DYNAMIC PROJECTION
INSTITUTE

MDC-X Media Server

Quick Setup Guide and Manual for MDC-X1 and MDC-X2

Quick Setup Guide for MDC-X1 and MDC-X2

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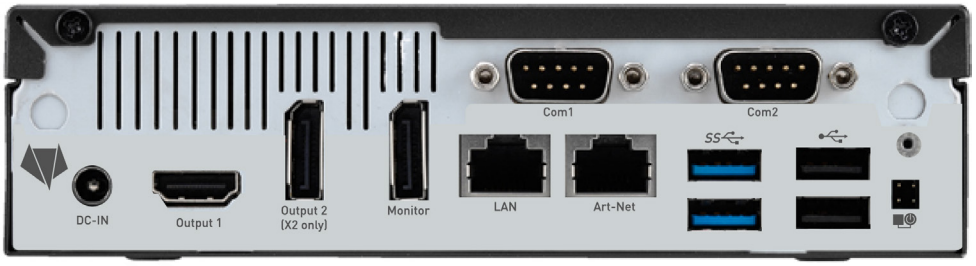
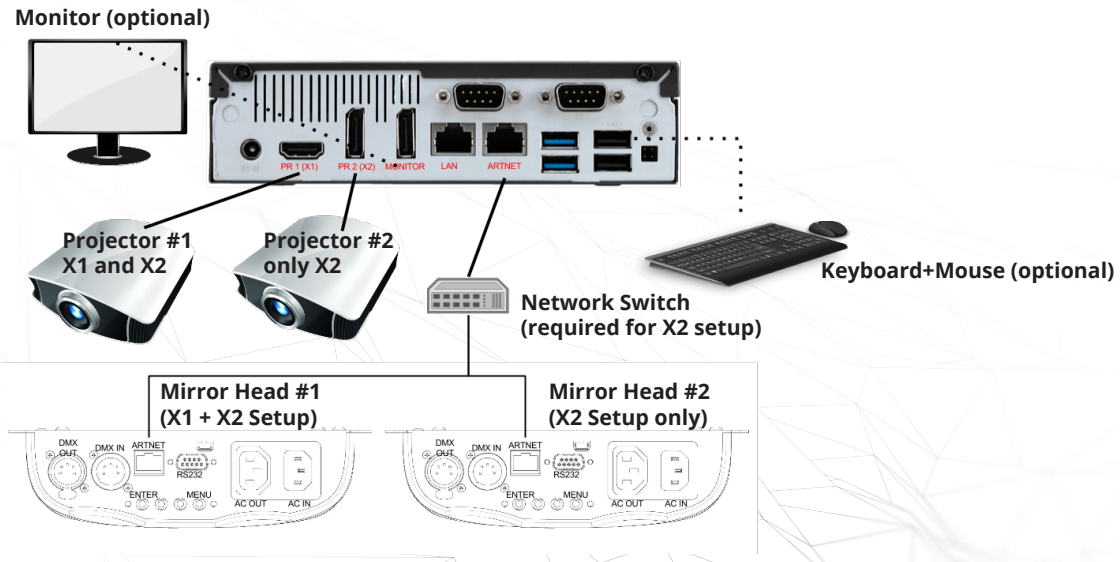
⚠ BEFORE YOU TURN ON ANY COMPONENT YOU HAVE TO MAKE ALL CONNECTIONS. THE ILLUSTRATIONS BELOW SHOW YOU HOW TO CONNECT THE MDC TO THE MIRROR HEAD, PROJECTOR, MONITOR AND KEYBOARD/MOUSE DEPENDING OF WHAT TYPE OF MDC YOU BOUGHT. PLEASE READ THE INSTRUCTION CAREFULLY! IF YOU ARE UNSURE PLEASE CONTACT US!

Below you see the connection diagrams for the MDC-X1 and MDC-X2 system. Please make sure you have all cables and adapters ready before you start connecting the systems.



Backside of the MDC-X system



In the case of an MDC-X1 system you do not need the "Network Switch". The second output is not fully available on a MDC-X1 system, so DO NOT CONNECT A DEVICE.

- **DO NOT OPEN THE MDC-X CASE .**
- **DO NOT COVER THE VENTILATION ON TOP AND OF THE SIDE OF THE MDC-X.**
- **DO NOT USE ANY OTHER POWER SUPPLY THAN THE ONE THAT WAS SHIPPED WITH THE UNIT.**

1. Connecting the Output devices

1.1 Programming Monitor

The Monitor MUST HAVE at least a resolution of 1920x1080 @ 60Hz with a connection either DVI, HDMI, VGA or DP. Whenever you connect a monitor without rebooting/booting and it is not recogniced you have to press "CTRL+ALT+SHIFT+S" , call "SCREEN SETUP" on the Touch interface or press "3.2 Reset System Outputs" on the MDC-Launcher. If you do not see any output or only a part of the screen check the SETUP page and RESOLUTION settings on MDC-Touch by connecting via Remote-Desktop or Browser (requires MDC-Touch Remote License). Note that you have to reboot as the system tells you after you changes the values. By default the resolution is set to 1920x1080@60Hz. If your need an adapter for your Monitor (if it does not have a DP connection) we recommend adapters made by "DeLock" (www.delock.de).

- DP->HDMI (DeLock Art.: 61849)
- DP->DVI (DeLock Art.: 61847)
- DP->VGA (DeLock Art.: 61848)

All adapters are passive due to the fact that the MDC offers DP++ ports.

Note: The Programming Monitor is optional and not required during playback of shows. Programming of shows can also be done with remote desktop software depending on the quality of you network.

1.2 Projector(s)

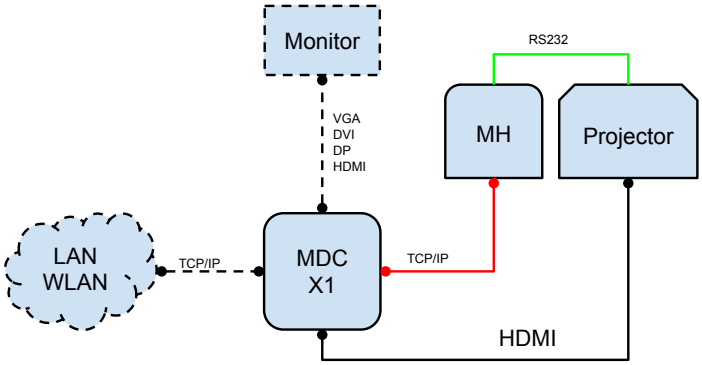
After you connected the projector for the first time please power it on before you turn on the MDC-X. Please note that some projectors do have a very long LAMP ON/OFF timeout depending on the last state of the lamp and the shutdown integrity - it may happen that the LAMP ON/OFF command (sent by TOUCH) is ignored if it was called to early. Later on you can control (ON/OFF) the Projector remotely by using MDC-Touch, DMX or OSC.

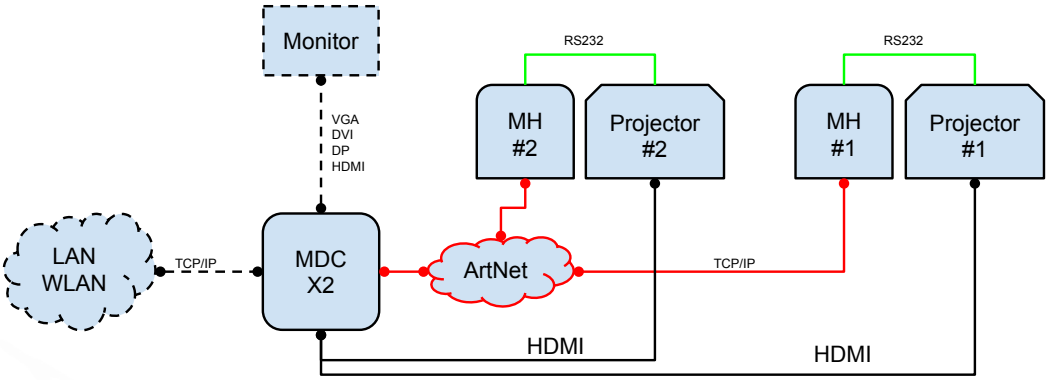
Notes on the connectors:

- HDMI output supports DVI-D with optional adapter.
- How to convert DisplayPort into HDMI/DVI:
  The DisplayPort outputs can be converted to HDMI or DVI by an additional, passive adapter cable. For example: DELOCK 82590: 1m, DisplayPort (male, 20p) to HDMI-A (male, 19p) DELOCK 82435: 5m, DisplayPort (male, 20p) to DVI-D (male, 24p)- The integrated graphics automatically detects the connected display and puts out the appropriate electric signal - either through DisplayPort (without an adapter) or HDMI/DVI (with an adapter). However, a monitor with a DisplayPort connector cannot be connected to the HDMI port with a simple, passive adapter.

⚠DO NOT CONNECT ANY DISPLAY SPLITTERS (DUAL OR TRIPLE HEAD UNITS) TO ONE OF THE DISPLAY/ OUTPUT CONNECTORS!

⚠DO NOT CONNECT THE MONITOR, PROJECTOR AND MIRROR HEAD TO ANY OTHER CONNECTOR THAN THE ONE SHOWN ON THE ILLUSTRATIONS!





Schematics of connections

1.3 Networks

The MDC comes with two network connections: one for Art-Net controlling the Mirror Head and one for LAN connection. The default IP of the LAN-Connection is 192.168.0.200/255.255.255.0 and 2.0.0.2/255.0.0.0 for Art-Net. The MDC has built in Wireless-Lan adapter. Before you can use it you have to install the antennas shipped with it and then connect to the WiFi-Hotspot using the Network-Manager in the lower right of the Desktop.

1.4 Mirror Head

The MDC-X system is preconfigured for the use with Mirror Head units. Its template generator asumes Mirror head #1on Art-Net Adress 2.0.0.3 and DMX Start Address of 001. The 2nd Mirror Head on 2.0.0.4 and DMX 015. Please make sure that your Mirror Head is configured correctly! For more information please read the Mirror Head Quick Installation Guide on how to change the Art-Net and DMX settings.

1.5 Note on attaching and detaching a monitor or projector

During operation of the MDC-X you can always hot-plug the programming monitor (assuming you always use the same monitor). Whenever you plug it in again you may have to call the reset of the system outputs routine so the MDC-X starts to detect it. There are many ways to do it:

- Press CTRL+ALT+SHIFT+S
- Click on “3.2 Reset System Outputs” on the MDC-Launcher interface on the desktop
- Click “MDC CONTROL -> MDC CONTROL -> SCREEN SETUP” on the MDC-Touch
- Call “/opt/mdcos/bin/mdc-screensetup” on the shell prompt
- Send “SCREENSETUP” to the mdc-daemon using the MDC PROXY interface (remote)
- Send “/opt/mdcos/bin/mdc-sender SCREENSETUP” to the local system

If you replug a projector during operation (this should never happen) the screen layout and output must be reconfigured also. The recommended way to do so is to reboot the MDC. A reboot can be initiated by:

