CUECORE3 MANUAL

WWW.VISUALPRODUCTIONS.NL

Revision History

Revision	**Date**	**Author(s)**	**Description**
1	29.03.2021	ME	Initial version.
2	20.06.2022	ME	Added Patch and Purple Cloud.
3	11.05.2023	JL	Updated HTTP API commands.
4	17.05.2023	JL	Updated track recording.
5	09.08.2023	JL	Update MTC informations.

Contents

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VISUAL
PRODUCTIONS

EU Declaration of Conformity

CE

We, manufacturer Visual Productions BV, herby declare under sole responsibility, that the following device:

CueCore3

Conforms to the following EC Directives, including all amendments:
EMC Directive 2014/30/EU

And the following harmonized standards have been applied:
NEN-EN-IEC 61000-6-1:2019

The object of the declaration is in conformity with the relevant Union harmonisation Legislation.

Full name and identification of the person responsible for product quality and accordance with standards on behalf of the manufacturer

Date:	Place:
November 24th, 2022	Haarlem, The Netherlands

ing. Maarten Engels
Managing Director
Visual Productions BV

SUPPLIER'S DECLARATION OF CONFORMITY (No. 2023/202-03)

This Declaration of Conformity is issued under the sole responsibility of the manufacturer

MANUFACTURER

Company name	Visual Productions BV
Full address	Izaak Enschedeweg 38A 2031 CR Haarlem
Country	The Netherlands

RESPONSIBLE PARTY – U.S. CONTACT INFORMATION

Company name	ACT Entertainment
Full address	3581 Larch Lane Jackson, MO 63755
Country	United States of America
Contact details (Phone)	+ 1 800 255 9822

DESCRIPTION AND IDENTIFICATION OF THE EQUIPMENT

Generic denomination	Lighting control system
Function/intended use	Architectural lighting controller
Model	CueCore3

The object of the Declaration described above is in conformity with all relevant provisions of:

FCC (47 CFR Part 15B)

Supplementary information

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

Signed for and on behalf of:

Place of issue:	Haarlem The Netherlands	**Identity:**	Maarten Engels
		Function:	Managing Director
Date of issue:	13-06-2023	**Signature:**	

Chapter 1

Introduction

Thank you for choosing the CueCore3; a lighting controller designed for (semi-)permanent installations. The CueCore3 is the most powerful controller developed so far by the engineers at Visual Productions.

We hope you will create beautiful lighting installations using the CueCore3 and enjoy commissioning your CueCore3 projects as much as we enjoyed designing this new controller.

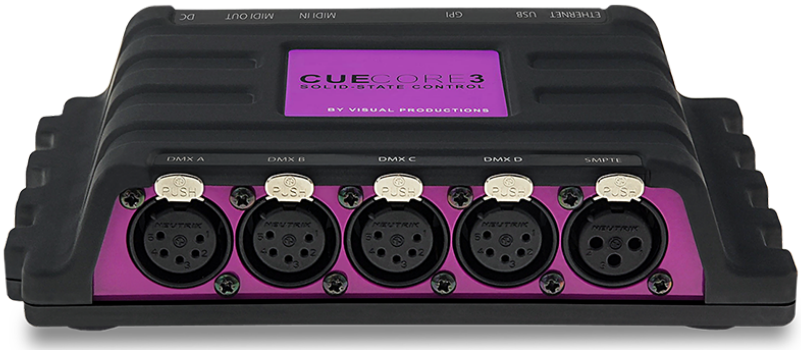


Figure 1.1: CueCore3

At the time of writing this manual the CueCore3's firmware was at version 1.26.50.

1.1 Design Goals

The CueCore3 builds on the success of the CueCore2 and QuadCore, using the same functionality, while at the same time expanding capacity and adding new features. The CueCore3 will not make the CueCore2 obsolete, rather it will give the user an additional choice for a lighting controller for more demanding projects, offering even more capabilities than the CueCore2.

The key extensions offered by the CueCore3 are:

1.1.1 Track Capacity

Featuring a flash memory 256 times the size of the memory in a CueCore2, the CueCore3 can store considerably longer DMX recordings. This makes the CueCore3 the preferred choice for channel heavy LED pixel projects.

1.1.2 Number of Playbacks

The number of playbacks has been increased from 6 to 16. The additional playbacks makes it easier to program multiple zones or create more interactivity by having various external triggers activate different playbacks.

1.1.3 Number of Actions

The CueCore3's larger memory also facilitates a higher number of actions and tasks to be programmed in the show control section. Taking the automation of the lighting controller to the next level.

1.1.4 RDM

The DMX ports are bi-directional and RDM capable, featuring RDM discovery and remote addressing.

1.1.5 Four Universes

The CueCore3 is has four DMX ports fitted with 5-pin XLR connectors. Each port has an independent optical isolation; a surge on one DMX port is preventing from affecting the other ports.

1.1.6 Patch

The previous CueCores did not contain fixture information; they only have DMX channel data. The new CueCore3, however, features a patch. In this patch the user can - it is optional - enter the fixture data like starting address and personality. When the patch is setup then the CueCore3 is capable of controlling the fixture's parameters. Also, the patch is used for determining the intensity channels when smartly dimming playbacks containing pre-recorded tracks. In the CueCore2 this function relied on the *Intensity Map.*

1.1.7 Purple Cloud

The CueCore3 is designed to be remotely monitored and controlled by the Purple Cloud. The Purple Cloud is cloud service that has been developed by Visual Productions parallel to the development of the CueCore3.

1.2 Compliance

This device is in compliance with CE, UKCA and FCC regulations.

1.3 Features

The feature set of the CueCore3 includes:

- 4x DMX-512 (ANSI E1.11) optically isolated port (bi-directional)
- RDM (ANSI E1.20)
- 4x GPI
- MIDI, MSC & MMC
- SMPTE, MTC & Art-Net timecode
- Art-Net, sACN & KiNet
- TCP, UDP & OSC
- Master-slave protocol for synchronising multiple CueCore3 units
- Scheduling with Real-Time clock[1], weekdays and sunrise/sunset
- NTP time synchronisation
- Desktop or DIN Rail mounted
- Kensington lock
- Locked power cable protection
- PoE (Power Over Ethernet) Class I
- Bundled with CueluxPro, vManager and Kiosc software

1.4 Comparison

The following table visualises the difference between the CueCore3, CueCore2 , QuadCore and CueCore1. This overview might prove to be helpful to CueCore users considering choosing the model for their new designs.

[1] Please note that there is no battery fitted inside the CueCore3. The Real-Time clock has a backup charge through means of a super-capacitor.

	CueCore3	QuadCore	CueCore2	CueCore1
CPU	4x1.2GHz	180MHz	180MHz	120MHz
Memory	8GB	32MB	32MB	8MB
DMX	4 in/out	4 in/out	2 in/out	2 out + 1 in
RDM	yes	-	-	-
MIDI	in+out	-	in+out	in+thru+out
GPI	4x digital/analog	-	4x digital/analog	4x digital
SMPTE	in	-	in	in
MTC	in	-	in	in
Art-Net	in+out	in+out	in+out	in+out
sACN	in+out	in+out	in+out	-
KiNet	out	out	out	-
TCP	in+out	in	in	-
UDP	in+out	in+out	in+out	in+out
OSC	in+out	in+out	in+out	in+out
POE	class III	class I	class I	class I
DHCP	yes	yes	yes	-
NTP	yes	yes	yes	-
Real-time Clock	yes	yes	yes	yes
CueluxPro	4 universes	4 universes	2 universes	2 universes

1.5 Limitations

The CueCore3 is a powerful device with many possibilities, there are however some limitations, as shown in the following table.

Playbacks	16
Cues per Playback	32
Tracks	128
Action lists	Each source once
Actions per list	64
Actions system-wide	128
Tasks per Action	16
Tasks system-wide	256
Variables	20
Timers	4

1.6 What's in the box?

The CueCore3 packaging contains the following items (see figure 1.2):

- CueCore3
- Ethernet cable
- 6-pin terminal
- Power supply
- 4x international plug
- Information card

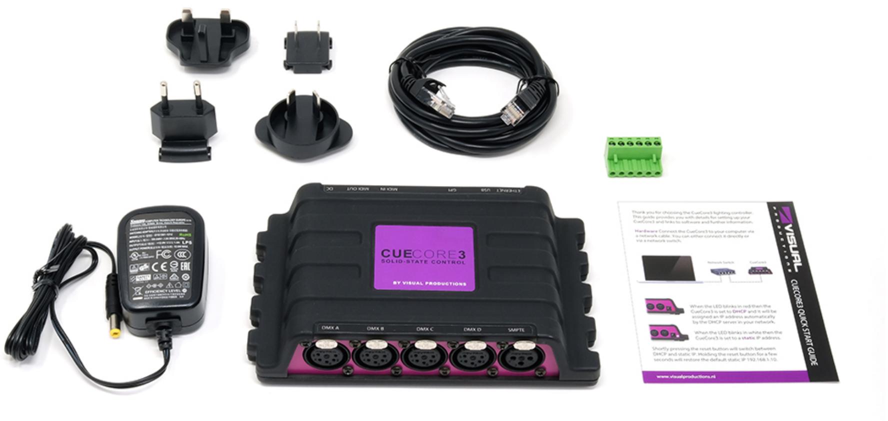


Figure 1.2: CueCore3 box contents

1.7 Saving data to memory

This manual will describe how to configure the CueCore3 and program tracks, playbacks, action, etc. The unit's web-interface is used for editing these kinds of elements. When changes are made, these changes are directly stored in the RAM memory of the CueCore3 and the programming will directly influence the behaviour of the unit. RAM memory is, however, volatile and its content will be lost through a power cycle. For this reason the CueCore3 will copy any changes in the RAM memory to its onboard flash memory. Flash memory retains its data even when not powered. The CueCore3 will load all its data back from the flash memory upon startup.

This memory copy process is conducted automatically by the CueCore3 and should not be of any concern of the user. One point of consideration is, however, that after making a change the unit should be given time to perform the copy to flash. As a rule of thumb, do not disconnect the power from the device within 30 seconds from making a programming change.

1.8 Document Organisation

This manual discusses setting up and programming the unit. Chapter 2 provides background information on the communication protocols used the CueCore3. Chapters 4 and 5 cover how to set up the unit and configure the network connection.

The *Patch* information is needed when controlling fixtures directly. This page is covered in Chapter 7.

Chapter 8 and 9 cover recording, storing and playback of lighting content.

Programming the automation, triggering and converting functionality is done in chapter 10.

Supporting tools such as Purple Cloud, vManager and Kiosc are explained in chapters 14, 15 and 16 respectively.

When in a hurry, you could skip all chapters and directly follow the quickstart tutorials in chapter 3.

1.9 Further Help

If, after reading this manual, you have further questions then please consult the online forum at `http://forum.visualproductions.nl` for more technical support.

Chapter 2

Protocols

The CueCore3 is fitted with several communication ports and supports various protocols. This chapter describes these protocols and to which extent they are implemented in the CueCore3

2.1 DMX-512

DMX-512 is the standard communication protocol for stage lighting. Its official name is E1.11-2008 USITT DMX512-A. Nowadays the reach of the DMX protocol has extended beyond entertainment lighting and is also used for architectural lighting.

Originally one DMX network contained 512 channels which is called a 'universe'. With the growing size and complexity of lighting systems it is now very common for a system to compose of multiple universes, each conveying 512 channels.

It is advised to use a shielded twisted pair cable for DMX cabling. The cable should be terminated with an 120 Ohm resistor.

DMX-512 is a very successful protocol with, however, a few limitations. The maximum number of attached devices is limited to 32 and they all have to be connected in bus-topology having one cable running via each device. Furthermore, a DMX-512 cable should not be longer than 300 meters.

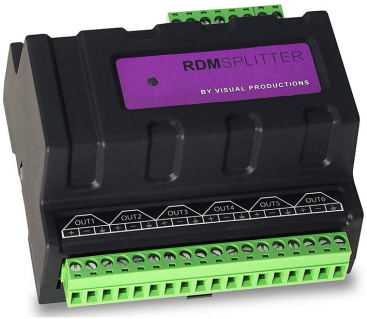


Figure 2.1: Visual Productions' RdmSplitter

The DIN Rail RdmSplitter from Visual Productions (See figure 2.1) helps tackle those inconvenient limitations. The Splitter takes a DMX signal and sends it out again on its 6 DMX output ports for scaling group topology. Each output port is capable of driving 32 more devices. The Splitter can also function as a signal booster as each port supports another 300 meter long connection.

2.2 RDM

The Remote Device Management (RDM) protocol - officially called ANSI E1.20 - is build on top of the DMX-512 protocol. RDM enhances DMX with bi-directional communication allowing the fixtures to be detected, addressed and polled for status information.

Although standard DMX cables can be used, the equipment requires specific electronic considerations for being RDM capable.

The CueCore3 can discover RDM fixtures, set starting addresses and choose modes.

2.3 Art-Net

The Art-Net protocol primarily transfers DMX-512 data over Ethernet. The high bandwidth of an Ethernet connection allows Art-Net to transfer up to 256 universes.

The data sent out for Art-Net does put a certain load on the network, therefore it is recommended to disable Art-Net when not in use.

Additional to transmitting DMX-512 data, Art-Net can also be used for transferring timecode information for equipment synchronisation.

Each CueCore3 supports sending and receiving of 2 Art-Net universes as well as receiving Art-Net timecode.

2.4 sACN

The streaming Architecture of Control Networks (sACN) protocol uses a method of transporting DMX-512 information over TCP/IP networks. The protocol is specified in the ANSI E1.31-2009 standard.

The sACN protocol supports multi-cast in order to take efficient use of the network's bandwidth.

The CueCore3 supports sending and receiving of four sACN universes.

2.5 KiNet

KiNet is a proprietary protocol of Philips Color Kinetics to control their LED fixtures and power supplies. It is a lightweight Ethernet-based protocol that carries DMX-style data. Within the CueCore3 it can only be used to output data.

2.6 TCP

The Transmission Control Protocol (TCP) is a core protocol of the Internet Protocol Suite. It is used for its reliable, ordered and error checked delivery of a stream of bytes between applications and hosts over IP networks. It is considered 'reliable' because the protocol itself checks to see if everything that was transmitted was delivered at the receiving end. TCP allows for the retransmission of lost packets, thereby making sure that all data transmitted is received.

The CueCore3 supports receiving and sending TCP messages.

2.7 UDP

User Datagram Protocol (UDP) is a simple protocol for sending messages across the network. It is supported by various media devices like video projectors and Show Controllers. It does not incorporate error checking, therefor it is faster than TCP but less reliable.

There are two ways how to have the CueCore3 respond to incoming UDP messages. The API (see page 130) makes typical CueCore3 functions available through UDP. Furthermore, custom messages can be programmed in the Show Control page (see page 61). This is also the place where to program outgoing UDP messages.

2.8 OSC

Open Sound Control (OSC) is a protocol for communicating between software and various multi-media type devices. OSC uses the network to send and receive messages, it can contain various information.

There are apps available for creating custom-made user interfaces on iOS (iPod, iPhone, iPad) and Android. These tools allow to program fool-proof user-interfaces for controlling the device. E.g. Kiosc from Visual Productions.

There are two ways how to have the CueCore3 respond to incoming OSC messages. Firstly, the API (see page 127) makes typical CueCore3 functions available through OSC. Secondly, custom messages can be programmed in the Show Control page (see page 61).

2.9 GPI

The CueCore3 features four General Purpose Input (GPI) ports that can be connected to external equipment, switches and sensors. State changes on these GPI ports can be used to trigger programmed events inside the CueCore3.

Each GPI port can be switched between *Digital* and *Analog*. Set to *Digital* the port works as a contact-closure. In *Analog* mode the port is a 0-10V level input.

2.10 MIDI

The MIDI protocol is intended for inter-connecting musical devices such as synthesisers and sequencers. Furthermore, this protocol is also very suitable to send triggers from one device to another and is often used to synchronise audio, video and lighting equipment. There is also a large collection of MIDI control surfaces available; user-interface consoles with knobs, (motorised-)faders, rotary-encoders, etc.

The CueCore3 is fitted with a MIDI input and MIDI output port. It supports receiving and sending MIDI messages like NoteOn, NoteOff, ControlChange and ProgramChange.

2.10.1 MTC

MIDI Timecode (MTC) is the timecode signal which is embedded into MIDI. The CueCore3 supports only receiving MTC. It is not recommended to combine the use of MTC with ordinary MIDI as MTC consumes the bandwidth of the MIDI connection.

2.10.2 MMC

MIDI Machine Control (MMC) is part of the MIDI protocol. It defines special messages for controlling audio equipment such as multi-track recorders. The CueCore3 supports the sending of MMC commands; please refer to page 125.

2.10.3 MSC

MIDI Show Control (MSC) is an extension of the MIDI protocol. It comprises of commands for synchronising show equipment like lighting, video and audio devices. The CueCore3 supports receiving MSC commands. This support is hard coded and does not require any Show Control programming. Please refer to appendix ??.

2.11 SMPTE

SMPTE is timecode signal which can be used to synchronise audio, video, lighting and other show equipment. The CueCore3 supports receiving SMPTE that is transferred as an audio signal, also know as LTC timecode.
The CueCore3 only supports receiving timecode. If a timecode generator is required then the Visual Productions' TimeCore is recommended as shown in figure 2.2.

Figure 2.2: TimeCore

2.12 NTP

Network Time Protocol (NTP) is a networking protocol for clock synchronisation between computer systems over networks.

The real-time clock (RTC) in the CueCore3 can have a small deviation and drift over time. By occasionally synchronising (e.g. once per day) to an external time server - using the NTP protocol - the RTC stays accurate.

2.13 DHCP

The Dynamic Host Configuration Protocol (DHCP) is a standardised network protocol used on Internet Protocol (IP) networks for dynamically distributing network configuration parameters, such as IP addresses.

The CueCore3 is a DHCP client.

Chapter 3

Quickstart

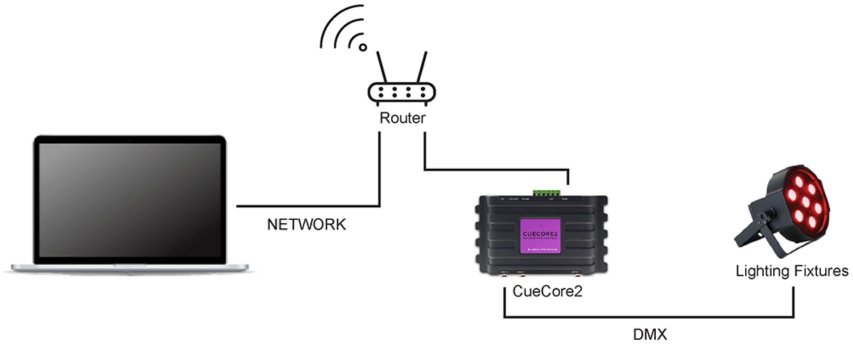
This chapter provides step by step tutorials on how to program your CueCore3 for some typical tasks:

- Playback lighting scenes based on the scheduler
- Choose between different lighting scenes via incoming UDP messages
- Record a show from an external DMX console
- Configure as Art-Net Node

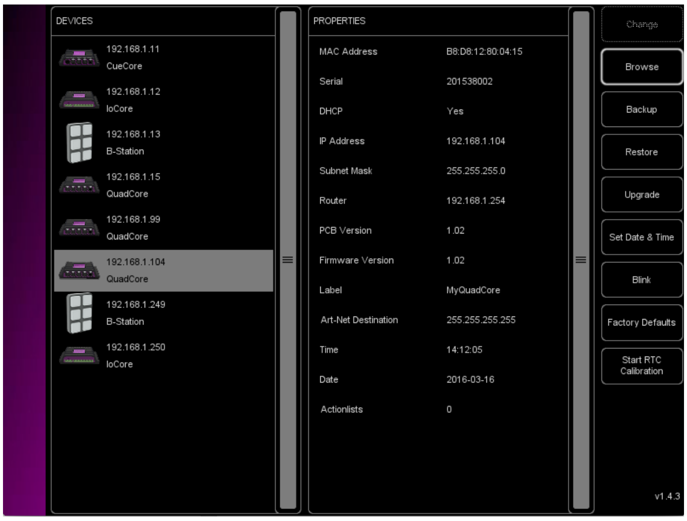
3.1 Playback based on scheduler

This tutorial shows how to create a lighting scene and have it activated at a certain time of the day. The scene will be de-activated at another time. Follow the steps below:

1. Connect to the network
   Connect the CueCore3 with an Ethernet cable to the router. It is required that the network is managed by a router that features a DHCP server. If the network router is not DHCP capable then read the network chapter on page 36 for alternative setups.



2. Install the vManager
   To access the web-interface of the CueCore3, the vManager tool is required. This tool can be downloaded from the Visual Productions website. Once the installation is complete, run the vManager to discover the IP address of the CueCore3.



DEVICES

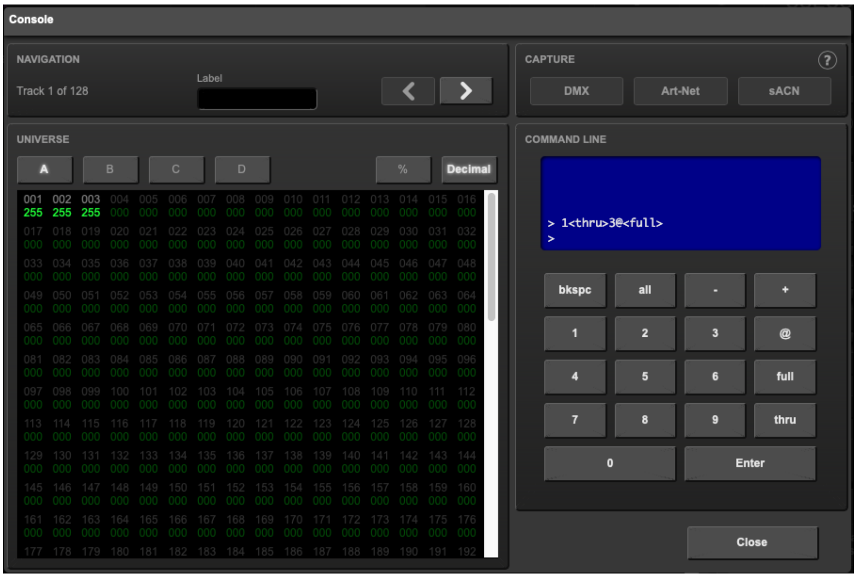
- 192.168.1.11 CueCore
- 192.168.1.12 IoCore
- 192.168.1.13 B-Station
- 192.168.1.15 QuadCore
- 192.168.1.99 QuadCore
- 192.168.1.104 QuadCore
- 192.168.1.249 B-Station
- 192.168.1.250 IoCore

PROPERTIES

MAC Address	B8:D8:12:80:04:15
Serial	201538002
DHCP	Yes
IP Address	192.168.1.104
Subnet Mask	255.255.255.0
Router	192.168.1.254
PCB Version	1.02
Firmware Version	1.02
Label	MyQuadCore
Art-Net Destination	255.255.255.255
Time	14:12:05
Date	2016-03-16
Actionlists	0

3. Open the web-interface
   Choose the CueCore3 from the device list and click on the *Browse* button to open the web-interface.

4. Create the scene
   Use the browser to go to the CueCore3's 'Track' page. Select a track from the table and press the 'Open Console' button. Create a scene by using the command-line syntax. E.g. `1<thru>3 @ <full>`



Console

NAVIGATION

Track 1 of 128

Label

CAPTURE

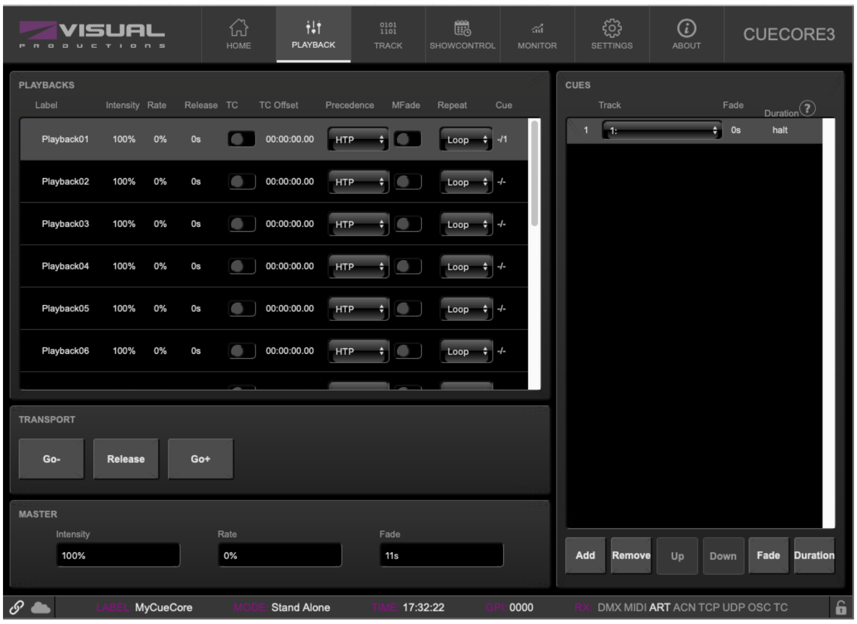
UNIVERSE

001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016
255	255	255	000	000	000	000	000	000	000	000	000	000	000	000	000
017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
097	098	099	100	101	102	103	104	105	106	107	108	109	110	111	112
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176
000	000	000	000	000	000	000	000	000	000	000	000	000	000	000	000
177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192

COMMAND LINE

```
> 1<thru>3@<full>
>
```

5. Create a cue
   Go to the Playback page and select Playback 1. Press the Add button to create a new cue. Once the Cue is added it will automatically refer to Track 1.



PLAYBACKS

Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
Playback01	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/1
Playback02	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
Playback03	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
Playback04	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
Playback05	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
Playback06	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-

TRANSPORT

MASTER

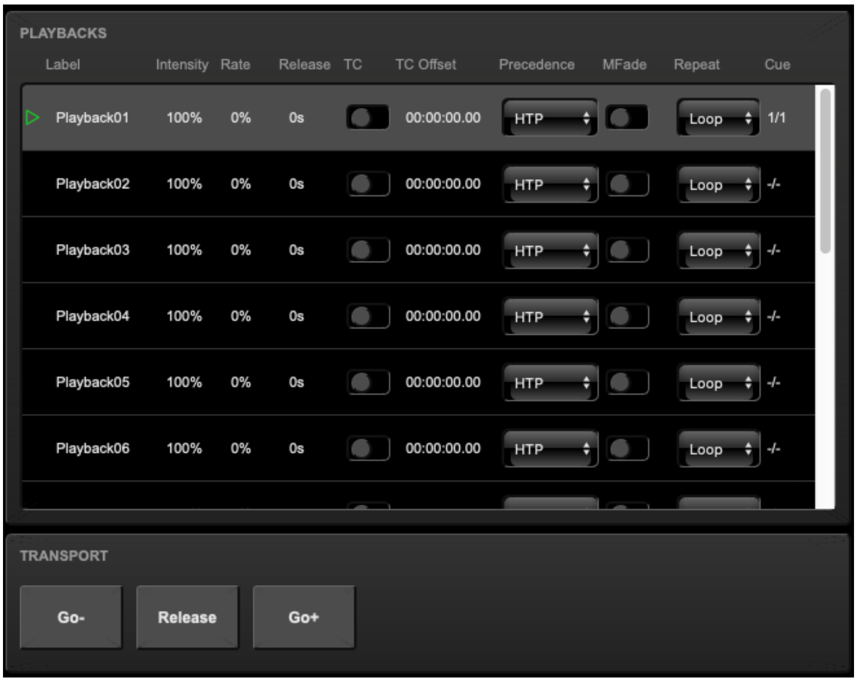
Intensity: 100%
Rate: 0%
Fade: 11s

CUES

	Track	Fade	Duration
1	1:	0s	halt

LABEL: MyCueCore MODE: Stand Alone TIME: 17:32:22 GPI: 0000 RX: DMX MIDI ART ACN TCP UDP OSC TC

6. Start playback
   Press Go+ on the transport area to start the Playback. The playback now indicated the green 'play' icon.



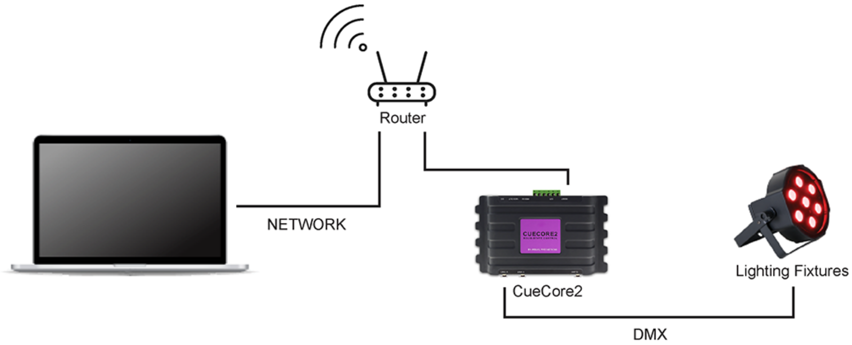
PLAYBACKS

	Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
▷	Playback01	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	1/1
	Playback02	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
	Playback03	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
	Playback04	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
	Playback05	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
	Playback06	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-

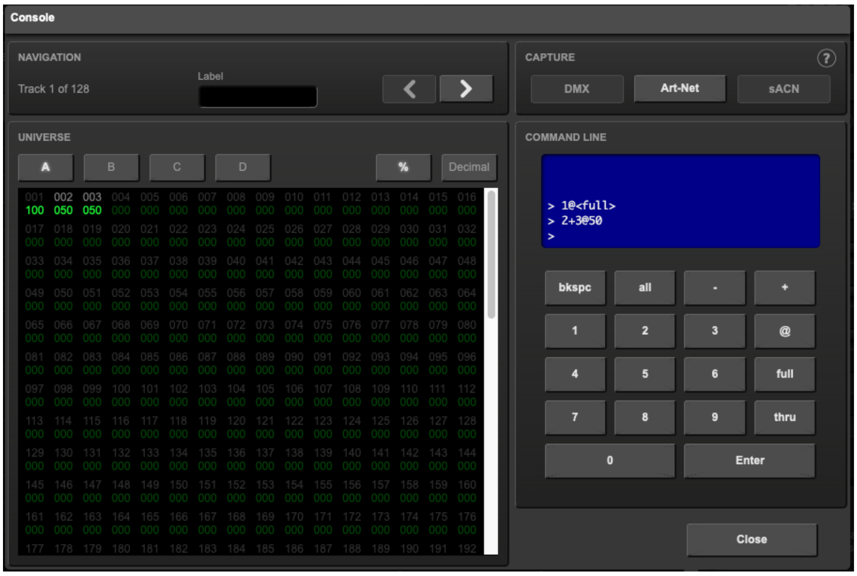
3.2 Choose scenes via UDP

This example will create two lighting scenes. They will be put into a single playback. This means only one scene will be active at a time. Furthermore, a cross-fade will be defined between the scenes and the scenes will be triggered by receiving simple UDP network messages. Please take the following steps:

1. Connect to the network
   Connect the CueCore3 with an Ethernet cable to the router. It is required that the network is managed by a router that features a DHCP server. If the network router is not DHCP capable then read the network chapter on page 36 for alternative setups.



