



# **mxGUI**

## User Manual

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This user manual describes **mxGUI**, Lawo's remote control software for the mc<sup>2</sup> console family.

The following products can be controlled using the current version of mxGUI.

- mc<sup>2</sup>36 MKII and xp.
- mc<sup>2</sup>56 MKIII.
- mc<sup>2</sup>96 (all variants).

To ensure compatibility, the first three fields of the mxGUI and mc<sup>2</sup> system software versions must match. Generally, it is recommended that all four fields match (to run identical versions). So, for example, if the mixing console is running 10.6.0.4, you will need mxGUI 10.6.0.x (mandatory) and 10.6.0.4 (recommended).

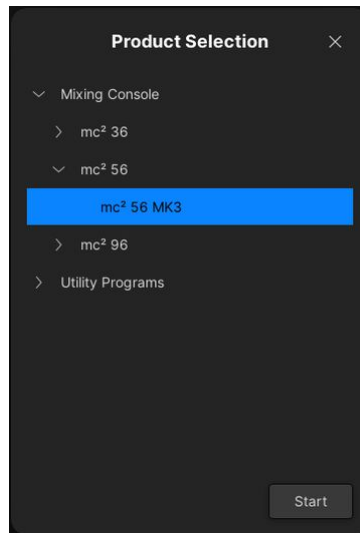
- ✔ You can check the system software version from the [Global Options](#) in the **System Settings** display, and the mxGUI version from the **Info** window in the **? main menu**.

# 1 mxGUI - Introduction

**mxGUI** (matrix GUI) can be used for remote operation or offline setup of any mc<sup>2</sup> system. The application runs on an external computer that must be supplied by the customer.

The software works by running an emulation of the mc<sup>2</sup> control system on a virtual Linux machine inside your host operating system. When you first start mxGUI, the computer boots the virtual machine and then the mxGUI application.

From the product selection window, you can launch one of the mc<sup>2</sup> emulations. You must choose the correct emulation (to match your system).



Once mxGUI is fully open, you will see the same displays as on the console's Central GUI. This allows you to make changes from the usual GUI displays. For example, to adjust channel parameters from the **Main Display**, or edit labels and connections from the **Signal List**.

The screenshot below shows how mxGUI looks once the application is connected to a system.





## 2 mxGUI - Installation and Setup

This chapter describes how to install and configure the software.

- [mxGUI - Prerequisites](#)
- [mxGUI - Software Installation](#)
- [mxGUI - Shared Folders](#)
- [mxGUI - Product Options](#)



## 2.1 mxGUI - Prerequisites

mxGUI runs on an external computer that must meet the system requirements described below.

### What you will need

To install the software, you will need a pre-installed **virtual machine** and the **mxGUI-x-x-x-x.ova** file for the required software release.

For the virtual machine, please choose one of the options listed below.

The mxGUI-x-x-x-x.ova file is included (as standard) with the system software. The .ova file creates an appliance which runs within the virtual machine. The same file can be used with any of the virtual machine options.

To ensure compatibility, the first three fields of the mxGUI and mc<sup>2</sup> system software versions must match. Generally, it is recommended that all four fields match (to run identical versions). So, for example, if the mixing console is running 10.6.0.4, you will need mxGUI 10.6.0.x (mandatory) and 10.6.0.4 (recommended).

- ✔ You can check the system software version from the [Global Options](#) in the **System Settings** display, and the mxGUI version from the **Info** window in the **? main menu**.

### Host Computer Requirements

The host computer **MUST** meet the following system requirements.

#### System Requirements

- Any recent 64-bit processor. Intel or AMD CPU on Windows and Intel CPU on Mac.
- At least 4GB RAM minimum/ 8GB RAM recommended.
- A minimum of 2GB of available disk space for the appliance.

#### Windows PC

- Operating System: Windows 10 or higher (32-bit and 64-bit).
- Operation: Keyboard and mouse.
- Interface: Ethernet 100/1000 Mbit/s.
- Virtual Machine, one of the following:
  - Oracle VirtualBox 7 or higher.
  - VMware Workstation Player 17 or higher.
  - VMware Workstation Pro 17 or higher.

#### Mac

- Operating System: MacOS 12 (Monterey) or higher.
- Operation: Keyboard and mouse.
- Interface: Ethernet 100/1000 Mbit/s.
- Virtual Machine, one of the following:
  - Oracle VirtualBox 7 or higher.
  - VMware Fusion 12 or higher.