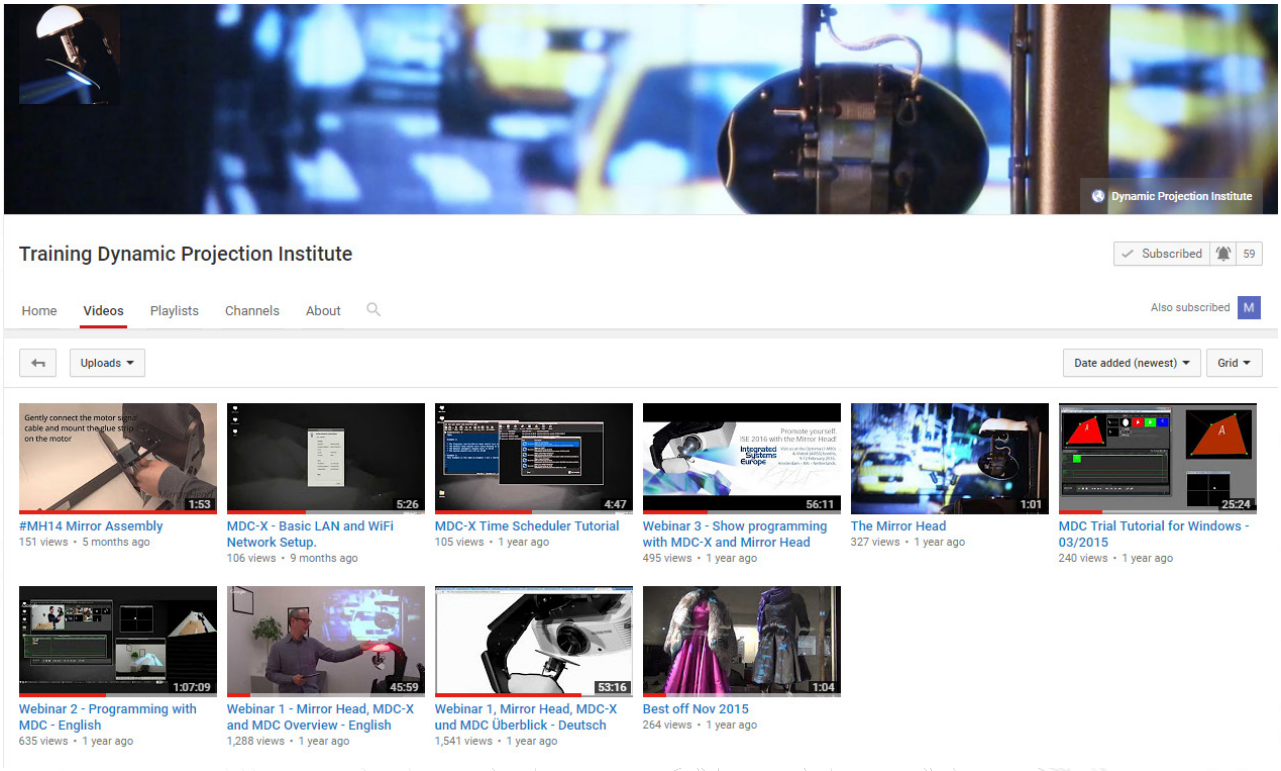
-
- Pressing CTRL+ALT+SHIFT+R
- Click “MDC CONTROL -> MDC CONTROL -> REBOOT MDC” on the MDC Touch
- Call “shutdown -r now” on the shell prompt
- Send “MDC_REBOOT” to the mdc-daemon using the MDC PROXY interface (remote)
- Send “/opt/mdcos/bin/mdc-sender MDC_REBOOT ” to the local system

⚠ BEFORE YOU CONTINUE PLEASE NOTICE:

DO NOT:

- **CHANGE THE USERNAME, HOSTNAME OR ANY DIRECTORY NAME ON THE SYSTEM!**
- **UPDATE THE SYSTEM UNLESS OUR SUPPORT TELLS YOU SO**
- **INSTALL OR REMOVE ANY OTHER SOFTWARE THAN THE ONE THAT IS SHIPPED WITH THE MDC-X**
- **SETUP THE SCREEN/DISPLAY WITH ANY OTHER PROGRAMM THAN THE MDC-X TOOLS**
- **CHANGE THE ARTNET/LAN NETWORK WITHOUT REASON**
- **USE REMOTE DESKTOP CONNECTION ON HIGH LATENCY NETWORKS**

You will find more information and tutorials on our YouTube Training channel:
http://www.dynamicprojection.com/training/



2. Starting the MDC-X for the first time

- **MDC-X: The MDC-X Media Server is a state of the art combination of hardware and software (MDC Control Software) to control the Mirror Head Out of the box, our system is ready-to-use.It is an industry approved highly optimized Linux Operating System. Commercial campaigns or corporate communication tasks can individually and creatively be assembled into shows using the MDC-X Media Server. With the MDC-X Media Server, content can easily and readily be transferred to the Mirror Head for projection, no matter where the input comes from. Built- in functions include: show automatization, a time scheduler, remote control options and many more.**

- **MDC: MDC Control Software offers key features such as: Media manipulation, geometric corrections, seamless transformations, Show Presets and DMX / Art-Net control. Images and videos can easily be arranged on screen using projection maps. Youcan create perfectly designed perspective projection mappings, picture-in-picture presentations and animations or just do simple cropping and alignment using their own media content. The show engine is controlled by a Timeline and/or Presets. Remote show control is also possible using OSC or DMX.**

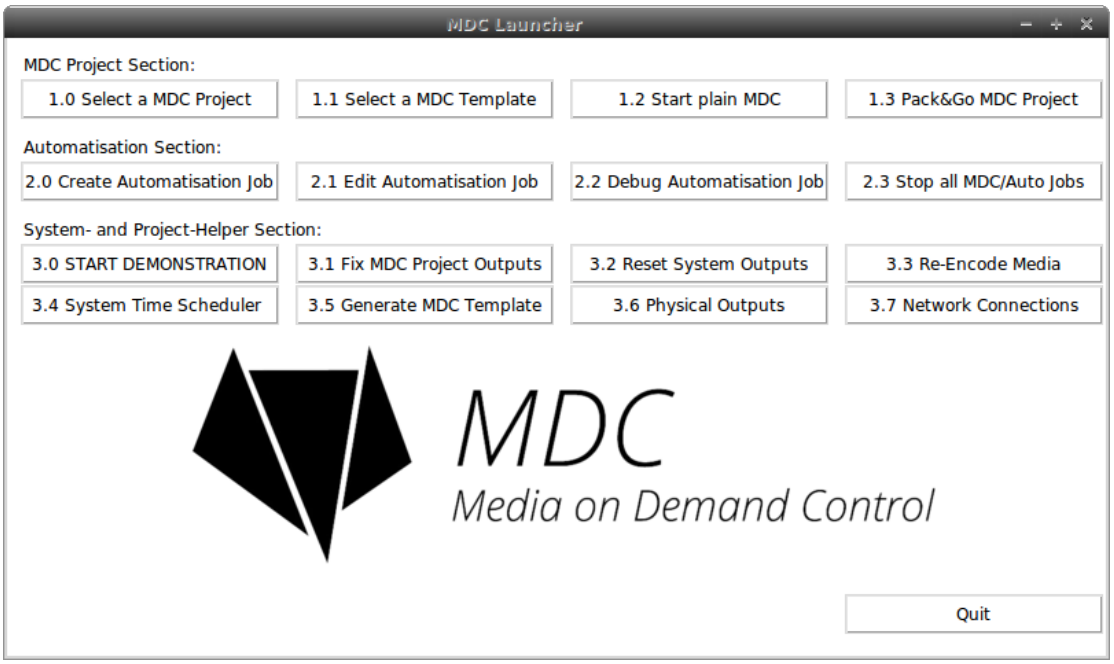
- **MDC-Touch: MDC-Touch allows to remotely (MDC-Touch network license required!) control the MDC-X Media Server using any device that has a browser (e.g. smartphones, tablets or desktop computers). No installation of any software or application is needed. With one click, customers can start and stop shows as well as playlists. You can have previews of all media content with thumbnails. Turning a projector on and off can also be done using the MDC-Touch. The local access to MDC-Touch through the desktop is always available.**

After you have connected the MDC-X to all devices please turn on the projector and the Mirror Head unit. When the Mirror Head unit finished calibrating itself and the mirror is in the home position turn on the MDC-X by pressing the Power button at the front; the desktop of the MDC-X will show up after a few seconds. During the start the display will flicker, this is normal because of the detection of the output screens.
NOTE: If you dont have a main screen connected you can still use the MDC-X by accessing it with a remote desktop software like VNC or NoMachine. (see section Remote Connection). For first time users we recommend a physical main screen.

The main programs on the desktop are:

2.1 MDC Launcher

This program is the main control to start programming MDC projects. Here you can select templates, projects, control various system features and run the MDC program.



The MDC-Launcher offers the following options:

- 1.0 Select a MDC Project:
  Here you can select and start an existing MDC project. The base-path is /home/mdcuser/Documents/. Please place all your projects only into this directory, otherwise they wont show up in MDC-Touch or on other parts of the MDC-X system.

- 1.1 Select a MDC Template:
  MDC Templates are the same as MDC projects but they are placed into /home/mdcuser/Templates/. Placing projects into this folder gives you the possibility to organise you work better.

- 1.2 Start plain MDC
  This start the MDC programm without any preconfigurations as DMX or Outputs.

- 1.3 Pack&Go MDC Project:
  Any project you select here will be re-organised and re-packed so it can be sent to other systems. This is mainly for debugging of projects.

- 2.0 Create Automatisation Job:
  Automatisation Jobs are scripts which control a MDC project over OSC. When you select a MDC project an Automatisation Job "Template" (suffix .mdc_auto_template) will be created. Inside of this template you will find all various informations extracted from the project so you can start editing your Automatisation Job (see Button 2.1)

- 2.1 Edit Automatisation Job:
  Here you can select Automatisation Job files and Automatision Job Templates. The file you choose will be opened in a text editor. Whenever you open an Automatisation Job Template (suffix .mdc_auto_template) please rename it to a new filename with the suffix ".mdc_auto"; otherwise you will not be able to debug/run the job and/or will overwrite you edit when you recreate a template!

- 2.2 Debug Automatisation Job
  During editing an Automatisation Job there comes the time when you want to see what the script does. Here you can open a script and see the OSC calls that are sent to the current MDC project that is running. Please note that your MDC project must have a valid OSC (remote control) setup file installed in order to make this possible. If you started your project using the MDC template generator (3.5 Generate MDC Template) or started the project using MDC-Touch then the project will have such an OSC setup file installed.

- 2.3 Stop All MDC/Auto Jobs
  This will instantly terminate all Automatisation and MDC Jobs without asking for saving!

- <u>3.0 START DEMONSTRATION</u>

This starts demonstration projects on your MDC-X and Mirror Head system. You can choose between a Preset or Timeline Demonstration. The Preset Demonstration offers you the possibility to switch between positions and animations manually. NOTE: This feature autodetects the outputs on your MDC-X system and will only work correctly if:

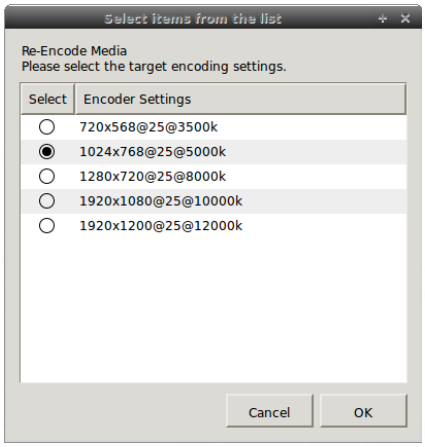
* All projectors/screens are turned on and recognised by the system
* All Mirror Head units are connected to the ArtNet network. The demonstration asumes Mirror Head #1 on 2.0.0.3 with DMX #1 and Mirror Head #2 on 2.0.0.4 with DMX #15.

Every time you select this button again the detection process will start again, so please do not modify the projects because they will be overwritten.

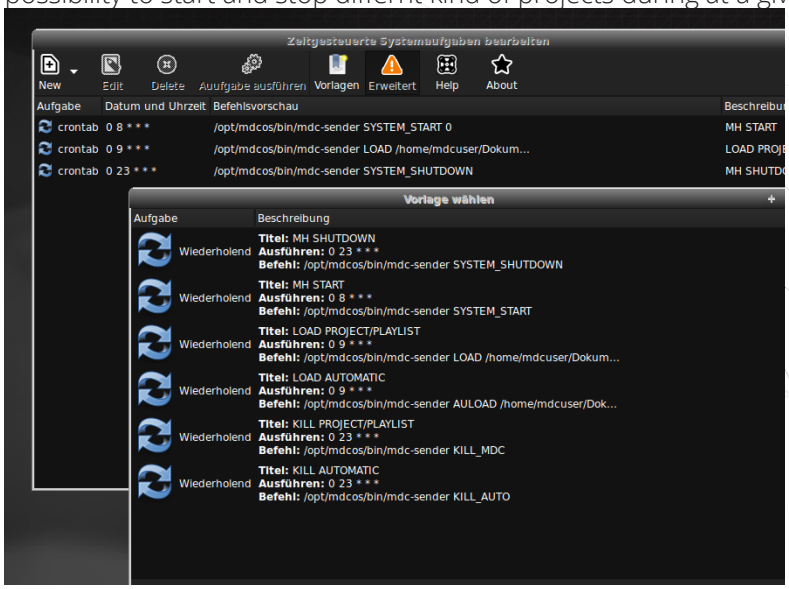
- 3.1 Fix MDC Project Outputs:
  If you accidently destroyed/modified your output configuration of your MDC project or changed the projector(s) for your show this feature is very handy: It autodetects the current phsyical outputs and rewrites the output configuration of the system. The modified file will be saved under the name "your_original_name-output-autodetect.mdc". The original file wont be harmed.