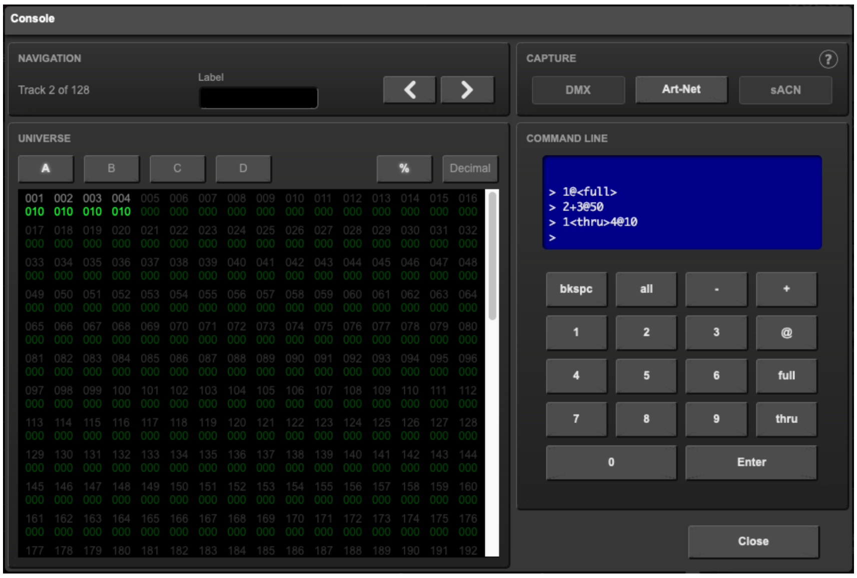
2. Create the first scene
   Use the browser to go to the CueCore3's 'Track' page. Select a track from the table and press the 'Open Console' button. Create a scene by using the command-line syntax. E.g. `1 @` <`full`> or `2+3 @ 50` <`enter`>



```
001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016
100 050 050 000 000 000 000 000 000 000 000 000 000 000 000 000
017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
033 034 035 036 037 038 039 040 041 042 043 044 045 046 047 048
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
081 082 083 084 085 086 087 088 089 090 091 092 093 094 095 096
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192
```

```
> 1@<full>
> 2+3@50
>
```

3. Create the second scene
   Press the 'right arrow' button to switch to the next track. Again make a scene by using some command-line syntax; e.g. `1 THRU 4 @ 10 ENTER`

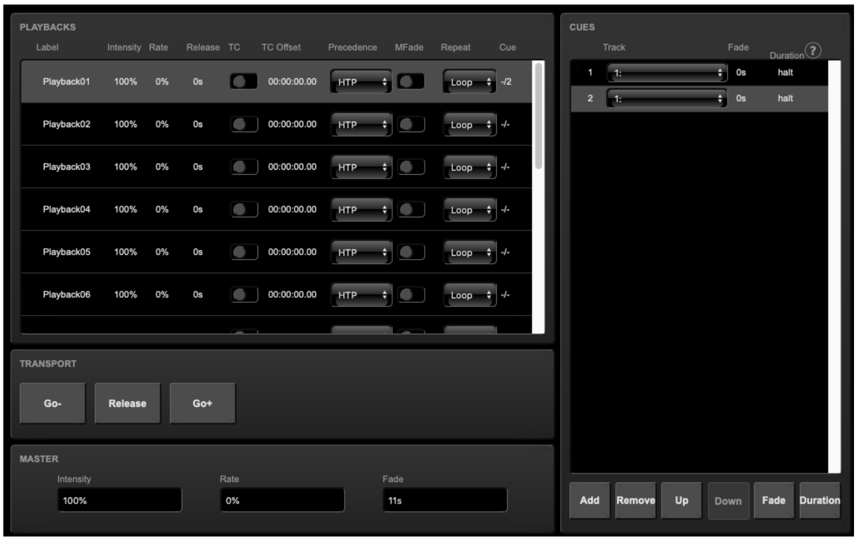


Track 2 of 128

```
001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016
010 010 010 010 000 000 000 000 000 000 000 000 000 000 000 000
017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
033 034 035 036 037 038 039 040 041 042 043 044 045 046 047 048
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
081 082 083 084 085 086 087 088 089 090 091 092 093 094 095 096
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192
```

```
> 1@<full>
> 2+3@50
> 1<thru>4@10
>
```

4. Program the playback
   Go to the 'Playback' page, select the first of the six playback and insert two cues by pressing the 'add' button. Set cue #1 to refer to your first track and cue #2 to refer to your second track.



Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
Playback01	100%	0%	0s		00:00:00.00	HTP		Loop	-/2
Playback02	100%	0%	0s		00:00:00.00	HTP		Loop	-/-
Playback03	100%	0%	0s		00:00:00.00	HTP		Loop	-/-
Playback04	100%	0%	0s		00:00:00.00	HTP		Loop	-/-
Playback05	100%	0%	0s		00:00:00.00	HTP		Loop	-/-
Playback06	100%	0%	0s		00:00:00.00	HTP		Loop	-/-

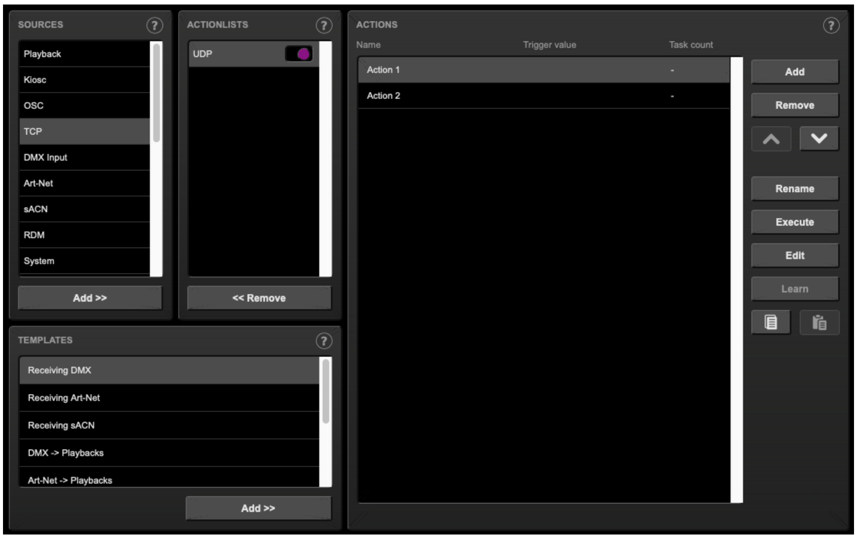
	Track	Fade	Duration
1	1:	0s	halt
2	1:	0s	halt

Intensity 100%

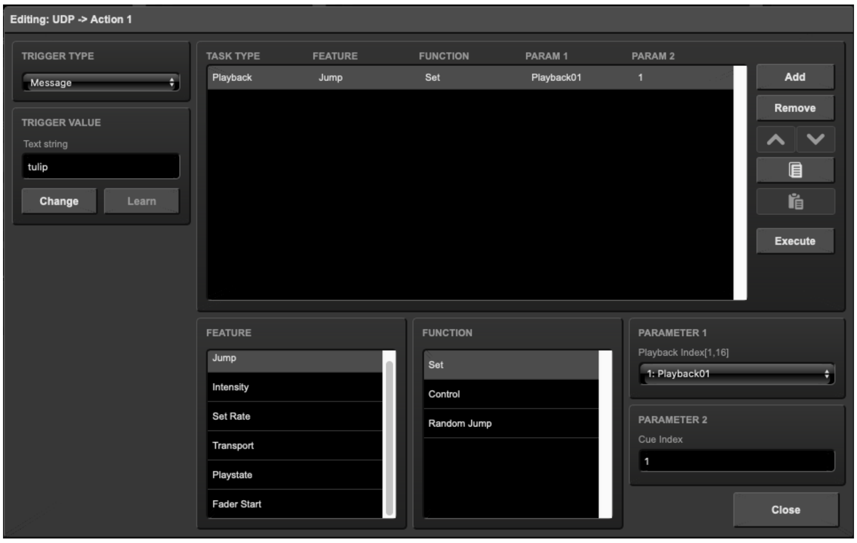
Rate 0%

Fade 11s

5. Create an action list
   Go to the 'Show control' page. Select 'UDP' from the 'Sources' table. Copy UDP to the 'Action list' table by using the 'Add >>' button. Select the new UDP action list and insert two actions by pressing the '<< Add' button twice.



6. Create actions
   Select the first action and press 'Edit' to open the dialog. Change the trigger value to "tulip". Add one task by using the 'Add' button. Choose 'Playback' from the list of task types. Select the newly added task and set the 'feature' to 'Transport' and set the 'function' to 'Jump. Parameter 1 should be set to '1' (addressing the first playback) and parameter 2 should be set to '1' (jump to the first cue).



Editing: UDP -> Action 1

TRIGGER TYPE: Message

TRIGGER VALUE
Text string: tulip

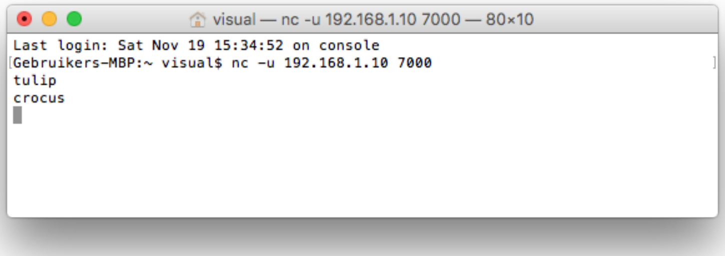
TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Playback	Jump	Set	Playback01	1

PARAMETER 1
Playback Index[1,16]: 1: Playback01

PARAMETER 2
Cue Index: 1

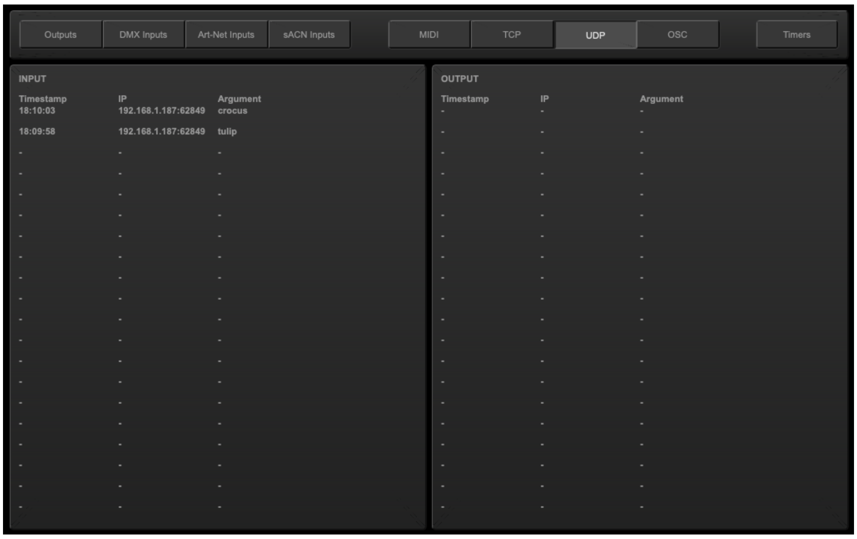
Press the 'Close' button, select the second action and press 'Edit' again. Change this trigger value to "crocus". Add a task by pressing 'Add' and choose the 'Playback' task-type. Select the newly added task and set the 'feature' to 'Transport' and set the 'function' to 'Jump. Parameter 1 should be set to '1' (addressing the first playback) and parameter 2 should be set to '2' (jump to the second cue).

7. Test with netcat and monitor
   On your computer, use a simple command-line tool like netcat to send a UDP string to the CueCore3. On Mac OSX netcat is started with the command `nc -u 192.168.1.10 7000` (replace 192.168.1.10 with IP address of your CueCore3). From now on you can type `tulip` <enter> or `crocus` <enter> to send this messages to the CueCore3.

   ```
   Last login: Sat Nov 19 15:34:52 on console
   Gebruikers-MBP:~ visual$ nc -u 192.168.1.10 7000
   tulip
   crocus
   ```

   Go to the 'Monitor' page in your browser and select 'UDP In' to verify your device is receiving the UDP messages correctly. On the 'Playback' page you should see playback #1 respond to the incoming UDP commands by activating either cue #1 or cue #2.

   INPUT

Timestamp	IP	Argument
18:10:03	192.168.1.187:62849	crocus
18:09:58	192.168.1.187:62849	tulip
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

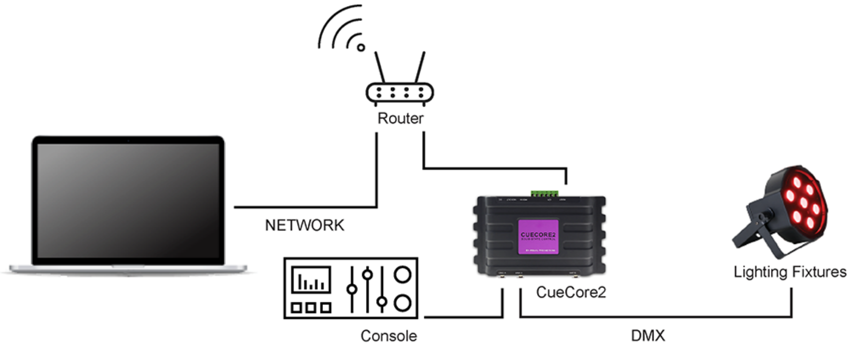
   OUTPUT

Timestamp	IP	Argument
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-
-	-	-

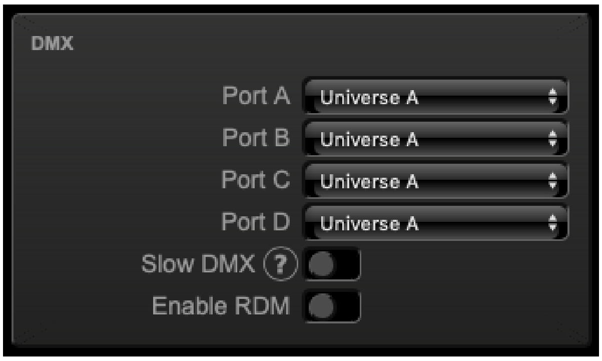
3.3 Record a show from an external DMX

The CueCore3 is capable of recording DMX data. This tutorial explains the required procedure.

1. Connect the external console
   Connect the DMX output of the DMX console to *Port A* of the CueCore3. Connect the fixtures to *Port B*.



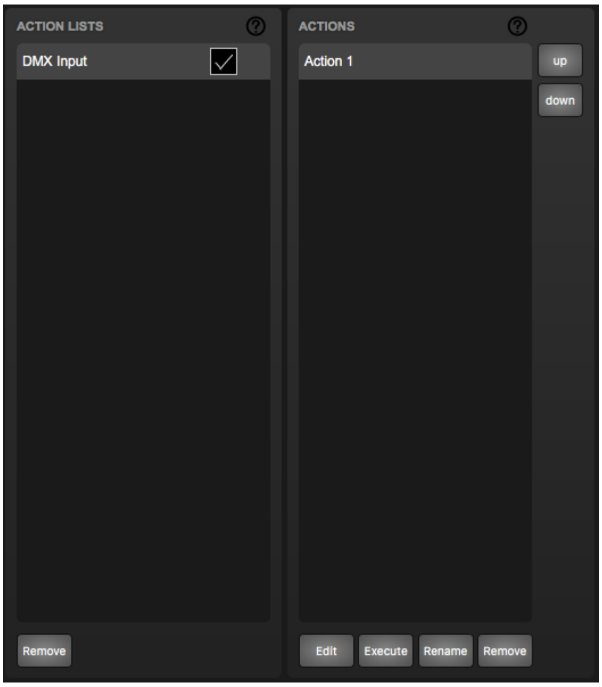
2. Configure port settings
   Go to the *Settings* page and set DMX *Port A* to *In*. Set *Port B* to *Universe A*, it will now transmit DMX channels 1-512.



DMX

Port A: Universe A
Port B: Universe A
Port C: Universe A
Port D: Universe A
Slow DMX ?
Enable RDM

3. Throughput the DMX
   The DMX received by the CueCore3 will not automatically be output to the fixtures, however, it is desirable to see the console's output on the actual fixtures. To achieve throughput of the DMX, go to the *Show Control* page. Create a *DMX Input* action list and insert one action.



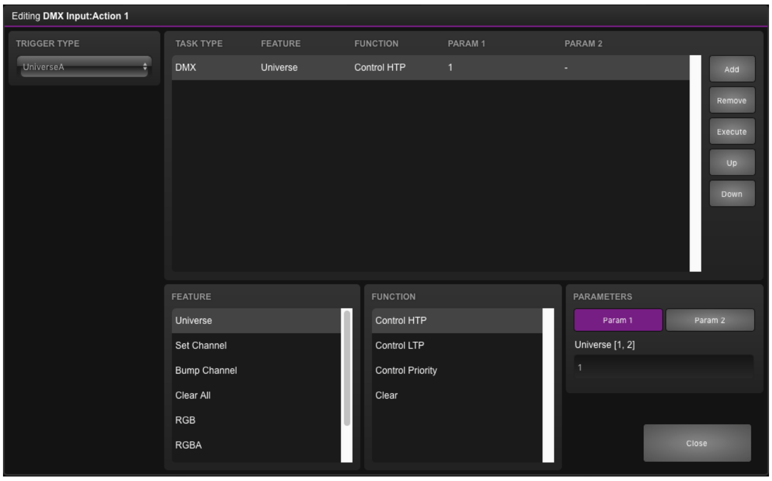
ACTION LISTS

DMX Input ☑

ACTIONS

Action 1

   Edit the action. Set the *Trigger Type* to *UniverseA*. Add a *DMX* task and set its feature to *Universe* and its function to *Control HTP*, the first parameter should be set to 1.



Editing **DMX Input:Action 1**

TRIGGER TYPE: UniverseA

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
DMX	Universe	Control HTP	1	-

FEATURE

Universe
Set Channel
Bump Channel
Clear All
RGB
RGBA

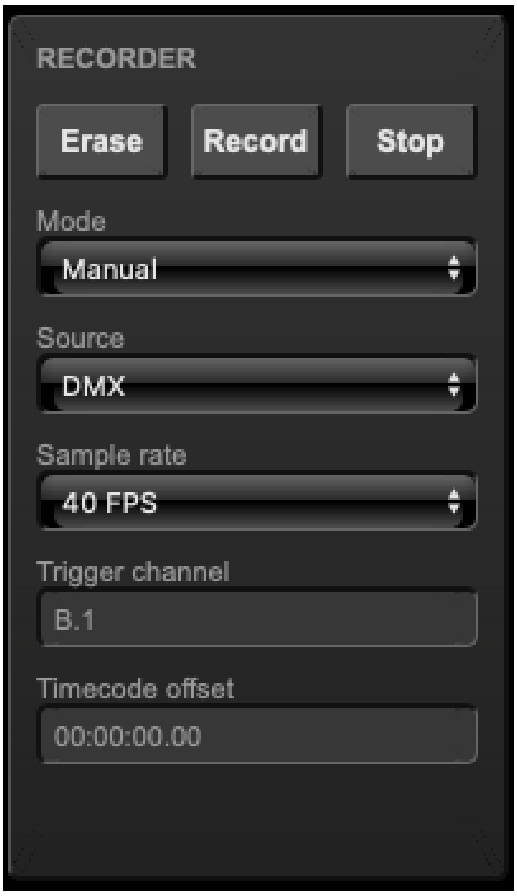
FUNCTION

Control HTP
Control LTP
Control Priority
Clear

PARAMETERS

Universe [1, 2]: 1

4. Configure the recording
   Go to the *Track* page. Select the first track and press the *Erase* button. Wait until the erase process is completed. Set *Mode* to *Manual*. Set *Source* to *DMX* and set *Sample rate* to 40 FPS.

   Mode
   Manual

   Source
   DMX

   Sample rate
   40 FPS

   Trigger channel
   B.1

   Timecode offset
   00:00:00.00

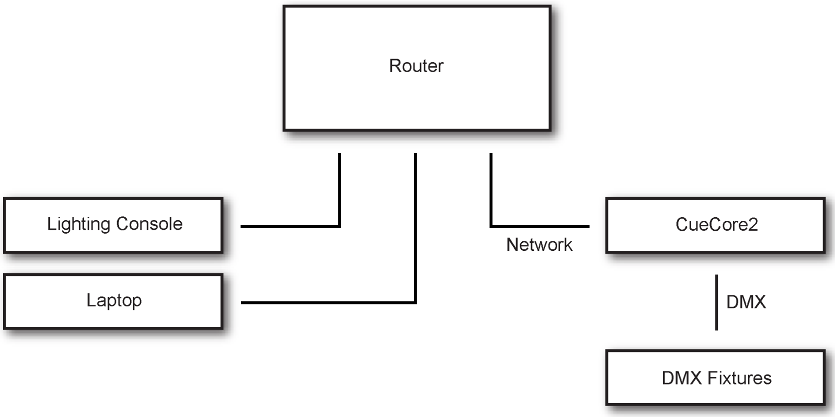
5. Record
   Press the *Record* button at the begin of the console's show. Press the *Stop* button when the show is finished.

6. Test the result
   Make sure the console outputs only zero values. Then playback the track's content by enabling the *Track Preview* checkbox.

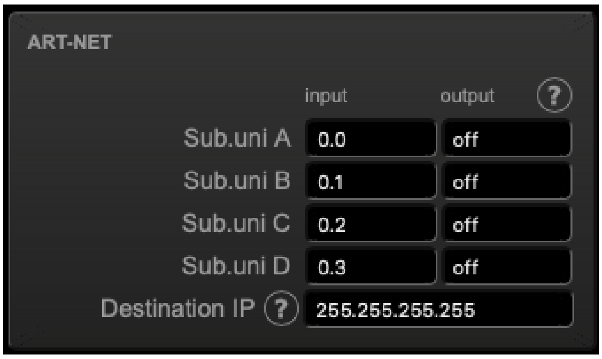
3.4 Configure as Art-Net Node

The CueCore3 is capable of sending and receiving various data protocols. This tutorial shows you how to receive Art-Net, and transmit the data through the DMX ports on the CueCore3.

1. Connect to the network
   Connect the CueCore3 with an Ethernet cable to the router. It is required that the network is managed by a router that features a DHCP server. If the network router is not DHCP capable then read the network chapter on page 36 for alternative setups.



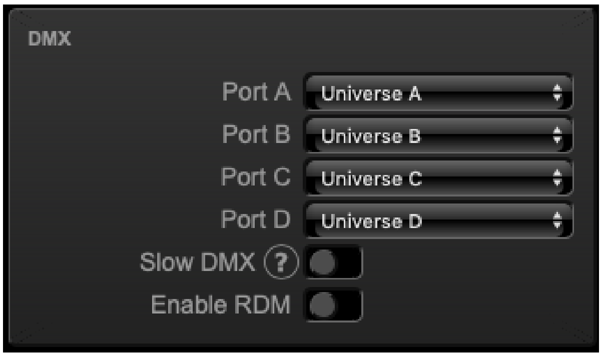
2. Configuring the Art-Net input
   Go to the *Settings* page and set the desired Art-Net universes for port A and B at *Sub.Uni A* and *Sub.Uni B* The CueCore3 counts the Art-Net universes from 0.0. For example, Art-Net universe 1 is at 0.0, Art-Net universe 16 is at 0.15 and Art-Net universe 17 is at 1.0. It is also possible to enter the Art-Net universe number (0, 16 or 17 for example) and the CueCore3 will automatically convert the value to a valid format.



ART-NET

	input	output
Sub.uni A	0.0	off
Sub.uni B	0.1	off
Sub.uni C	0.2	off
Sub.uni D	0.3	off
Destination IP	255.255.255.255	

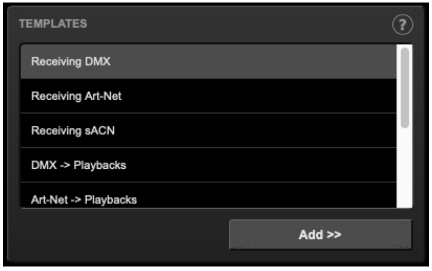
3. Configure port settings
   Go to the *Settings* page and set DMX *Port A* to *Universe A* and *Port B* to *Universe B*.



DMX

Port A: Universe A
Port B: Universe B
Port C: Universe C
Port D: Universe D
Slow DMX ?: ○
Enable RDM: ○

4. Forwarding Art-Net to the DMX outputs
   To forward the Art-Net values to the DMX ports, the *Receiving Art-Net* template can be used. Select it, and add it by clicking the *Add* >> button. The Art-Net input is now forwarded to the DMX output.



Chapter 4

Installation

This chapter discusses how to set up the CueCore3.

4.1 DIN Rail Mounting

The device can be DIN Rail mounted. The device is prepared for DIN Rail mounting by using the 'DIN rail holder TSH 35' from Bopla (Product no. 22035000).

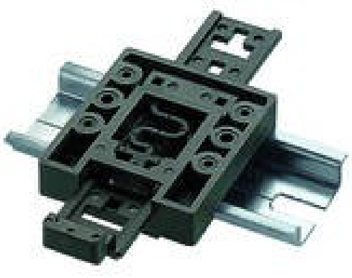


Figure 4.1: Bopla DIN rail adapter

This adapter is - amongst others - available from:

- Farnell / Newark (order code 4189991)
- Conrad (order code 539775 - 89)
- Distrelec (order code 300060)

4.2 Rackmount

There is an adapter available for mounting the CueCore3 into a 19" rack . The rackmount adapter is 1U and is sold separately. It fits two units, however, it is supplied with one position closed by a blind panel, see figure 4.2.

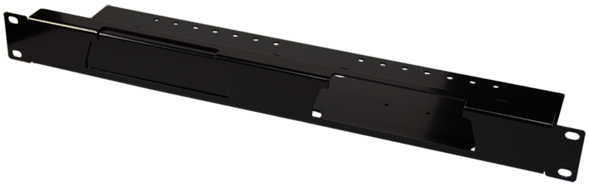


Figure 4.2: Rackmount adapter

4.3 Power

The CueCore3 requires a DC power supply between Volt with a minimum of 500mA. The 2,1 mm DC connector is center-positive. The CueCore3 is also Power-over-Ethernet (PoE) enabled. It requires PoE Class I.

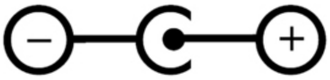


Figure 4.3: DC polarity

4.4 GPI

The CueCore3 features four General Purpose Inputs (GPI) ports that can be connected to external equipment, switches and sensors. State changes on these GPI ports can be used to trigger programmed events inside the CueCore3.

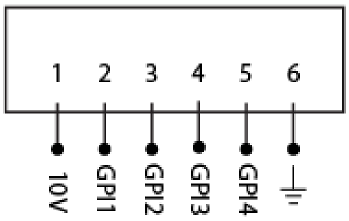
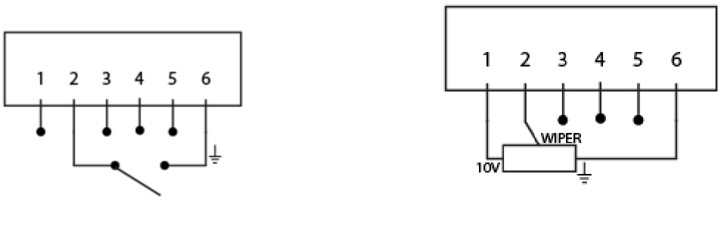


Figure 4.4: GPI Pinout

Each GPI port can be switched between 'digital' and 'analog'. In the digital mode the signal is held up by an internal pull-up resistor and results in a logic '0'. The external equipment is intended to short the port's pin to the provided ground pin. This short will create a logic '1'. All four ports share one common ground pin.

When set to analog the external equipment is supposed to supply a voltage between 0V and 10V to the port's pin. For convenience, a 10V supply is available on one of the pins of the GPI connector. Please refer to figure 4.4 for the pinout of the GPI connector. Be careful not to supply more than 10V to the GPI port as that might cause permanent damage.

Figure 4.5 shows examples of how to wire a contact-closure to a GPI port set to digital. And it shows an example of potentiometer connected to a GPI port set to analog.



(a) Contact-closure

(b) Potentiometer

Figure 4.5: GPI Wiring examples

Please refer to page 90 for more information on configuring the GPI ports. Programming events based on GPI activity is done in the Show Control page, which is discussed on page 61.

Figure 4.6: GPI Connector

The green connector used for the GPI port has part number CTB9200/6A and replacements can be ordered from Farnell/Newark (order code 3881880).

Chapter 5

Network

The CueCore3 is a network capable device. A network connection between a computer and the unit is required to configure and program the CueCore3, however, once the device is programmed then it is not necessary anymore for the CueCore3 to be connected to an Ethernet network.

There are multiple arrangements possible for connecting the computer and the CueCore3. They can be connected peer-to-peer, via a network switch or via Wi-Fi. Figure 5.1 illustrates these different arrangements.

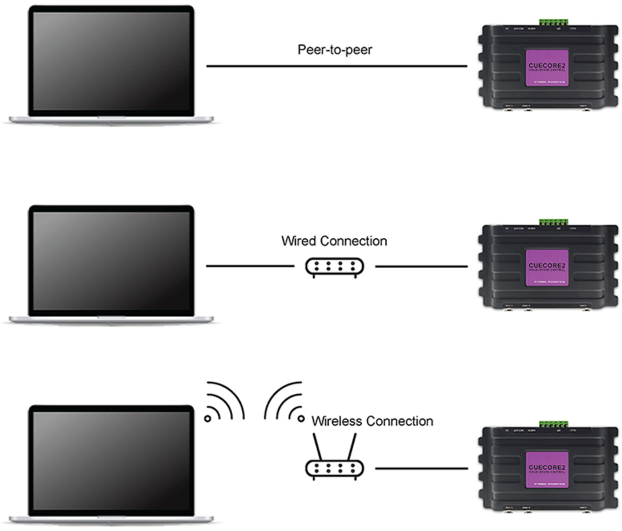


Figure 5.1: Network arrangements

The Ethernet port on the CueCore3 is auto-sensing; it does not matter whether a cross or straight network-cable is being used. Although the Ethernet port is classified as 100 Mbps, buffer limits may apply for specific tasks as API messages.