- ❗ In the current release, mxGUI's [shared folders](#) are NOT supported by **VMware Fusion**.

## 2.2 mxGUI - Software Installation

There are two parts to the software installation: the virtual machine and mxGUI appliance.

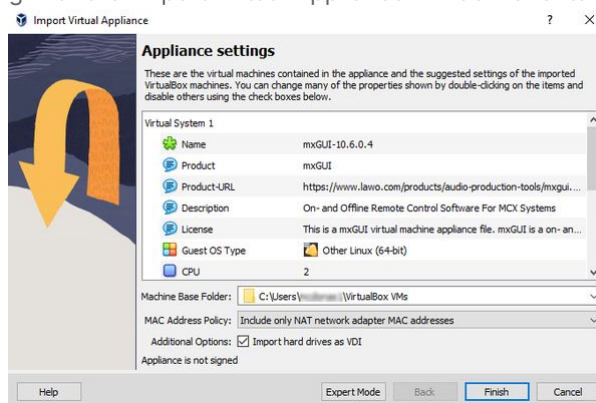
- For the virtual machine, please download and run the installer from the third-party provider.
- Once you have installed the virtual machine, the next step is to import the mxGUI appliance.

**i** It is possible to install multiple versions of mxGUI on the same virtual machine. There is no need to uninstall or delete older versions.

The instructions below describe how to install the mxGUI appliance if you are using the Oracle VM VirtualBox Manager. The same principles can be applied to the other virtual machine options.

1. Double-click on the **mxGUI-x-x-x-x.ova** file.

The VirtualBox Manager opens along with the 'Import Virtual Appliance' window and its suggested settings.

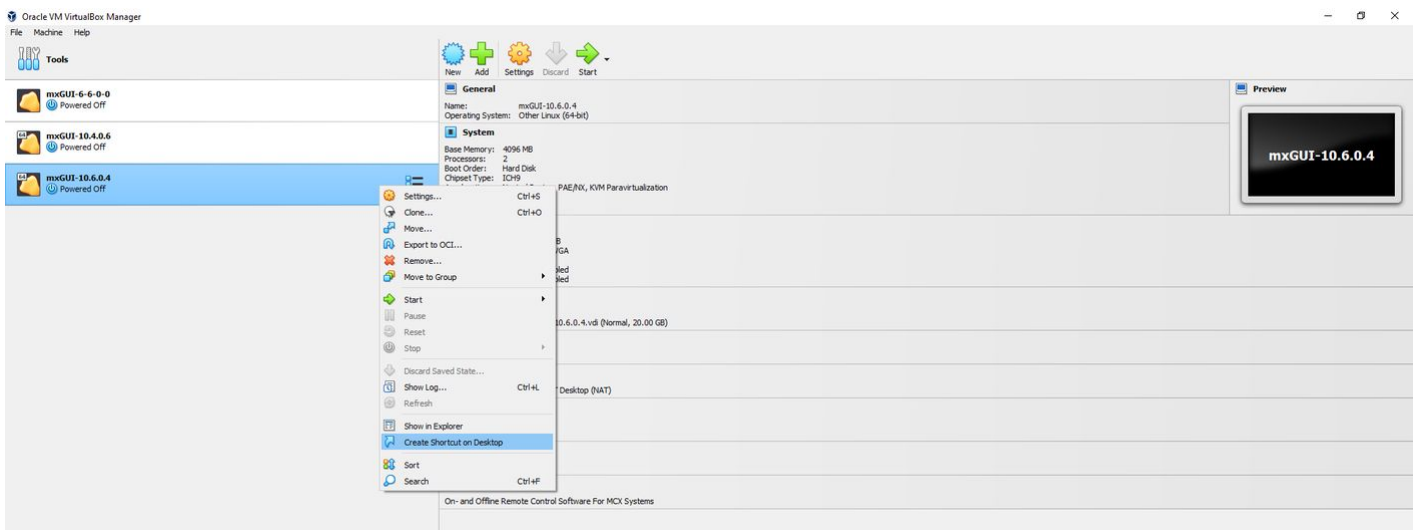


2. Select **Finish** to import the mxGUI appliance, and **Agree** to accept the terms and conditions of the software license.

The import process can take a few seconds. Once complete, mxGUI-x-x-x-x is added to the list of virtual machines (on the left of the display).

At this stage, you can configure the Shared Folders (if they are required) or continue on to create a desktop icon (to start mxGUI).