- 3.2 Reset System Outputs:
  This forces a redetection of the connected output devices and will take up to 5 seconds. The screen may be flickers during the initialisation.

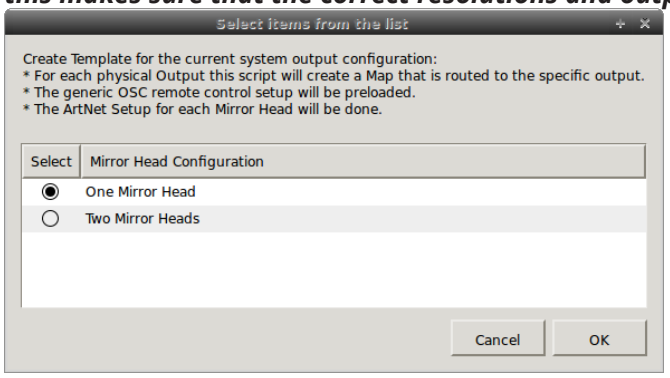
- 3.3 Re-Encode Media
  If you want to re-encode your media to optimal settings to use with the MDC-X platform you can choose between various encoding presets. Note: Selecting an image it will be converted to a video clip.



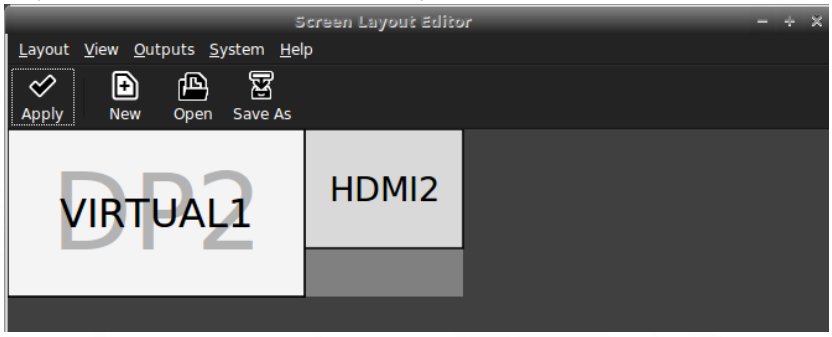
- 3.4 System Time Scheduler:
  This starts the userinterface for the time scheduler. The MDC-X system comes with a scheduler which offers the possibility to start and stop differnt kind of projects during at a given time.



- 3.5 Generate MDC Template:
  This generates a template for the current physical output configuration of the MDC-X system. You can select if you want to template for one or two Mirror Head units. The template will be safed in /home/mdcuser/Templates/. Once the system generated a template a Window will pop up with the text "Template Generic-Template-MX-OY. mdc was created". MX stands for the amount of Mirror Heads that are used in the Template (M1 or M2). and OY stands for the detected physical outputs, O0 for zero, O1 for once and O2 for two outputs.
  We strongly recommend to alwayas start your projected by generating a template as explaind here because this makes sure that the correct resolutions and output configurations are set.

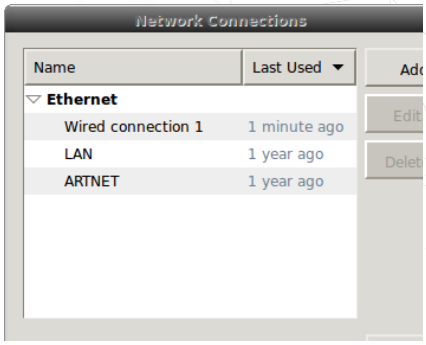


- 3.6 Physical Outputs:
  This is for debugging of outputs only. This tool will show you a representation of the current physical output configuration. Any modifications wont be safed and executed after a reboot of the system. If at least one physical output screen is connected to the system the information will show a setup like in the picture below.



  Example of the Phyiscal Output debugger. "VIRTUAL1" is the main desktop which is physically connected to a screen using port "DP2". The first output screen, which is a Mirror Head unit, is connected to "HDMI2". The absence of a screen right of VIRTUAL1 would indicate that there is no physical connection to an output device. In the case of a MDC-X2 system with two outputs connected there must be two screens right of the VIRTUAL1.
  WARNING: THIS SCREEN DOES NOT AUTOUPDATE WHEN A DEVICE IS CONNECTED!

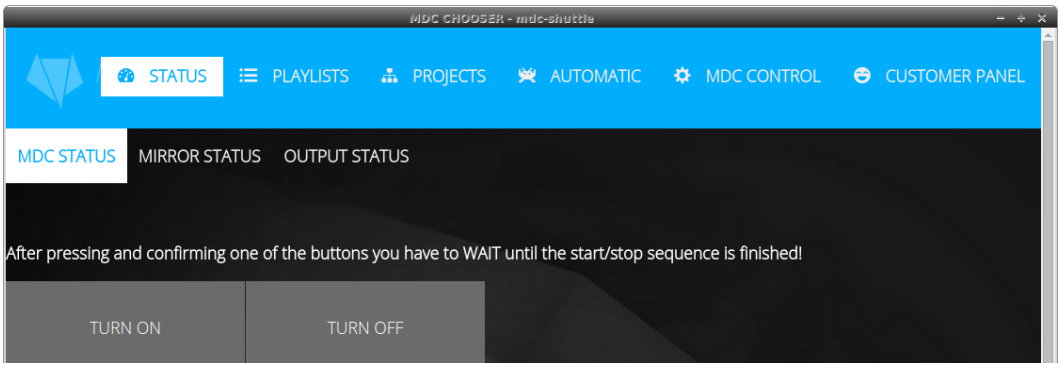
- 3.7 Network Connections:
  Starts the basic part of the network manager. Here you can change the LAN IP or add APs for your WiFi connection. The default IP on the LAN device is 192.168.0.200/255.255.255.0



2.2 MDC-Touch (local access)

Here you can access the MDC-Touch interface in local mode (always available). Usually MDC-Touch is accessed remotely (if the network licence was purchased) from a tablets, smartphone or any other device in the same network

as the MDC. MDC-Touch offers lots of functions for controlling and starting MDC projects. ***Futhermore the main setup for the MDC-X system is directly available over MDC-Touch.*** This makes it very easy to control and setup the MDC-X server without the need of a main monitor or remote desktop. For further details please see the MDC-Touch Manual.



2.3 MDC EULA

This is the enduser license agreement.

IMPORTANT NOTICE:

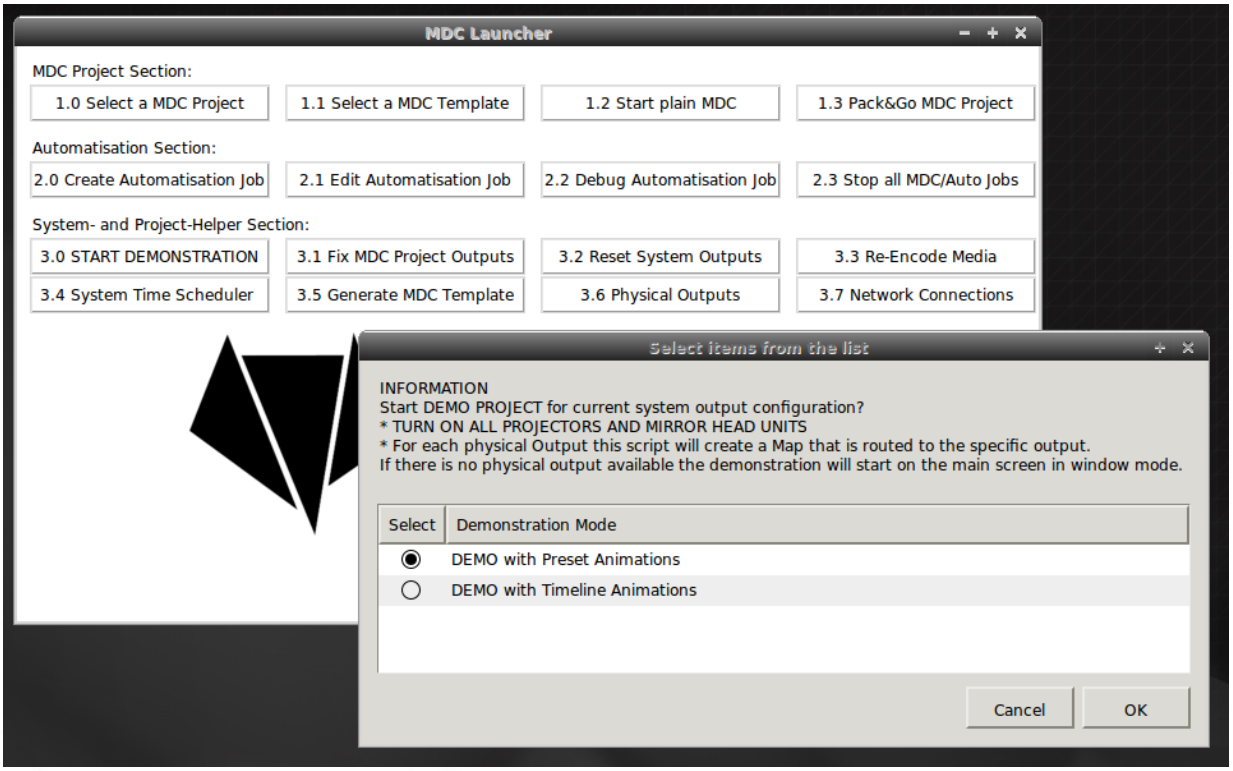
MDC-X is shipped preconfigured and ready to use so basically there is no need at all to do any further configurations as long as the recommended requirements are met.

All system and project configurations except network and keyboard are done using the SETUP page in the MDC-Touch interface.

3. Starting the Demonstration Project

The MDC-X is shipped with a small demonstration project to show the basic functions of the MDC and the Mirror Head. It gives you the possibility to check that all parts are functional and working. The demonstration project can be started using the MDC-Launcher on the desktop and clicking the button "3.0 START DEMONSTRATION".