5.1 IP Address

The CueCore3 supports both static IP addresses and automatic IP addresses. By default, the CueCore3 is set DHCP in which it will be automatically assigned an IP address by the DHCP server in the network. The 'DHCP server' is typically part of the router's functionality.

Static IP addresses are useful when there is no DHCP server in the network, for instance when there is a direct peer-to-peer connection between a CueCore3 and a computer. It is also useful in permanent installations where the IP address of the CueCore3 is known by other equipment and therefor should not change. When using DHCP there is always the risk of automatically being given a new IP address in the event that the DHCP server is replaced. When using static IP addresses make sure that all equipment on the network have unique IP addresses.

The CueCore3's LED helps to determine which kind of IP address is set. The LED will indicate red when using DHCP and it will indicate white in the case of a static IP address.

There are three ways to change the IP address setting of the CueCore3.

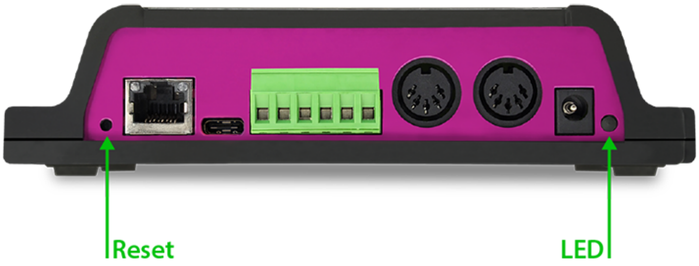


Figure 5.2: Reset button

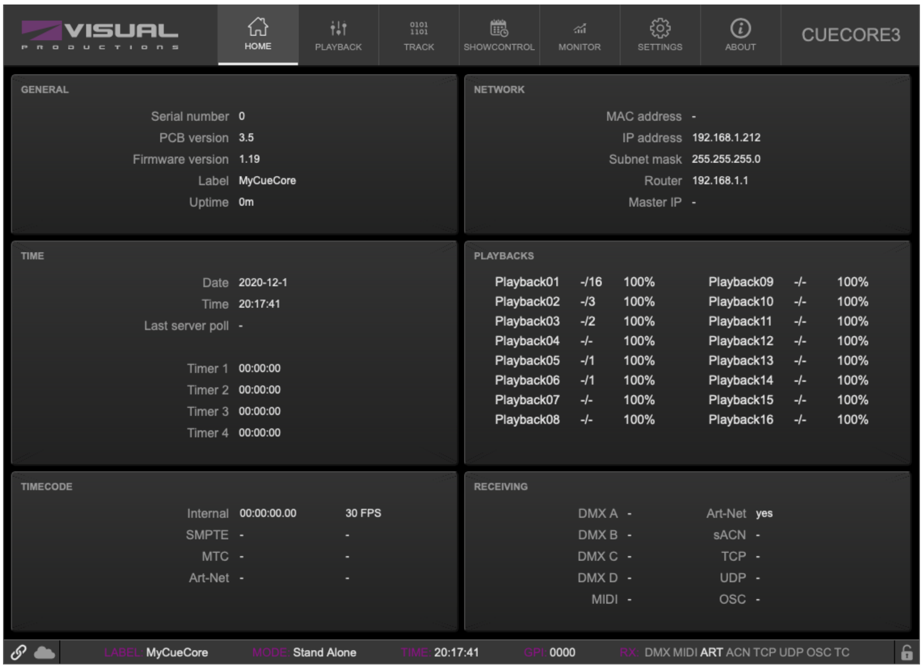
- **vManager** can be used to detect a CueCore3 on the network. Once found, the vManager software (figure chapter 15) allows for changing the IP address, subnet mask and DHCP settings.
- If the IP address is already known then browsing to this address using the computer's browser will show the CueCore3's **web-interface**. The Settings page on this web-interface enables changing the IP address, subnet mask and DHCP settings.
- By briefly pressing the **reset button** on the device it toggles between static and automatic IP addresses. By pressing and holding the reset button (see figure 5.2) on the device for 3 seconds, it will reconfigure the unit to the factory default IP address and subnet mask. No other settings will be changed. The default IP address is 192.168.1.10 with the subnet mask set to 255.255.255.0.

5.2 Web-interface

The CueCore3 features an inbuilt web-server. This web-interface can be accessed via a standard browser. It is recommended to use any of the following browsers:

- Microsoft Edge
- Google Chrome (v102 or higher)
- Apple Safari (v15 or higher)
- Mozilla Firefox (v54 or higher)

The web-interface enables you to configure and program the CueCore3. When browsing to the unit the home page (figure 5.3) will appear first. The home page is read-only; it provides information but does not allow for changing any setting. The other pages present many settings that can be edited. These pages will be discussed in the subsequent chapters.



GENERAL

Serial number 0
PCB version 3.5
Firmware version 1.19
Label MyCueCore
Uptime 0m

NETWORK

MAC address -
IP address 192.168.1.212
Subnet mask 255.255.255.0
Router 192.168.1.1
Master IP -

TIME

Date 2020-12-1
Time 20:17:41
Last server poll -

Timer 1 00:00:00
Timer 2 00:00:00
Timer 3 00:00:00
Timer 4 00:00:00

PLAYBACKS

Playback01	-/16	100%	Playback09	-/-	100%
Playback02	-/3	100%	Playback10	-/-	100%
Playback03	-/2	100%	Playback11	-/-	100%
Playback04	-/-	100%	Playback12	-/-	100%
Playback05	-/1	100%	Playback13	-/-	100%
Playback06	-/1	100%	Playback14	-/-	100%
Playback07	-/-	100%	Playback15	-/-	100%
Playback08	-/-	100%	Playback16	-/-	100%

TIMECODE

Internal	00:00:00.00	30 FPS
SMPTE	-	-
MTC	-	-
Art-Net	-	-

RECEIVING

DMX A	-	Art-Net	yes
DMX B	-	sACN	-
DMX C	-	TCP	-
DMX D	-	UDP	-
MIDI	-	OSC	-

LABEL: MyCueCore MODE: Stand Alone TIME: 20:17:41 GPI: 0000 RX: DMX MIDI ART ACN TCP UDP OSC TC

Figure 5.3: Home page

5.2.1 Uptime

This field indicates how long the unit has been alive since its last reboot.

5.2.2 Last Server Poll

Indicates the last time the time & date was fetched from a NTP time server.

5.2.3 Master IP

When the unit is not in Stand Alone mode, then this field displays the IP number of system that is mastering the CueCore3. Refer to chapter 6 for more information on operating modes.

5.3 Access via Internet

The CueCore3 can be accessed through the Internet. There are two ways to achieve this: Port Forwarding and VPN.

- **Port Forwarding** Is relatively easy to setup in the router. Each router is different so it is advised to consult the router's documentation (sometimes it is referred to as NAT or Port-Redirecting). Please note that port forwarding is not secure, since anybody could access the CueCore3 this way.
- Accessing via a **Virtual Private Network** (VPN) tunnel requires more setup efforts, also the router needs to support the VPN feature. Once set up, this is a very secure way to communicate with the CueCore3. A VPN is a network technology that creates a secure network connection over a public network such as the Internet or a private network owned by a service provider. Large corporations, educational institutions, and government agencies use VPN technology to enable remote users to securely connect to a private network. For further information about VPN please refer to `http://whatismyipaddress.com/vpn`.

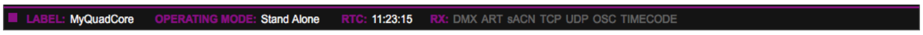
Chapter 6

Operating Modes

A CueCore3 can operate in three modes, each mode resulting in a different behaviour of the device.

- Stand-alone
- Slave
- CueluxPro

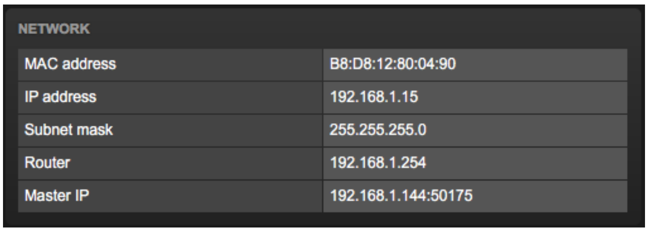
By default the CueCore3 operates in the Stand-alone mode.



■ LABEL: MyQuadCore OPERATING MODE: Stand Alone RTC: 11:23:15 RX: DMX ART sACN TCP UDP OSC TIMECODE

Figure 6.1: Status bar

The status bar at the bottom of the web-interface (figure 6.1) indicates the current operating mode. When mastered by CueluxPro the home page of the web-interface show the IP address of the CueluxPro system (figure 6.2).



NETWORK

MAC address	B8:D8:12:80:04:90
IP address	192.168.1.15
Subnet mask	255.255.255.0
Router	192.168.1.254
Master IP	192.168.1.144:50175

Figure 6.2: Master IP

6.1 Stand-alone mode

In this mode the CueCore3 is an autonomous device for controlling lighting. Typically it is loaded with lighting content and programmed to respond to external triggers and/or internal scheduling. This is the default behaviour of a

CueCore3; the stand-alone mode is active whenever the CueCore3 is not in the slave or CueluxPro mode.

6.2 Slave Mode

Some demanding lighting designs can require more than four universes of DMX. When multiple CueCore3 units are combined to create a large multi-universe system there is the need for synchronisation of those CueCore3 devices. The Slave mode facilitates this. See figure 6.3.

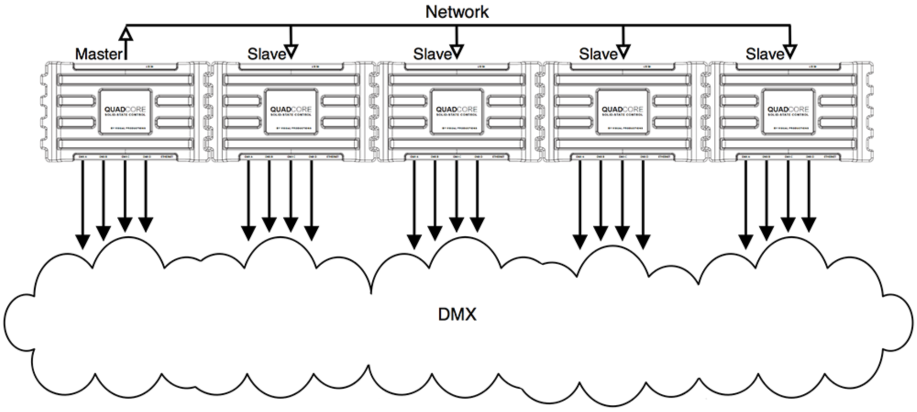


Figure 6.3: Master/Slave setup

When in Slave mode the CueCore3 is taken over by a master-CueCore3 and is no longer responsible for its playbacks and scheduling; the master takes care of this. All the slave requires is to contain the lighting content in its tracks. The master-CueCore3 will control all its slaves to activate the same tracks and keep the playback of those tracks synchronised.

It is necessary to put all action-programming in the master-CueCore3. In fact, the playback information inside the slaves will be overwritten by the master. The master does this because it stores a copy of its playback-data in each slave to enable the slave to continue autonomously in case the communication between master and slave is interrupted.

The logical place for the action lists and action for a master/slave system is also inside the master, however, it is allowed to place actions in a slave and they will get executed.

The Slave mode is enabled in the Settings page (See chapter 13, page 83). Once enabled, the Slave mode is entered as soon as the master connects to the slave. The Slave mode reverts back to the Stand-alone mode when the master disconnects or when the slave disables Master/Slave in the Settings page.

6.3 CueluxPro Mode

CueluxPro (see figure 6.4) is a software-based lighting console that is bundled with the CueCore3. The purpose of the CueCore3 in this mode is to be an interface between CueluxPro and the DMX lighting fixtures. Therefore the CueCore3 will forward the data received from the CueluxPro software to its DMX outlets. During this mode all internal playback and scheduling within the CueCore3 is suspended. Figure 6.5 illustrates a typical CueluxPro/CueCore3 system.

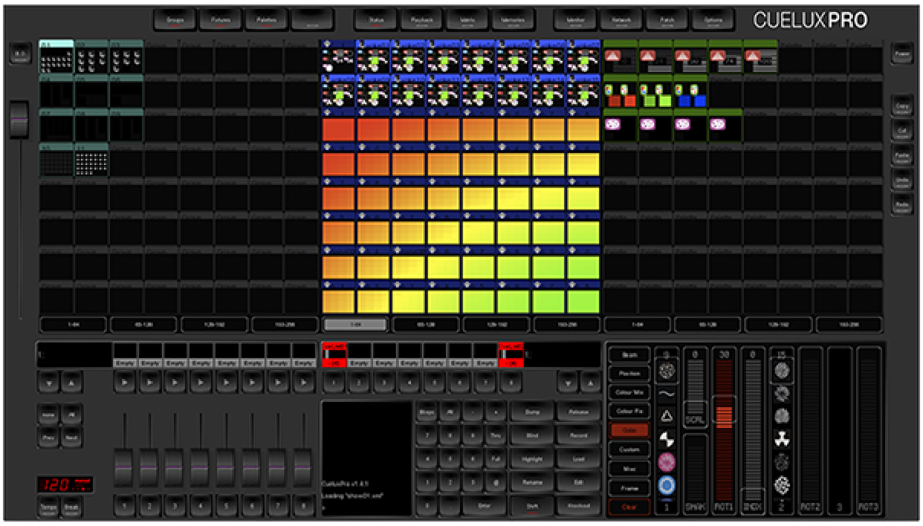


Figure 6.4: CueluxPro

The CueCore3 enters the CueluxPro mode as soon as it is patched to one or more universes within the CueluxPro software. This mode is exited by un-patching the CueCore3 or closing down the CueluxPro software.

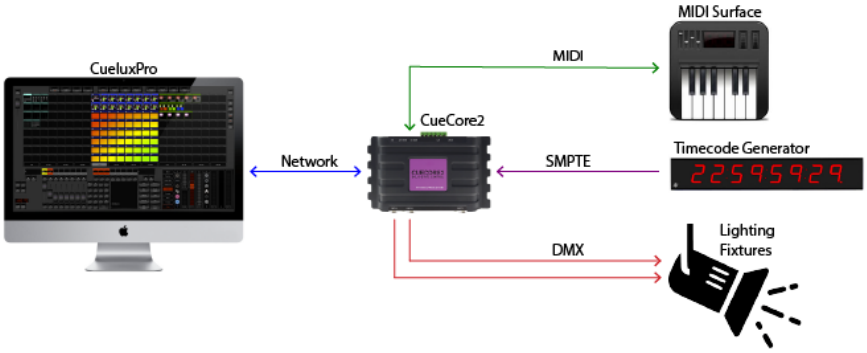


Figure 6.5: A typical CueluxPro system

Using the CueluxPro software in combination with the CueCore3 results in a lighting control system with a larger feature set than using the CueCore3 on its own in the stand-alone mode. CueluxPro features:

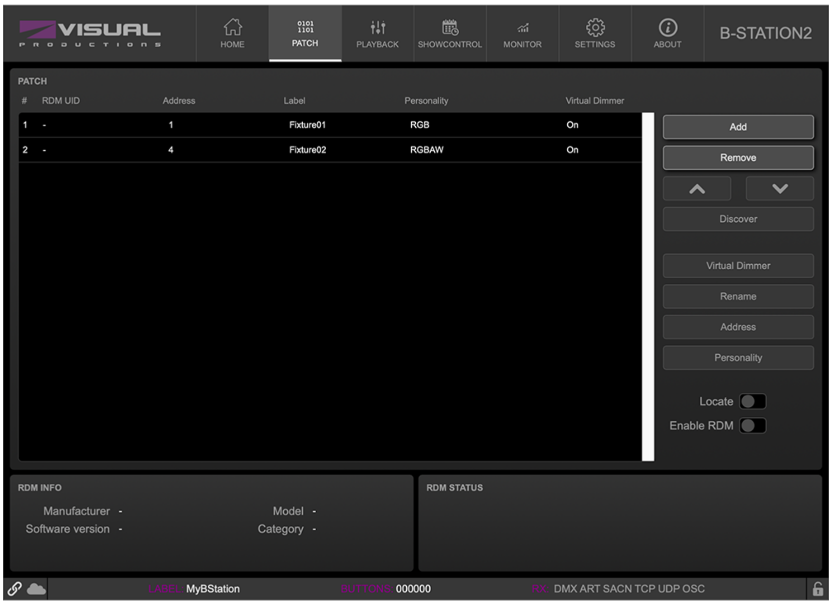
- Personality library with 3000+ fixtures
- FX Generator
- Matrix Pixel-mapping
- Groups
- Palettes
- Timeline editor

CueluxPro can also be used for generating the lighting content that can be uploaded to the CueCore3. After uploading, the CueCore3 can continue to be used stand-alone. For information on how to use CueluxPro please refer to the CueluxPro manual on the Visual Productions website. This manual provides instructions for connecting to CueluxPro and uploading content to the CueCore3.

Chapter 7

Patch

The *Patch* page is the starting point when using the CueCore3 to control DMX fixtures. This page is used for identifying which fixtures will be controlled. Up to 256 fixtures can be entered.



PATCH

#	RDM UID	Address	Label	Personality	Virtual Dimmer
1	-	1	Fixture01	RGB	On
2	-	4	Fixture02	RGBAW	On

RDM INFO

Manufacturer -
Software version -
Model -
Category -

RDM STATUS

LABEL: MyBStation BUTTONS: 000000 RX: DMX ART SACN TCP UDP OSC

Figure 7.1: Patch Page

7.1 Address

DMX starting addresses range between 1 and 2048 (or between A.1 and D.512). The CueCore3 automatically sets the DMX address when adding fixtures to the patch, by finding the first available DMX channel in your configuration. You are free to change the address.

If you have multiple fixtures selected, the CueCore3 will set the entered address for the first selected fixture and will automatically have the next selected fixtures follow the previous ones. For example, if you select four RGB fixtures in the patch and set the address to `101`, this will result in addresses `101`, `104`, `107` and `110` for the selected fixtures.

7.2 Personality

Each fixture requires a *personality*; a profile that matches the fixture's DMX traits. The personality can be composed out of the following parameters:

I	Intensity
R	Red
G	Green
B	Blue
C	Cold White
W	Warm White
A	Amber
U	UV
Z	Zoom
F	Focus
S	Special

When a parameter is 16-bit it requires two DMX channels. In this case, the *fine* channel is denoted by the parameter character in small capitals. E.g. a 16-bit RGB fixture, occupying 6 DMX channels, would have the following personality `RrGgBb`.

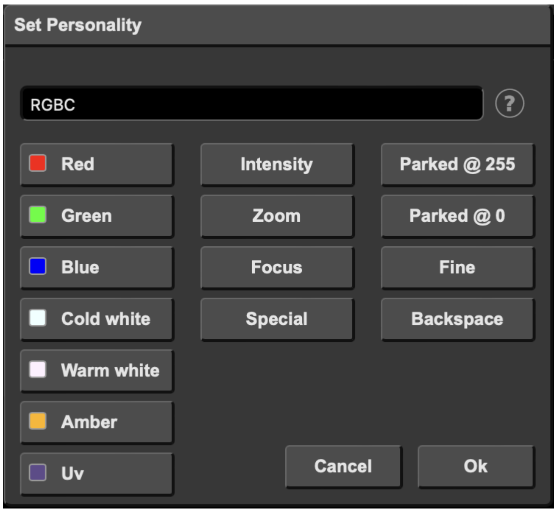
A personality string can be entered directly in the patch table or by using the *Personality* dialog (figure 7.2).

7.3 Virtual Dimmer

Personalities with RGB but without Intensity will automatically be given a virtual dimmer. This means that the CueCore3 will act as if the fixture has an intensity channel and allows for RGB and intensity to be programmed separately, however, it will modulate the intensity on the RGBCWA values.

7.4 Discover

Use the *Discover* button to search for RDM capable fixtures. Fixtures found via a RDM discovery will show their RDM UID in the patch table.



RGBC

Figure 7.2: Personality dialog

Before using RDM, RDM needs to be enabled. This can be done on the *Patch* or *Settings* page. By default RDM is disabled.

7.5 Locate

When the *Locate* checkbox is enabled, then all fixtures will be doused except the selected fixtures; they will be fully on. This function will help identify selected fixtures.

Chapter 8

Tracks

A *Track* is a piece of lighting content that can be activated by a playbacks. Tracks can contain dynamic lighting effects; each track can be a 'DMX recording' with a certain duration. Of course a static scene can also be stored in a track.

There are three different ways to put the content inside the track. The *Console* page allows the user to create and edit a static scene directly via the web-interface. This page also is capable of recording a static scene from an external DMX, Art-Net or sACN source. The *Console* page is discussed in detail on page 48.

The second way for storing content into the tracks is done via the *Recorder* section; this section of the *Track* page contains control for recording dynamic DMX content from external DMX, Art-Net and sACN sources.

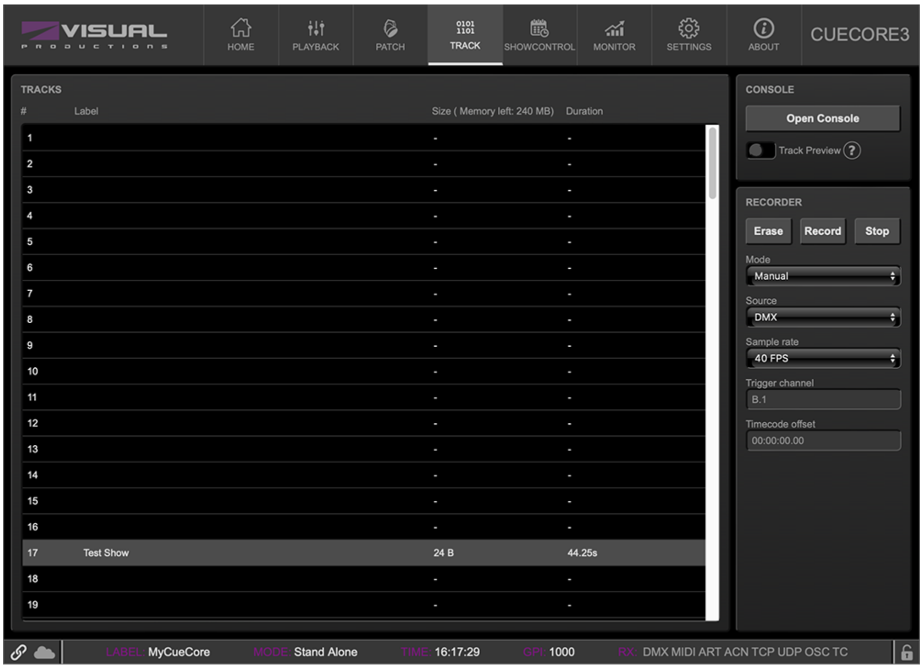
Furthermore, it is also possible to create the lighting content using the CueluxPro software and upload it to the CueCore3. This can be dynamic as well as static content. For more information on CueluxPro see chapter 6, page 40.

8.1 Number of Tracks

The CueCore3 has a fixed number of 128 tracks.

8.2 Track Properties

The Track listing (See figure 8.1) displays the following track properties:



TRACKS

#	Label	Size (Memory left: 240 MB)	Duration
1		-	-
2		-	-
3		-	-
4		-	-
5		-	-
6		-	-
7		-	-
8		-	-
9		-	-
10		-	-
11		-	-
12		-	-
13		-	-
14		-	-
15		-	-
16		-	-
17	Test Show	24 B	44.25s
18		-	-
19		-	-

Mode: Manual
Source: DMX
Sample rate: 40 FPS
Trigger channel: B.1
Timecode offset: 00:00:00.00

LABEL: MyCueCore MODE: Stand Alone TIME: 16:17:29 GPI: 1000 RX: DMX MIDI ART ACN TCP UDP OSC TC

Figure 8.1: Tracks

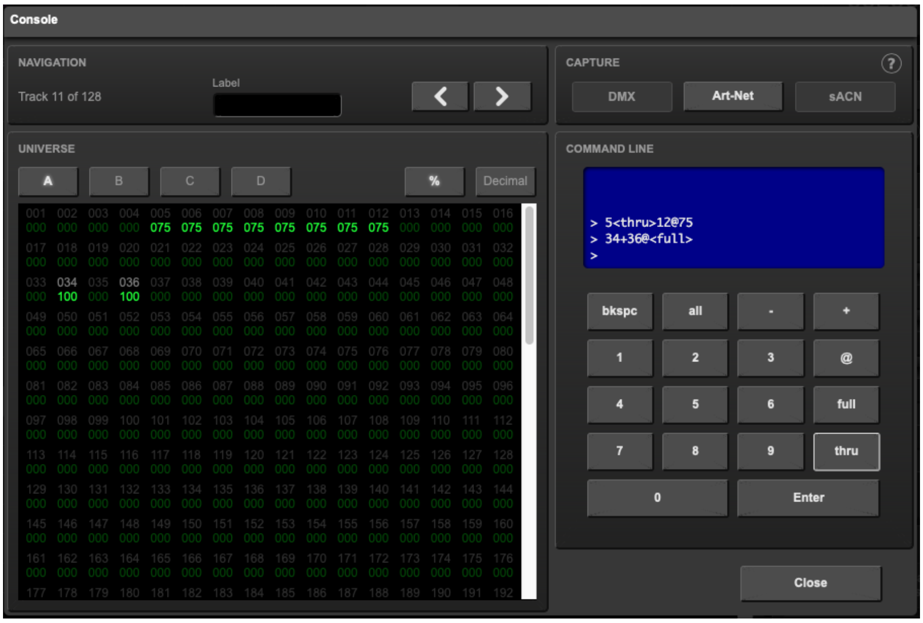
Label	The name of the track; this field can be changed by double-clicking.
Size	The number of bytes used by the data inside the track.
Duration	The length of the track displayed in hours:minutes:seconds.milliseconds.
FPS	The sample rate of the track displayed in Frames Per Second (FPS). The sample rate has been chosen during the recording process and cannot be altered afterwards.

8.3 Console

The Console page (see figure 8.2) allows to edit a track directly through the web-interface, however, a track does need to be a static scene; it should only contain a single DMX frame. If the track already contains more than one DMX frames and thus it is a dynamic track, then it can be made static by erasing it. The track can be edited by selecting the track in the table and then pressing the *Open Console* button. This will automatically enable the *Track Preview* checkbox so the content that is being edited in the Console page is also outputted live.

The 'Track Preview' is a useful option to briefly test the content stored in a track without having to configure a playback for it. Please note that any active playback will be released when the Track Preview is enabled.

Inside the Console page the DMX values of the track can be changed by using the



```
001 002 003 004 005 006 007 008 009 010 011 012 013 014 015 016
000 000 000 000 075 075 075 075 075 075 075 075 000 000 000 000
017 018 019 020 021 022 023 024 025 026 027 028 029 030 031 032
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
033 034 035 036 037 038 039 040 041 042 043 044 045 046 047 048
000 100 000 100 000 000 000 000 000 000 000 000 000 000 000 000
049 050 051 052 053 054 055 056 057 058 059 060 061 062 063 064
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
065 066 067 068 069 070 071 072 073 074 075 076 077 078 079 080
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
081 082 083 084 085 086 087 088 089 090 091 092 093 094 095 096
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
097 098 099 100 101 102 103 104 105 106 107 108 109 110 111 112
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
113 114 115 116 117 118 119 120 121 122 123 124 125 126 127 128
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
129 130 131 132 133 134 135 136 137 138 139 140 141 142 143 144
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
145 146 147 148 149 150 151 152 153 154 155 156 157 158 159 160
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
161 162 163 164 165 166 167 168 169 170 171 172 173 174 175 176
000 000 000 000 000 000 000 000 000 000 000 000 000 000 000 000
177 178 179 180 181 182 183 184 185 186 187 188 189 190 191 192
```

```
> 5<thru>12@75
> 34+36@<full>
>
```

Figure 8.2: Console page

Command-line interface. The following table offers examples of the supported commands.

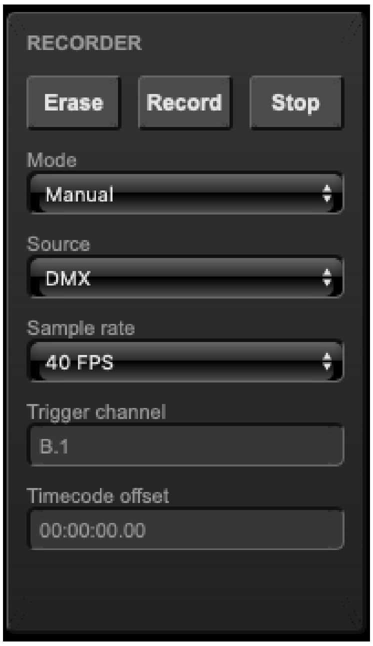
Command	Function
`1 @ 50 ENTER`	Sets channel 1 at 50%
`1 + 2 @ FULL`	Sets channel 1 and 2 at 100%
`1 THRU 3 @ 0`	Sets channels 1 through 3 at 0%
`1 THRU 3 + 5 @ 0 ENTER`	Sets channels 1, 2, 3, and 5 at 0%
`ALL @ 100 ENTER`	Sets all channels in the selected universe at 100%
`1 @ + 10 ENTER`	Increases channel 1 value with 10%
`ALL @ — 20 ENTER`	Decreases all channels in the selected universe by 20%

By default the Console page presents the DMX values in percentage (%). When the representation is switched to decimal (by using the 'Decimal' button) then the values in the table above would be interpreted as decimal values as well. E.g. `1 @ 50 ENTER` would set the channel at decimal value 50 which relates to 20%.

Instead of setting the values manually, the Console page also offers to make a snapshot - record the entire scene - from an external DMX, Art-Net or sACN source. The buttons in the Capture section become available when the CueCore3 is receiving the signal of the corresponding protocol. I.e. that the 'DMX' button is disabled unless the unit is receiving actual DMX. Please be aware that - once enabled - pressing one of the capture buttons will overwrite the current channel levels in all universes.

8.4 Recorder

The Recorder section is used to capture dynamic content from an external source and store it inside a track. In order to be stored in flash memory, a track requires to be erased first. It is advised to manually erase the track before starting a record. This is done by selecting it in the table and then pressing the 'Erase' button. In case a non-erased track will be directly recorded then the CueCore3 will automatically first erase the track, however, this gives less control over the timing of the start of the recording, especially in the Manual mode.



Mode: Manual

Source: DMX

Sample rate: 40 FPS

Trigger channel: B.1

Timecode offset: 00:00:00.00

Figure 8.3: Recorder section

The icons in the track table visualise the different states of the recorder. The 'trash icon' indicates a track is being erased. The 'orange dot' signifies a track being ready to start recording, this corresponds to the Triggered or Timecode mode. A 'red dot' indicates a recording in progress.

8.4.1 Mode

The triggering modes define how the recorder is initiated. There are three different modes.