3. Right-click on the mxGUI-x-x-x-x virtual machine and select **Create Shortcut on Desktop** to add an alias to your desktop.



4. You can now close the Oracle VM VirtualBox Manager, and start mxGUI x.x.x.x from the desktop icon.





What happens next is described in [mxGUI - First Steps](#).

If you need to re-open the VirtualBox Manager, then you will find it in your list of programs (or Applications).

## 2.3 mxGUI - Shared Folders

mxGUI supports two shared folders: **mxgui\_user\_share** and **mxgui\_config\_share**.

The **mxgui\_user\_share** folder appears in both mxGUI and your host operating system. You will need this folder if you wish to copy user data from mxGUI to your operating system or vice versa (e.g. to transfer a production to a USB memory stick).

The **mxgui\_config\_share** folder stores the complete "Local Control System" for the mxGUI computer including the system configuration (i.e. the hardware definition and Signal List).

**i** In the current release, mxGUI's shared folders are NOT supported by **VMware Fusion**.

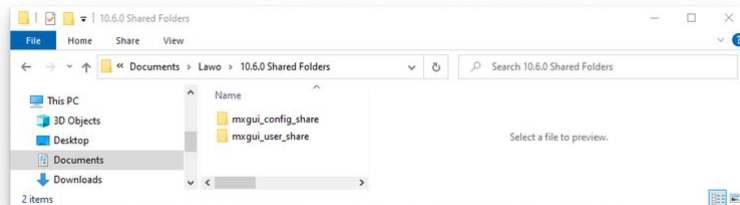
### Configuring the Shared Folders

To provide access to the folders, you must define their file paths in the virtual machine. The instructions below describe how to do this if you are using the Oracle VM VirtualBox Manager. The same principles can be applied to the other virtual machine options.

1. Start by creating two new folders in your Operating System named **mxgui\_config\_share** and **mxgui\_user\_share**.

You can choose any location on your computer, but the file paths must define the actual folder locations and not a short cut.

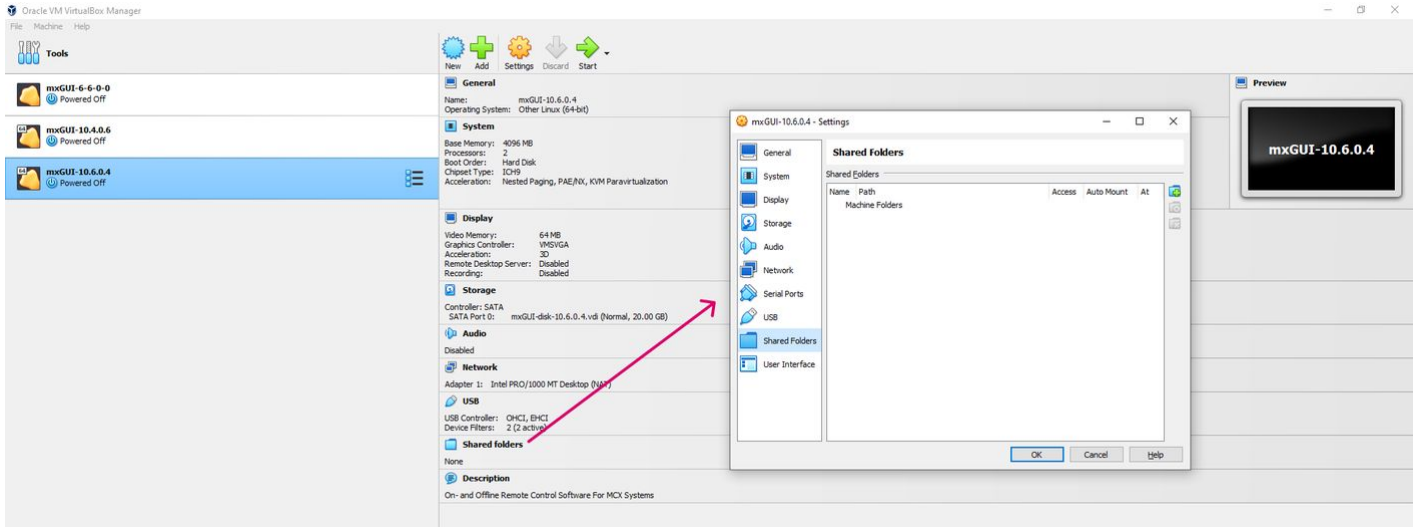
**⚠ Important:** It is recommended to create a new set of shared folders for every major mxGUI release (to keep a backup copy of your user data and avoid any backwards compatibility issues in the future). In the example below, this is done by creating a new parent folder for each mxGUI release.