3.1 Start the Demonstration Project using the MDC programming software

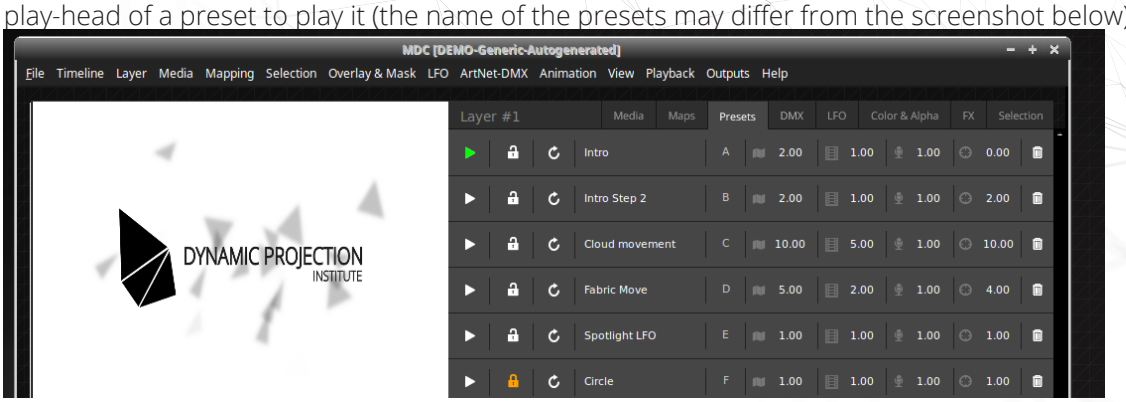


This starts demonstration projects on your MDC-X and Mirror Head system. You can choose between a Preset or Timeline Demonstration. The Preset Demonstration offers you the possibility to switch between positions and animations manually. NOTE: This feature autodetects the outputs on your MDC-X system and will only work correctly if:

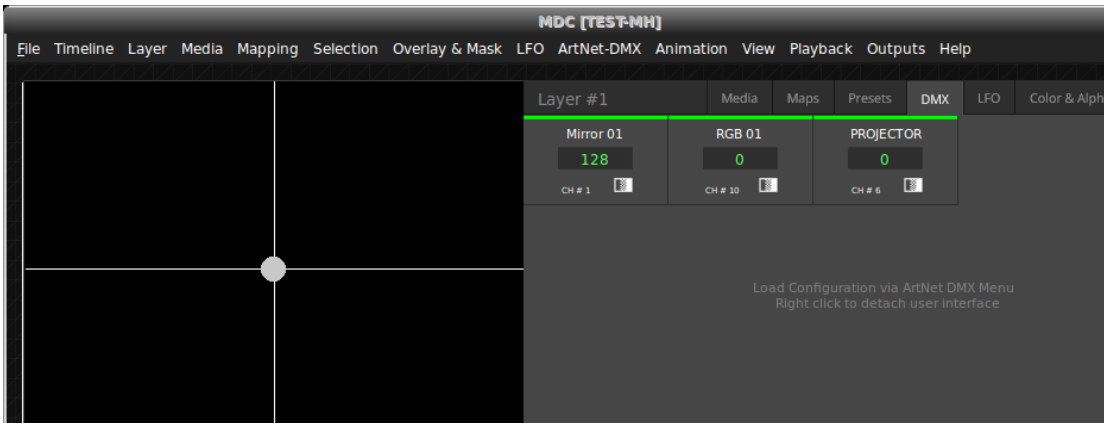
* All projectors/screens are turned on and recognised by the system
* All Mirror Head units are connected to the ArtNet network. The demonstration asumes Mirror Head #1 on 2.0.0.3 with DMX #1 and Mirror Head #2 on 2.0.0.4 with DMX #15.

After you selected a Demonstration mode please wait until the project is loaded and the playback of the video starts.

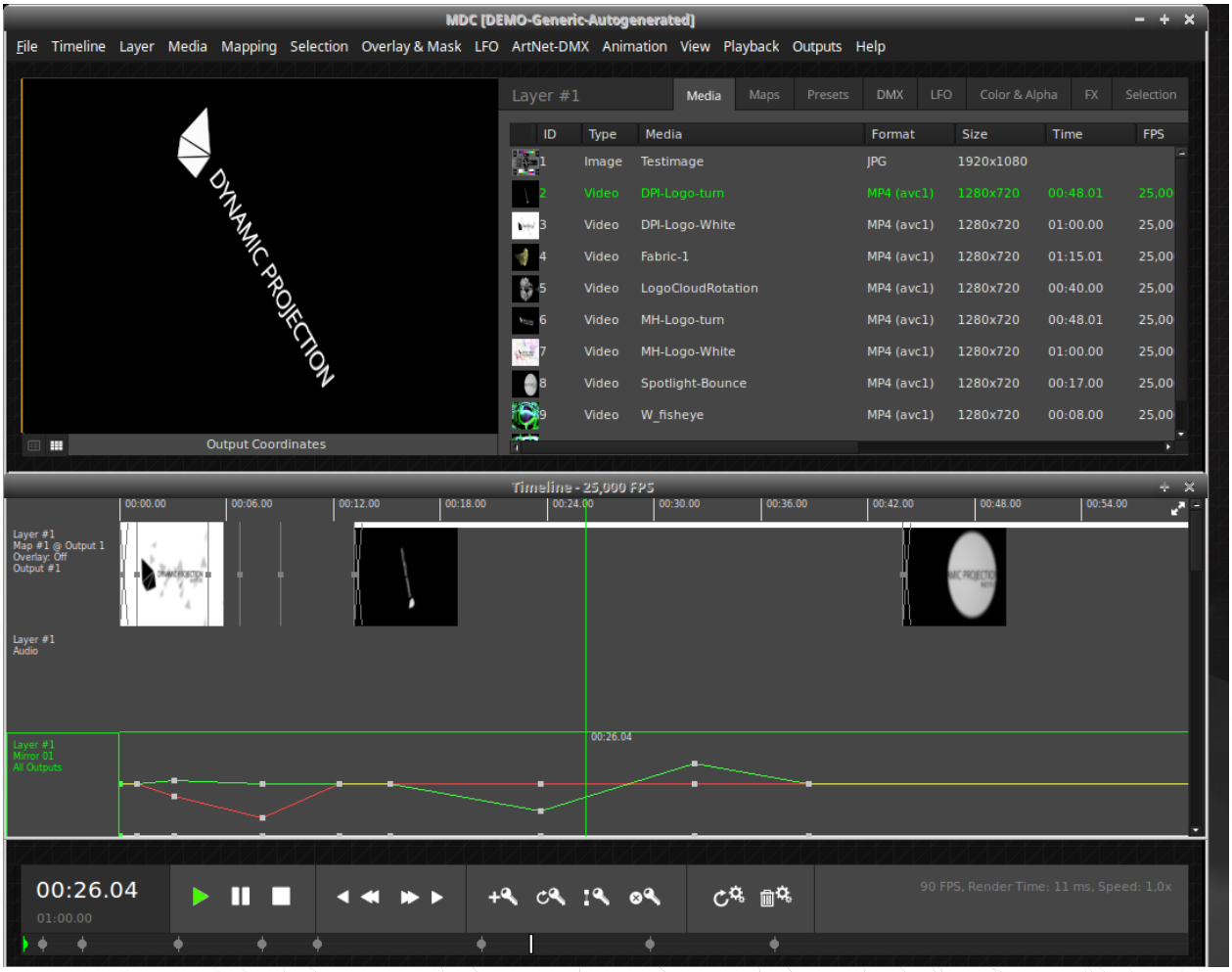
If you selected the "Preset" Demonstration please navigate to the "Presets" Tab of the MDC Program an click on the play-head of a preset to play it (the name of the presets may differ from the screenshot below).



To move a Mirror Head manualy go to the DMX tab and move the white circle with the mouse.



If you have selected the Timeline Demonstration then the playback of a small show will start after the project is loaded.



Note: Every time you select “3.0 START DEMONSTRATION” button again the detection process will start again, so please do not modify the projects because they will be overwritten.

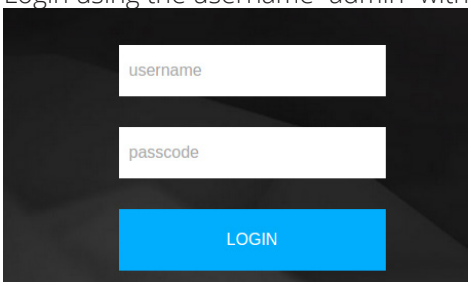
3.2 ALTERNATIVE: Control the PRESET Demonstration Project using MDC-Touch

The MDC-Touch is a web-based application for controlling the MDC system. It offers setup functionality, Mirror Head-, job-, playlist- and project-control. If can be accessed by any device using a Web-Browser (NOTE: To access MDC-Touch remotely over the network you have to have the appropriate license! If you have it you can connect to http://192.168.0.200).

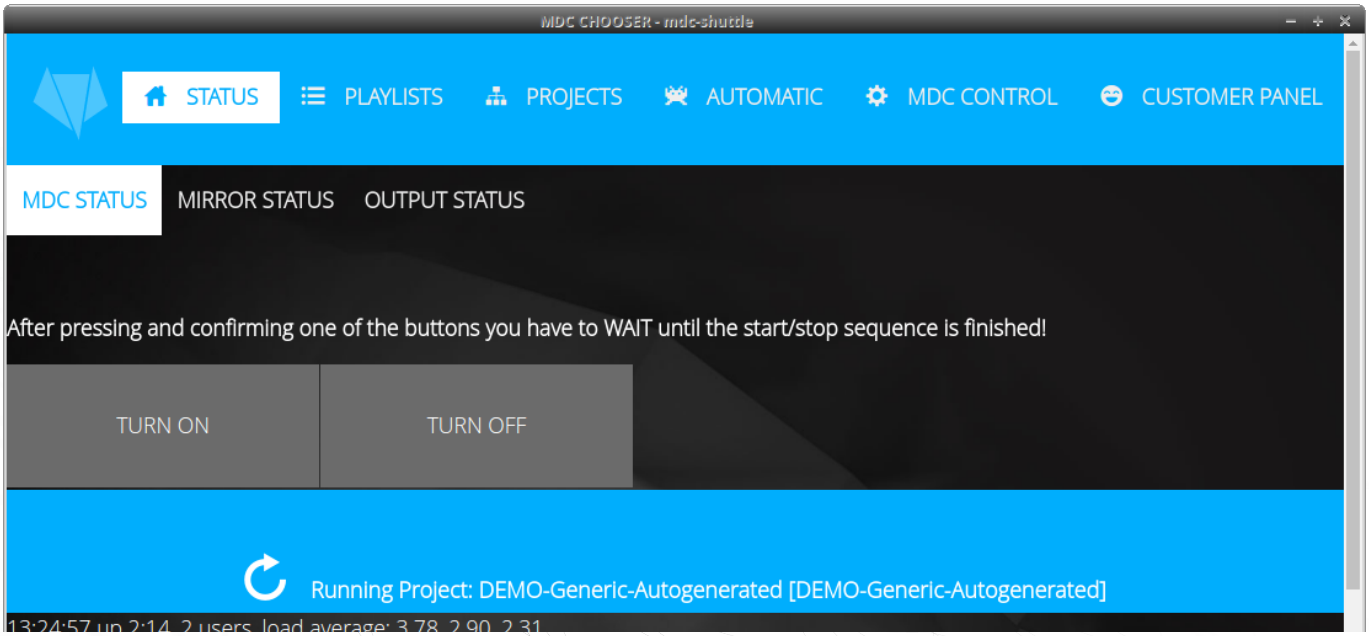
- Launch the Demonstration Project and select “WITH PRESET ANIMATIONS” using the MDC-Launcher. Wait until the Project is up and running.