- The most simple mode is **Manual**. In this mode the user has to manually press the 'Record' button to start and press the 'Stop' button to end the recording. Although simple to operate, this mode does not give accurate control over the timing of the begin and end of the recording. Both human interaction and operation through a web-based user-interface will introduce some degree of lag.

- An automated way of starting and stopping the recording process is done in the **Triggered** mode. One of the data channels is allocated to control the start/stop. The channel address is denoted by the 'Trigger Channel' field. It is advised to include this channel in the show programming done on the external source; a typical lighting console allows accurate timing of DMX channels which gives fine control over when the recording starts and ends in relationship to the show content. When using the Triggered mode pressing the 'Record' button will prepare the track for recording; it will be erased when necessary and then stay idle in anticipation of the trigger channel going over 50% to indicate 'start'. The recording is ended by setting the trigger channel back under 50%.
- The **Timecode** mode allows for the recording process to be synchronised by incoming timecode. Pressing the 'Record' button will prepare the track for recording; it will be erased when necessary and then stay idle in anticipation of the timecode to start running, it stops when the timecode stops running. If you want to record from an other frame than 00:00:00.00 set the 'TC Offset' property to the value you want your recording start from.

A typical challenge with recording dynamic DMX data is to create a seamless loop. Often the manual mode will most likely not be sufficiently accurate to achieve a seamless loop. The triggered mode offers a way to remote control and make the recording seamless. Alternatively, the lighting content can be designed in CueluxPro instead of recording from an external source, as CueluxPro automatically takes care of making its content seamless.

8.4.2 Sources

The CueCore3 is capable of recording DMX data from an external source by using three different protocols:

- DMX
- Art-Net
- sACN

Please consider that the operation of these protocols depend on their properties the Settings page.

8.4.3 Sample Rate

The Sample Rate setting will determine how many samples of the data are taken per second and stored in memory. This setting variants are 5, 10, 30 and 40 Frames Per Second (FPS). 40 FPS gives maximum quality in terms of smooth dimming curves. 5 FPS is a low value but useful for slow DMX changes and consumes much less memory. The 40 FPS setting is recommended unless there is a reason to reduce the sample rate.

8.4.4 XLR Adapter

The DMX ports on the CueCore3 are mainly used for outputting DMX and therefor are fitted with female XLR connectors. When using the ports as an input it is likely that the XLR needs to 'gender change' into a male connector. Neutrik offers the NA5MM (figure 8.4), a 5-pin XLR male-to-male adapter for this purpose.

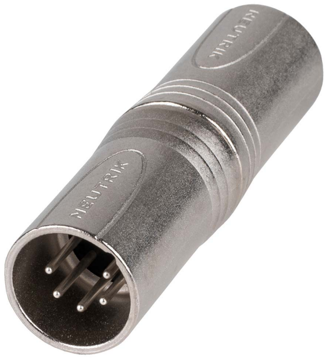


Figure 8.4: Neutrik NA5MM

8.5 Track Capacity

The CueCore3 has 8GB memory, of which approximately 4GB is reserved for the tracks. The device uses a compression algorithm to store the data and optimise the storage for best use. The duration of the recording that the track can hold depends on several parameters: number of tracks, dynamic lighting content and the number of DMX channels used. Therefor the maximum duration is hard to specify, however, some guidance can be provided:

In a typical scenario where 32 moving heads - together consuming 512 channels - are constantly changing their primary attributes (position, shutter, colour & gobo) then the memory will hold approx. 16 minutes per track in a 8-track setup. In a 32-track it will hold 3 minutes per track. Both examples are recording at 40 FPS.

In a worst-case scenario with 2,048 channels actively changing to random values (pixel-mapping content) then a 1-track setup will hold approx. 6m32s, a 16-track setup will hold 24s per track. Both examples are recording at 40 FPS.

If the limits of the capacity are reached then there are three different ways to help overcome this.

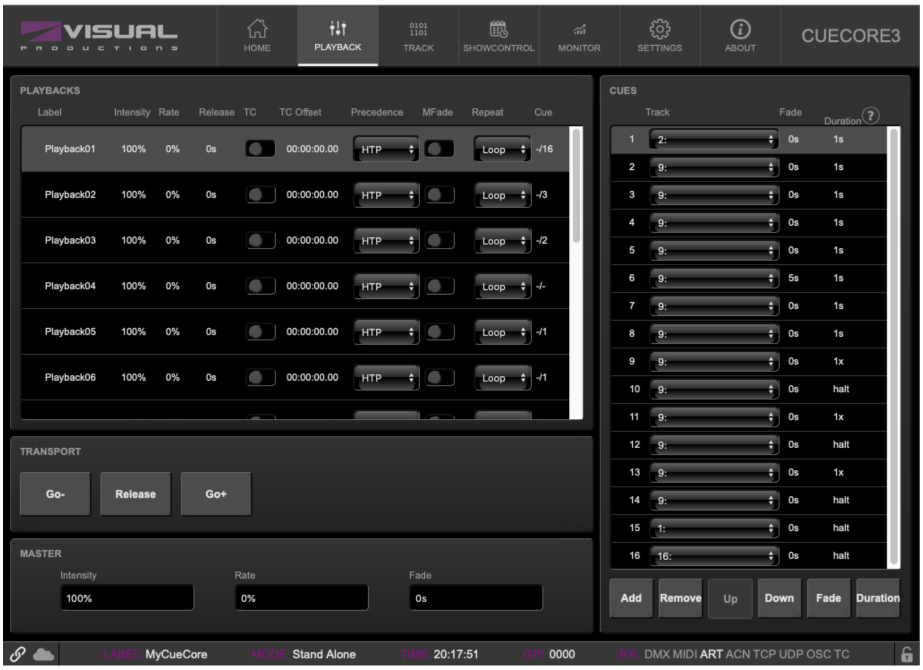
- Reduce the 'number of tracks' in the settings page. Note that the current track content is lost when changing this setting.
- Reduce the sample rate.
- Spread the content over multiple tracks. They can be linked together later on the Playback page (For more information go to chapter Playbacks, page

20). This way cross-fades can be generated by the CueCore3 instead of being recorded.

Chapter 9

Playbacks

A playback is capable of activating the lighting content stored in the tracks. Tracks are merely storage for lighting scenes and effects; the playbacks actually plays them. The playbacks are located in the Playback page in the web-interface, see figure 9.1.



PLAYBACKS

Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
Playback01	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/16
Playback02	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/3
Playback03	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/2
Playback04	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/-
Playback05	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/1
Playback06	100%	0%	0s	○	00:00:00.00	HTP	○	Loop	-/1

TRANSPORT

MASTER

Intensity: 100%
Rate: 0%
Fade: 0s

CUES

	Track	Fade	Duration
1	2:	0s	1s
2	9:	0s	1s
3	9:	0s	1s
4	9:	0s	1s
5	9:	0s	1s
6	9:	5s	1s
7	9:	0s	1s
8	9:	0s	1s
9	9:	0s	1x
10	9:	0s	halt
11	9:	0s	1x
12	9:	0s	halt
13	9:	0s	1x
14	9:	0s	halt
15	1:	0s	halt
16	16:	0s	halt

LABEL: MyCueCore MODE: Stand Alone TIME: 20:17:51 GPI: 0000 RX: DMX MIDI ART ACN TCP UDP OSC TC

Figure 9.1: Playback page

There are 16 playbacks available. Each can contain up to 32 steps, called 'cues'. A cue will contain a reference to a track plus additional information such as fade-time and duration. Figure 9.2 illustrates the structure of a playback.

Playbacks can be run independently of each other; they can all start or stop at different times. It is possible to control the same DMX channels from multiple

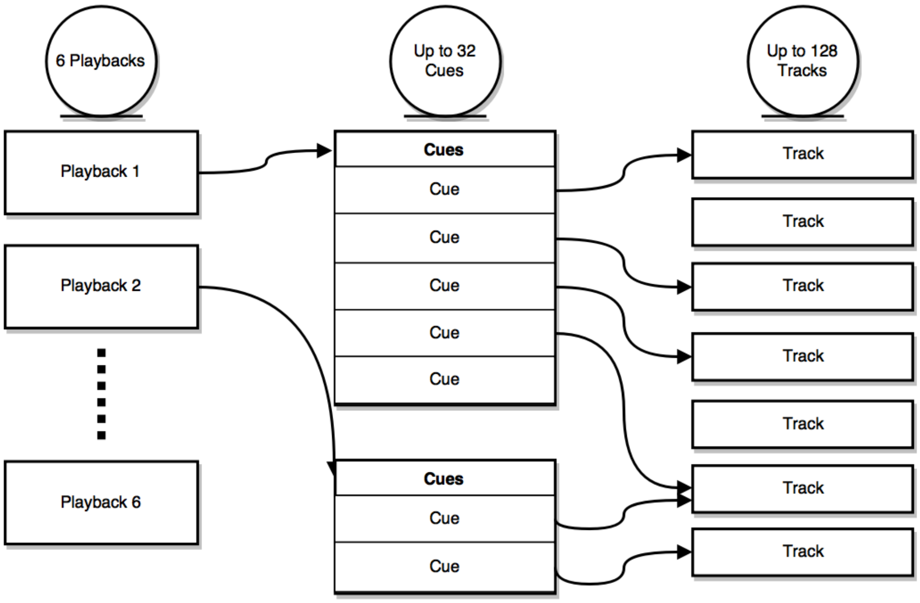


Figure 9.2: Playback structure

playbacks and have them merged together. Also, it is possible to have each playback control a different set of DMX channels; making each playback responsible for a different zone. Figure 9.3 shows an example of controlling multiple zones in a hypothetical restaurant.

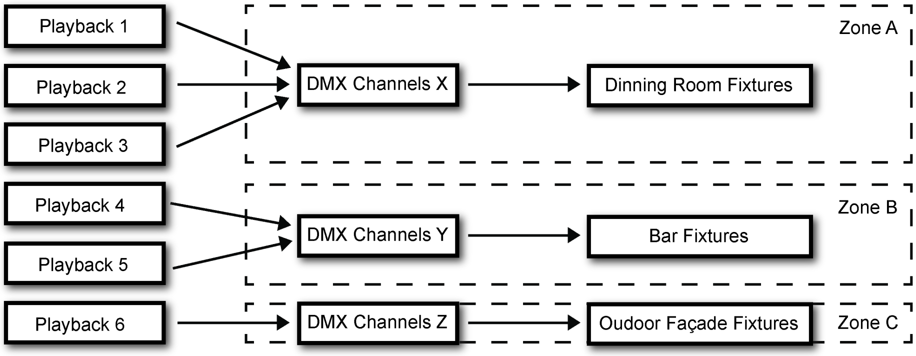


Figure 9.3: Playbacks controlling zones in a restaurant

9.1 Precedence

All active Playbacks produce DMX values. These values will be merged together and sent to the DMX output. The precedence setting determines how this merging is done. Each playback can be set to either HTP (Highest Takes Precedence), LTP (Latest Takes Precedence) or Priority.

HTP is the most common choice in precedence. With HTP the output of all playbacks is compared to each other; for each DMX channel the level is set to the highest value found in that particular channel amongst all playbacks. The table below shows an example of HTP merging.

	Playback 1	Playback 2	Playback 3	Merged Output
Channel 1	0%	0%	25%	25%
Channel 2	100%	0%	25%	100%
Channel 3	0%	0%	0%	0%
Channel 4	0%	100%	25%	100%

In the LTP approach only one playback is active amongst all LTP playbacks. The output of that active playback is included in the merge with all HTP playbacks. All other LTP playbacks are ignored. Which LTP playback is active is determined by which playback is started latest, or which received a Go+ command latest. Please consider figure 9.4.

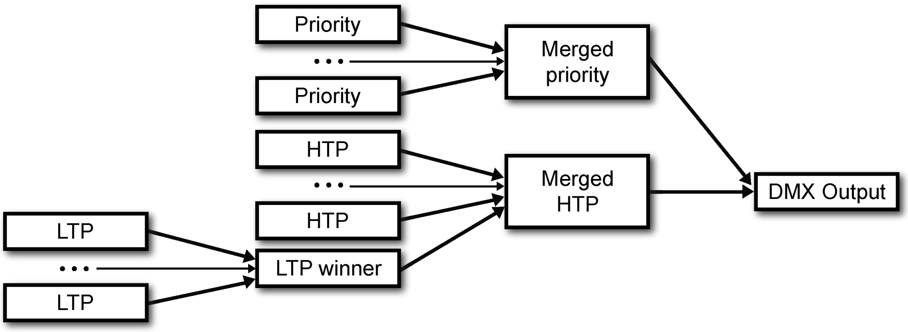


Figure 9.4: Playback precedence

If there is a playback active with its precedence set to Priority then all other playbacks are ignored. When there are multiple Priority playback then those will be merged together according to the HTP principle.

9.2 Playback Properties

Each playback provides a set of properties that can be used to customise the playback's behaviour. Some properties are changed by double-click.

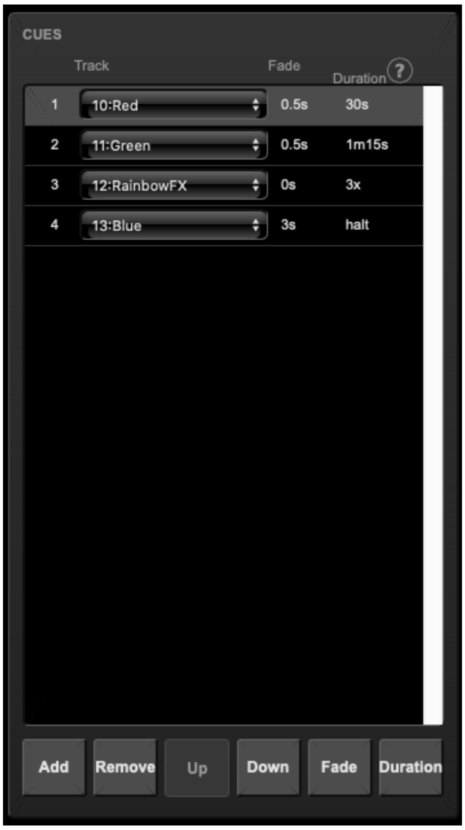
Label	The name of the playback.
Intensity	The output level of the playback. Typically, a DMX recorder stores the values of the channels without knowing its functions. When reducing the output level at the Playback all channels are reduced, also the ones that contain information other than intensity/dimmer levels. This has the undesired effect that RGB or Pan Tilt channels are also affected, whereas ideally only the intensity levels should be lowered. This is a challenge all DMX recorders have. The CueCore3 overcomes this issue by using the information from the Patch page to check which channels control intensity, only those channels will be dimmed. If no fixtures are patched, then all channels will be dimmed.
Rate	The speed of the playback. By default, it is set to 0%. It can go up to 100% (faster) and down to -100% (slower).
Release	When released the playback can fade out to zero. This release time defines how long this fade out will take. Setting it to 0s will result in an instant release.
TC	When enabled, the playback is synchronised to the current timecode (TC). By default, TC is disabled. Note that the Settings page provides a field for selecting the timecode protocol, e.g. 'internal' or 'Art-Net'.
TC Offset	Specifies at which timecode frame the playback starts.
Precedence	Determines how the output of the playbacks is merged together, as explained on page 55.
MFade	Normally the fade time between cues is determined by the 'fade' field in the cue properties. When Mfade is enabled then the playback will ignore the cue's fade times and use the master fade time for all its cues.
Repeat	This property determines what the playback does when it finishes the last cue. Loop: Will start over from the beginning. Bounce: Will make it traverse back to the beginning, and it will keep going back and forth. Random: The order of the cues will be random. Off: The Playback will automatically release when reaching the end of the cues.
Cue	Current/Total of Cues. Indicates which cue is currently active and indicates the total number of cues in the Playback.

The intensity and rate properties are not stored in the CueCore3's internal flash memory. It is expected that these properties can change often during the operation of the CueCore3 and could consequently wear out the flash memory.

A consequence of not storing these properties is that after a power cycle their levels will be reverted to the default values. If the intensity or rate requires to be permanently set to a value other than the default value then it is recommended to use the Show Control page and create an action in the 'System' action list. This action can have its trigger set to 'Startup' and contain tasks to set the playback's intensity and rate to the desired values.

9.3 Cue

A cue is a step inside a playback. A playback can contain up to 32 cues. A cue does not contain a lighting scene, rather, it refers to a track which does contain the lighting scenes. It is possible for multiple cues to refer to the same track. The cue does contain information on how long the lighting scene should be played and if it should be cross-faded from the previous cue.



CUES

	Track	Fade	Duration
1	10:Red	0.5s	30s
2	11:Green	0.5s	1m15s
3	12:RainbowFX	0s	3x
4	13:Blue	3s	halt

Figure 9.5: Cues

Each cue provides the following properties:

Track
A reference to the track that will be played in this step.

Fade
The cue will fade from the current levels to its programmed levels. The time it takes to cross-fade is specified by ’Fade’. When the fade is set to 0 then there will be no cross-fade; the values will change instantly.

Duration
Determines how long the cue will be active before traversing to the next cue. This is the time between the completion of the cross-fade into this cue and and the start of the cross-fade to the next cue.
The duration field accept not only ’time’ input such as ”.5” ”30s” or ”1m15”, it also accepts ’number of cycles’; the playback can run the cue ”1x” or ”10x”. This is particularly useful when the track referred to by the cue contains a (seamless-)looped effect. Please note that if the track contains a static scene; i.e. the track only holds a single DMX frame, then running it for a number of cycles will create a very short cue as a single DMX frame only takes 25ms.
The third option for the duration field is to input ”halt”. In this case the cue will continue to run indefinitely; it requires a Go+, Go-, Jump or Release command to traverse to the next cue.

The Playback page provides the following buttons to edit the cues:

- Add: Will add a new empty cue.
- Remove: Will remove the selected cue
- Up: Will move the selected cue up a position.
- Down: Will move a selected cue down a position.
- Fade: Will open a pop-up window where you can set the fade time.
- Duration: Will open a pop-up window where you can set the duration.

9.4 Transport

The transport section offers buttons to control the playbacks.

Go+
Jump to the next cue.

Go-
Jump to the previous cue.

Release
Deactivates the selected playback. Press and hold to release all playbacks.

9.5 Master

The master section provides features that are applied to all playbacks.

Intensity The master intensity works like a theatrical 'grand master'; it dims the output of all playbacks taking their individual intensity setting into account.

Rate The master rate will control the play speed of all playbacks; with taking their individual rate settings into account.

Fade The master fade time overrides the fade time of all cues. This only applies to playbacks that have 'MFade' enabled.

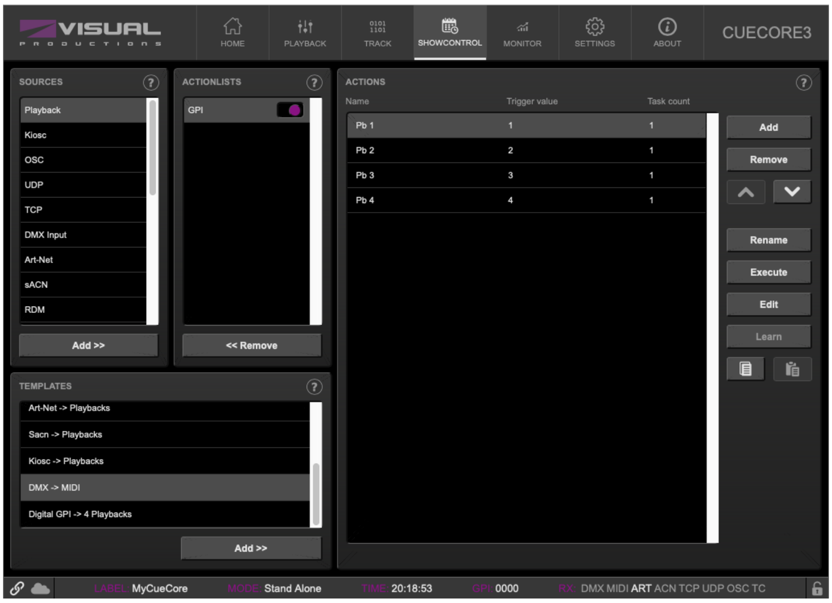
Similar to some of the playback properties, the master properties are not stored in the internal flash memory. Please refer to the discussion on page 57.

Chapter 10

Show Control

The CueCore3 can interact with the outside world;

Another option is integrating the CueCore3 with other systems, by using the various protocols it can receive to trigger its functionality. The *Show Control* page (See figure 10.1) enables this kind of programming to be made.



Name	Trigger value	Task count
Pb 1	1	1
Pb 2	2	1
Pb 3	3	1
Pb 4	4	1

LABEL: MyCueCore MODE: Stand Alone TIME: 20:18:53 GPI: 0000 RX: DMX MIDI ART ACN TCP UDP OSC TC

Figure 10.1: Show Control page

The *Show Control* page presents a system of *actions*. A signal that the CueCore3 should to respond to or perhaps convert into some other signal, needs to be expressed in an action. Before programming actions please consider the show control structure in figure 10.2.

The CueCore3 is capable of listening to various protocols. These available protocols are listed in *Sources*, however, the CueCore3 can only actively listen to 8

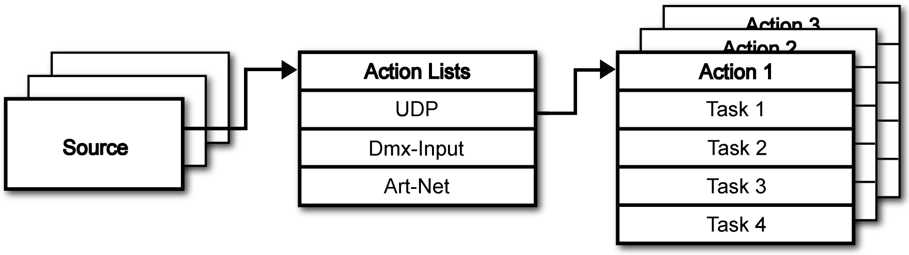


Figure 10.2: Show Control structure

protocols at once. The active protocols are listed in *Actionlists*. Each actionlist can contain actions. Within a protocol/source each individual signal requires its own action. For example, when listening to channel 1 and 2 on the incoming DMX, the DMX actionlist needs two actions; one for each channel.

Inside the action we define the trigger and tasks. The trigger specifies for which signal to filter. In the above DMX example the trigger would be set to 'channel 1' and 'channel 2' respectively. The tasks determine what the CueCore3 will do when this action is triggered. Several tasks can be placed in the action. There are tasks available for a wide range of CueCore3 features and external protocols. Task types are detailed in Appendix B on page 114.

Please consult the API appendix on page 127 before implementing incoming OSC or UDP messages; the API already exposes typical functionality through OSC and UDP and therefor it might not be necessary to implement custom messages.

10.1 Sources and Actionlists

The Sources listing presents all protocols that the CueCore3 is capable of receiving. It also includes internal features that can create events that can be used for triggering actions, such as the calendar-scheduler. These sources are available, however, they will only be actively listened to once moved to the action-list table.

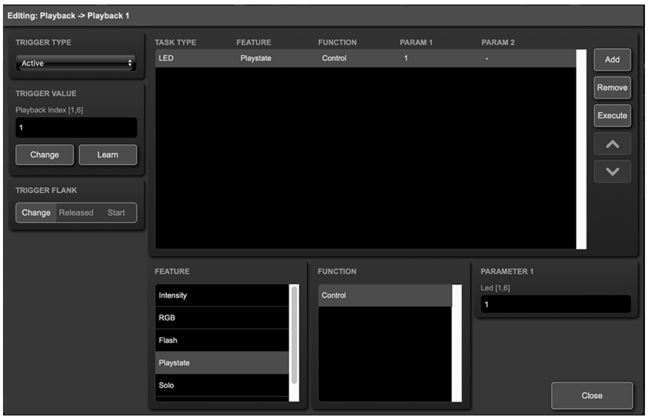
UDP	Incoming UDP network messages
TCP	Incoming TCP network messages
OSC	Incoming OSC network message
DMX Input	DMX received on one or more of the DMX ports (switch port to input in the settings page)
Art-Net	Incoming Art-Net DMX data
sACN	Incoming sACN DMX data
Timecode	Timecode signal, specify the incoming timecode protocol on the Settings page.
Kiosc	Triggers from Kiosc. For each Action various controls can be chosen such as buttons and sliders, colour picker etc. The order of the actions will control the arrangement in Kiosc.
Scheduler	Triggers based on time, date, weekdays, sunrise, sunset & timespan.
Playback	Events generated by the playbacks
Randomiser	The randomiser can generate a random number
System	Events such as 'Start up'
Variable	The Variable source works in combination with the variable task (For more information about the Variable task please refer to Task Types). The Variable task will set a value of which an enabled actionlist type with Variable as Source will use as a trigger. The CueCore3 will keep the values of the 10 variables even after shut down so long as the RTC battery is not empty.
Timer	There are 4 internal timers in the CueCore3. An event will be raised when a timer expires. Timers are set and activated by the Timer tasks.
Actionlist	Gives an event when an actionlist is enabled or disabled.
User List 1-4	These actionlists will never trigger an event, however, they are useful for advanced programming.

Actionlists can be temporarily suspended by disabling their checkbox in the Show Control page. There is also a task available to automate changing the state of this checkbox.

10.2 Actions

Actions are executed when a certain signal is received. This signal is defined by the trigger. A trigger is always relative to the actionlist the action belongs to. For example, when the trigger-type is set to 'Channel' then it refers to a single DMX channel if the action is placed inside a 'DMX Input' list and it means a single Art-Net channel if the action resides in an Art-Net actionlist.

Figure 10.3 shows the screen when editing an action.



Editing: Playback -> Playback 1

TRIGGER TYPE: Active

TRIGGER VALUE

Playback Index [1,6]: 1

TRIGGER FLANK: Change

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
LED	Playstate	Control	1	-

FEATURE: Playstate

FUNCTION: Control

PARAMETER 1

Led [1,6]: 1

Figure 10.3: Edit Action dialog

A trigger is determined by the trigger-type, trigger-value and trigger-flank fields. Although these fields are not applicable for all actionlists and are therefor sometimes omitted in the web GUI. The trigger-type field specifies what kind of signal the action will be triggered by.

For example, when making an action in the Scheduler list there is the choice between 'DateAndTime' and 'WeekdayAndTime' trigger-types. The trigger-value specifies the actual signal value. In the schedular example the trigger-value could be set to "2016-03-24 11:00" or "Weekend 10:00" respectively.

In some actionlists actions do also need to specify the trigger-flank. The flank further specifies the value that the signal should have before triggering the action. For example, when an action is triggered from the Kiosc list, the flank will determine whether to trigger only when the button goes down or only when it goes up. Appendix A provides an overview of the available trigger-types.

An actionlist can have up to 48 actions, system-wide there is a maximum of 64 actions.

10.3 Tasks

Tasks are added to an action in order to specify what to do when it gets executed. Up to 8 tasks can be included in an action, systemwide there is a maximum of 128 tasks. The tasks are executed in the order of the list. There is a wide selection of tasks available to choose from, they include altering any of the internal software features like playbacks and recorder but also sending out messages through any of the supported protocols. The tasks are organised in categories. Once a task is chosen from these categories each task allows for further choice between several *Features* and *Functions*. Tasks contain up to two parameters that might be required for its execution.

If the event that triggers the action passes a parameter along then this parameter can be used in a task. The *Set* function makes a task use a fixed value, however, when using the *Control* function then the trigger's parameter is used. This is very useful for conversions between protocols.

For example when converting 0-10V to DMX the GPI action specifies the port (e.g. #1) and flank (e.g. OnChange) on which it will trigger. The actual 0-10V level sampled on the GPI port will be passed along and fed into the action. Then when a task (e.g. DMX) uses the function *Control* this 0-10V level will be used for setting the DMX value.

A task can be tested by selecting it and pressing the 'execute' button in the *Edit Action* dialog. The complete action can also be tested; go to the *Show Control* page, select the action and press the *Execute* button.When either of these *Execute* buttons are used, the source of the *Control* value for tasks will be the *Execute* button. The result will depend on the chosen task and feature, but will most likely be 100%, 1.0, or 255 when pressed and 0%, 0.0, or 0 when depressed.

Appendix B provides a detailed overview of the available tasks, features, functions and parameters.

10.4 Templates

The *Show Control* page presents a list of templates. A template is a set of actionlists, actions and task. These templates configure the CueCore3 to perform typical functions; for example convert Art-Net to DMX or control the 6 playbacks through OSC. The templates thus save time; otherwise actions should have been set up manually. They can also function as a guide to soften the learning curve on actions; a lot can be learned from adding a template and then exploring the actions and tasks it created.

Please note that some templates require settings to be changed in the settings page; for example the 'Receiving Art-Net' template needs the DMX outlets to be set to outputs in order to achieve an Art-Net to DMX conversion.

Appendix C gives an overview of the available templates.

10.5 Variables

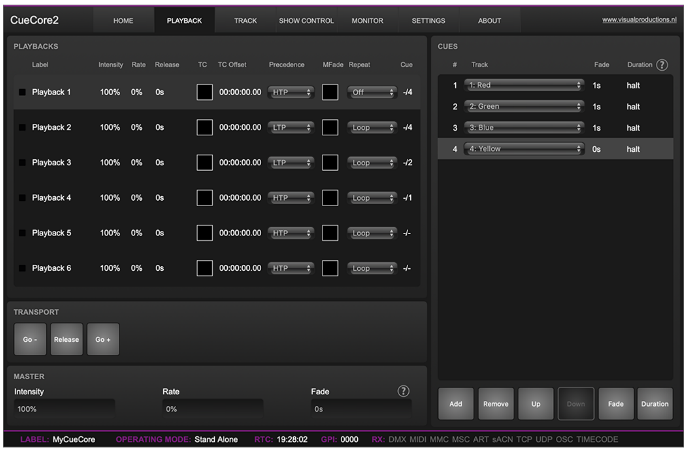
Variables are part of the show control system in the CueCore3. There are 20 variables and each can hold a value in the range of [0,255]. These values can be manipulated by tasks and can be used for advanced action programming. Variables can be added as sources in order to have actions triggered when a variable changes value.

You can see the status of the variables in the monitor page, as discussed on page 79.

The values of the variables are stored in the same battery backed-up memory as the RTC; it will hold the values between power cycles, if the time between power-on does not exceed a few days.

To illustrate the use of variables, please see the following example in which a variable is used to keep track of the cue index between power-cycles. (By default, the CueCore3 does not remember which playback or cue was active after a power-cycle.) For simplicity, we assume that an external system is selecting cues inside the CueCore3 by sending UDP messages.

- Program a playback to contain 4 cues.