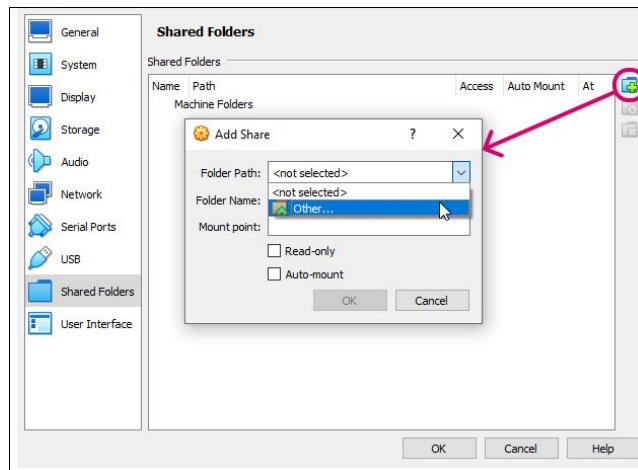
2. Open the Oracle VM VirtualBox Manager and select the correct mxGUI virtual machine from the list on the left.

The mxGUI virtual machine must be powered off in order to create the folder links. If the machine is shown as "Powered On", then close mxGUI before continuing to the next step.

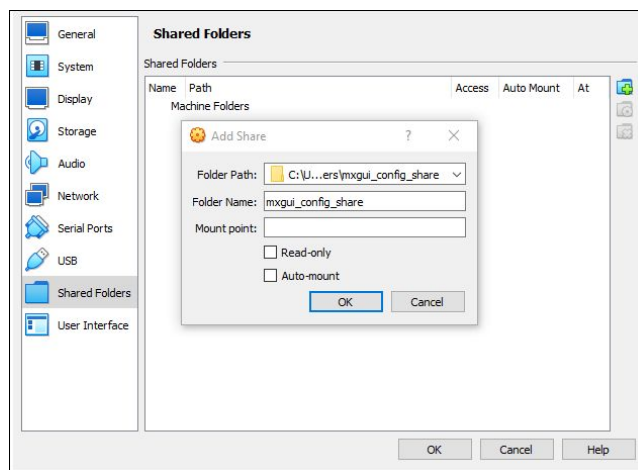
3. Click on **Shared folders** (in the Details area) to open the Shared Folder Settings:



4. Select the **+** icon to define a new folder location, click in the **Folder Path** field and choose **Other**:

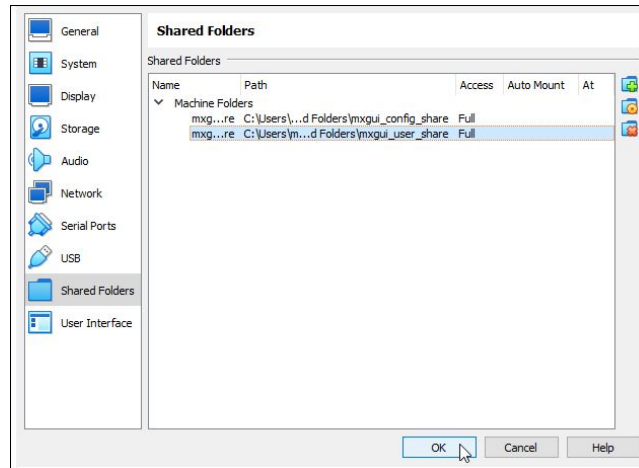


5. Select the **mxgui\_config\_share** folder which you created in step 1 and click **OK**:



6. Repeat steps 4 and 5 to define the file path for the **mxgui\_user\_share** folder.

You should now have two Shared Folder entries:



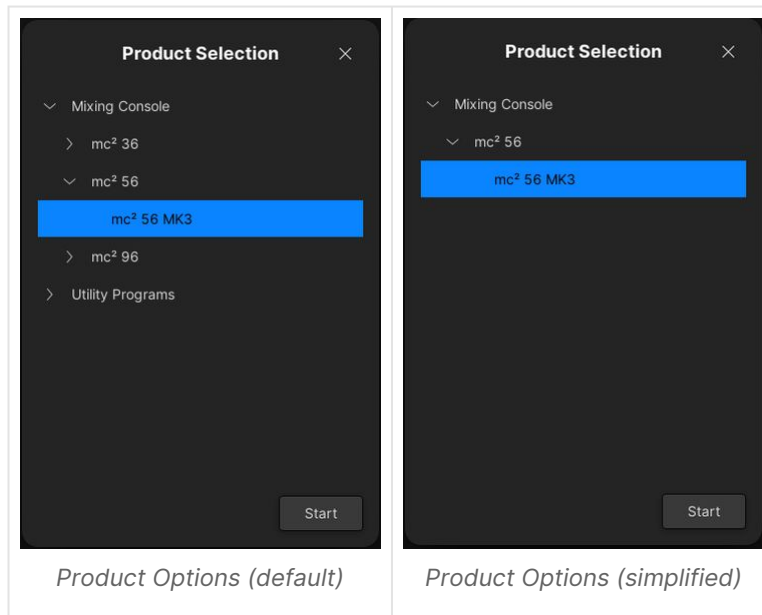
7. Select **OK** to confirm the changes.

When you next start mxGUI, the contents of the **mxgui\_user\_share** folder can be accessed from the Productions → File Transfer display AND all data stored by mxGUI on its "Local Control System" is saved into the **mxgui\_config\_share** folder.

If you created a new set of folders (in step 1), then any existing user data can be copied across from the "mxgui\_user\_share" folder for the previous release.

## 2.4 mxGUI - Product Options

When mxGUI first starts up, the 'Product Selection' window appears. To simplify the operation, some of the options can be hidden from view. For example, to show only console emulations of a certain type.



### Editing the Product Options

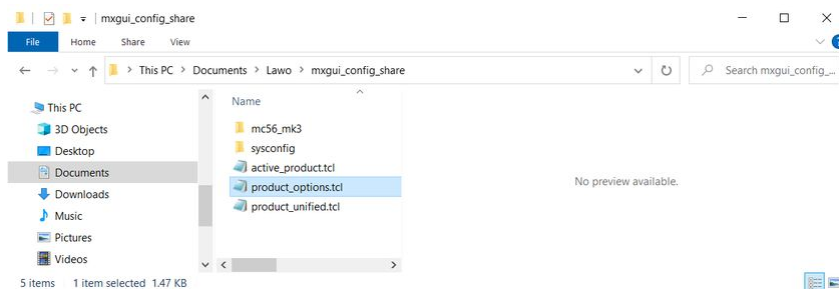
The current options are read from the "product\_options.tcl" file when mxGUI starts up. By default, all options are included after a standard install. To make a change, you will need to edit and save the file, and then restart mxGUI.

To edit the file, you can use any suitable tcl file editor. The correct syntax for each product can be found in the "product\_unified.tcl" file.

Note that the supported options vary depending on the mxGUI release. The screenshots below are taken from the V10.6.0.x release. Other mxGUI versions can be edited in a similar manner.

1. Start by opening the "product\_options.tcl" file in your tcl file editor.

The screenshot below shows the default file location.



If you have created a different mxgui\_config\_share file\_path (for a new mxGUI release), then it will be necessary to edit the new file or copy across the file from the previous release).

The screenshot below shows the default contents of the "product\_options.tcl" file (after a standard install). In this instance, nothing is suppressed and so all options will be visible in the 'Product Selection' window.

```

product_options.tcl - [C:\Users\mcdonas1\OneDrive - Lawo AG\Documents\mxgui_config_share\product_options.tcl]
#
# IMPORTANT WARNING: Touching the content between HEADER BEGIN and HEADER END markers
# can lead to unpredictable behavior.
# Please, only edit the file after HEADER END marker
#
# Here are the possible options:
#
# autostart_last VALUE      : if VALUE is 1, mxGUI will automatically start latest selected product
#
# product_suppress TREEPATH : suppress an entry from the Product Selection popup.
# TREEPATH must match the one used at creation with product_info command (see product_unified.tcl).
# Example1:
#   product_info "Mixing Console" "mc2-36" "RAVENNA Link" "16 Faders" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_36_16_Link\""
#   can be suppressed by:
#   product_suppress "Mixing Console" "mc2-36" "RAVENNA Link" "16 Faders"
# Example2:
#   You can also suppress a complete node (all mc2-36 in this example)
#   product_suppress "Mixing Console" "mc2-36"
#
# product_rename TREEPATH NEWNAME : rename an entry in the Product Selection popup.
# See product_suppress for details on TREEPATH, only last string item in the TREEPATH will be replaced by the NEWNAME string)
#
# HEADER END
  
```

2. Edit the file as shown below. For example, to suppress the mc<sup>2</sup> 36, mc<sup>2</sup> 96 and utility programs.

```

#
# HEADER END
product_suppress "Mixing Console" "mc2 36"
product_suppress "Mixing Console" "mc2 96"
product_suppress "Utility Programs"
  
```

Make sure that you add the live entries after the # HEADER END. You can suppress individual entries or a complete branch of the menu (as in the example above).