- Now launch MDC-Touch on the Desktop or connect to the MDC-X with your browser (http://192.168.0.200)

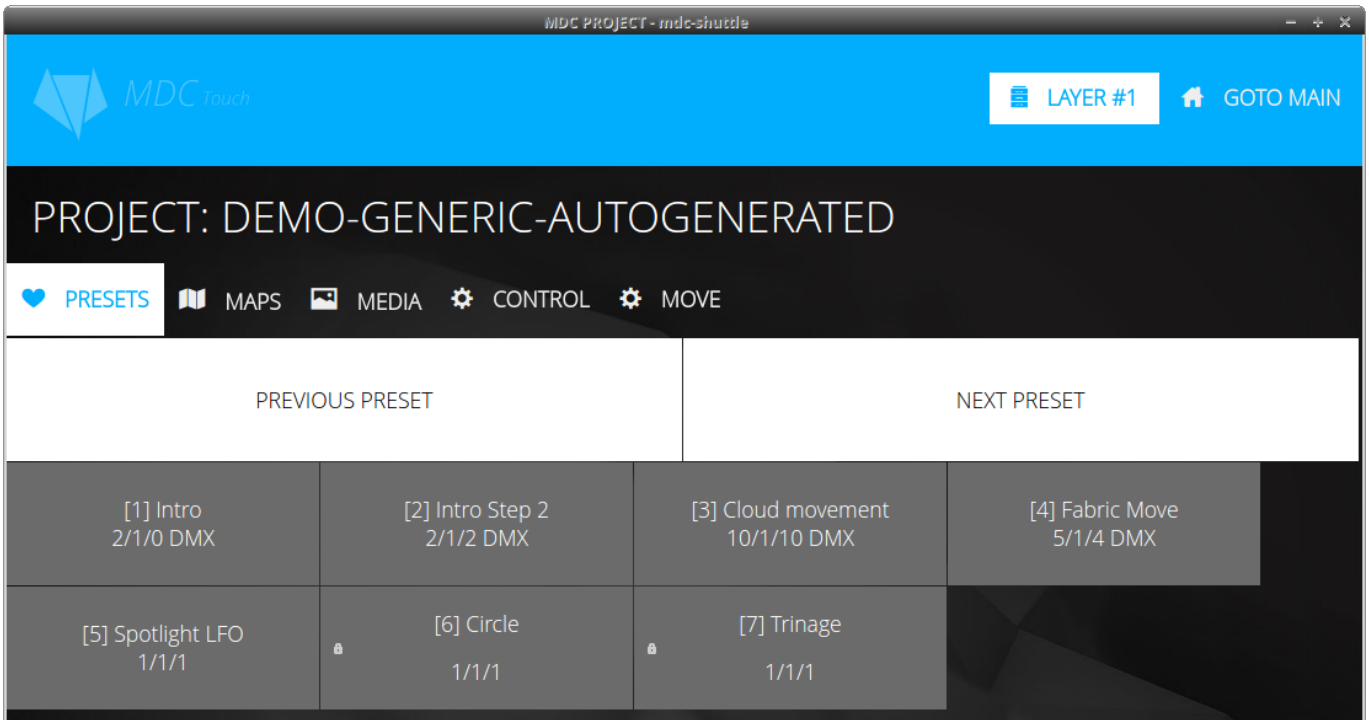
- Login using the username “admin” with password “1234”.

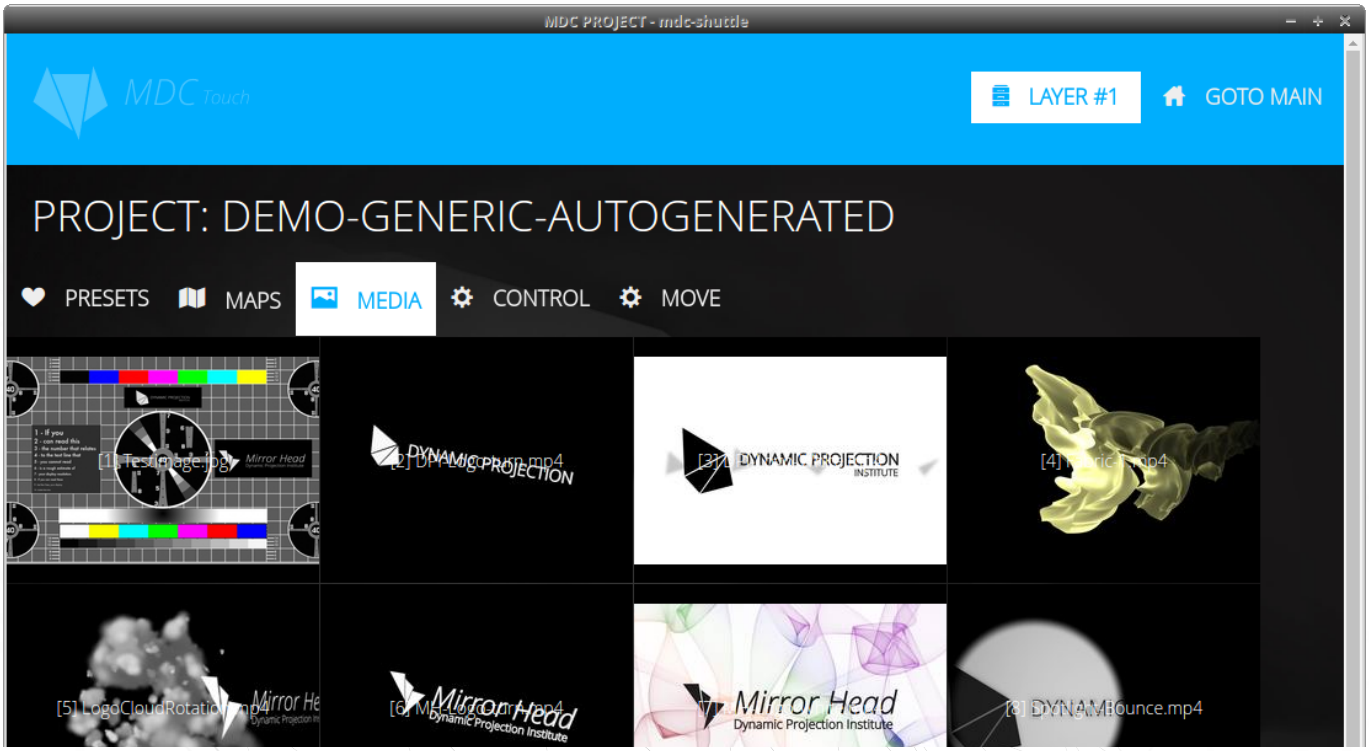


- Once you are logged in you will see the STATUS Page of MDC-Touch with a notification Button (big blue button at the bottom of the image below) showing that there is a project running; click on the button and wait until the page is loaded.



- Now the project remote control is loaded and you can use some of the predefined presets and load different kind of media.





- To exit the remote control click on “GOTO MAIN” on the top right of the screen (the little HOUSE icon).
- On the MAIN screen go to “MDC CONTROL -> JOB CONTROL” and click on “KILL MDC JOB”. This will stop the running project and kill the MDC process in the background. If you want to turn off the projector you can go to “MDC CONTROL -> ALL MIRRORS” and click on “GLOBAL Projector LAMP OFF” (Note: this required that the Projector Mode inside of the Firmware of the Mirror Head is set correctly, the RS232 connection is working and the Projector accets RS232).

NOTE: Since MDC-Touch is stateless more than one user can connect at the same time controlling different aspects of the Project like Media, Movement or Presets.

4. Connecting remotely to the MDC-X

The MDC-X can also be used and operated without a physical monitor attached. You can always connect to the MDC-X using "Remote Desktop" (vnc protocol or NoMaschine), ssh or MDC Touch

The default LAN address of the MDC-X is 192.168.0.200 (Netmask: 255.255.255.0). Please note: Whenever you change the LAN-IP of MDC-X or use wireless LAN your IP-Address maybe different. To change the IP-Address of the MDC or connect to a wireless network please use the Network-Manager of the system by clicking icon on the lower right of the taskbar. Please change only the address of the LAN device and NOT the ARTNET! ***After you changed the LAN IP of the MDC-X and have any Controll system like OSC, SYSTEM or DMX enabled you have to reboot the system in order to make them work again.***

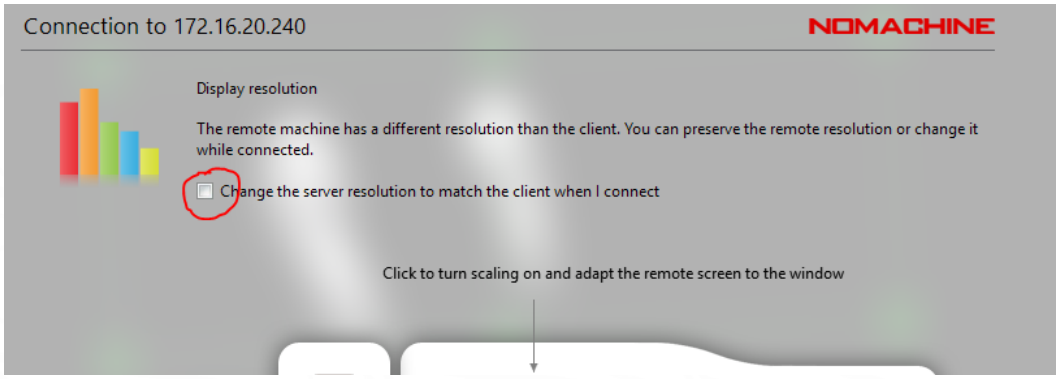
4.1 MDC-Touch

Use a webbrowser/smartphone/tablet and connect to http://192.168.0.200 (if licence for remove access was purchased). Please note that the address may depends on your settings.

4.2 Remote Desktop

We recommend using NoMachine to connect to the MDC-X system!

- NoMachine:
  If you want to use NoMachine to connect you have to install the client software for NoMachine on your remote system (PC, Notebook,..) first. Please download it from "https://www.nomachine.com/download". After installing connect to the default IP 192.168.0.200. In this case the username is "mdcuser" and password "mdcmdc". Important Note: When you connect for the first time to the MDC-X system make sure the checkbox (red circle in the picture below) is NOT CHECKED!



- VNC:
  Use a remote desktop viewer (i.g. tightvnc, realvnc - NOT Microsoft RDP!) and connect to 192.168.0.200. The default user is "mdcuser" and password is "remote". Please note that the performance of the connection depends on the network, compression quality settings of your VNC-client. When you use Remote-Desktop the whole screen including all outputs is exported which will result in a high latency desktop.

4.3 SSH / SCP

Use any ssh/scp client (e.g. putty, winscp) and connect to 192.168.0.200. Username "mdcuser", password "mdcmdc". If you have a local X11 environment like Xming you can enable X11-forwarding. Please note that X11-forwarding is not usable for MDC programming!

4.4 Windows share / Samba

Connect using the network browser and search for "MDC-SHUTTLE". If you dont see the name use:

- Windows: "\\192.168.0.200\mdcuser\"
- Mac/Linux: "smb://192.168.0.3/mdcuser/"

on the address line in the explorer/finder to connect to the device. Username "mdcuser" password "mdcmdc".
WARNING: DO NOT USE FILENAMES WITH WHITE SPACES OR SPECIAL CHARS WHEN YOU UPLOAD THEM TO MDC-X!

4.5 USB Stick / Harddisk / SD-Card

To transfer data to the MDC-X a USB harddisk or stick is the fasted and prefered way. You can connect any USB

device using the front or back USB connectors. Note that the blue connectors are USB3.0. Take care of mounting/ unmounting the USB devices as you usually do. **WARNING: DO NOT USE FILENAMES WITH WHITE SPACES OR SPECIAL CHARS WHEN YOU UPLOAD THEM TO MDC-X!**

4.6 Backup MDC

All project depended data and configuration files should always be inside of "/home/mdcuser/" and the directories below (Dokumente, Videos,....). To backup a project just copy the Project file to a safe place.

4.7 MDC Filetypes

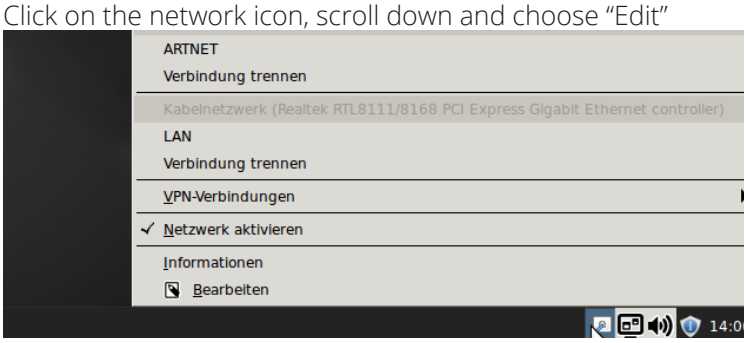
WARNING: DO NOT USE FILENAMES WITH WHITE SPACES OR SPECIAL CHARS

- filename.mdc - MDC project file
- filename.mdc_OSC - MDC remote control file (auto generated when project is started using MDC-Touch or any other remote control)
- filename.mdc_auto - Control file for MDC automatic jobs. User generated files for automatic preset control.

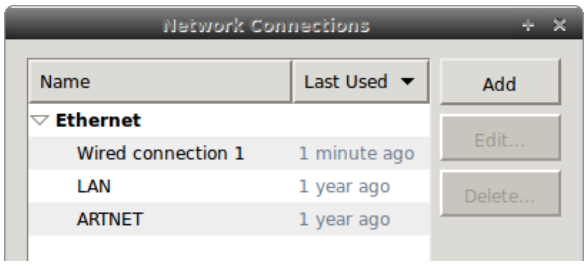
IMPORTANT NOTE: Please do not launch the MDC projects from the file browser. To lauch a project use the MDC-Launcher or MDC-Touch otherwise some important backend functions like OSC will not be available or work incorrectly!