PLAYBACKS

Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
Playback 1	100%	0%	0s	□	00:00:00.00	HTP	□	Off	-/4
Playback 2	100%	0%	0s	□	00:00:00.00	LTP	□	Loop	-/4
Playback 3	100%	0%	0s	□	00:00:00.00	LTP	□	Loop	-/2
Playback 4	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/1
Playback 5	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-
Playback 6	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-

CUES

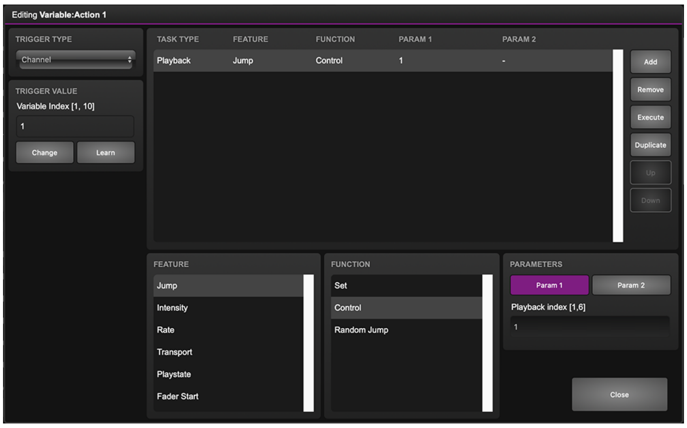
#	Track	Fade	Duration
1	1: Red	1s	halt
2	2: Green	1s	halt
3	3: Blue	1s	halt
4	4: Yellow	0s	halt

MASTER

Intensity: 100%
Rate: 0%
Fade: 0s

LABEL: MyCueCore OPERATING MODE: Stand Alone RTC: 19:28:02 GPI: 0000 RX: DMX MIDI MMC MSC ART sACN TCP UDP OSC TIMECODE

- Add the *Variable* source and insert one action. If the variable changes then jump to the appropriate cue by adding a *Playback* task to this action.



Editing Variable:Action 1

TRIGGER TYPE: Channel

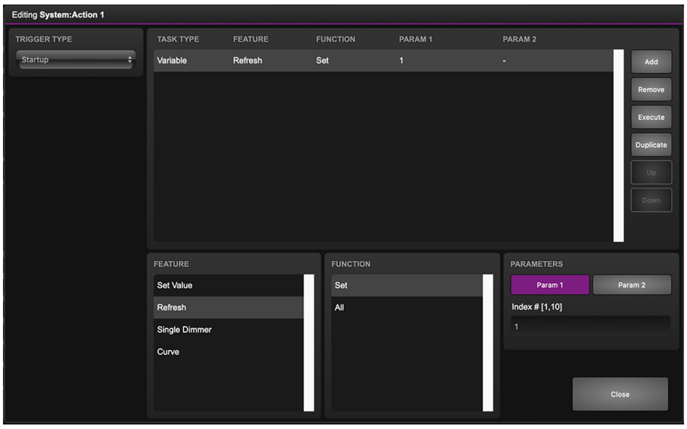
TRIGGER VALUE
Variable Index [1, 10]: 1

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Playback	Jump	Control	1	-

PARAMETERS
Playback index [1,6]: 1

- Have the external system use the UDP API to set the variable values in order to select a cue. The appropriate API message is `core-va-1-set=<integer>` where `integer` is the cue index.

- Add the *System* source and insert one action. At start-up, trigger a variable 'change' in order to jump to the previously selected cue.



Editing System:Action 1

TRIGGER TYPE: Startup

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Variable	Refresh	Set	1	-

FEATURE: Set Value, Refresh, Single Dimmer, Curve

FUNCTION: Set, All

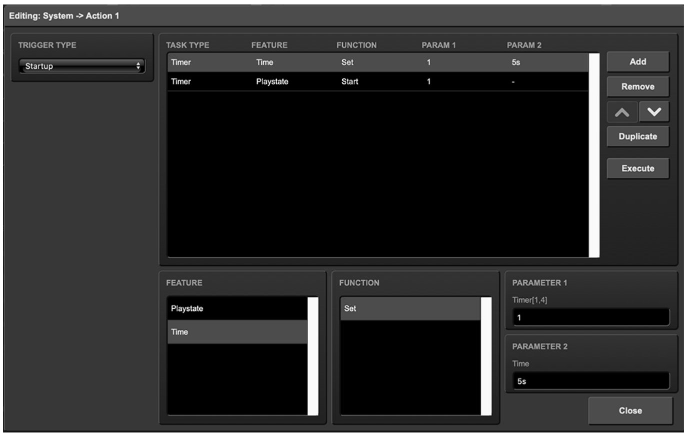
PARAMETERS: Param 1 — Index # [1,10]: 1

10.6 Timers

The show control system of the CueCore3 features four internal timers. By using tasks, the timers can be set to certain durations and they can be started. Once started the timers will countdown to zero. When the timer reaches zero it will generate an event that can be captured by using the *Timer* actionlist. Please note that the timer values are not stored between power cycles. You can see the status of the four timers in the monitor page, under *Timers*.

The next example will show a timer being used to regularly send a UDP message to an external system in order to notify that the CueCore3 is still 'alive'.

- Setup and start the timer at power-on. This is done by creating an action in the *System* actionlist.



Editing: System -> Action 1

TRIGGER TYPE: Startup

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Timer	Time	Set	1	5s
Timer	Playstate	Start	1	-

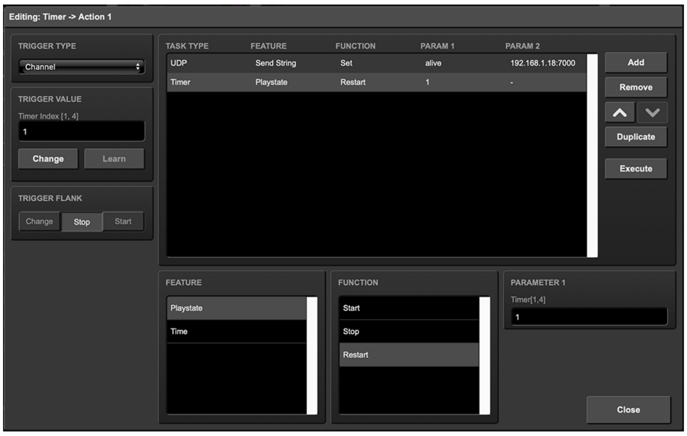
FEATURE: Playstate, Time

FUNCTION: Set

PARAMETER 1 — Timer[1,4]: 1

PARAMETER 2 — Time: 5s

- If the timer expires then send the UDP message and restart the timer. This is done by creating an action in the *Timer* actionlist.



Editing: Timer -> Action 1

TRIGGER TYPE: Channel

TRIGGER VALUE
Timer Index [1, 4]: 1

TRIGGER FLANK: Stop

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
UDP	Send String	Set	alive	192.168.1.18:7000
Timer	Playstate	Restart	1	-

FEATURE: Playstate

FUNCTION: Restart

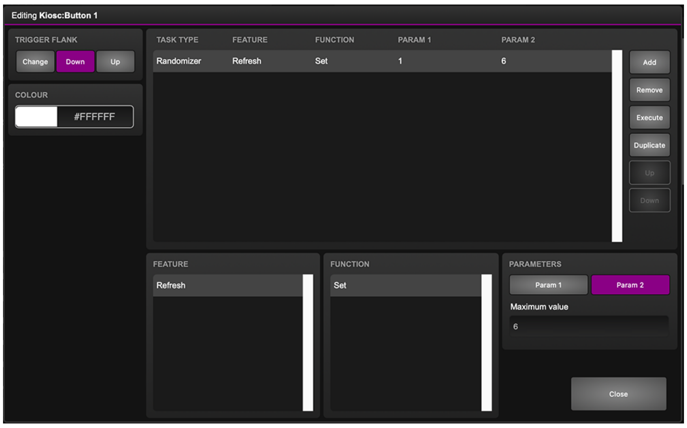
PARAMETER 1
Timer[1,4]: 1

10.7 Randomizer

The *Randomizer* is an internal software feature that can generate a (pseudo-)random number. This is useful for having an event trigger a random lighting scene in a themed environment. The randomizer is activated by the Randomizer task. The result of the randomizer's calculation can be obtained by catching the event in the Randomizer actionlist.

The following example shows how to use a Kiosc button to trigger a random cue.

- Inside the Kiosc actionlist is a button-action. This triggers the task Randomizer, which is set to a range of between 1 and 6. (Parameters 1 and 2 of the task Randomizer)



Editing Kiosc:Button 1

TRIGGER FLANK: Change [✓ Down] Up

COLOUR: #FFFFFF

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Randomizer	Refresh	Set	1	6

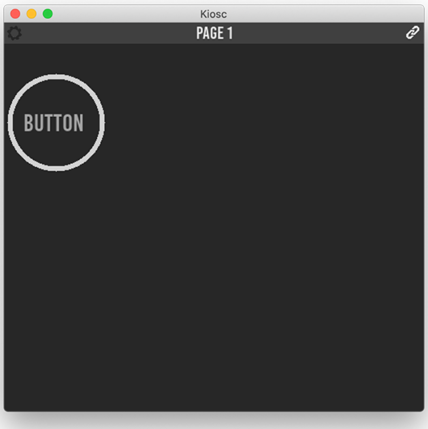
FEATURE: Refresh

FUNCTION: Set

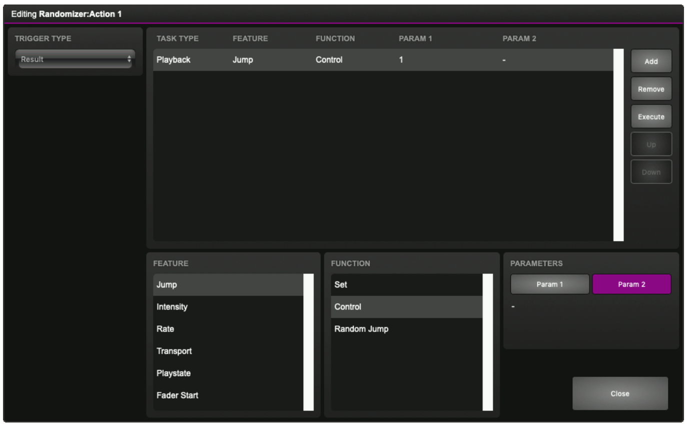
PARAMETERS: Param 1 [✓ Param 2]

Maximum value: 6

Kiosc will just simply show one button.



- Next in the actionlist Randomizer there is an action triggered by the Randomizer. The task Playback, controlled by the result of the Randomizer, jumps to a cue in Playback 1 (Parameter 1 of the task Playback).



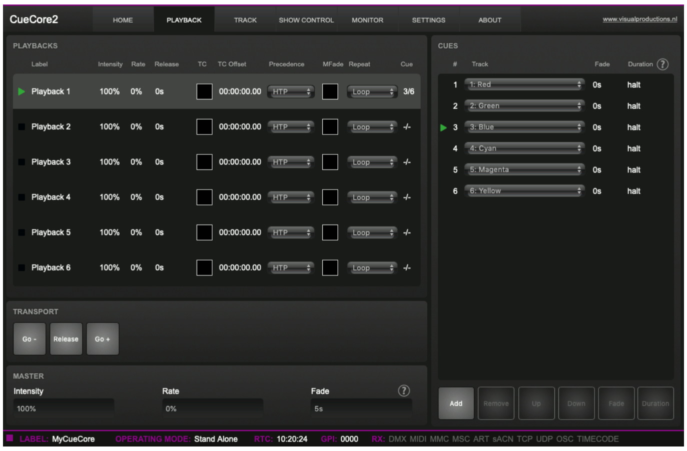
TRIGGER TYPE: Result

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Playback	Jump	Control	1	-

FEATURE: Jump, Intensity, Rate, Transport, Playstate, Fader Start

FUNCTION: Set, Control, Random Jump

- When the Kiosc button is pressed the Randomizer picks a number between one and six, as defined in the Randomizer task. The Playback task receives this number and triggers the corresponding cue.



PLAYBACKS

Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
Playback 1	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	3/6
Playback 2	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-
Playback 3	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-
Playback 4	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-
Playback 5	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-
Playback 6	100%	0%	0s	□	00:00:00.00	HTP	□	Loop	-/-

CUES

#	Track	Fade	Duration
1	1: Red	0s	halt
2	2: Green	0s	halt
3	3: Blue	0s	halt
4	4: Cyan	0s	halt
5	5: Magenta	0s	halt
6	6: Yellow	0s	halt

MASTER

Intensity: 100% Rate: 0% Fade: 5s

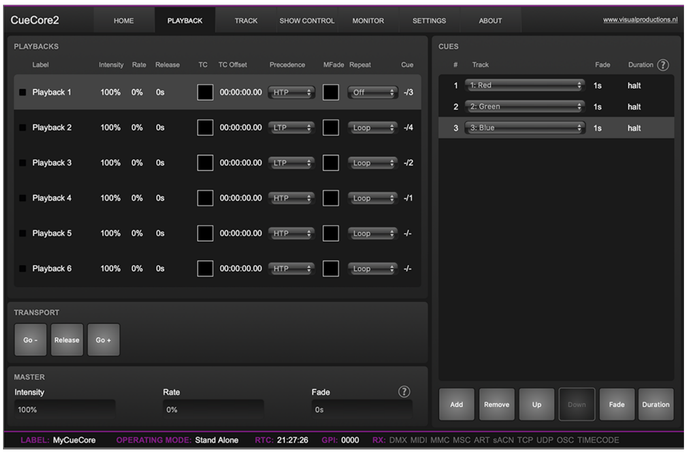
LABEL: MyCueCore OPERATING MODE: Stand Alone RTC: 10:20:24 GPI: 0000 RX: DMX MIDI MMC MSC ART sACN TCP UDP OSC TIMECODE

10.8 User Lists

Normally a source is connected to a communication port, protocol or software feature. Actionlists will be triggered as soon as an event happens in a source. There is an exception; the User Lists are not connected to any source and therefor will not be triggered by any communication or other event. The purpose of User Lists is to have extra actionlists containing actions which can be triggered by explicitly linking to it. See page 122 for details of the *Link* feature in the *Action* task.

The following example demonstrates the use of a User List. Imagine a scenario in which the GPI is used to change between three lighting scenes. To prevent unauthorised use a key-contact-closure is connected to GPI pin 4; the first three GPI should only respond when pin 4 is a closed contact by using the key.

- Create a playback with three cues



Label	Intensity	Rate	Release	TC	TC Offset	Precedence	MFade	Repeat	Cue
Playback 1	100%	0%	0s	■	00:00:00.00	HTP	■	Off	-/3
Playback 2	100%	0%	0s	■	00:00:00.00	LTP	■	Loop	-/4
Playback 3	100%	0%	0s	■	00:00:00.00	LTP	■	Loop	-/2
Playback 4	100%	0%	0s	■	00:00:00.00	HTP	■	Loop	-/1
Playback 5	100%	0%	0s	■	00:00:00.00	HTP	■	Loop	-/-
Playback 6	100%	0%	0s	■	00:00:00.00	HTP	■	Loop	-/-

#	Track	Fade	Duration
1	1: Red	1s	halt
2	2: Green	1s	halt
3	3: Blue	1s	halt

MASTER

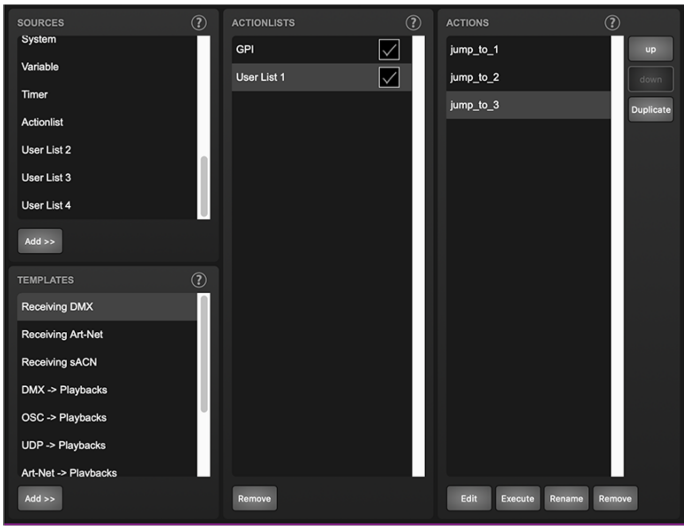
Intensity: 100%

Rate: 0%

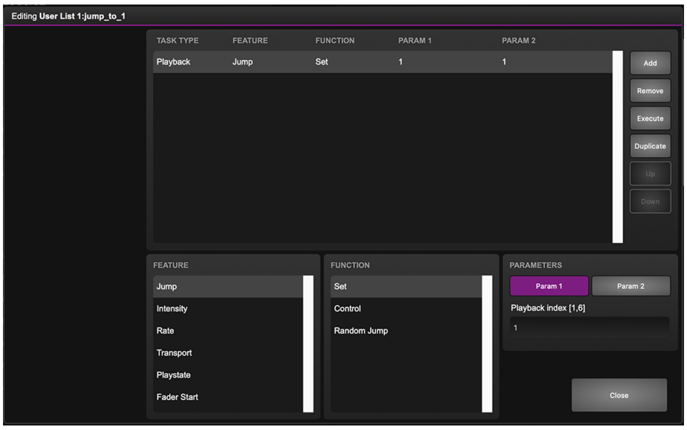
Fade: 0s

LABEL: MyCueCore OPERATING MODE: Stand Alone RTC: 21:27:26 GPI: 0000 RX: DMX MIDI MMC MSC ART sACN TCP UDP OSC TIMECODE

- Create an User List with three actions.



Set each action to jump to one of the three cues in playback 1.

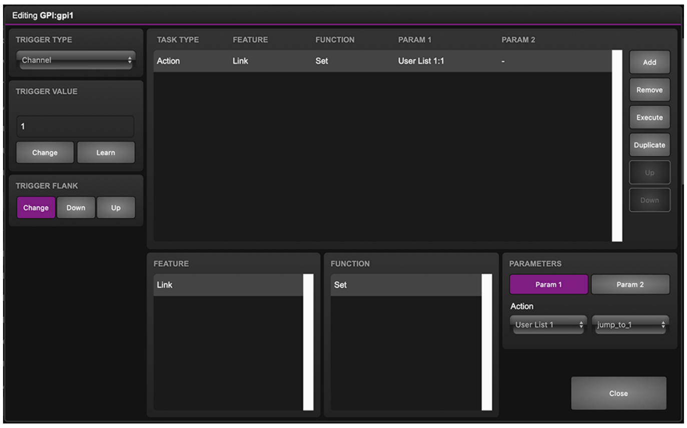


Editing **User List 1:jump_to_1**

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Playback	Jump	Set	1	1

Playback index [1,6]: 1

- Add an GPI actionlist and link the first three GPI ports to the action in the User List.



Editing GPI:gpi1

TRIGGER TYPE: Channel

TRIGGER VALUE: 1

TRIGGER FLANK: Change

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Action	Link	Set	User List 1:1	-

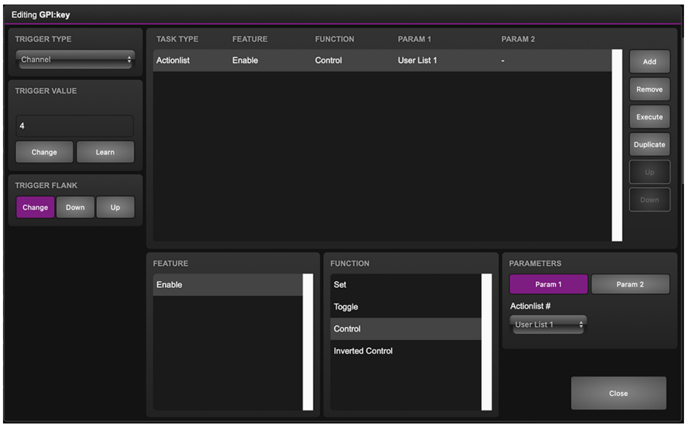
FEATURE: Link

FUNCTION: Set

PARAMETERS: Param 1

Action: User List 1, jump_to_1

- Use the fourth GPI port enable or disable the User List.



Editing GPI:key

TRIGGER TYPE: Channel

TRIGGER VALUE: 4

TRIGGER FLANK: Change

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
Actionlist	Enable	Control	User List 1	-

FEATURE: Enable

FUNCTION: Set, Toggle, Control, Inverted Control

PARAMETERS: Param 1

Actionlist #: User List 1

For brevity the state of the GPI port 4 is ignored at start-up. Usually additional actions are created to *Refresh* this port on start-up.

Chapter 11

Protocol Conversion

The CueCore3 is fitted with several communication ports and additionally supports various Ethernet-based protocols. Although some protocols are predominantly used for triggering the internal playbacks (such as GPI, MIDI, UDP, OSC, etc.) and some other protocols are mainly used for recording (such as DMX input, Art-Net and sACN) the CueCore3 is capable of converting one protocol into another. This chapter provides an insight on which conversions are possible and how to set them up.

All possible conversions can be organised into two categories: Converting Control Protocols and Converting DMX Universe Protocols.

11.1 Converting Control Protocols

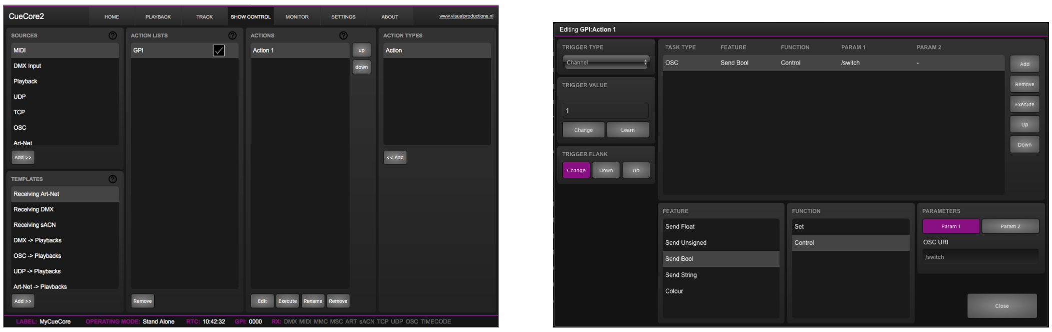
The first category of conversions comprise the protocols typically used for triggering or transporting one piece of information. The following table shows these protocols and what kind of information they are able to carry.

Control Protocols	Information
Digital GPI	On/Off
Analog GPI	percentage [0%,100%]
MIDI	number [0,127]
UDP	-
TCP	-
OSC	percentage [0%,100%], number, string, colour, On/Off
DMX	number [0,255]
Art-Net	number [0,255]
sACN	number [0,255]

Although DMX, Art-Net and sACN are dedicated lighting protocols and naturally fit in the next category, their individual channels lend themselves well for conveying control messages.

Setting up a conversion is done in the Show Control page. First add the incoming protocol from the 'Sources' table into the 'Action list' table. Then add an action to this new action-list. Inside this action the trigger-flank field (if visible) should be set to Change; as this action should be triggered every time the incoming signal changes. Furthermore, a task need to be added, the task-type determines which protocol is the output of our conversion. It is important that the 'function' in this task is set to 'Control'. This will make sure that the output is not a fixed value, rather it will output the information received from the incoming signal.

Please consider two examples. Figure 11.1 shows a conversion between Digital GPI and OSC. This example assumes the GPI Port 1 is set to 'Digital' on the Settings page.



ACTION LISTS: GPI ☑

ACTIONS: Action 1

LABEL: MyCueCore OPERATING MODE: Stand Alone RTC: 10:42:32 GPI: 0000 RX: DMX MIDI MMC MSC ART sACN TCP UDP OSC TIMECODE

(a) Step 1

Editing **GPI:Action 1**

TRIGGER TYPE: Channel

TRIGGER VALUE: 1

TRIGGER FLANK: Change

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
OSC	Send Bool	Control	/switch	-

FEATURE: Send Bool

FUNCTION: Control

PARAMETERS: Param 1

OSC URI: /switch

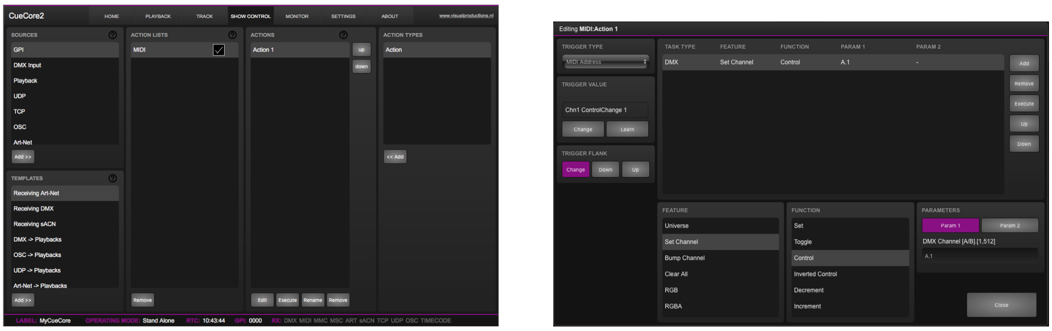
(b) Step 2

Figure 11.1: Conversion from GPI to OSC

Figure 11.2 shows a conversion between MIDI and DMX. This example assumes the DMX Port A is set to 'Output A' on the Settings page.

11.2 Converting DMX Universe Protocols

This category includes all protocols that carry a DMX Universe (a block of 512 DMX channels). These protocols are DMX, Art-Net, sACN and to some extend KiNet. The CueCore3 is capable of receiving a complete DMX universe from one protocol and sending it out on a different protocol. Furthermore, it is able to merge DMX universes from multiple sources into one output protocol. All this is done with a minimal amount of configuration in the CueCore3. The following table lists examples of the conversions that can be made.



LABEL: MyCueCore OPERATING MODE: Stand Alone RTC: 10:43:44 GPI: 0000

TRIGGER TYPE: MIDI Address

TRIGGER VALUE: Chn1 ControlChange 1

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
DMX	Set Channel	Control	A.1	-

DMX Channel [A/B].[1,512]: A.1

(a) Step 1

(b) Step 2

Figure 11.2: Conversion from MIDI to DMX

Example DMX Universe Conversions
DMX ->Art-Net
Art-Net ->DMX
DMX ->sACN
sACN ->DMX
DMX ->KiNet
Art-Net ->sACN

It is also possible to create combinations of the examples above. For instance you could set up a conversion from DMX to both Art-Net and sACN. Or merge incoming Art-Net and sACN together into the DMX output. Also, at any point it is possible to merge the incoming DMX data with the data generated by the internal playbacks.

To set up the conversion go to the Show Control page and choose the incoming protocol from the 'Sources' table and add it to the 'Action lists' table. Then add an action for each DMX Universe you wish to convert; e.g. when converting two DMX ports to Art-Net it requires two action to programmed. The trigger-type in the actions should be set to 'Universe' to make the CueCore3 process the 512 channels as a whole rather then process individual channels. Each action should contain a DMX-task with the 'feature' set to 'Universe'; all DMX Universe data is first being copied into the CueCore3's internal DMX buffer. From this buffer it can be copied to the DMX outlet or the other protocols such as Art-Net and sACN. Figure 11.3 provides a schematic for this data flow.

The function needs to be set to *Control HTP*.

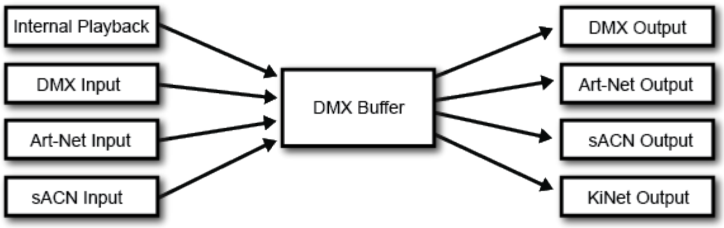


Figure 11.3: DMX merging data flow

Function	
Control HTP	Highest Takes Precedence
Clear	

All channels are compared and the highest levels are used for the merged output (HTP precedence).

The additional 'Clear' function is not related to the data merging precedence; it is just a function to clear the whole universe to zero.

Please note that the 'Templates' table provides pre-programmed configurations for the most popular conversions.

A very typical conversion that can illustrate as an example is to convert Art-Net universes 0.0 and 0.1 to DMX output A and B respectively. Figure 11.4 shows action-list, figure 11.5 show the contents of 'Action 1' and figure 11.6 show the required configuration of the Settings page.

