-Port on the back of the controller. If more than 25 pixels are used, an external power supply has to be used. See following schema:



Port-Pin	OMC Pin	Macro	Function
Pin1	83	omcSS2	SPI SS
Pin2	GND		
Pin3	15	omcMISO2	SPI MISO / UART3 RX
Pin4	GND		
Pin5	14	omcMOSI2	SPI MOSI / UART3 TX
Pin6	GND		
Pin7	82	omcSCK2	SPI Clock
Pin8	GND		
Pin9	5V DC		
Pin10	5V DC		

9.2 Type

Choose connected pixel type out of: WS2801, WS2811, WS2812, WS2812B, NEOPIXEL, WS2811_400.

9.3 Pixel Count

Choose amount of RGB LED pixels you want to control. A higher value will decrease the refresh rate. Maximum is 320.

10. Recorder

Record and play back input data to the internal SD memory card. The recorder saves all incoming data (Artnet, DMX, mini stage console) with a timestamp. The data is recorded and played pre process. This means that the white balance and colour conversions are not recorded to the SD card and can still be changed during play back.

10.1 Record

The controller chooses the next file name which does not exist on the SD card. The file name which will be used for the next recording is displayed on the LCD (first line).

Recorded files will be saved in the directory /REC on the SD card and are named REC1.DAT, REC2.DAT and so on.

By pressing long on button 3 a new recording will be started. Press long again to stop the recording.

10.2 Playing

Choose the file to play using button 2 (<) and button 3 (>). Only existing file names can be chosen. Start and stop playing by long pressing button 3.

10.3 Repeat Enable

Choose if file is repeated during playback or only played once.

10.4 Auto Play

Choose if the controller should start to playback a file when starting up.

10.5 Auto Play File

Choose which file should be played in auto play mode.

11. User Params

10 parameters (0-255) to be used freely in the user code section. In the code the parameters can be accessed as:

```
s.userParam1
s.userParam2
...
s.userParam10
```

Troubleshoot

If the controller does not start up the stored settings may be corrupt.

- Unplug the controller from any power supply and USB.
- Press and hold button 1 (square)
- Connect the controller to a power source while keep on holding the button until the controller finished starting up (about 2 seconds)

The controller starts up with default settings. The settings are not changed permanently. To store the new settings (default), browse the menu for any setting and store it by holding button 3. This will store all settings and overwrite the corrupt settings.