The correct syntax can be copied from the "product\_unified.tcl" file:

```

product_unified.tcl - [C:\Users\mcdonas1\OneDrive - Lawo AG\Documents\mxgui_config_share\product_unified.tcl]
product_info "Mixing Console" "mc2 36" "mc2 36 MK2" "32 Faders" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_36_mk2_32\""
product_info "Mixing Console" "mc2 36" "mc2 36 MK2" "48 Faders" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_36_mk2_48\""
product_info "Mixing Console" "mc2 36" "mc2 36 MK2 xp" "16 Faders" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_36_mk2_xp_16\""
product_info "Mixing Console" "mc2 36" "mc2 36 MK2 xp" "32 Faders" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_36_mk2_xp_32\""
product_info "Mixing Console" "mc2 36" "mc2 36 MK2 xp" "48 Faders" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_36_mk2_xp_48\""
product_info "Mixing Console" "mc2 96" "mc2 96 MK3" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_96_mk3\""
product_info "Mixing Console" "mc2 96" "mc2 96" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_96\""
product_info "Mixing Console" "mc2 96" "mc2 96 Xtra" "/usr/mx_gui_starter/start%GuiVariant.sh \"mc2_96_xtra\""
product_info "Utility Programs" "mxUpdater" "/usr/mx_updater/start%Updater.sh"
product_info "Utility Programs" "Image Creator" "/usr/image_creator/startImageCreator.sh"
  
```

3. Now save the "product\_options.tcl" file.

4. Then close mxGUI and the virtual machine (as described [here](#)).

When you next start mxGUI, the changes to the product options are applied.



## 3 mxGUI - Operation

This chapter describes how to operate mxGUI once the software is installed and configured.

- [mxGUI - First Steps](#)
- [mxGUI - Online and Offline Status](#)
- [mxGUI - Operating Principles](#)
- [mxGUI - Remote Operation](#)
- [mxGUI - Offline Setup](#)

### 3.1 mxGUI - First Steps

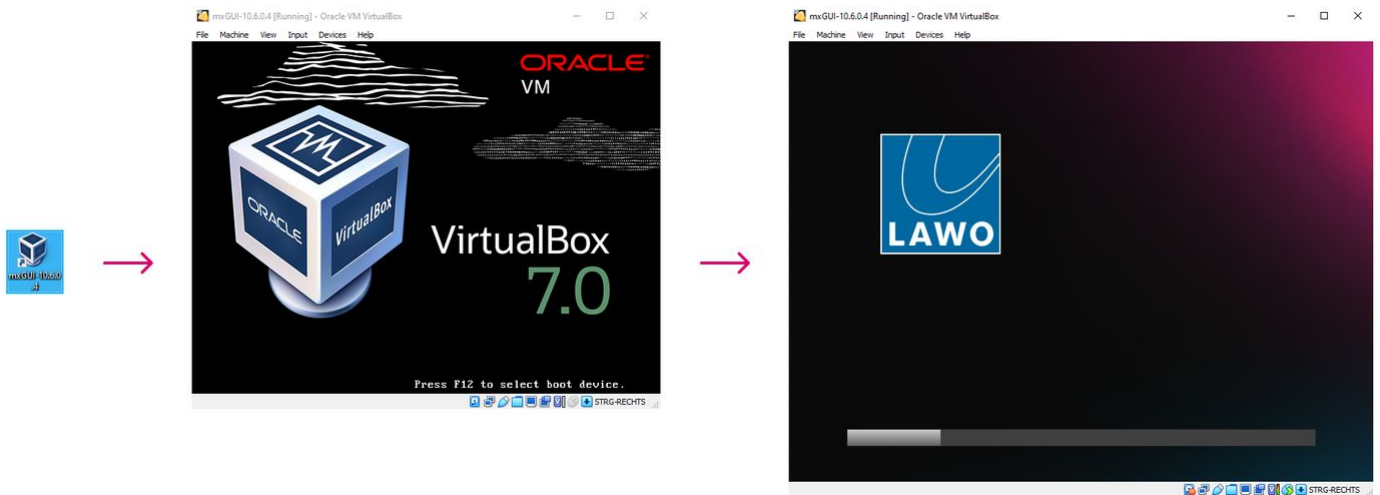
This topic describes how to open and close mxGUI, and adjust the view (in the Virtual Machine).