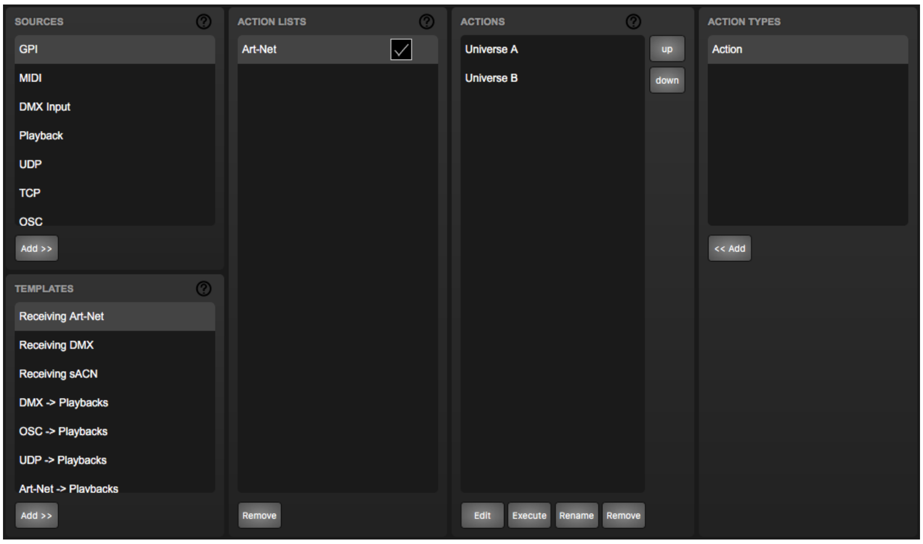
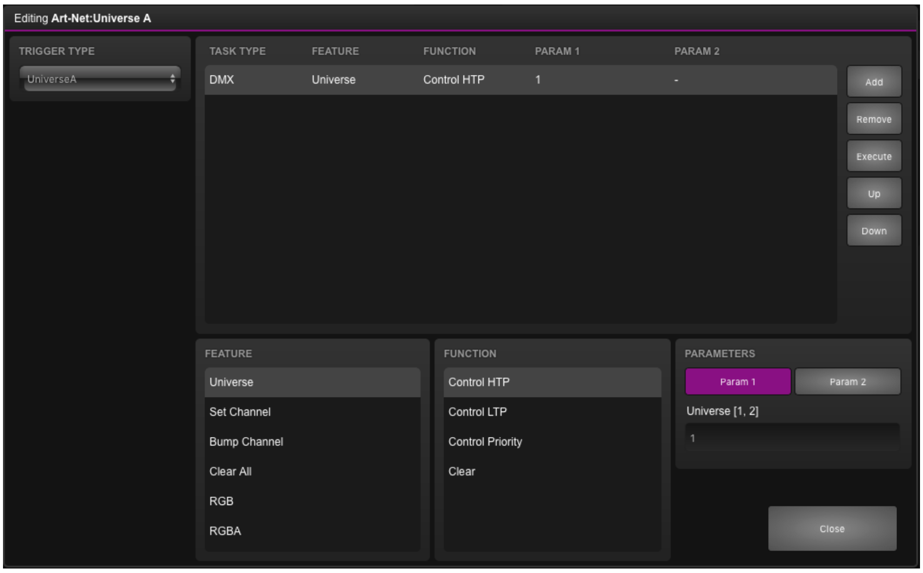


Figure 11.4: Converting Art-Net to DMX step 1



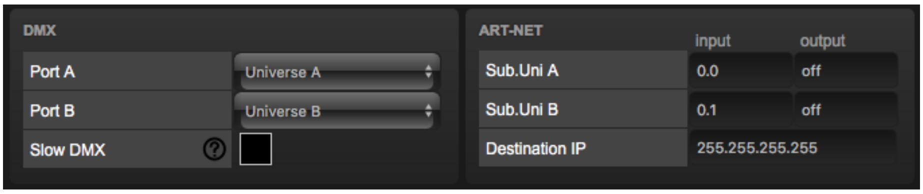
Editing **Art-Net:Universe A**

TRIGGER TYPE: UniverseA

TASK TYPE	FEATURE	FUNCTION	PARAM 1	PARAM 2
DMX	Universe	Control HTP	1	-

Universe [1, 2]: 1

Figure 11.5: Converting Art-Net to DMX step 2



DMX

Port A	Universe A
Port B	Universe B
Slow DMX	□

ART-NET

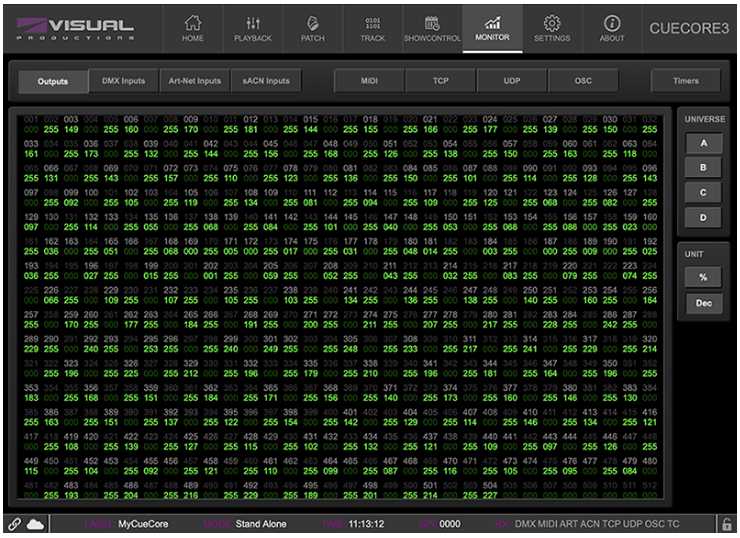
	input	output
Sub.Uni A	0.0	off
Sub.Uni B	0.1	off
Destination IP	255.255.255.255	

Figure 11.6: Converting Art-Net to DMX step 3

Chapter 12

Monitors

This page allows the user to inspect the incoming and outgoing data, both DMX-type data (See figure 12.1) as well as control messages (See figure 12.2). Monitoring incoming and outgoing data can help the user troubleshoot during programming.



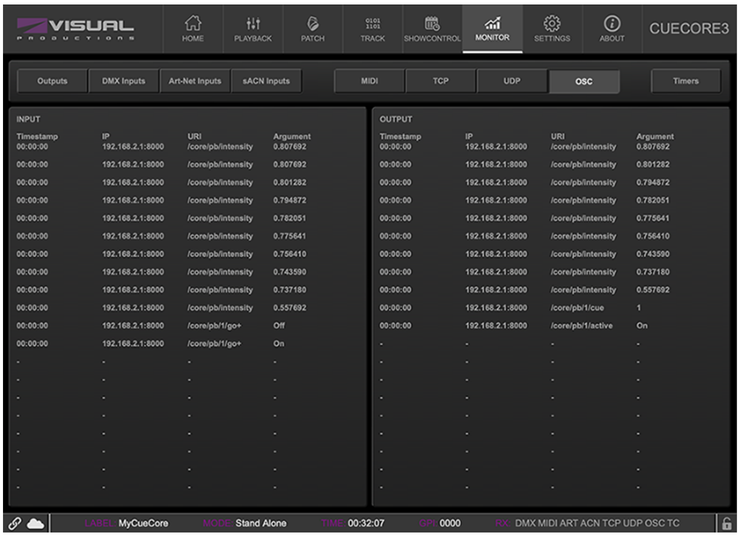
001	002	003	004	005	006	007	008	009	010	011	012	013	014	015	016	017	018	019	020	021	022	023	024	025	026	027	028	029	030	031	032
000	255	149	000	255	160	000	255	170	000	255	181	000	255	144	000	255	155	000	255	166	000	255	177	000	255	139	000	255	150	000	255
033	034	035	036	037	038	039	040	041	042	043	044	045	046	047	048	049	050	051	052	053	054	055	056	057	058	059	060	061	062	063	064
161	000	255	173	000	255	132	000	255	144	000	255	156	000	255	168	000	255	126	000	255	138	000	255	150	000	255	163	000	255	118	000
065	066	067	068	069	070	071	072	073	074	075	076	077	078	079	080	081	082	083	084	085	086	087	088	089	090	091	092	093	094	095	096
255	131	000	255	143	000	255	157	000	255	110	000	255	123	000	255	136	000	255	150	000	255	101	000	255	114	000	255	128	000	255	143
097	098	099	100	101	102	103	104	105	106	107	108	109	110	111	112	113	114	115	116	117	118	119	120	121	122	123	124	125	126	127	128
000	255	092	000	255	105	000	255	119	000	255	134	000	255	081	000	255	094	000	255	109	000	255	125	000	255	068	000	255	082	000	255
129	130	131	132	133	134	135	136	137	138	139	140	141	142	143	144	145	146	147	148	149	150	151	152	153	154	155	156	157	158	159	160
097	000	255	114	000	255	055	000	255	068	000	255	084	000	255	101	000	255	040	000	255	053	000	255	068	000	255	086	000	255	023	000
161	162	163	164	165	166	167	168	169	170	171	172	173	174	175	176	177	178	179	180	181	182	183	184	185	186	187	188	189	190	191	192
255	036	000	255	051	000	255	068	000	255	005	000	255	017	000	255	031	000	255	048	014	255	000	003	255	000	000	255	009	000	255	025
193	194	195	196	197	198	199	200	201	202	203	204	205	206	207	208	209	210	211	212	213	214	215	216	217	218	219	220	221	222	223	224
036	255	000	027	255	000	015	255	000	001	255	000	059	255	000	052	255	000	043	255	000	032	255	000	083	255	000	079	255	000	074	255
225	226	227	228	229	230	231	232	233	234	235	236	237	238	239	240	241	242	243	244	245	246	247	248	249	250	251	252	253	254	255	256
000	066	255	000	109	255	000	107	255	000	105	255	000	103	255	000	134	255	000	136	255	000	138	255	000	140	255	000	160	255	000	164
257	258	259	260	261	262	263	264	265	266	267	268	269	270	271	272	273	274	275	276	277	278	279	280	281	282	283	284	285	286	287	288
255	000	170	255	000	177	255	000	184	255	000	191	255	000	200	255	000	211	255	000	207	255	000	217	255	000	228	255	000	242	255	000
289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	308	309	310	311	312	313	314	315	316	317	318	319	320
229	255	000	240	255	000	253	255	000	255	240	000	249	255	000	255	248	000	255	233	000	255	217	000	255	241	000	255	229	000	255	214
321	322	323	324	325	326	327	328	329	330	331	332	333	334	335	336	337	338	339	340	341	342	343	344	345	346	347	348	349	350	351	352
000	255	196	000	255	225	000	255	212	000	255	196	000	255	179	000	255	210	000	255	196	000	255	181	000	255	164	000	255	196	000	255
353	354	355	356	357	358	359	360	361	362	363	364	365	366	367	368	369	370	371	372	373	374	375	376	377	378	379	380	381	382	383	384
183	000	255	168	000	255	151	000	255	184	000	255	171	000	255	156	000	255	140	000	255	173	000	255	160	000	255	146	000	255	130	000
385	386	387	388	389	390	391	392	393	394	395	396	397	398	399	400	401	402	403	404	405	406	407	408	409	410	411	412	413	414	415	416
255	163	000	255	151	000	255	137	000	255	122	000	255	154	000	255	142	000	255	129	000	255	114	000	255	146	000	255	134	000	255	121
417	418	419	420	421	422	423	424	425	426	427	428	429	430	431	432	433	434	435	436	437	438	439	440	441	442	443	444	445	446	447	448
000	255	108	000	255	139	000	255	127	000	255	115	000	255	102	000	255	132	000	255	121	000	255	109	000	255	097	000	255	126	000	255
449	450	451	452	453	454	455	456	457	458	459	460	461	462	463	464	465	466	467	468	469	470	471	472	473	474	475	476	477	478	479	480
115	000	255	104	000	255	092	000	255	121	000	255	110	000	255	099	000	255	087	000	255	116	000	255	105	000	255	095	000	255	084	000
481	482	483	484	485	486	487	488	489	490	491	492	493	494	495	496	497	498	499	500	501	502	503	504	505	506	507	508	509	510	511	512
000	255	193	000	255	204	000	255	216	000	255	229	000	255	189	000	255	201	000	255	214	000	255	227	000	000	000	000	000	000	000	000

LABEL: MyCueCore MODE: Stand Alone TIME: 11:13:12 GPI: 0000 RX: DMX MIDI ART ACN TCP UDP OSC TC

Figure 12.1: DMX Monitor

In the Monitor page three different sources of input can be found (DMX, Art-Net and sACN), along with the control input and output sources (TCP, UDP and OSC). On the right side of the page there are the universes were the user can swap between the two of them or choose a preferable unit for displaying the requested information.

The Monitor page also presents an overview of timer and variable values. See figure 12.3



INPUT

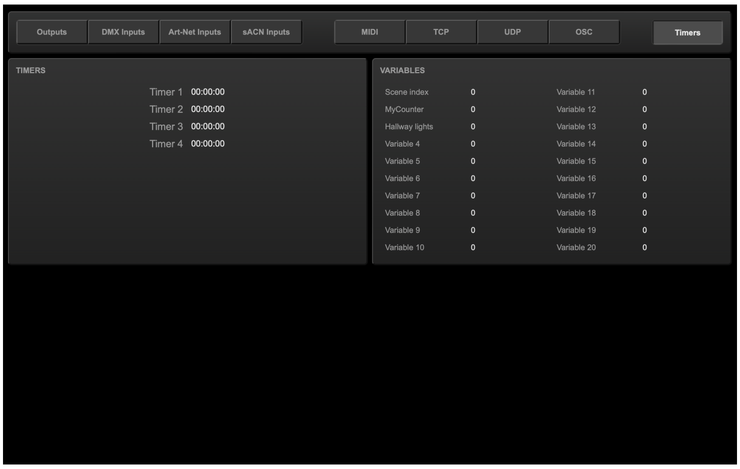
Timestamp	IP	URI	Argument
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.807692
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.807692
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.801282
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.794872
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.782051
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.775641
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.756410
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.743590
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.737180
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.557692
00:00:00	192.168.2.1:8000	/core/pb/1/go+	Off
00:00:00	192.168.2.1:8000	/core/pb/1/go+	On
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

OUTPUT

Timestamp	IP	URI	Argument
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.807692
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.801282
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.794872
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.782051
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.775641
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.756410
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.743590
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.737180
00:00:00	192.168.2.1:8000	/core/pb/intensity	0.557692
00:00:00	192.168.2.1:8000	/core/pb/1/cue	1
00:00:00	192.168.2.1:8000	/core/pb/1/active	On
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-
-	-	-	-

Figure 12.2: OSC Monitor

The variables can be renamed for convenience. It also possible to set the variable value directly in this screen.



TIMERS

Timer 1	00:00:00
Timer 2	00:00:00
Timer 3	00:00:00
Timer 4	00:00:00

VARIABLES

Scene index	0	Variable 11	0
MyCounter	0	Variable 12	0
Hallway lights	0	Variable 13	0
Variable 4	0	Variable 14	0
Variable 5	0	Variable 15	0
Variable 6	0	Variable 16	0
Variable 7	0	Variable 17	0
Variable 8	0	Variable 18	0
Variable 9	0	Variable 19	0
Variable 10	0	Variable 20	0

Figure 12.3: Timer & Variable Monitor

Chapter 13

Settings

The CueCore3's settings are organised into sections, see the Settings page figure 13.1. This chapter will discuss each section.

13.1 General

You can change the CueCore3's label. This label can be used to distinguish the unit in a set-up with multiple devices.

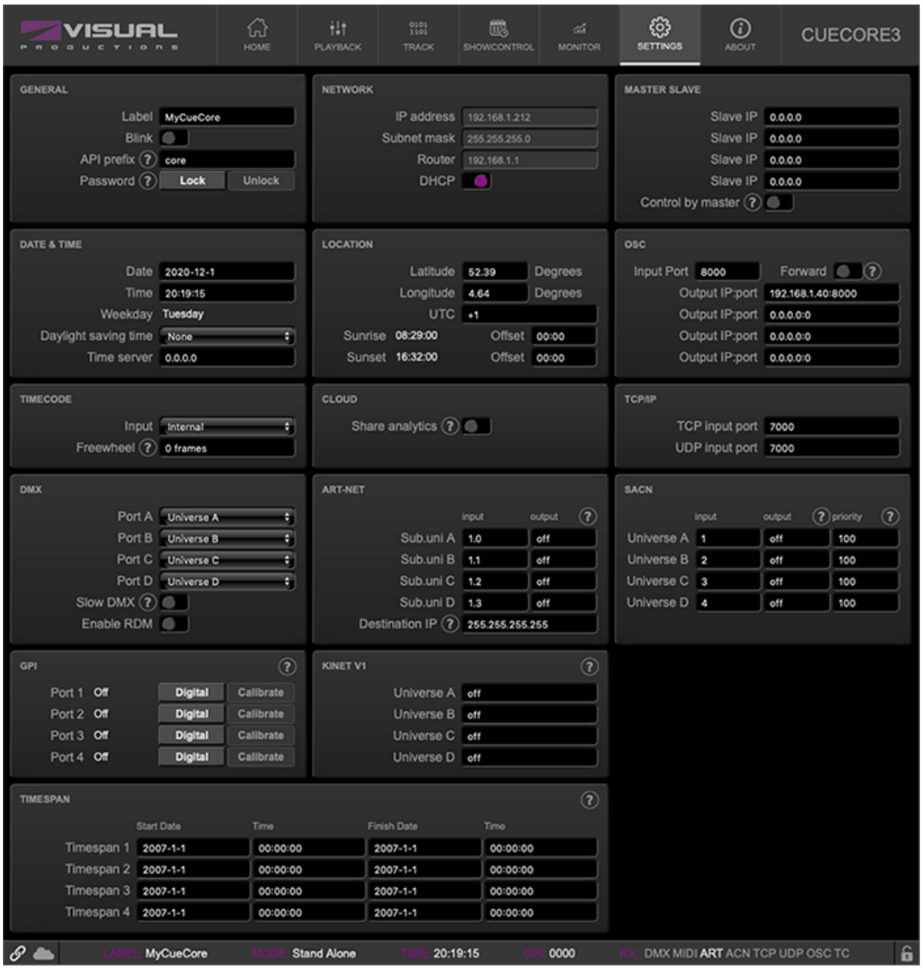
By enabling the *Blink* checkbox the device's LED will blink to help to identify it amongst multiple devices.

The API commands discussed in appendix D start with a prefix that is set to *core* by default. When using multiple devices from Visual Productions it can be useful to assign unique labels to these prefix, especially when using broadcasted messages. Read more about feedback loops in paragraph D.4.1.

Unauthorised users can be prevented from making changes to the CueCore3 by enabling the *Password* protection. Once enabled, the password can be disabled via the web-interface (using the *Disable* button) and the reset button (see figure 5.2). Long-press the reset button to disable the password protection; this will also revert the unit's static IP back to the default factory settings.

13.2 IP

The IP fields are for setting up the IP address and subnet mask of the CueCore3. The *Router* field is only required when Port Forwarding is used. You can also enable or disable the DHCP feature (For more information see chapter 5 at page 36).



GENERAL

Label MyCueCore
Blink
API prefix core
Password Lock Unlock

NETWORK

IP address 192.168.1.212
Subnet mask 255.255.255.0
Router 192.168.1.1
DHCP

MASTER SLAVE

Slave IP 0.0.0.0
Slave IP 0.0.0.0
Slave IP 0.0.0.0
Slave IP 0.0.0.0
Control by master

DATE & TIME

Date 2020-12-1
Time 20:19:15
Weekday Tuesday
Daylight saving time None
Time server 0.0.0.0

LOCATION

Latitude 52.39 Degrees
Longitude 4.64 Degrees
UTC +1
Sunrise 08:29:00 Offset 00:00
Sunset 16:32:00 Offset 00:00

OSC

Input Port 8000 Forward
Output IP:port 192.168.1.40:8000
Output IP:port 0.0.0.0:0
Output IP:port 0.0.0.0:0
Output IP:port 0.0.0.0:0

TIMECODE

Input Internal
Freewheel 0 frames

CLOUD

Share analytics

TCP/IP

TCP input port 7000
UDP input port 7000

DMX

Port A Universe A
Port B Universe B
Port C Universe C
Port D Universe D
Slow DMX
Enable RDM

ART-NET

	input	output
Sub.uni A	1.0	off
Sub.uni B	1.1	off
Sub.uni C	1.2	off
Sub.uni D	1.3	off

Destination IP 255.255.255.255

SACN

	input	output	priority
Universe A	1	off	100
Universe B	2	off	100
Universe C	3	off	100
Universe D	4	off	100

GPI

Port 1	Off	Digital	Calibrate
Port 2	Off	Digital	Calibrate
Port 3	Off	Digital	Calibrate
Port 4	Off	Digital	Calibrate

KINET V1

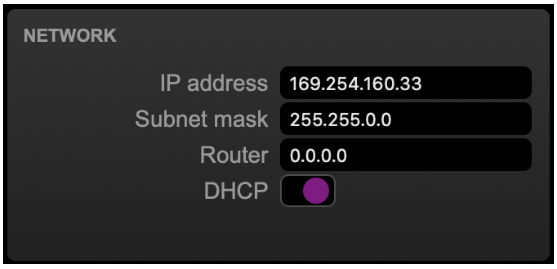
Universe A off
Universe B off
Universe C off
Universe D off

TIMESPAN

	Start Date	Time	Finish Date	Time
Timespan 1	2007-1-1	00:00:00	2007-1-1	00:00:00
Timespan 2	2007-1-1	00:00:00	2007-1-1	00:00:00
Timespan 3	2007-1-1	00:00:00	2007-1-1	00:00:00
Timespan 4	2007-1-1	00:00:00	2007-1-1	00:00:00

LABEL MyCueCore MODE Stand Alone TIME 20:19:15 GPI 0000 RX DMX MIDI ART ACN TCP UDP OSC TC

Figure 13.1: Settings page



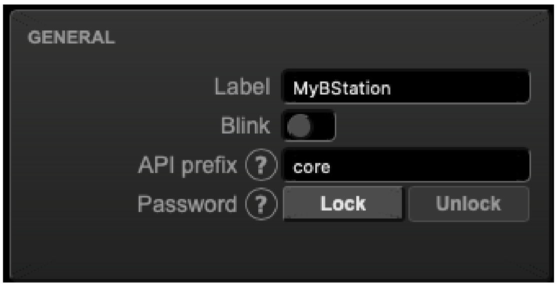
NETWORK

IP address 169.254.160.33
Subnet mask 255.255.0.0
Router 0.0.0.0
DHCP

Figure 13.3: IP Settings

13.3 Slaves

This section enables the master-slave synchronisation.



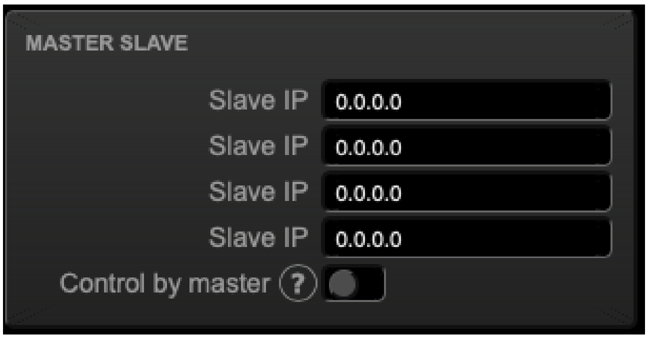
Label: MyBStation

Blink: ○

API prefix: core

Password

Figure 13.2: General Settings



Slave IP: 0.0.0.0

Slave IP: 0.0.0.0

Slave IP: 0.0.0.0

Slave IP: 0.0.0.0

Control by master: ○

Figure 13.4: Slaves Settings

The master-CueCore3 should specify the IP addresses of its slaves. When the IP is indicated in white then the master-slave connection is established, otherwise the IP is indicated in orange. For creating a system with more than four slaves, a broadcast IP can be set. A message sent to a broadcast address may be received by all network-attached hosts. A typical broadcast IP address is 192.168.1.255, however, this depends on the subnet used.

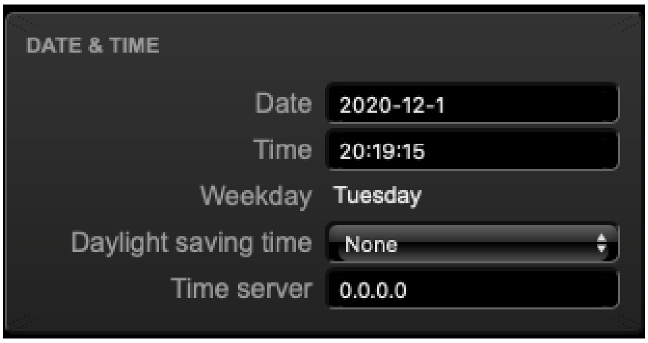
The slave-CueCore3 units require the 'Allow control by master' checkbox to be enabled. Enabling 'Allow control by master' checkbox will cause playback data to be overwritten.

13.4 Date & Time

The date and time of the RTC can be set here. The clock has a back-up battery to keep the time during a power down. Daylight Saving Time (DST) is supported for the regions Europe and United States.

The Time Server field allows a NTP server to specified. At start up, the CueCore3 will fetch the time and date from this server. Additionally, an action can be used to fetch the time. The DST and the Coordinated Universal Time (UTC) are taken into account when obtaining the time for the NTP server.

The following table lists suggested NTP servers.



DATE & TIME

Date 2020-12-1

Time 20:19:15

Weekday Tuesday

Daylight saving time None

Time server 0.0.0.0

Figure 13.5: Date & Time Settings

Continent	Server
North America	64.90.182.55
South America	201.49.148.135
Europe	216.239.35.8
Africa	196.23.245.74
Asia	133.100.9.2
Australia	137.92.140.80

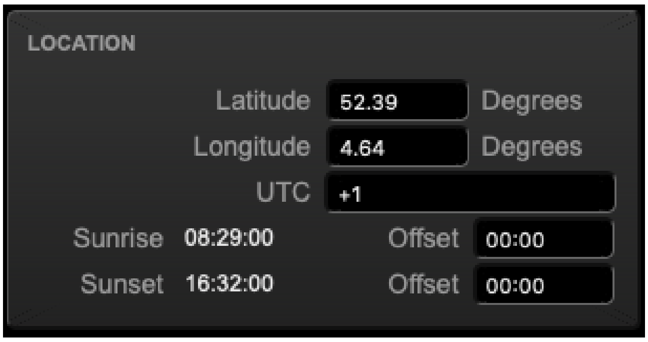
13.5 Location

The astronomical clock in the CueCore3 calculates the sunrise and sunset times based on day of the year, latitude, longitude and UTC. The latitude and longitude values define the position in the world and should be entered in degrees. The latitude value should be positive for North and negative for South, the longitude should positive for East and negative for West.

The website http://www.findlatitudeandlongitude.com/ can help discover the latitude and longitude values for the current location. The time-zone and perhaps daylight saving time of the current location is expressed in the UTC value. UTC is - in this context - equivalent to Greenwich Mean Time (GMT).

For example, Visual Productions' HQ is based in the city of Haarlem, the Netherlands. During the winter the UTC equals +1 and in the summer during day light saving time it is set to +2. So, the settings for the Visual Productions' HQ are shown in Figure 13.6.

The Offset fields allows to shift the sunrise and sunset triggers, both earlier and later. For example, to have a trigger half an hour before sunrise set the offset to -00:30.



LOCATION

Latitude 52.39 Degrees

Longitude 4.64 Degrees

UTC +1

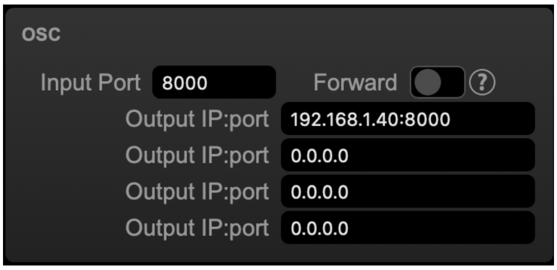
Sunrise 08:29:00 Offset 00:00

Sunset 16:32:00 Offset 00:00

Figure 13.6: Location settings

13.6 OSC

External equipment sending OSC messages to the CueCore3 need to be aware of the number specified in the ’Port’ field. This is the port the CueCore3 listens to for incoming messages.



OSC

Input Port 8000 Forward ○ ?

Output IP:port 192.168.1.40:8000

Output IP:port 0.0.0.0

Output IP:port 0.0.0.0

Output IP:port 0.0.0.0

Figure 13.7: OSC Settings

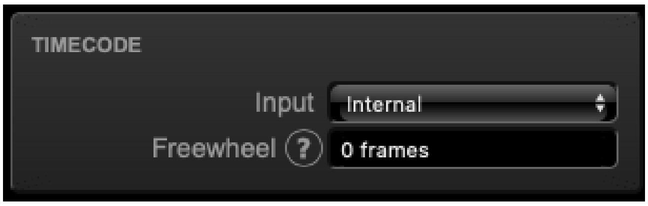
The CueCore3 will send its outgoing OSC messages to the IP addresses specified in the ’Out IP’ fields. Up to four IPs can be specified here. Use the ’ip-address:port’ format in these fields, e.g. ”192.168.1.11:9000”. If a field should not be used then it can be filled with IP 0.0.0.0:0. It is possible to enter a broadcast IP address like 192.168.1.255 in order to reach more than four recipients.

Enabling the *Forward* checkbox will have the CueCore3 copy every incoming OSC message and send it the addresses specified in the ’Out IP’ fields.

13.7 Timecode

The CueCore3 can receive SMPTE, MTC and Art-Net timecode. This section allows to choose one of these protocols as the timecode source. Alternatively, the CueCore3 also has ’internal’ timecode; a timecode generated by the unit itself. Synchronisation of playbacks and actions depend on this choice.

The timecode freewheel will allow continue for some frames after the timecode source stops. ”Forever” can be entered to continue when no timecode is re-


TIMECODE

Input: Internal

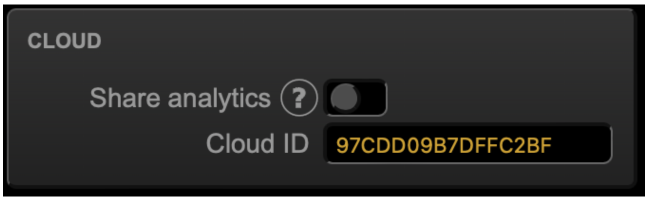
Freewheel ?: 0 frames

Figure 13.8: Timecode Settings

ceived.

13.8 Purple Cloud

The CueCore3 can be remotely monitored via the Purple Cloud.


CLOUD

Share analytics ?

Cloud ID: 97CDD09B7DFFC2BF

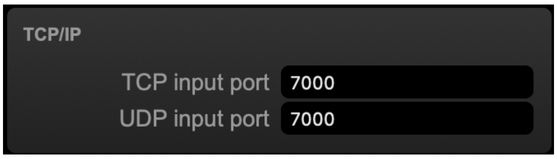
Figure 13.9: Cloud Settings

The *Share Analytics* checkbox needs to enabled - as well as an Internet connection - in order to establish a connection with the *Purple Cloud*. By enabling the *Share Analytics* checkbox you agree to having anonymous statistics and usage data collected by the cloud. Visual Productions will only use this data for improving its products.

The *Cloud ID* should contain your ID as generated by the *Purple Cloud*. This ID can be found on the cloud's *Account* page. This ID connects the CueCore3 device to your *Purple Cloud* account. The *Cloud ID* is displayed in yellow in case no match has been found in the *Purple Cloud*'s database.

13.9 TCP/IP

Defines the listening ports for TCP and UDP messages. External systems intending to send TCP or UDP message to the CueCore3 need to know the unit's IP address and this port number. By default both ports are set to 7000.


TCP/IP

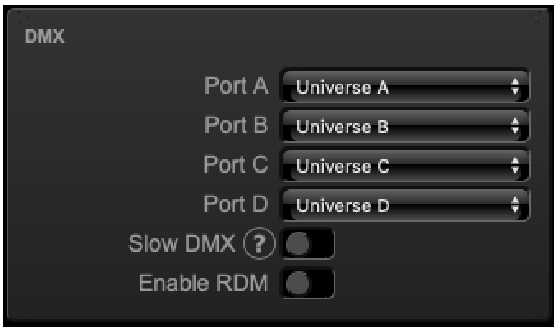
TCP input port: 7000

UDP input port: 7000

Figure 13.10: TCP/IP settings

13.10 DMX

The *DMX* settings specify whether the DMX port is an *Input* or *output.*



DMX

Port A: Universe A

Port B: Universe B

Port C: Universe C

Port D: Universe D

Slow DMX ?

Enable RDM

Figure 13.11: DMX settings

When the *Slow DMX* checkbox is enabled, the CueCore3 will slowdown the rate at which it sends out DMX. This is done to facilitate DMX fixtures that have difficulties keeping up with the optimal DMX transmission rate.

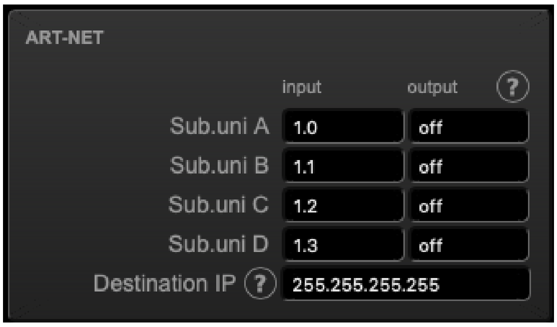
When programming a show that does not use all DMX universes it can be useful to set multiple DMX ports to the same universe. This can make cabling more efficient and perhaps prevent the need of a DMX splitter. For example, when using only 512 channels bothDMX ports can be set to 'Universe A'.