5. Network and WiFi connections

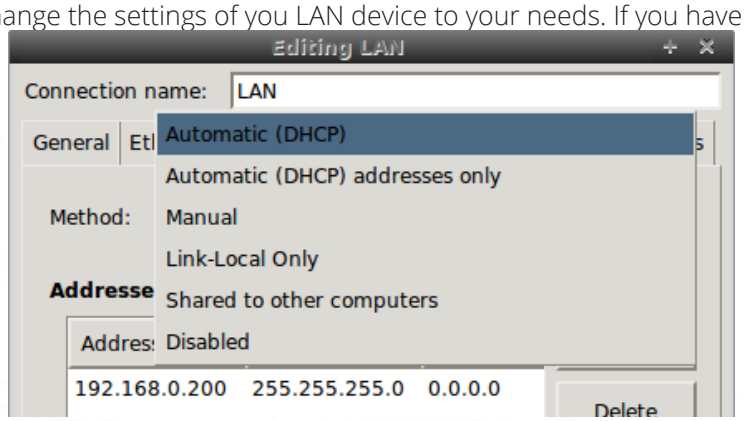
- If you have to change the LAN settings of the MDC usw the Network-Manager on the Desktops lower right. Right-Click on the network icon, scroll down and choose “Edit”



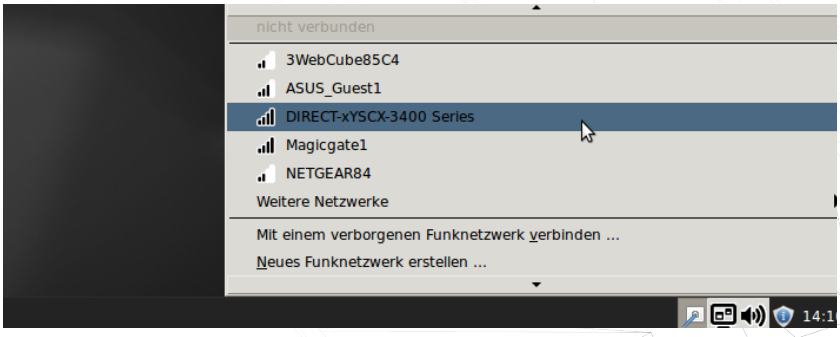
- Choose “LAN” and click “Edit...”. Please DO NOT change the ARTNET settings unless really have to. Wrong settings can make the communication the the Mirror Head impossible.



- Change the settings of you LAN device to your needs. If you have a DHCP Server on your network choose it.



- For setting up a WiFi connection select the appropriate hotspot from the Network-Manager and follow the instructions.

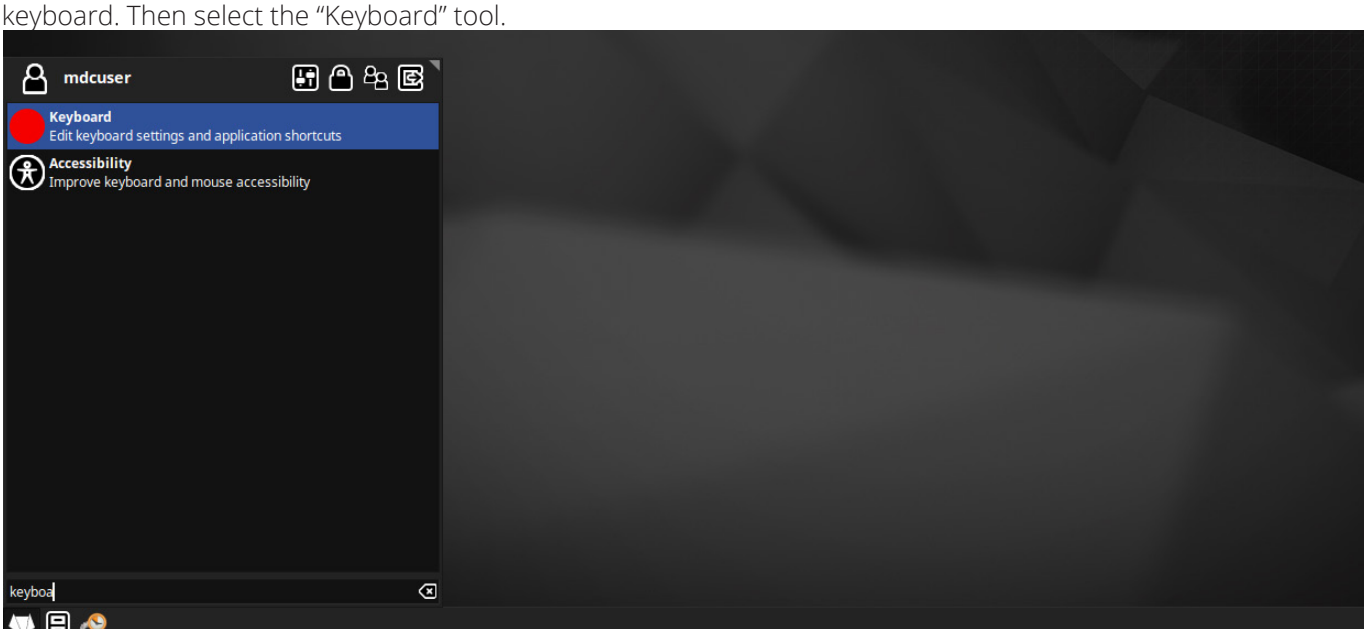


⚠ **NOTE:**

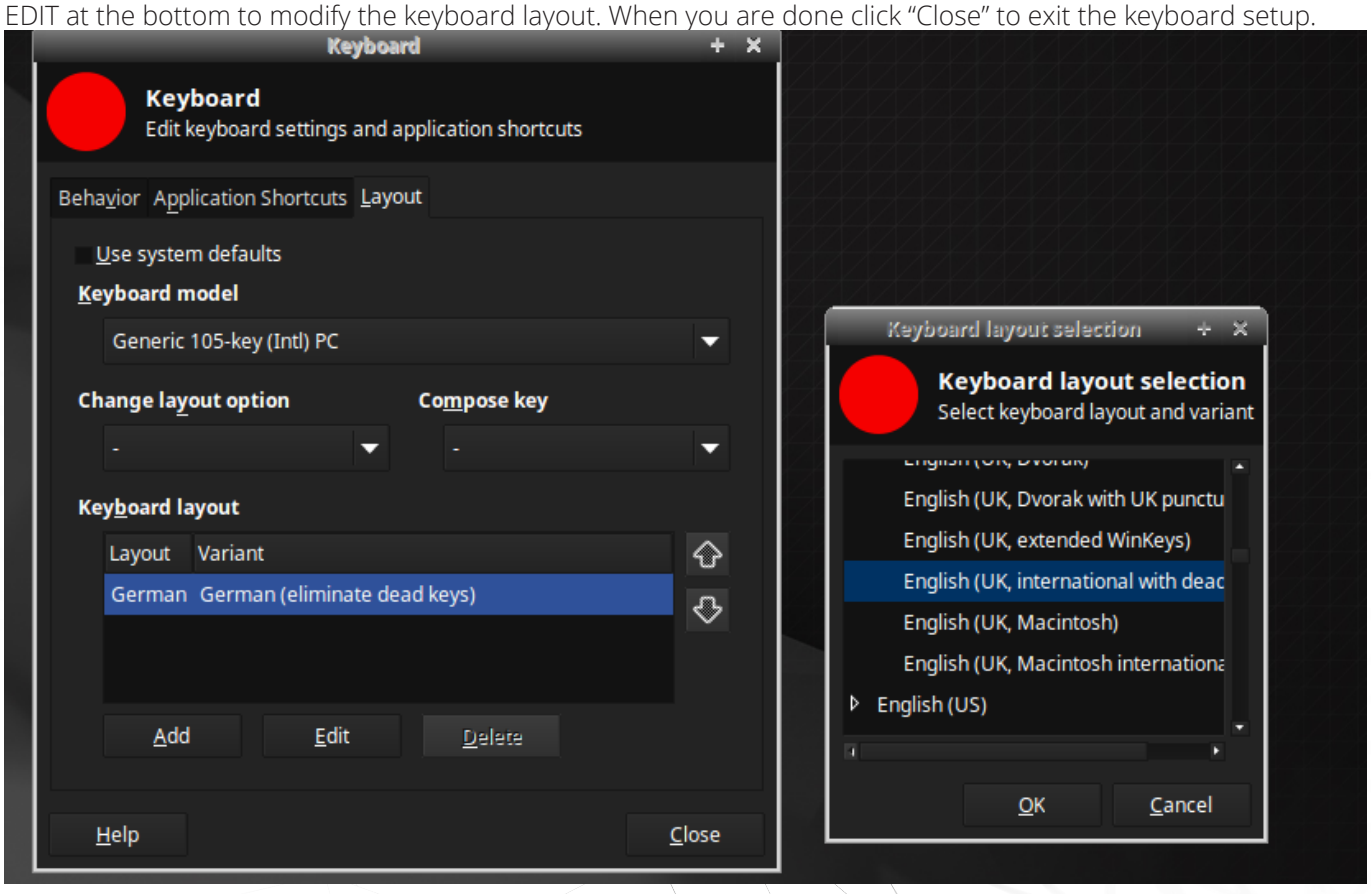
- **CHANGING THE NETWORK CONFIGURATION MAYBE REQUIRES A REBOOT DEPENDING ON YOUR CHANGES.**

6. Changing the keyboard layout

- To change the keyboard layout of the MDC click on the START button in the lower left corner and type “ke” on the keyboard. Then select the “Keyboard” tool.



- From the Keyboard management tool uncheck the “Use System wide settings” checkbox and then click ADD or EDIT at the bottom to modify the keyboard layout. When you are done click “Close” to exit the keyboard setup.