#### Starting mxGUI

1. The easiest way to start mxGUI is to double-click on the **mxGUI-X-X-X-X** desktop icon (created during the [installation procedure](#)).

Alternatively, you can open the VirtualBox Manager and start mxGUI either from the right-click options or **Start** button.

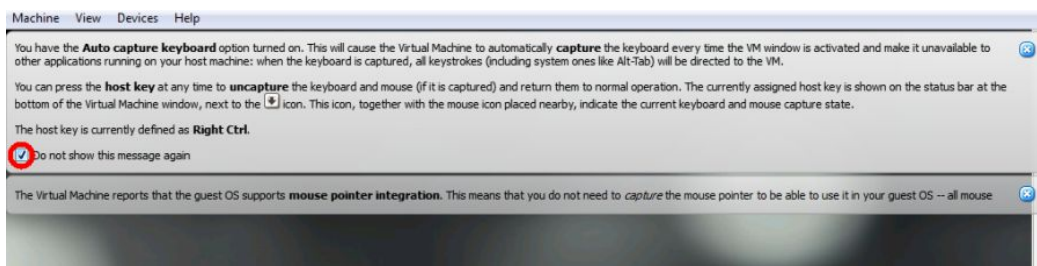
A window opens where you can see the boot-up of the virtual machine (e.g. VirtualBox) and then the application (Lawo mxGUI). This can take some time - the boot-up progress is shown on-screen.



2. If you are starting VirtualBox for the first time, then you may see some additional messages that relate to the interaction between your computer's KVM interface and the virtual machine.

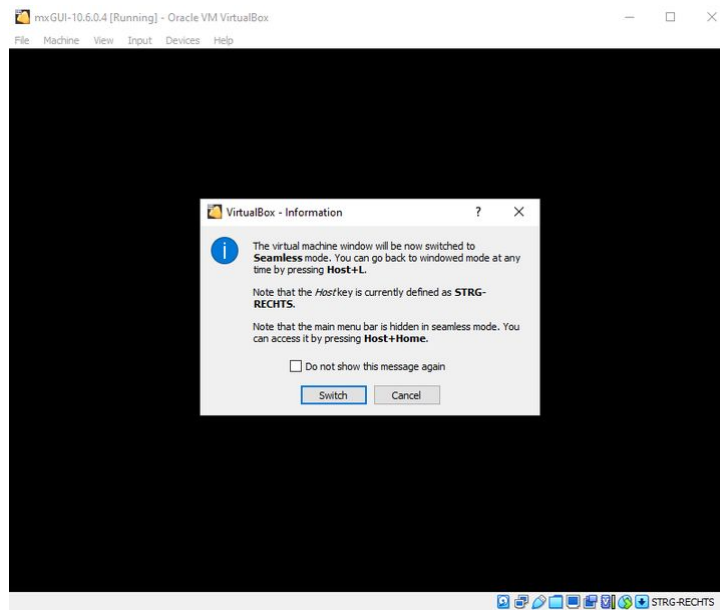
These vary depending on your host OS, and do not appear if they have already been suppressed for future start-ups. The examples below are taken from a Windows PC.

If the following (or similar) messages appear, then enable the option to suppress the message on future start-ups and click **X** to close.



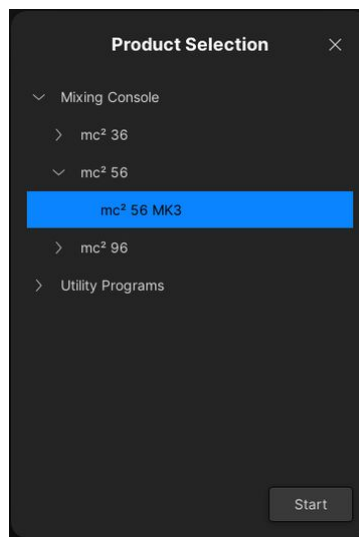


3. At the following dialog box, click **Do not show this message again** (to suppress the message on future start-ups) and select **Switch** (to view the virtual machine in **Seamless** mode).



The view can be changed later (as described [below](#)).

4. Once mxGUI has finished booting, you will see the 'Product Selection' window.



From here you can launch any of the mixing console emulations or a utility program. In each case, click on the arrows to view all available options. If you cannot see all of the options above, then they may have been edited (as described [here](#)).