RDM can be disabled by using the *Enable RDM* checkbox. This checkbox is repeated on the *Patch* page.

13.11 Art-Net

The *Art-Net* feature in the CueCore3 supports 4 universe out and 4 universes in.

These universes can be mapped to any of the 256 available universes in the Art-Net protocol. The universe is entered in the 'subnet.universe' format, i.e. the lowest universe number is written as '0.0' and the highest universe number is denoted as '15.15'. The outgoing Art-Net transmission can be disabled by entering 'off' in the output fields.


ART-NET

	input	output
Sub.uni A	1.0	off
Sub.uni B	1.1	off
Sub.uni C	1.2	off
Sub.uni D	1.3	off
Destination IP	255.255.255.255	

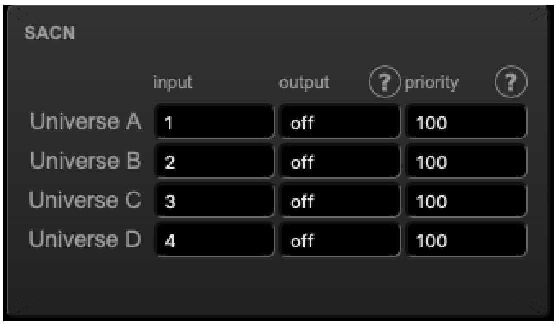
Figure 13.12: Art-Net settings

The *Destination IP* determines where the outgoing Art-Net data will be sent to. Typically, this field contains a broadcast address like 2.255.255.255 which will send the Art-Net data to the 2.x.x.x IP range. Another typical Art-Net broadcast address is 10.255.255.255. When using broadcast address 255.255.255.255 then all the devices on the network will receive the Art-Net data.

It is also possible to fill in a unicast address like 192.168.1.11; in this case the Art-Net data will be send to one IP address only. This keeps the rest of the network clean of any Art-Net network messages.

13.12 sACN

The CueCore3 supports 4 incoming *sACN* universe and 4 outgoing universe. The universe field should hold a number in the range of [1,63999]. Outgoing sACN transmission can be disabled by entering *off* into the sACN output field.


SACN

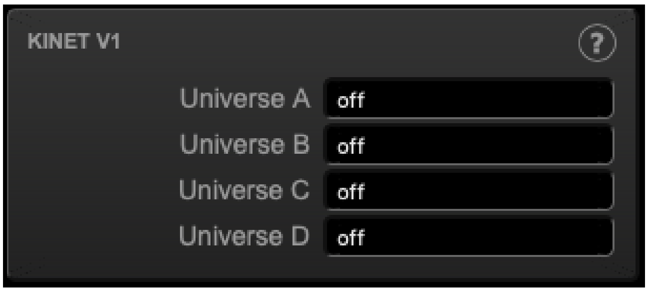
	input	output	priority
Universe A	1	off	100
Universe B	2	off	100
Universe C	3	off	100
Universe D	4	off	100

Figure 13.13: sACN settings

Set priority field to control the priority level of the output universe. The priority can be set from 0 (lowest) to 200 (highest).

13.13 KiNet v1

The CueCore3 features transmission of DMX data via KiNet; it supports KiNet protocol version 1.



Universe A off

Universe B off

Universe C off

Universe D off

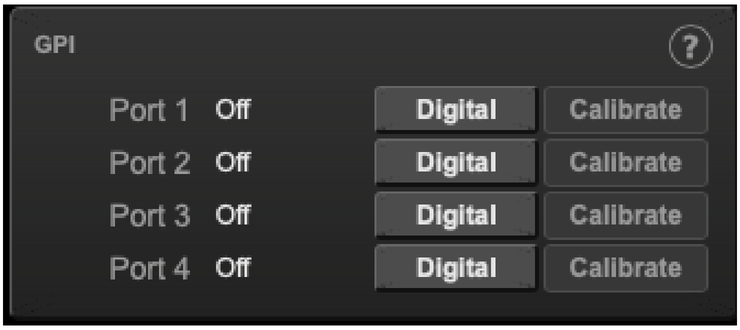
Figure 13.14: Kinet Settings

13.14 GPI

The GPI ports can be configured either as digital (contact-closure) or as analog (0-10V) input.

In case a port is set as analog and the signal supplied falls within the 0-10V range (e.g. 1-5V) then it is recommended to calibrate to port in order to map the minimal voltage to a logical 0% and map the maximum voltage to 100%.

To perform a calibration first enable the Calibrate button, then bring the incoming signal to the minimum level, bring the signal to the maximum level and then close the calibration process by clicking the Calibrate button again.



Port 1 Off Digital Calibrate

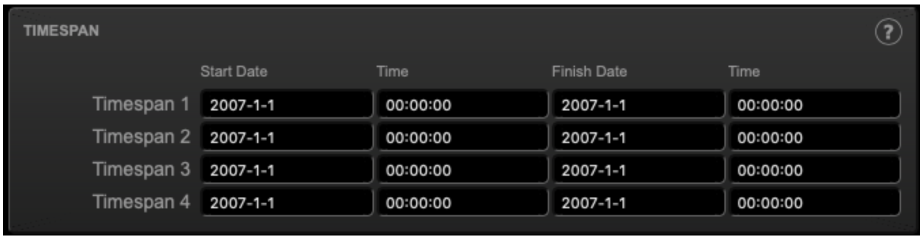
Port 2 Off Digital Calibrate

Port 3 Off Digital Calibrate

Port 4 Off Digital Calibrate

Figure 13.15: GPI Settings

Do not apply more than 10V to the GPI port, as this could cause permanent damage.



TIMESPAN

	Start Date	Time	Finish Date	Time
Timespan 1	2007-1-1	00:00:00	2007-1-1	00:00:00
Timespan 2	2007-1-1	00:00:00	2007-1-1	00:00:00
Timespan 3	2007-1-1	00:00:00	2007-1-1	00:00:00
Timespan 4	2007-1-1	00:00:00	2007-1-1	00:00:00

Figure 13.16: Timespan settings

13.15 Timespan

The *Timespan* section allows for four periods of time to be defined. The beginning and end of the time periods will trigger actions in the show control page.

An advantage of *Timespans* over normal scheduler actions is that Timespans are power-cycle safe. When the CueCore3 is without power during the moment of a normal scheduler trigger then it will miss that trigger. *Timespans*, however, will still receive the trigger once the power is restored after the moment has occurred.

Timespans are ideal for defining periods of time during a year (like Christmas or Easter) or periods during the day (like opening times).

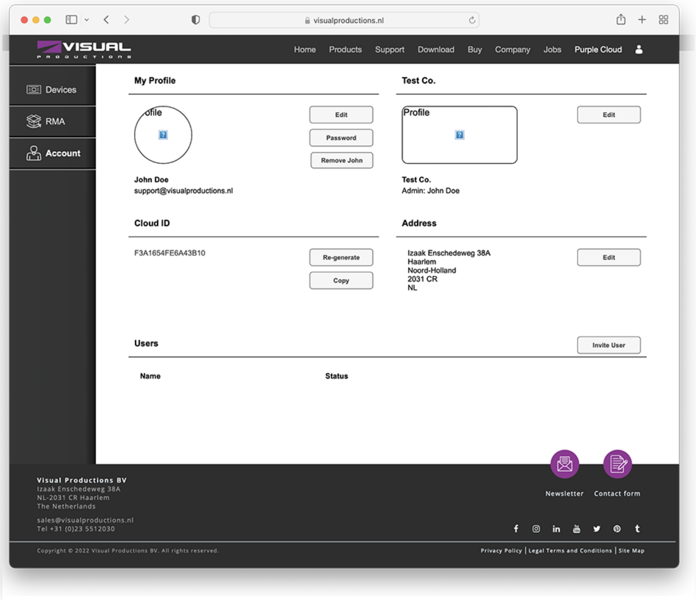
When entering the date and time data, XX's can be used to signify a 'don't care'. This allows for easily programming of yearly, monthly or daily reoccurring events.

Chapter 14

Purple Cloud

The *Purple Cloud* is a cloud service created by Visual Productions. It allows CueCore3 and Kiosc Touch devices to be remote monitored via the internet.

The *Purple Cloud* is accessible via `www.visualproductions.nl`. Registration is free of charge.



My Profile

John Doe
support@visualproductions.nl

Test Co.

Test Co.
Admin: John Doe

Cloud ID

F3A1654FE6A43B10

Address

Izaak Enschedeweg 38A
Haarlem
Noord-Holland
2031 CR
NL

Users

Name	Status

Visual Productions BV
Izaak Enschedeweg 38A
NL-2031 CR Haarlem
The Netherlands

sales@visualproductions.nl
Tel +31 (0)23 5512030

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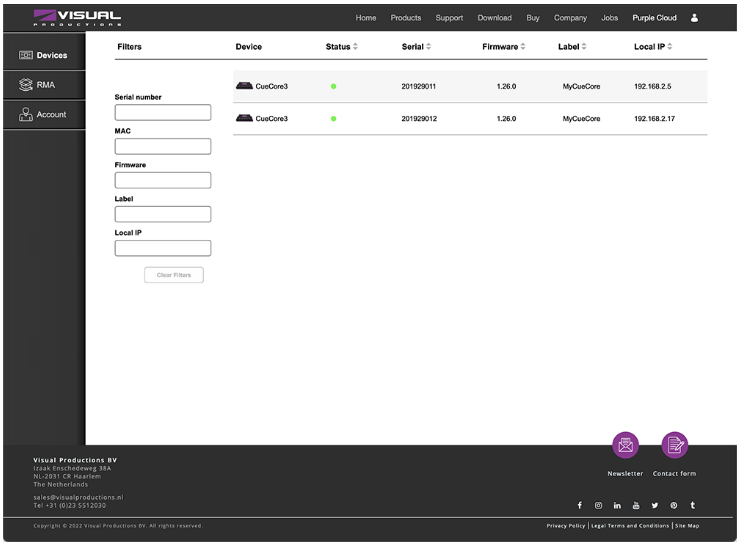
Figure 14.1: Account settings

Organisations can register an *Account* - see figure 14.1 - and add their team members as *Users*.

To connect your devices to your cloud account, you would need to take the following steps:

1. Enable Share Analytics
   Enable the checkbox in the CueCore3's *Settings* page. See also page 87.
2. Enter the Cloud ID
   This ID can be found on the *Purple Cloud*'s account page. Copy this ID into the Cloud ID field on the *Settings* page of the CueCore3.

Your device should now be visible in the *Devices* page of the *Purple Cloud*, see figure 14.2



Device	Status	Serial	Firmware	Label	Local IP
CueCore3	●	201929011	1.26.0	MyCueCore	192.168.2.5
CueCore3	●	201929012	1.26.0	MyCueCore	192.168.2.17

Visual Productions BV
Izaak Enschedeweg 38A
NL-2031 CR Haarlem
The Netherlands

sales@visualproductions.nl
Tel +31 (0)23 5512030

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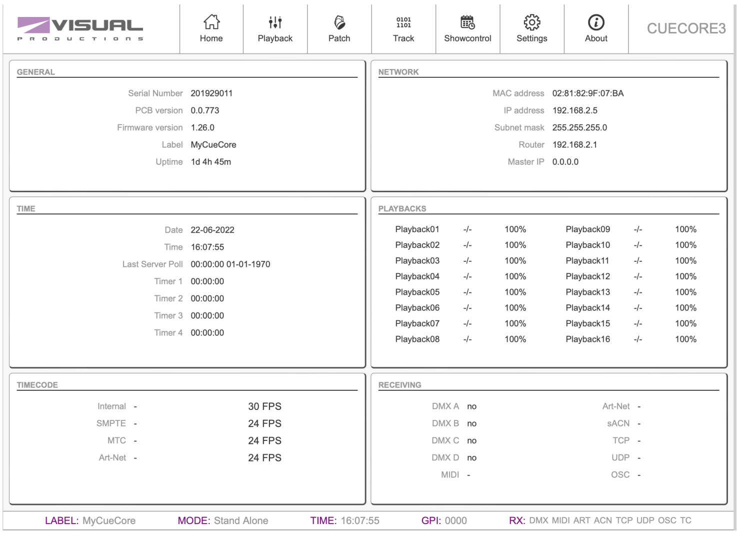
Figure 14.2: Devices overview

The CueCore3 can now be monitored by double clicking the device in the table. This brings up a pop-up window that mimics the CueCore3's web-interface.



GENERAL

Serial Number	201929011
PCB version	0.0.773
Firmware version	1.26.0
Label	MyCueCore
Uptime	1d 4h 45m

NETWORK

MAC address	02:81:82:9F:07:BA
IP address	192.168.2.5
Subnet mask	255.255.255.0
Router	192.168.2.1
Master IP	0.0.0.0

TIME

Date	22-06-2022
Time	16:07:55
Last Server Poll	00:00:00 01-01-1970
Timer 1	00:00:00
Timer 2	00:00:00
Timer 3	00:00:00
Timer 4	00:00:00

PLAYBACKS

Playback01	-/-	100%	Playback09	-/-	100%
Playback02	-/-	100%	Playback10	-/-	100%
Playback03	-/-	100%	Playback11	-/-	100%
Playback04	-/-	100%	Playback12	-/-	100%
Playback05	-/-	100%	Playback13	-/-	100%
Playback06	-/-	100%	Playback14	-/-	100%
Playback07	-/-	100%	Playback15	-/-	100%
Playback08	-/-	100%	Playback16	-/-	100%

TIMECODE

Internal	-	30 FPS
SMPTE	-	24 FPS
MTC	-	24 FPS
Art-Net	-	24 FPS

RECEIVING

DMX A	no	Art-Net	-
DMX B	no	sACN	-
DMX C	no	TCP	-
DMX D	no	UDP	-
MIDI	-	OSC	-

LABEL: MyCueCore MODE: Stand Alone TIME: 16:07:55 GPI: 0000 RX: DMX MIDI ART ACN TCP UDP OSC TC

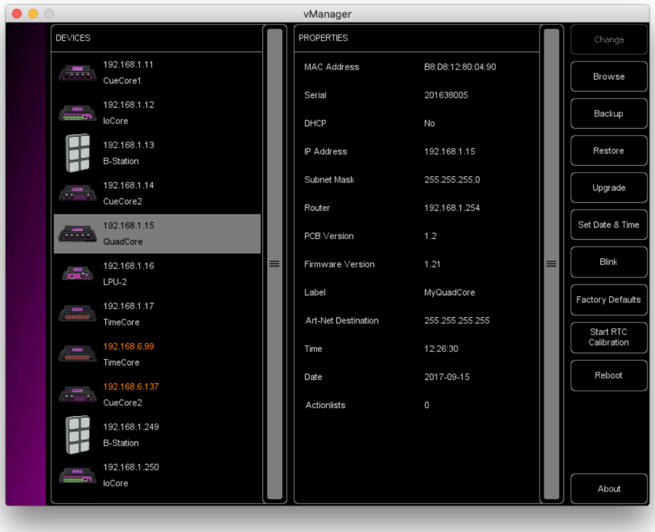
Figure 14.3: Remote monitoring a CueCore3

Chapter 15

vManager

A free-of-charge software tool called vManager has been developed to manage the devices. vManager allows for:

- Setup the IP address, subnet mask, router and DHCP
- Backup and restore the device's internal data and settings
- Perform firmware upgrades
- Set the real-time clock of the CueCore3 (The computer's date and time will be used)
- Identify a specific device (in a multi device set-up) by blinking its LED
- Revert to factory defaults



DEVICES	
192.168.1.11	CueCore1
192.168.1.12	IoCore
192.168.1.13	B-Station
192.168.1.14	CueCore2
192.168.1.15	QuadCore
192.168.1.16	LPU-2
192.168.1.17	TimeCore
192.168.6.99	TimeCore
192.168.6.137	CueCore2
192.168.1.249	B-Station
192.168.1.250	IoCore

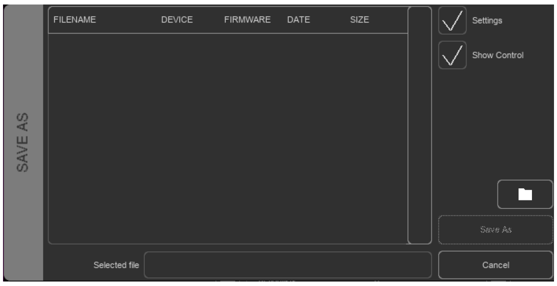
PROPERTIES	
MAC Address	B8:D8:12:80:04:90
Serial	201638005
DHCP	No
IP Address	192.168.1.15
Subnet Mask	255.255.255.0
Router	192.168.1.254
PCB Version	1.2
Firmware Version	1.21
Label	MyQuadCore
Art-Net Destination	255.255.255.255
Time	12:26:30
Date	2017-09-15
Actionlists	0

Figure 15.1: vManager

The following section explain the buttons in the vManager, as seen in figure 15.1.

15.1 Backup

Backups of all the programming data inside the device can be made. This backup file (an XML) is saved on the computer's hard-disk and can be easily transferred via e-mail or USB stick. The data of the backup can be restored via the *Restore* button.



FILENAME	DEVICE	FIRMWARE	DATE	SIZE

☑ Settings

☑ Show Control

Selected file

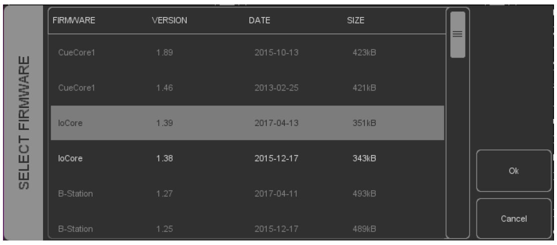
Figure 15.2: Creating a backup

Apps distributed by app stores are not allowed to access files outside this designated location. It is important to know where vManager is storing its files, in case you wish transfer a backup file to memory stick or dropbox.

The designated file location differs per operating system and is likely to be a long and obscure path. For this reason, vManager provides you with a shortcut to the correct file location. A *Folder* button can be found in the file related dialogs. Clicking this button will open a file browser at appropriate folder.

15.2 Upgrade Firmware

To upgrade the firmware, first select the device and press the *Upgrade* Firmware button. The dialogue allows for selecting from the list of firmware versions available.



FIRMWARE	VERSION	DATE	SIZE
CueCore1	1.89	2015-10-13	423kB
CueCore1	1.46	2013-02-25	421kB
IoCore	1.39	2017-04-13	351kB
IoCore	1.38	2015-12-17	343kB
B-Station	1.27	2017-04-11	493kB
B-Station	1.25	2015-12-17	489kB

Figure 15.3: Firmware upgrade

Warning: Make sure the power to the device is not interrupted during the upgrade process.

15.3 Set Date & Time

The computer's date and time can be quickly copied to the unit by selecting a device and clicking the *Set Date & Time* button. Not all Visual Productions devices feature an internal real-time clock.

15.4 Blink

The device's LED can be set to *Blink* fast for identifying the particular unit amongst multiple devices. The blinking is enabled by double-clicking on a device in the Devices list or by selecting a device and then clicking the Blink button.

15.5 Factory Defaults

All the user data like cues, tracks and actions are stored in the on-board flash memory. They will be completely erased and all settings will reverted to their defaults by pressing the *Factory Defaults* button. This action does not affect the device's IP settings.

15.6 RTC Calibration

The CueCore3 features an internal real-time clock (RTC) that is used for generating scheduler triggers (date, time, sunrise, etc). In case that the clock is drifting, i.e. slowly falling behind or getting ahead of the real time, then it can be calibrated again using the vManager. The procedure is as follows:

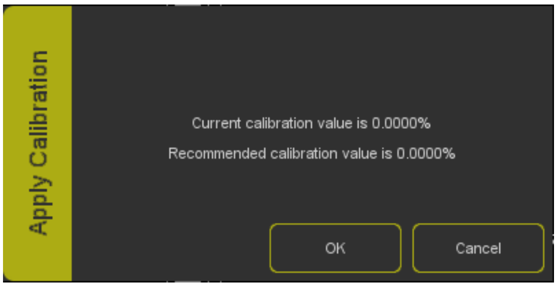
1. Select the CueCore3
2. Click on the *Start RTC Calibration* button
3. wait approximately 30 minutes
4. Click on the *Stop RTC Calibration* button
5. Apply the recommended calibration value in the dialog (figure 15.4)

15.7 Reboot

The *Reboot* button allows you to remotely restart the device. This is useful for testing the unit's behaviour after a power-cycle.

15.8 Installing vManager

The vManager app is available on a wide range of operating systems, both mobile and desktop.



Current calibration value is 0.0000%

Recommended calibration value is 0.0000%

Figure 15.4: Apply calibration value

The softwares is distributed through app-stores to take advantage of receiving future software updates automatically.

15.8.1 iOS

vManager can be downloaded from the Apple iOS app-store at `https://itunes.apple.com/us/app/vman/id1133961541`.

15.8.2 Android

vManager can be found on the Google Play store at `https://play.google.com/store/apps/details?id=org.visualproductions.manager`.

Android 5.0 or higher is required.

15.8.3 Windows

Visit the Microsoft store at `https://www.microsoft.com/en-us/p/vmanager/9nblggh4s758`.

Windows 10 is required.

15.8.4 macOS

Visit the Apple macOS app store at `https://apps.apple.com/us/app/vmanager/id1074004019`.

macOS 11.3 is recommended.

15.8.5 Ubuntu

You can acquire the vManager from Snapcraft at `https://snapcraft.io/vmanager`.

Alternatively, it can be installed by using the command-line:

```
snap find vmanager
snap install vmanager
```

To update the apps later on via the command-line type:

```
snap refresh vmanager
```

Ubuntu 22.04 LTS is recommended. The software is only available for the amd64 architecture.

Chapter 16

Kiosc

Kiosc is an application for creating custom touch screen user-interfaces for the range of lighting controllers from Visual Productions. Kiosc is designed to have no editing capability, making it a fool-proof interface that can safely be presented to non-technical operators.

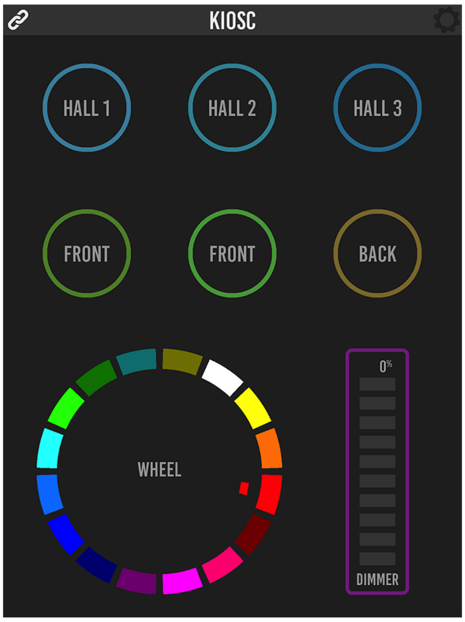


Figure 16.1: Kiosc

Kiosc is the ideal way to remote control our solid-state lighting controllers like CueluxPro, CueCore1, CueCore2, QuadCore, IoCore1, IoCore2, LPU-2, DaliCore, B-Station1 and the CueCore3. Kiosc enables you to choose scenes or presets, set intensity levels or choose RGB colours.

You can also use it to control third-party AV equipment. Kiosc speaks OSC, UDP and TCP.

Kiosc is available as software app and as a physical product. The hardware version of Kiosc is a wall-mount 7" touch screen with Kiosc pre-installed. It is powered by PoE and requires only a RJ-45 connection.

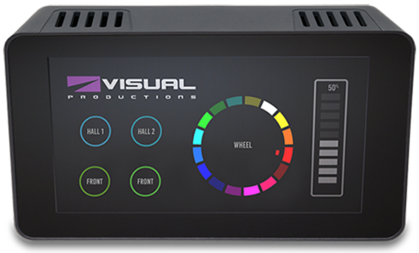


Figure 16.2: Kiosc

Please read the Kiosc manual, available from `http://www.visualproductions.nl/downloads` for more details.

Appendices

Appendix A

Trigger Types

The following tables list the different types of triggers that can be used in the CueCore3. The different types are accompanied with values and flanks.

A.1 Playback

Trigger Type	Trigger Value	Flank	Description
Active	Playback Index	Change	Playback starts or stops
Active	Playback Index	Released	Playback stops
Active	Playback Index	Start	Playback starts
Release	Playback Index	Change	Playback starts or finishes releasing
Release	Playback Index	Released	Playback finished releasing
Release	Playback Index	Release	Playback starts releasing
Released	Playback Index	Change	Playback starts or stops
Released	Playback Index	Playing	Playback starts playing
Released	Playback Index	Released	Playback finished releasing
Playing	Playback Index	Change	Playback starts or stops
Playing	Playback Index	Release	Playback starts releasing
Playing	Playback Index	Playing	Playback starts playing
Running	Playback Index	Change	Playback starts or pauses
Running	Playback Index	Paused	Playback pauses
Running	Playback Index	Playing	Playback starts playing
Intensity	Playback Index	Change	Playback intensity changes
Intensity	Playback Index	Non-zero	Playback intensity becomes >0%
Intensity	Playback Index	Zero	Playback intensity becomes 0%
End	Playback Index	-	Playback stops playing
CueChange	Cue Index	Change	Cue activated or deactivated
CueChange	Cue Index	Inactive	Cue becomes inactive
CueChange	Cue Index	Active	Cue becomes active
CueIndex	Playback Index	-	Active cue index changed
CueLabel	Playback Index	-	Label of the current Cue
TrackBegin	Playback Index	-	Track starts

A.2 Fixture

Trigger Type	Trigger Value	Flank	Description
Intensity	Fixture index [1,256]	-	A fixture’s intensity changes
Colour	Fixture index [1,256]	-	A fixture’s colour changes

A.3 DMX Input

Trigger Type	Trigger Value	Flank	Description
Channel	DMX Address	Change	Channel changes
Channel	DMX Address	Non-zero	Channel becomes non-zero
Channel	DMX Address	Zero	Channel becomes zero
UniverseA	-	-	A DMX level change in the first universe
UniverseB	-	-	A DMX level change in the second universe
UniverseC	-	-	A DMX level change in the third universe
UniverseD	-	-	A DMX level change in the forth universe
Receiving	-	Change	Start receiving or loose DMX signal
Receiving	-	Stop	Lost DMX signal
Receiving	-	Start	Start receiving DMX signal

A.4 RDM

Trigger Type	Trigger Value	Flank	Description
Count	DMX port [A,D]	-	A RDM discovery has been performed. The number of RDM fixtures found will be passed on with this trigger.

A.5 Art-Net

Trigger Type	Trigger Value	Flank	Description
Channel	DMX Channel	Change	Channel changes
Channel	DMX Channel	Non-zero	Channel becomes non-zero
Channel	DMX Channel	Zero	Channel becomes zero
UniverseA	-	-	A DMX level change in the first universe
UniverseB	-	-	A DMX level change in the second universe
UniverseC	-	-	A DMX level change in the third universe
UniverseD	-	-	A DMX level change in the forth universe
Receiving	-	Change	Start receiving or loose Art-Net signal
Receiving	-	Stop	Lost Art-Net signal
Receiving	-	Start	Start receiving Art-Net signal

A.6 sACN

Trigger Type	Trigger Value	Flank	Description
Channel	DMX Channel	Change	Channel changes
Channel	DMX Channel	Non-zero	Channel becomes non-zero
Channel	DMX Channel	Zero	Channel becomes zero
UniverseA	-	-	A DMX level change in the first universe
UniverseB	-	-	A DMX level change in the second universe
UniverseC	-	-	A DMX level change in the third universe
UniverseD	-	-	A DMX level change in the forth universe
Receiving	-	Change	Start receiving or loose sACN signal
Receiving	-	Stop	Lost sACN signal
Receiving	-	Start	Start receiving sACN signal

A.7 OSC

Trigger Type	Trigger Value	Flank	Description
Message	URI	Change	Receive a message that matches the URI
Message	URI	Down	Receive a message that matches the URI and the value non-zero
Message	URI	Up	Receive a message that matches the URI and the value is zero
Receiving	-	-	Receive any message

The user can define his own URI as the trigger value of a message, however, the OSC specification dictate this string must start with a '/' sign. Please note that this string has a maximum length of 31 characters, including the '/'.

A.8 UDP

Trigger Type	Trigger Value	Flank	Description
Message	String	-	Receive a message that matches the trigger-value
Receiving	-	-	Receive any message

The user can define his own string as the trigger value of a message. Please note that this string has a maximum length of 31 characters.

It is possible to pass a parameter along with a message. In order to do this use the syntax `trigger=value`. For example when the trigger type is set to 'message' and the trigger value is set to `intensity` then the transmitting equipment can pass an intensity level by sending `intensity=255`, where 255 can be any number in the range [0,255].

A.9 TCP

Trigger Type	Trigger Value	Flank	Description
Message	String	-	Receive a message that matches the trigger-value
Receiving	-	-	Receive any message

The user can define his own string as the trigger value of a message. Please note that this string has a maximum length of 31 characters.

A.10 GPI

Trigger Type	Trigger Value	Flank	Description
Channel	Port number	Change	Port state changes
Channel	Port number	Down	Port is closed
Channel	Port number	Up	Port is opened
Channel 0-19%	Port number	Change	Analog level enters or leaves the range
Channel 0-19%	Port number	Enter	Analog level enters the range
Channel 0-19%	Port number	Leave	Analog level leaves the range
Channel 20-39%	Port number	Change	Analog level enters or leaves the range
Channel 20-39%	Port number	Enter	Analog level enters the range
Channel 20-39%	Port number	Leave	Analog level leaves the range
Channel 40-59%	Port number	Change	Analog level enters or leaves the range
Channel 40-59%	Port number	Enter	Analog level enters the range
Channel 40-59%	Port number	Leave	Analog level leaves the range
Channel 60-79%	Port number	Change	Analog level enters or leaves the range
Channel 60-79%	Port number	Enter	Analog level enters the range
Channel 60-79%	Port number	Leave	Analog level leaves the range
Channel 80-100%	Port number	Change	Analog level enters or leaves the range
Channel 80-100%	Port number	Enter	Analog level enters the range
Channel 80-100%	Port number	Leave	Analog level leaves the range
Binary	Combination value	-	A combination of ports being closed
Short press	Port number	-	Short closure on port
Long press	Port number	-	Long closure on port

Use the Binary trigger type to catch port combinations when they are set as digital. Specify the port combination by adding the values that correspond to the ports (see table below). This value is entered as the trigger value.