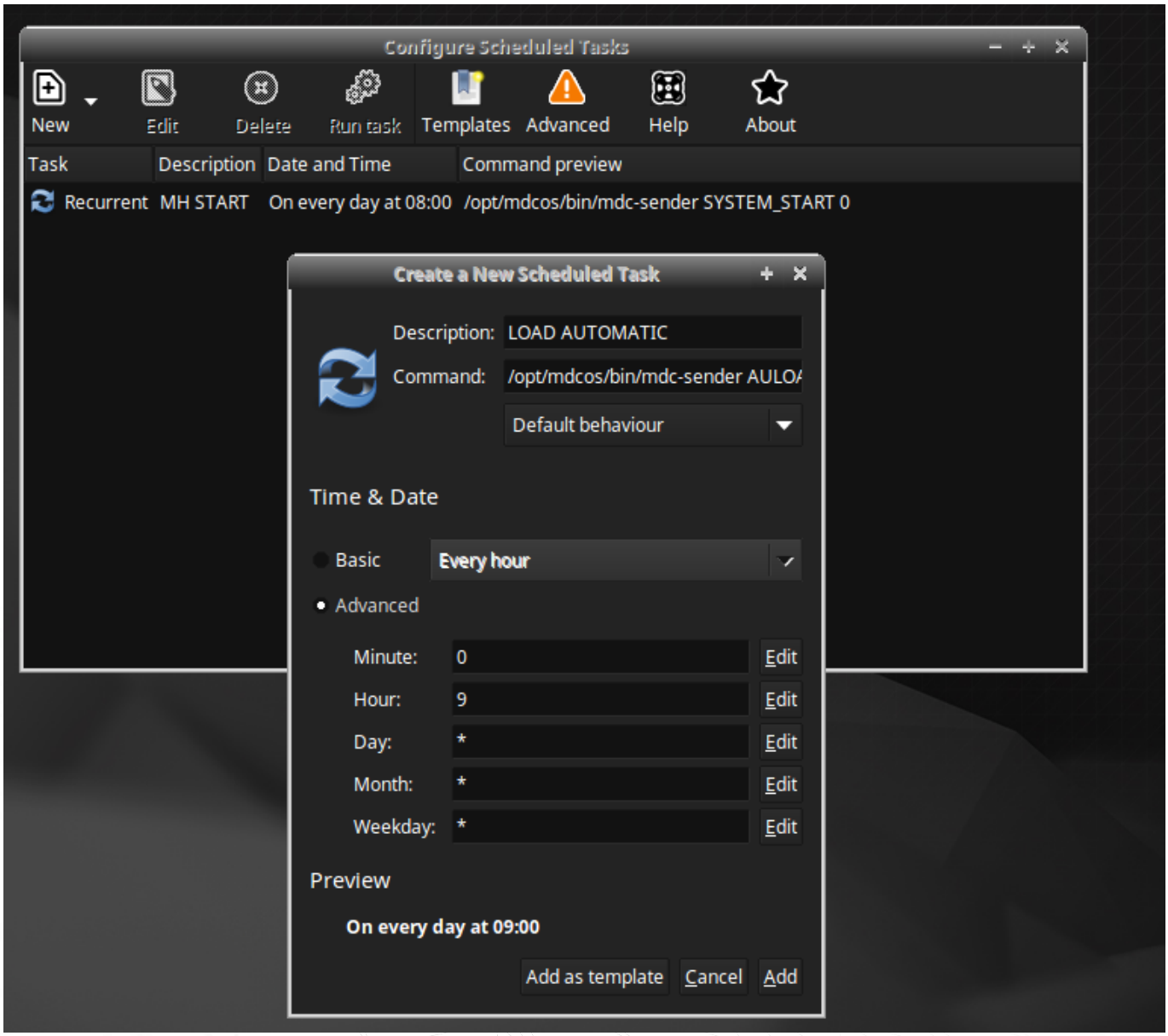


⚠ **NOTE:**

- **DO NOT CHANGE THE LANGUAGE SETTINGS OF THE MDC SYSTEM!**
- **SYSTEMS BOUGHT AFTER 1.4.2016 DO HAVE A LANGUAGE FLAG IN THE LOWER RIGHT CORNER WHICH GIVES DIRECT ACCESS TO THE KEYBOARD SETTINGS**

7. Scheduler and MDC-System-daemon

The MDC-X system comes with a scheduler which offers the possibility to start and stop differnt kind of projects during at a given time. Per default the scheduler que is empty and there are no scheduled tasks.
The MDC Scheduler (aka cron / fcron) is a very versatile system do to all kind of scheduled tasks.



Even though tasks can be very different all tasks have some things in common:

- Date and Time of task (when it should be started): Minute, Second, Day, Month, Day of Week
- Command that will be started: Some command that is available on the system

To enable the scheduler all you have to do is add a new task entry. You can use the templates for some common task.
For controlling the MDC with the scheduler you can use the MDC daemon interface and send commands to it:

- /opt/mdcos/bin/mdc-sender COMMAND [MIRROR_ID]

If the command requires a MIRROR_ID you have to use it. A MIRROR_ID of “0” means that the command goes out to all mirrors - the “0” must be added to all commands even they do not route to a specific Mirror Head. The list of

commands are:

- KILL_MDC : Terminates the current running MDC project.
- LOAD $path_to_mdc_project_or_playlist : Load and start project/playlist
- AULOAD $path_to_mdc_automatic : Load and start automatic file
- KILL_AUTO : Kill all automatic jobs
- LAMP_ON $MIRROR_ID : Projector lamp on
- LAMP_OFF $MIRROR_ID : Projector lamp off
- MOTOR_OFF $MIRROR_ID : Mirror Head Motor&LED off
- MOTOR_ON $MIRROR_ID : Mirror Head Motor&LED off
- RESET $MIRROR_ID : Mirror Head Reset
- SCREENSETUP : Request restart of screen detection (== CRTL+ALT+SHIFT+S)
- MDC_REBOOT : Request MDC reboot (== CRTL+ALT+SHIFT+R)
- MDC_HALT : Request HALT of MDC
- SYSTEM_SHUTDOWN $MIRROR_ID : Combination of KILL_MDC + LAMP_OFF + MOTOR_OFF
- SYSTEM_START $MIRROR_ID : Combination of KILL_MDC + LAMP_ON + MOTOR_ON
- MODE_MANUAL : Enable manual control
- MODE_AUTOMATIC : Disable manual control
- DLOAD : Load default project - can be set in the SETUP page of MDC-Touch
- DAULOAD : Load default automatic - can be set in the SETUP page of MDC-Touch
- SIMPLESTART: This is equal to the TURN ON button on MDC-Touch
- SIMPLEKILL: This is equal to the TURN OFF button on MDC-Touch

Examples:

- /opt/mdcos/bin/mdc-sender SYSTEM_START 0
  Start all attached Mirror Heads and turn on the lamps
- /opt/mdcos/bin/mdc-sender LOAD /home/mdcuser/Dokumente/show1.mdc
  Load project “show1” and start it
- /opt/mdcos/bin/mdc-sender KILL_AUTO 0
  Kill all automatic jobs

8. Remote Control of the MDC-X system

8.1 MDC-Touch / Webinterface

The MDC-X system can be controlled remotly over the MDC-Touch webinterface. The remote connection is available if the MDC-Touch network license is enabled (upgrade is always possible - please contact sales department). Use a webbrowser/smartphone/tablet and connect to http://192.168.0.200 (if licence for remove access was purchased). Please note that the address may depends on your settings.

8.2 OSC Control

The OSC Control of the MDC-X system offers the possibility to control the current project by remote OSC commands.

The MDC-X System accepts the following OSC commands over the OSC-Proxy on port 7475 of the network device that was set in the setup. You can enable/disable and configure the proxy on the MDC-Touch SETUP page.

Supported commands are:

- /mdc_layerX_presetP : Load Presets $P on layer $X
- /mdc_layer$X_preset_next : Select next preset
- /mdc_layer$X_preset_previous : Select previous preset
- /mdc_layerX_mediaY : Load Media $Y on layer $X
- /mdc_layerX_mapM: Select Map $M on layer $X. If $M is set to 0 then ALL maps are selected.
- /mdc_layer$X_map_all : Same as /mdc_layer$X_map0
- /mdc_layer$X_mm_$M_$Y : Same as /mdc_layer$X_map$M + sleep 1 sec + /mdc_layerX_mediaY
- /mdc_timeline_play : Set playback to play
- /mdc_timeline_pause : Set playback to pause
- /mdc_timeline_stop : Set playback to stop
- /mdc_killanimation : Kill all animation keyframes
- /mdc_restart : Restart project
- /mdc_fullscreen : Toggle fullscreen mode
- /mdc_playlist$Z : Select playlist item $Z
- /mdc_playlist_next : Select next playlist item
- /mdc_playlist_previous : Select previous playlist item
- /mdc_glm_on : Global Lock Media ON
- /mdc_glm_off : Global Lock Media OFF

$X = Layer ID starting at 1, $M = ID of Map, $Y = ID of Media, $P = ID of Preset starting at 1, $Z = ID of playlist item starting at 1

Note: Between OSC commands you must have at least a 500ms break. Remote OSC commands are only accepted if the OSC proxy is running (Check the SETUP page and the status screen) and the project was started using MDC-Touch or is using the generic OSC command template.

8.3 DMX/ArtNet Control

The DMX/ArtNet control of the MDC-X server is basically the same as the OSC control. To enable ArtNet on the MDC-X you have to set the required Bcast-IP as well (for the default IP 192.168.0.200 the Bcast-IP for ArtNet is 192.168.0.255) as the DMX start address for the listening service -> MDC-Touch -> MDC CONTROL -> SETUP.

MDC-X FIXTURE:

#1: **Preset Contol Channel**
0 : no option
1 - 255 : Preset

#2: **Map Contol Channel**
0 : no option
1 - 254 : Map
255 : All Maps

#3: **Media Contol Channel**
0 : no option
1 - 255 : Media

#4: **Timeline Contol Channel**
0 : no option
1-10 : Play
11-20 : Pause
21-30 : Stop
31-40 : Restart
41-50 : Fullscreen
51-60 : Kill Animation

#5: **Output Contol Channel**
0-255 : Fade

#6: Reserved
#7: Reserved
#8: Reserved
#9: Reserved
#10: Reserved

#11: **Mirror Head Movement Channel**
0-255: Pan COASE
#12: **Mirror Head Movement Channel**
0-255: Pan FINE
#13: **Mirror Head Movement Channel**
0-255: Tilt COASE
#14: **Mirror Head Movement Channel**
0-255: Tilt FINE

#15: **System Control Channel**
0 : no option
1 : LAMP_ON
2 : LAMP_OFF
3 : MOTOR_ON
4 : MOTOR_OFF
5 : RESET MIRROR
6 : SIMPLESTART (= TURN ON)
7 : SIMPLEKILL (= TURN OFF)
8 : DLOAD
9 : DAULOAD

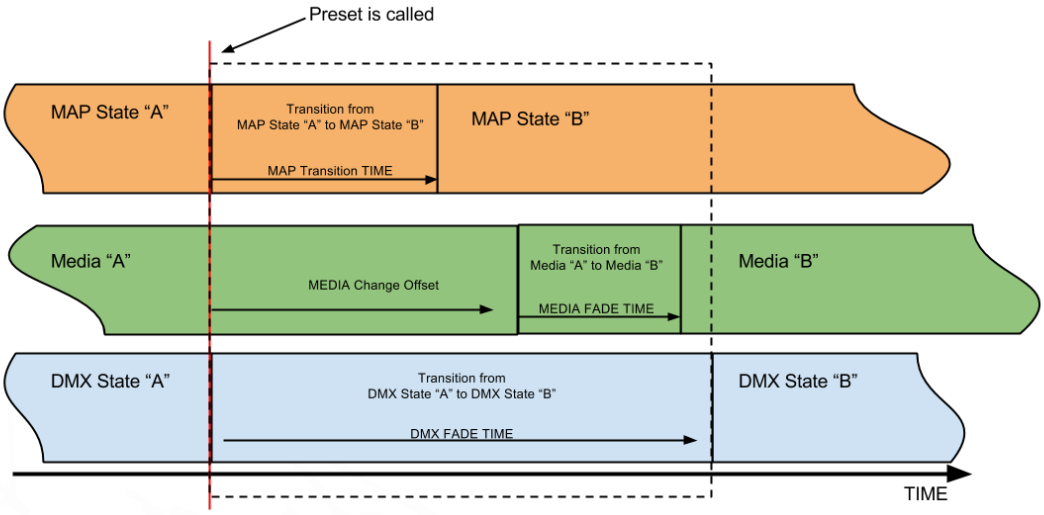
9. Automatisation programming

The MDC automatisation backend is one of the most powerful ways to control a MDC show. Basically it works like a sequencer that sends commands to the MDC program, telling it what to do next. Before you start with automatisation we strongly recommend that you get familiar with the MDC concept of Presets. To do so please watch one of our tutorials. Below you will find a short explaination what Presets are.

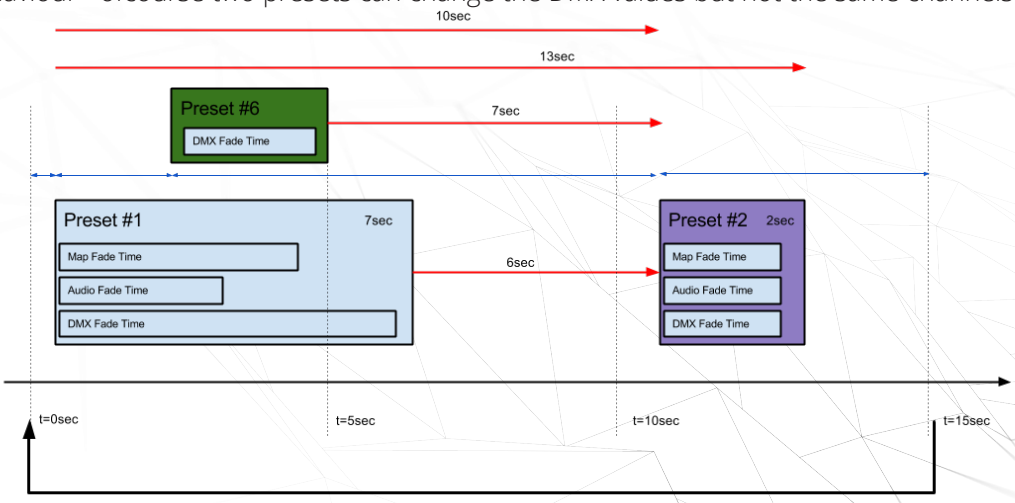
- A preset is a container storing the values of different states (timeline).
- Every value has transition/change times (map, audio, dmx,media)

Every Preset in the MDC program has four fade times:
- Map Fade Time
- Media change offset time
- Audio Fade Time
- DMX Fade Time

The illustration below when the timing starts and when the preset is finished with loading.