Port	Value
1	1
2	2
3	4
4	8

For example, to trigger on both port 1 and 2 being closed fill in trigger value 3 (1+2). To trigger on port 3 and 4, fill in value 12 (4+8).

A.11 MIDI

Trigger Type	Trigger Value	Flank	Description
Message	MIDI address	Change	Receive a message that matches the address
Message	MIDI address	Down	Receive a message that matches the address and the value non-zero
Message	MIDI address	Up	Receive a message that matches the address and the value is zero
Receiving	-	-	Receive any message

MIDI address can be any note-on, note-off or control-change.

A.12 Timecode

Trigger Type	Trigger Value	Flank	Description
Time	Frame	-	Timecode frame
Receiving	-	Change	Start receiving or loose timecode signal
Receiving	-	Stop	Lost timecode signal
Receiving	-	Start	Start receiving timecode signal

A.13 Kiosc

Trigger Type	Trigger Value	Flank	Description
-	-	Change	Button/Fader goes up or down
-	-	Down	Button is pressed
-	-	Up	Button is released

When editing the Kiosc actionlist it will be possible to add different kind of actions such as Button, Fader and Colour Picker. These elements will be displayed in the Kiosc software.

More details on Kiosc can be found on page 100.

A.14 Scheduler

The scheduler depends on the *Date & Time* settings, as well as the *Location* settings that are located in the *Settings* page. These settings are discussed on page 84.

Trigger Type	Trigger Value	Flank	Description
WeekdayAndTime	-	-	Enable weekdays and specify a time (don't care 'X' can be used)
DateAndTime	-	-	Specify a specific date and time (don't care 'X' can be used)
Sunrise	-	-	When the sun rises in the morning
Sunset	-	-	When the sun goes down in the evening
DaylightST	-	Change	Daylight Saving Time period starts or ends
DaylightST	-	Stop	Daylight Saving Time period ends
DaylightST	-	Start	Daylight Saving Time period starts
Timespan	Index [1-4]	Change	Timespan starts or ends
Timespan	Index [1-4]	Start	Timespan starts
Timespan	Index [1-4]	Finish	Timespan ends

Timespans can be used to define periods of time. E.g. Christmas holiday or the daily opening hours of the venue. The timespan can be used for triggering in the show control page. If the CueCore3 will be power cycled during the start or finish of a timespan, then the trigger will still be fired as soon as the unit powers up. Timespans are defined on the *Settings* page.

A.15 Randomizer

The *Randomizer* will generate a pseudo-random number, this functionality is discussed on page 68.

Trigger Type	Trigger Value	Flank	Description
Result	-	-	The Randomizer made a new value
Specific Value	Number in the range of [0,255]	-	The Randomizer made a value that matches

A.16 System

Trigger Type	Trigger Value	Flank	Description
Startup	-	-	The CueCore3 has been powered up
Network Connection	-	Change	Network connection established or lost
Network Connection	-	Stop	Network connection lost
Network Connection	-	Start	Network connection established
ReleasedByMaster	-	Change	Master (e.g. CueluxPro) released or obtained connection
ReleasedByMaster	-	Stop	Master released connection
ReleasedByMaster	-	Start	Master obtained connection

Use *Startup* if something needs to happen as soon as the CueCore3 is powered on. Please note that ethernet network might not be online yet.

Use the *Network Connection* trigger if something needs to happen as soon as the ethernet network becomes online after a power-cycle.

ReleasedByMaster is a trigger that will happen when the CueCore3 is disconnected from CueluxPro.

A.17 Variable

Variables can contains a number between 0 and 255. This functionality is explained on page 65.

Trigger Type	Trigger Value	Flank	Description
Channel	Variable Index	-	The specified variable changes
Variable 1	Number [0,255]	Change	Variable 1 becomes = or # to the specified number
Variable 1	Number [0,255]	Equal	Variable 1 = number
Variable 1	Number [0,255]	Stop Equal	Variable 1 stops to be = to number
Variable 2	Number [0,255]	Change	Variable 2 becomes = or # to the specified number
Variable 2	Number [0,255]	Equal	Variable 2 = number
Variable 2	Number [0,255]	Stop Equal	Variable 1 stops to be = to number
Variable 3	Number [0,255]	Change	Variable 3 becomes = or # to the specified number
Variable 3	Number [0,255]	Equal	Variable 3 = number
Variable 3	Number [0,255]	Stop Equal	Variable 1 stops to be = to number
...			
Variable 19	Number [0,255]	Change	Variable 19 becomes = or # to the specified number
Variable 19	Number [0,255]	Equal	Variable 19 = number
Variable 19	Number [0,255]	Stop Equal	Variable 19 stops to be equal to number
Variable 20	Number [0,255]	Change	Variable 20 becomes = or # to the specified number
Variable 20	Number [0,255]	Equal	Variable 20 = number
Variable 20	Number [0,255]	Stop Equal	Variable 20 stops to be = to number

A.18 Timer

There are four timers in the CueCore3. This functionality is explained on page 67.

Trigger Type	Trigger Value	Flank	Description
Channel	Timer Index	Change	The timer starts or stops
Channel	Timer Index	Stop	The timer stops
Channel	Timer Index	Start	The timer starts
Time	Timer Index	-	A Stream of the current time of that timer

The timer will automatically stop when it reaches 00:00.0. An *Action* needs to be programmed in order to restart the timer and make it loop.

A.19 Actionlist

Actionslists are discussed in detail on page 62. The Actionlists have a checkbox for enabling/disabled. Changing this checkbox generates a trigger.

Trigger Type	Trigger Value	Flank	Description
-	Actionlist Index	Change	The actionlist enable checkbox changes
-	Actionlist Index	Down	The actionlist is enabled
-	Actionlist Index	Up	The actionlist is disabled

A.20 User List (1-4)

User lists have no triggers. Actions inside user lists can only be activated by other actions through *Action* task using the *Link* feature.

Appendix B

Task Types

Tasks allow you to automate the functionality in the CueCore3. All this functionality is categorized in task-types. This appendix provides a listing of the various task-types. The tables present an overview of all available *Features* and *Functions* per task-type.

B.1 Playback

Manipulate one of the 16 playbacks.

Feature	Function	Parameter 1	Parameter 2
Jump	Set	Playback Index	Cue index
Jump	Control	Playback Index	-
Jump	Random Control	Playback Index	-
Intensity	Set	Playback Index	percentage [0%,100%]
Intensity	Control	Playback Index	-
Intensity	Inverted Control	Playback Index	-
Intensity	Increment	Playback Index	percentage [0%,100%]
Intensity	Decrement	Playback Index	percentage [0%,100%]
Intensity	Stop Continuous	Playback Index	-
Intensity	Increment Continuous	Playback Index	percentage [0%,100%]
Intensity	Decrement Continuous	Playback Index	percentage [0%,100%]
Set Rate	Set	Playback Index	percentage [-100%,100%]
Set Rate	Control	Playback Index	-
Transport	Pause	Playback Index	-
Transport	Release	Playback Index	-
Transport	Go+	Playback Index	-
Transport	Go-	Playback Index	-
Transport	Solo	Playback Index	-
Transport	Random Solo	Playback Index	-
Play State	Toggle	Playback Index	-
Play State	Control	Playback Index	-
Play State	Inverted Control	Playback Index	-
Fader Start	Toggle	Playback Index	-
Fader Start	Control	Playback Index	-
Fader Start	Inverted Control	Playback Index	-

The *Fader Start* feature controls the playback's intensity while at the same time start the playback when the intensity is higher than 0% and release when the intensity reaches 0%.

B.2 Playback Master

Manipulate the master settings on the Playback page.

Feature	Function	Parameter 1	Parameter 2
Intensity	Set	-	percentage [0%,100%]
Intensity	Control	-	-
Intensity	Inverted Control	-	-
Intensity	Increment	-	percentage [0%,100%]
Intensity	Decrement	-	percentage [0%,100%]
Intensity	Stop Continuous	-	-
Intensity	Increment Continuous	-	percentage [0%,100%]
Intensity	Decrement Continuous	-	percentage [0%,100%]
Set Rate	Set	-	percentage [-100%,100%]
Set Rate	Control	-	-
Fade time	Set	Time	-
Fade time	Control	-	-
Release	All	-	-

B.3 Fixture

Manipulate a fixture.

Feature	Function	Parameter 1	Parameter 2
Intensity	Set	Fixture index	percentage [0%,100%]
Intensity	Control	Fixture index	-
RGB	Set	Fixture index	Colour
RGB	Control	Fixture index	-
Cold White	Set	Fixture index	percentage [0%,100%]
Cold White	Control	Fixture index	-
Warm White	Set	Fixture index	percentage [0%,100%]
Warm White	Control	Fixture index	-
Amber	Set	Fixture index	percentage [0%,100%]
Amber	Control	Fixture index	-
Select	Set	Fixture index	-
Select	Control	-	-
Select	Increment	-	-
Select	Decrement	-	-
Zoom	Set	Fixture index	percentage [0%,100%]
Zoom	Control	Fixture index	-
Focus	Set	Fixture index	percentage [0%,100%]
Focus	Control	Fixture index	-
Special	Set	Fixture index	percentage [0%,100%]
Special	Control	Fixture index	-
UV	Set	Fixture index	percentage [0%,100%]
UV	Control	Fixture index	-
Clear	Set	-	-

B.4 OSC

Send an OSC message via the network. The OSC recipients are specified in the Settings page.

Feature	Function	Parameter 1	Parameter 2
Send Float	Set	URI	floating point number
Send Float	Control	URI	-
Send Integer	Set	URI	positive number
Send Integer	Control	URI	-
Send Bool	Set	URI	true or false
Send Bool	Control	URI	-
Send String	Set	URI	String of characters
Send String	Control	URI	-
Send Colour	Set	URI	RGB colour
Send Colour	Control	URI	-

Please note that string in parameter 1 has a maximum length of 31 characters, including the compulsory leading '/' sign.

B.5 UDP

Send a UDP message via the network. Specify the recipient in Parameter 2. For example "192.168.1.11:7000".

Feature	Function	Parameter 1	Parameter 2
Send Float	Set	floating point number	IP address & port
Send Float	Control	-	IP address & port
Send Unsigned	Set	positive number	IP address & port
Send Unsigned	Control	-	IP address & port
Send Bool	Set	true or false	IP address & port
Send Bool	Control	-	IP address & port
Send String	Set	text string	IP address & port
Send String	Control	-	IP address & port
Send String Hex	Set	text string	IP address & port
Send String Hex	Control	-	IP address & port
Send Bytes	Set	Hex string	IP address & port
Wake On Lan	Set	MAC Address	IP address & port

Please note that string in parameter 1 has a maximum length of 31 characters.

The *Send Bytes* enables you to send a string of characters, where the characters are specified by their hexadecimal ASCII*ASCII* code. This allows for non-printable characters - e.g. NULL (0x00) and CR (0x0D) to be sent. For example to send the string `Visual` with an added CR and LF enter `56697375616C0D0A` in parameter 2.

When using the Wake On Lan feature parameter 1 should contain the MAC Address of system's NIC (Network Interface Controller) you wish to wake up. The recommended value for parameter 2 is `255.255.255.255:7`. This broadcasts the message to the whole network at port 7 which is most commonly used for Wake On Lan.

B.6 DMX

Manipulate the DMX levels. These are the levels that can also be sent out via Art-Net or sACN.

Feature	Function	Parameter 1	Parameter 2
Universe	Control HTP	Universe #	-
Universe	Clear	Universe #	-
Channel	Set	DMX Channel	DMX Value
Channel	Toggle	DMX Channel	-
Channel	Control	DMX Channel	-
Channel	Inverted Control	DMX Channel	-
Channel	Decrement	DMX Channel	-
Channel	Increment	DMX Channel	-
Bump	Set	DMX Channel	DMX Value
Bump	Control	DMX Channel	-
Clear	All	-	-
RGB	Set	DMX Address	RGB Colour value
RGB	Control	DMX Address	-
RGBW	Set	DMX Address	RGBW Colour value
RGBW	Control	DMX Address	-
XY	Control	DMX Address	-
XxYy	Control	DMX Address	-
Ii	Set	DMX Address	Intensity Value
Ii	Control	DMX Address	-
Block	Control	DMX address and footprint	Fixture count
Set Source	-	-	-

The *Bump* feature will momentarily set the value of a DMX channel and then take it back to 0, effectively creating a pulse.

XY will take an incoming position and translate it to two DMX channels. *XxYy* will translate it to four DMX channels; a 16-bit pan and a 16-bit tilt level.

The *Ii* feature can take an incoming value and translate it to two-channel DMX 16-bit value.

Block can set a number of DMX channels to the same value. Parameter 1 will denote the starting channel and parameter 2 determines how many channels will be set. The footprint field in parameter 1 offers the possibility to have 'space' between the channels.

B.7 RDM

Perform a discovery using the RDM protocol.

Feature	Function	Parameter 1	Parameter 2
Discover	Set	DMX port [A,D]	-

B.8 TCP

Send a TCP message via the network. Specify the recipient in Parameter 2. For example "192.168.1.11:7000".

Feature	Function	Parameter 1	Parameter 2
Send Float	Set	floating point number	IP address & port
Send Float	Control	-	IP address & port
Send Unsigned	Set	positive number	IP address & port
Send Unsigned	Control	-	IP address & port
Send Bool	Set	true or false	IP address & port
Send Bool	Control	-	IP address & port
Send String	Set	text string	IP address & port
Send String	Control	-	IP address & port
Send String Hex	Set	text string	IP address & port
Send String Hex	Control	-	IP address & port
Send Bytes	Set	Hex string	IP address & port
Wake On Lan	Set	MAC Address	IP address & port

Please note that string in parameter 1 has a maximum length of 31 characters.

The *Send Bytes* enables you to send a string of characters, where the characters are specified by their hexadecimal ASCII*ASCII* code. This allows for non-printable characters - e.g. NULL (0x00) and CR (0x0D) to be sent. For example to send the string `Visual` with an added CR and LF enter `56697375616C0D0A` in parameter 2.

When using the Wake On Lan feature parameter 1 should contain the MAC Address of system's NIC (Network Interface Controller) you wish to wake up. The recommended value for parameter 2 is `255.255.255.255:7`. This broadcasts the message to the whole network at port 7 which is most commonly used for Wake On Lan.

B.9 System

Miscellaneous tasks.

Feature	Function	Parameter 1	Parameter 2
Blink	Set	On or Off	-
Blink	Toggle	-	-
Blink	Control	-	-
Blink	Pulse	Seconds	-

The Blink feature controls the LED on the unit as seen in figure 5.2.

B.10 Timer

Manipulate on of the four internal timers.

Feature	Function	Parameter 1	Parameter 2
Playstate	Start	Timer #	-
Playstate	Stop	Timer #	-
Playstate	Restart	Timer #	-
Time	Set	Timer #	Time

B.11 Randomizer

Trigger the Randomizer to generate a new random number.

Feature	Function	Parameter 1	Parameter 2
Refresh	Set	Minimum value	Maximum value

The Randomizer functionality is discussed on page 68.

B.12 Variable

Manipulate one of the 10 variables.

Feature	Function	Parameter 1	Parameter 2
Set Value	Set	Variable #	Number in the range of [0,255]
Set Value	Toggle	Variable #	Number in the range of [0,255]
Set Value	Control	Variable #	-
Set Value	Inverted Control	Variable #	-
Set Value	Decrement	Variable #	-
Set Value	Increment	Variable #	-
Set Value	Stop Continuous	Variable #	-
Set Value	Continuous Decrement	Variable #	Delta
Set Value	Continuous Increment	Variable #	Delta
Set Value	Control Scaled	Variable #	-
Set Value	Control Offset	Variable #	-
Refresh	Set	Variable #	-
Single Dimmer	Set	Variable #	Delta
Curve	Control	Variable #	Curve
Curve	Inverted Control	Variable #	Curve

Variables are further explained on page 65.

The Single Dimmer feature is used to increase or decrease a level by using only one switch. When controlling this task through a GPI action , then closing the GPI will increase or decrease the level. Opening the GPI port will freeze on the current level. This feature is useful for controlling an intensity will just one button.

B.13 Action

Use the Link feature to have one action trigger another action.

Feature	Function	Parameter 1	Parameter 2
Link	Set	Action	-

B.14 Actionlist

Manipulate an actionlist.

Feature	Function	Parameter 1	Parameter 2
Enable	Set	Actionlist	On or Off
Enable	Toggle	Actionlist	-
Enable	Control	Actionlist	-
Enable	Inverted Control	Actionlist	-

B.15 sACN Setting

Change the universe routing for sACN. These settings are visible in the *Settings* page.

Feature	Function	Parameter 1	Parameter 2
Input	Set	Universe [A,D]	sACN Universe [0,63999
Input	Control	Universe [A,D]	-
Output	Set	Universe [A,D]	sACN Universe [0,63999]
Output	Control	Universe [A,D]	-
Priority	Set	Universe [A,D]	Priority [0,200]
Priority	Control	Universe [A,D]	-

B.16 Art-Net Setting

Change the universe routing for Art-Net. These settings are visible in the *Settings* page.

Feature	Function	Parameter 1	Parameter 2
Input	Set	Universe [A,D]	Art-Net Universe [0.0, 15.15]
Input	Control	Universe [A,D]	-
Output	Set	Universe [A,D]	Art-Net Universe [0.0, 15.15]
Output	Control	Universe [A,D]	-

B.17 GPI

Manipulate the GPI port.

Feature	Function	Parameter 1	Parameter 2
Sample Binary	Set	-	-
Refresh	Set	-	-

B.18 MIDI

Send a MIDI message.

Feature	Function	Parameter 1	Parameter 2
Send	Set	MIDI Address	MIDI Value
Send	Control	MIDI Address	-

B.19 Time Server

Fetch a time from the NTP time server. Please refer to the Settings on page 84.

Feature	Function	Parameter 1	Parameter 2
Refresh	Set	-	-

B.20 Timecode

Manipulate the internal timecode generator.

Feature	Function	Parameter 1	Parameter 2
Playstate	Start	-	-
Playstate	Stop	-	-
Playstate	Restart	-	-
Playstate	Pause	-	-
Time	Set	-	Time

B.21 Track

Manipulate the settings on the Track page or record a snapshot.

Feature	Function	Parameter 1	Parameter 2
Program	Stop	-	-
Program	Record	Track Index	-
Program	Erase	Track Index	-
Intensity Map	Clear	-	-
Intensity Map	Capture DMX	-	-
Intensity Map	Capture Art-Net	-	-
Intensity Map	Capture sACN	-	-
Snapshot	Clear	-	-
Snapshot	Capture DMX	-	-
Snapshot	Capture Art-Net	-	-
Snapshot	Capture sACN	-	-

Please refer to page **??** for more details on *Intensity Map*.

The *Snapshot* feature records a static scene from an incoming protocol like DMX, Art-Net or sACN.

B.22 MMC

Send a MMC (MIDI Machine Control) message via the MIDI port.

Feature	Function	Parameter 1	Parameter 2
Send	Start	MIDI Channel	-
Send	Stop	MIDI Channel	-
Send	Restart	MIDI Channel	-
Send	Pause	MIDI Channel	-
Send	Record	MIDI Channel	-
Send	Deferred Play	MIDI Channel	-
Send	Record Exit	MIDI Channel	-
Send	Record Pause	MIDI Channel	-
Send	Eject	MIDI Channel	-
Send	Chase	MIDI Channel	-
Send	Fast Forward	MIDI Channel	-
Send	Rewind	MIDI Channel	-
Send	Goto	MIDI Channel	Time

Appendix C

Templates

This appendix discusses the templates provided in the Show Control page.

Template	Description
Receiving DMX	Receiving DMX on all ports. DMX properties in the Settings page have to be configured accordingly.
Receiving Art-Net	Receiving DMX on all universes. Art-Net properties in the Settings page have to be configured accordingly.
Receiving sACN	Receiving sACN on all universes. sACN properties in the Settings page have to be configured accordingly.
Art-Net ->Playbacks	Art-Net universe A (channel 1-16) will control the intensity of all sixteen playbacks. When a channel is >0% it will activate the playback, when set 0% it the playback will be released.
sACN ->Playbacks	sACN universe A (channel 1-16) will control the intensity of all sixteen playbacks. When a channel is >0% it will activate the playback, when set 0% it the playback will be released.
Kiosc ->Playbacks	A simple Kiosc layout is generated in order to control all 16 playbacks. Connect Kiosc to the CueCore3 using the *Remote* mode.
DMX ->MIDI	Translates 8 channels from DMX port A into outgoing MIDI ControlChange messages in MIDI channel 1. DMX port A should be configured as an input in the Settings page.
Digital GPI ->4 Playbacks	The GPI ports will control the Playstate of playbacks 1-4. Make sure the GPI ports are configures as *Digital*.

Appendix D

API

The CueCore3 is pre-programmed to make its internal functionality available via OSC, TCP, UDP and HTTP. There is a simple API implemented for each protocol. Notwithstanding these API's, it is possible to create your own OSC, TCP and UDP implementation in the Show Control page.

The API is originally designed for external equipment to control the CueCore3, however, it is also capable to send information back. This feedback mechanism is discussed at the end of this chapter, on page 134.

D.1 OSC

The following table uses playback #1 as an example. The number '1' can be replaced by any number in the range of [1,16].

URI	Parameter	Description
/core/pb/1/go+*	-	Jump to the next cue in playback #1
/core/pb/1/go-	-	Jump to the previous cue in playback #1
/core/pb/1/jump	integer	Jump to a specific cue in playback #1
/core/pb/1/release	-	Release the playback
/core/pb/1/intensity	float	Set the playback's intensity
/core/pb/1/rate	float	Set the playback's intensity
/core/pb/release	-	Release all playbacks
/core/pb/intensity	float	Set the master intensity
/core/pb/rate	float	Set the master rate
/core/pb/fade	string	Set the master fade time
/core/pb/solo	integer	Start a solo playback

* This command does not work when the parameter is off or a 0 value.

The following table uses track #1 as an example. The number '1' can be replaced by any number in the range of [1,128].

URI	Parameter	Description
/core/tr/select	integer	Select a track
/core/tr/erase	-	Erase the selected track
/core/tr/record	-	Start recording the selected track
/core/tr/stop	-	Stop recording
/core/tr/1/erase	-	Erase track #1
/core/tr/1/record	-	Start recording track #1
/core/tr/snapshot/dmx	-	Record a snapshot of the current DMX input
/core/tr/snapshot/artnet	-	Record a snapshot of the current Art-Net input
/core/tr/snapshot/sacn	-	Record a snapshot of the current sACN input

The following table only applies when Internal is selected as timecode in at the settings page.

URI	Parameter	Description
/core/tc/start	-	Start the internal timecode
/core/tc/stop	-	Stop the internal timecode
/core/tc/restart	-	Restart the internal timecode
/core/tc/pause	-	Pause the internal timecode
/core/tc/set	string	Set the internal timecode

The following table uses actionlist #1 as an example. The number '1' can be replaced by any number in the range of [1,16]. The table also uses action #2 as an example. The number '1' can be replaced by any number in the range of [1,48].

URI	Parameter	Description
/core/al/1/2/execute	bool/float/integer	Execute action #2 inside action list #1
/core/al/1/enable	bool	Set the 'enable' checkbox for action list #1

The following table uses timer #1 as an example. The number '1' can be replaced by any number in the range of [1,4].

URI	Parameter	Description
/core/tm/1/start	-	Start timer #1
/core/tm/1/stop	-	Stop timer #1
/core/tm/1/restart	-	Restart timer #1
/core/tm/1/pause	-	Pause timer #1
/core/tm/1/set	time-string	Set timer #1 at the time-string

The following table uses variable #1 as an example. The number '1' can be replaced by any number in the range of [1,20].

URI	Parameter	Description
/core/va/1/set	integer	Set the value of variable #1
/core/va/1/refresh	-	Refresh variable #1; a trigger will be generated as if the variable changed value
/core/va/refresh	-	Refresh all variables; triggers will be generated

The following table shows how to active miscellaneous functions.

URI	Parameter	Description
/core/dmx/1	integer	Set the value of a DMX channel
/core/blink	-	Momentarily flashes the CueCore3's LED
/core/hello	-	The unit will reply with the same Hello message

D.2 TCP & UDP

TCP (Transmission Control Protocol) is a protocol for sending messages across an Ethernet network. TCP provides reliable, ordered and error-checked delivery of messages between programs running on computers connected to a local area network, intranet or the public Internet.

UDP (User Datagram Protocol) is a simple protocol for sending message across the network. It does not provide any error checking. Although UDP is a bit faster than TCP, it is less secure.

Typically either TCP or UDP is supported by various media devices like video projectors and show controllers.

The functionality within the CueCore3 can controlled by using the following ASCII strings (human readable text) messages:

The following table uses playback #1 as an example. The number '1' can be replaced by any number in the range of [1,16].

String	Description
core-pb-1-go+	Jump to the next cue in playback #1
core-pb-1-go-	Jump to the previous cue in playback #1
core-pb-1-jump=<integer>	Jump to a specific cue in playback #1
core-pb-1-release	Release the playback
core-pb-1-intensity=<float>	Set the playback's intensity
core-pb-1-rate=<float>	Set the playback's intensity
core-pb-release	Release all playbacks
core-pb-intensity=<float>	Set the master intensity
core-pb-rate= <float>	Set the master rate
core-pb-fade=<text>	Set the master fade time
core-pb-solo=<integer>	Start a solo playback

The following table uses track #1 as an example. The number '1' can be replaced by any number in the range of [1,128].

String	Description
core-tr-select=<integer>	Select a track
core-tr-erase	Erase the selected track
core-tr-record	Start recording the selected track
core-tr-stop	Stop recording
core-tr-1-erase	Erase track #1
core-tr-1-record	Start recording track #1
core-tr-snapshot-dmx	Record a snapshot of the current DMX input
core-tr-snapshot-artnet	Record a snapshot of the current Art-Net input
core-tr-snapshot-sacn	Record a snapshot of the current sACN input

The following table only applies when Internal is selected as timecode in at the settings page.

String	Description
core-tc-start	Start the internal timecode
core-tc-stop	Stop the internal timecode
core-tc-restart	Restart the internal timecode
core-tc-pause	Pause the internal timecode
core-tc-set= <string >	Set the internal timecode

The following table uses actionlist #1 as an example. The number '1' can be replaced by any number in the range of [1,16]. The table also uses action #2 as an example. The number '1' can be replaced by any number in the range of [1,48].

String	Description
core-al-1-2-execute=<arg>	Execute action #2 inside action list #1
core-al-1-enable=<bool>	Set the 'enable' checkbox for action list #1

The following table uses timer #1 as an example. The number '1' can be replaced by any number in the range of [1,4].

String	Description
core-tm-1-start	Start timer #1
core-tm-1-stop	Stop timer #1
core-tm-1-restart	Restart timer #1
core-tm-1-pause	Pause timer #1
core-tm-1-set=<text>	Set timer #1 at the time-string

The following table uses variable #1 as an example. The number '1' can be replaced by any number in the range of [1,20].

String	Description
core-va-1-set=<integer>	Set the value of variable #1
core-va-1-refresh	Refresh variable #1; a trigger will be generated as if the variable changed value
core-va-refresh	Refresh all variables; triggers will be generated

The following table shows how to activate miscellaneous functions.

String	Description
core-dmx-1=<integer>	Set the value of a DMX channel
core-blink	Momentarily flashes the CueCore3's LED
core-hello	The unit will reply with the same Hello message

D.3 HTTP

HTTP (Hyper Text Transfer Protocol) is the standard protocol to access web pages. It can also be used to control the CueCore3, using the URLs listed below.

The following table uses playback #1 as an example. The number '01' can be replaced by any number in the range of [01,16].

Description	URL	Parameter Range	Example
Playback Go Forward	/ajax/pb/XX/go+	-	http://192.168.1.10/ajax/pb/01/go+
Playback Go Back	/ajax/pb/XX/go-	-	http://192.168.1.10/ajax/pb/01/go-
Playback Jump	/ajax/pb/XX/jump	[1, 32]	http://192.168.1.10/ajax/pb/01/jump
Release playback	/ajax/pb/XX/release	-	http://192.168.1.10/ajax/pb/01/release
Set playback intensity	/ajax/pb/XX/intensity	[0.0, 1.0]	http://192.168.1.10/ajax/pb/01/intensity=0.55
Set playback rate	/ajax/pb/XX/rate	[-1.0, 1.0]	http://192.168.1.10/ajax/pb/01/rate=0.55
Release all playbacks	/ajax/pb/release	-	http://192.168.1.10/ajax/pb/release
Set master intensity	/ajax/pb/intensity	[0.0, 1.0]	http://192.168.1.10/ajax/pb/intensity=0.55
Set master rate	/ajax/pb/rate	[-1.0, 1.0]	http://192.168.1.10/ajax/pb/rate=0.55
Set master fade	/ajax/pb/fade	text	http://192.168.1.10/ajax/pb/fade=3s
Start a solo playback	/ajax/pb/solo	[1, 6]	http://192.168.1.10/ajax/pb/solo=3

Description	URL	Example
Record a snapshot of DMX	/ajax/tr/snapshot/dmx	http://192.168.1.10/ajax/track/snapshot/dmx
Record a snapshot of Art-Net	/ajax/tr/snapshot/artnet	http://192.168.1.10/ajax/track/snapshot/artnet
Record a snapshot of sACN	/ajax/tr/snapshot/sacn	http://192.168.1.10/ajax/track/snapshot/sacn

The following table uses actionlist #1 as an example. The number '01' can be replaced by any number in the range of [01,16].

Description	URL	Parameter Range	Example
Execute action	/ajax/al/XX/XX/execute	true/false	http://192.168.1.10/ajax/al/01/02/execute=true
Enable actionlist	/ajax/al/XX/enable	true/false	http://192.168.1.10/ajax/al/01/enable=false

Description	URL	Parameter Range	Example
Blink LED	/ajax/blink	-	http://192.168.1.10/ajax/blink

You can send your HTTP GET requests to port 80.

D.4 Feedback

The CueCore3 is able to send feedback to external equipment using its API, so called 'clients'. The CueCore3 keeps a memory of the last four OSC clients and last four UDP clients. The clients will automatically receive updates on several playback related state changes.

Below is a table listing the messages the CueCore3 will send back to its clients.

The `hello` command is ideal for polling the device; it allows you to verify that the CueCore3 is online at the IP address and port that you expect.

A power-cycle will clear the internal client lists. Send `/core/goodbye` or `core-goodbye` to explicitly be removed from the client list.

Consider programming custom action in the show control when additional feedback functionality is required.

D.4.1 Preventing a feedback loop

Feedback is automatically send to a device which uses the OSC or UDP API. If the external device is also a Visual Productions unit then the feedback message could be interpreted by the external unit a new command. This can result in another feedback message being generated. An endless stream of feedback messages can stall the units involved.

This feedback loop can be prevented by assign a unique label the device's API prefix. This setting is discussed on page 82.