When calling presets one after the other or in parallel you have to consider that a value can only change to one specific target value over time. So calling two presets which overlap in a value at the same time will cause unecpected behaviour - ofcourse two presets can change the DMX values but not the same channels!



In the case above the calling sequence of the Presets would be:
1. Call Preset#1
2. Wait 2 seconds
3. Call Preset#6
4. Wait 7 seconds
5. Call Preset#2
6. Wait 4 seconds
7. Return to the beginning

This is the basic concept behind the automatisation. We now explain every step to an automatisation show in detail:

1. Create a MDC Project with at least 2 Presets. Save the Project in the Documents folder and close the MDC program (example: myproject.mdc) . For this short tutorial we asume that we have six Presets like in the illustration example above.
2. Open the MDC-Launcher and choose “2.0 Create Automatisation Job” and select your project (myproject.mdc) . Confirm the message that the template (myproject.mdc_auto_template) was created.
3. Choose “2.1 Edit Automatisation Job” and open the myproject.mdc_auto_template file. This file is a text representation of the project you saved before. It allready contains all information to create an automatisation job.
4. Before you start editing the file save it under a new name like “myshow1.mdc_auto”. Take care that you do not add the “_tempate” at the end! The reason for saving it is that if we would create the template from the project again we would overwrite what we have done.
5. The automatisation template file consists of the following sections - all are commented with “#” :
   * Short syntax description
   * Generic commands
   * Layer Section with Presets, Maps and Media
   Every line that starts with a “#” is later on ignored by the automatisation program.

myshow1.mdc_auto_template

```
### SHORT SYNTAX DESCRIPTION
#H=5,10 ! Halt here between 5-10sec
#H=15 ! Halt here for 15sec
# REPLACE H with S and you can use milliseconds. S=1000 means sleep 1 sec
#/mdc_layer1_preset=1,4,5,6 ! randomly choose a preset out of preset number 1,4,5,6
#RETURN ! return to the top


###GENERIC
#/mdc_timeline_play !PLAY
#/mdc_timeline_pause !PAUSE
#/mdc_timeline_stop !STOP

#/mdc_output1_fade

#LayerCount: 1

##########################################
# Layer 1 Name:'Layer #1'
##########################################
# PresetCount: 5 @Layer: 1
#/mdc_layer1_preset1 !Layer 1 Preset 1 Name:'Preset #1' DMXCount: 5 MeshCount: 1 MediaID: 1
#/mdc_layer1_preset2 !Layer 1 Preset 2 Name:'Preset #2' DMXCount: 5 MeshCount: 1 MediaID: 1
#/mdc_layer1_preset3 !Layer 1 Preset 3 Name:'Preset #3' DMXCount: 5 MeshCount: 1 MediaID: 1
#/mdc_layer1_preset4 !Layer 1 Preset 4 Name:'Preset #4' DMXCount: 5 MeshCount: 1 MediaID: 2
#/mdc_layer1_preset5 !Layer 1 Preset 5 Name:'Preset #5' DMXCount: 5 MeshCount: 1 MediaID: 2
#/mdc_layer1_preset6 !Layer 1 Preset 6 Name:'Preset #6' DMXCount: 5 MeshCount: 1 MediaID: 2

####
# MapCount: 1 @Layer: 1
#/mdc_layer1_map1 !Layer 1 Map 1 Name:'Map #1 @ Output 1'

####
# MediaCount: 2 @Layer: 1
#/mdc_layer1_media1 !Layer 1 Media 1 Name:'/opt/mdc/QIP/Testimage.jpg'
#/mdc_layer1_media2 !Layer 1 Media 2 Name:'/home/mdcuser/Schreibtisch/Samples/Footage3/a_Schritte_11.mov'

####
```

6. To write down a “show” like in the example before we have to translate the sequence into the OSC language. The statesments in OSC are already written down in the Preset section. Below you see how the sequence looks like.

*myshow1.mdc_auto_template

```
### SHORT SYNTAX DESCRIPTION
#H=5,10 ! Halt here between 5-10sec
#H=15 ! Halt here for 15sec
# REPLACE H with S and you can use milliseconds. S=1000 means sleep 1 sec
#/mdc_layer1_preset=1,4,5,6 ! randomly choose a preset out of preset number 1,4,5,6
#RETURN ! return to the top

/mdc_layer1_preset1
H=2
/mdc_layer1_preset6
H=7
/mdc_layer1_preset2
H=4
RETURN
```

IMPORTANT NOTE: Between every statement/command there MUST BE a Hold/Sleep for at least 250ms (S=250).

7. Once you finished writing your sequence you can save it and close the editor. To start/test the sequence start your MDC project with “1.0 Select a MDC Project” and wait until it is loaded. Now select “2.2 Debug Automatisation

Job" and select your automatisation "myshow1.mdc_auto". You will now see the commands that are send to the MDC project and the project will start playing the presets you are calling. To stop the debug job just close the window with the X in the upper right corner.

Valid commands for the automatisation scripts are:

- /mdc_layerX_presetY : where X and Y are numbers
- /mdc_timeline_play : start playback, usually not needed
- /mdc_timeline_pause: pause playback
- /mdc_timeline_stop: stop playback - warning, this closes the output screens
- /mdc_layerX_mapY: select a specific map for later media change
- /mdc_layerX_mediaY: select a media
- H=X : hold for X seconds
- S=X : hold for X milliseconds (S=1000 is equal to H=1)

Examples for various scenarios:

Simple random show:

```
/mdc_layer1_map1                      !select map one for later media change
S=250                                 ! 250ms sleep
/mdc_layer1_preset=1,2,3,3,,10,23,12 !select a random preset with number 3 more often
H=10,20                               !hold here bewteen 10 and 20 seconds randomly
/mdc_layer1_media=4,7,3,4             !select a random media
H=5,10                                !hold between 5 to 10 seconds
RETURN                                !return to the start
```

Media exchange on a X2 system with two outputs:

```
/mdc_layer1_map1                      ! select map1
S=250ms                               ! 250ms sleep
/mdc_layer1_media=1,2,3,4             ! select a media, map 1 will be used as target
S=250ms                               ! 250ms sleep
/mdc_layer1_map2                      ! select map2
S=250ms                               ! 250ms sleep
/mdc_layer1_media=5,6,7,8             ! select a media, map 2 will be used as target
H=20                                  ! hold for 20 seconds
/mdc_layer1_map0                      ! select all maps
S=250ms                               ! 250ms sleep
/mdc_layer1_media10                   ! select media #10 on both maps
H=10                                  ! hold for 10 seconds
RETURN                                ! return to start
```

Automatisation scripts can be set to be loaded by default in the SETUP page of MDC-Touch.

10. Updating MDC-X and further information

All updates, manuals and further information can be downloaded from our MDC support page:
http://www.dynamicprojection.com/mdc-support/

10.1 Update MDC-X

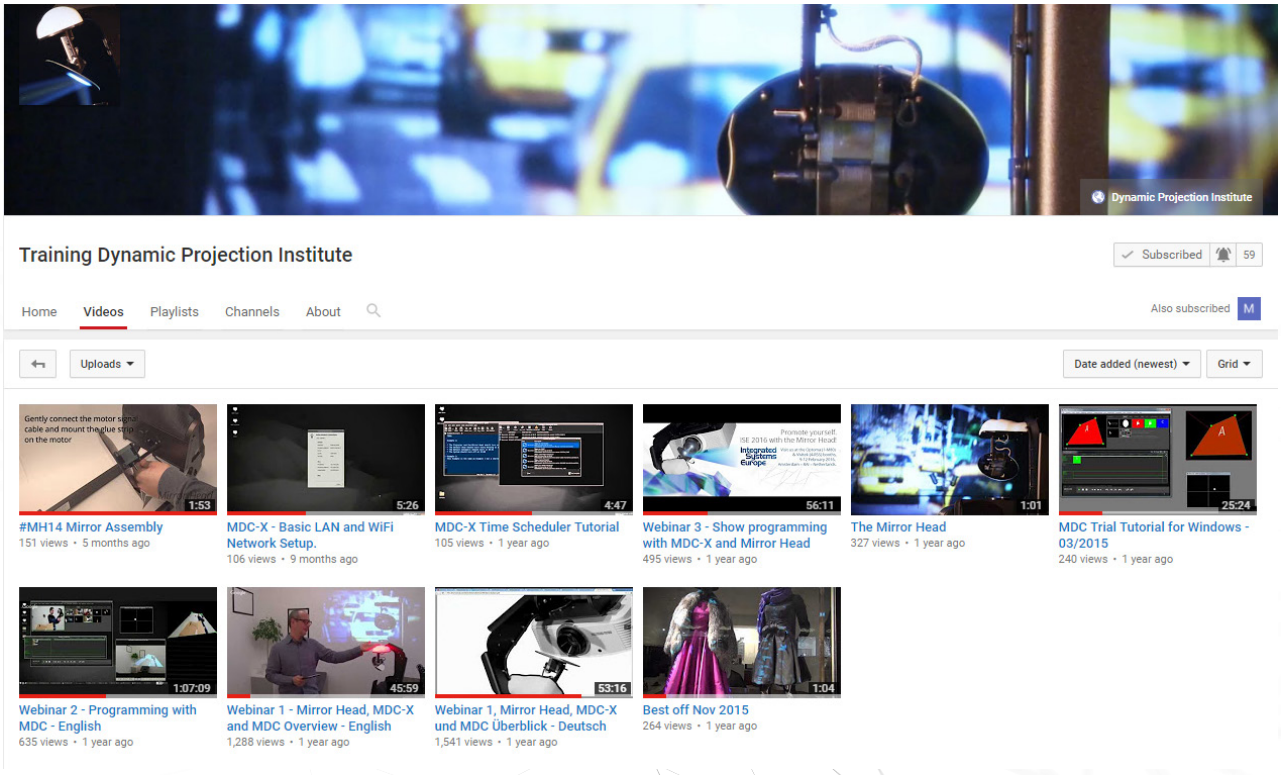
We recommend updating the MDC-X system only in cases when you need a new feature or told so by our support - do not update systems that are running fine or during a show setup. Please test your systems, system integrations and projectes after an update.

Update Installation Instructions:
Download the files - NOTE: DO NOT unzip the files!
Please follow the Installation Instructions:
0) Make sure that no MDC show or program is running.
1) Copy the file MDC-X-update*.zip to your MDC-X system by using a USB stick or network connection (NOTE: DO NOT unzip the file!)
2) Once the file was copied to the MDC-X (preferable to the Download folder) right click the ZIP file and choose "Extract Here".
3) After the file was extracted you will find the file "MDC-X-update-*.run" in the same folder where the ZIP file is.
4) Double click the MDX-X-update-*.run file and follow the on-screen dialog to install the MDC update.
5) When the installation is finished click "OK" on the popup and the system will reboot.

NOTE: The update packages must be installed in the order of release. You will find your current version in MDC-Touch on the first page after the login in the lower left corner on the page or

10.2 Information and tutorials

You will find more information and tutorials on our YouTube Training channel:
http://www.dynamicprojection.com/training/



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To protect the environment, please try to recycle the packing material as much as possible.