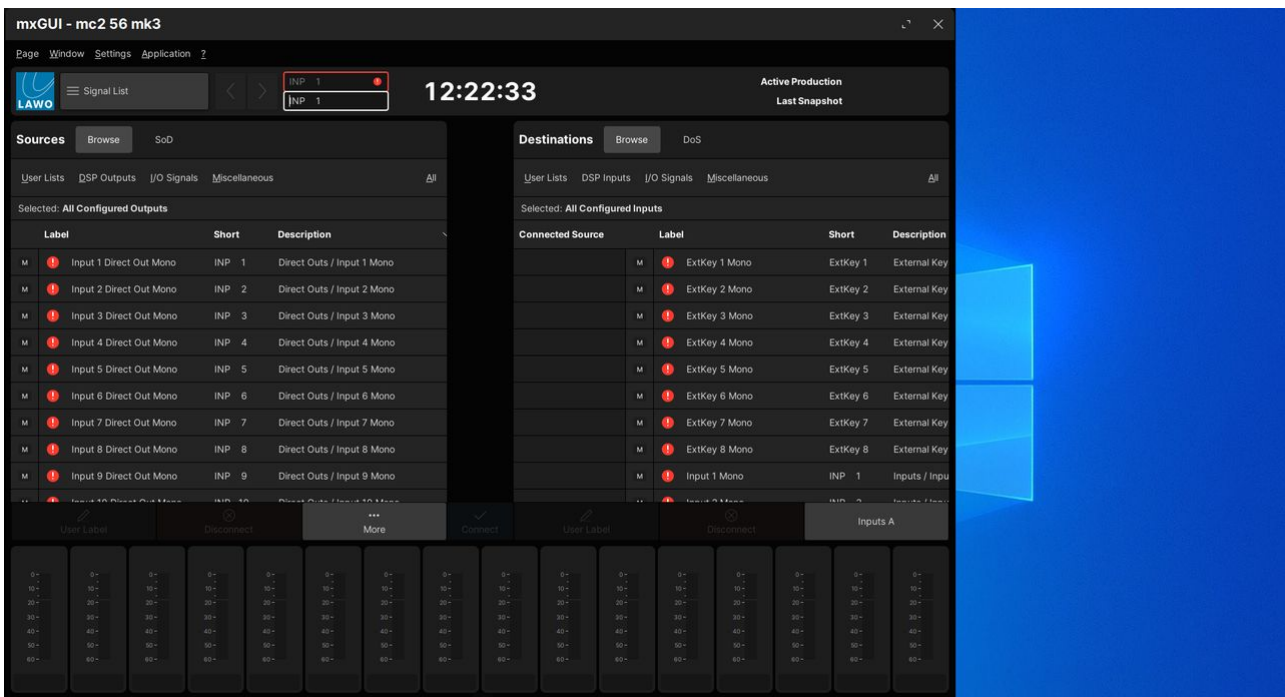
**Please note:** it is important to choose the correct mixing console emulation (so that mxGUI shows the correct features and displays).

Product Selection	Can be used for...
Mixing Console →	
mc <sup>2</sup> 36 → mc <sup>2</sup> 36 MK2 → 16 Faders	mc <sup>2</sup> 36 MKII console: 16C
mc <sup>2</sup> 36 → mc <sup>2</sup> 36 MK2 → 32 Faders	mc <sup>2</sup> 36 MKII console: 16 (single faders) + 16C
mc <sup>2</sup> 36 → mc <sup>2</sup> 36 MK2 → 48 Faders	mc <sup>2</sup> 36 MKII console: 16 (dual faders) + 16C

Product Selection	Can be used for...
mc <sup>2</sup> 36 → mc <sup>2</sup> 36 MK2 xp → 16, 32 or 48 Faders	as above, but for the mc <sup>2</sup> 36 xp.
mc <sup>2</sup> 56 → mc <sup>2</sup> 56 MK3	mc <sup>2</sup> 56 MKIII console: all frame variants.
mc <sup>2</sup> 96 → mc <sup>2</sup> 96	mc <sup>2</sup> 96 console with standard centre section.
mc <sup>2</sup> 96 → mc <sup>2</sup> 96 Xtra	mc <sup>2</sup> 96 console with extra faders centre section.
Utility Programs →	
mxUpdater	System software updates, user data backup and restore.
Image Creator	Image backups for system and user data recovery.

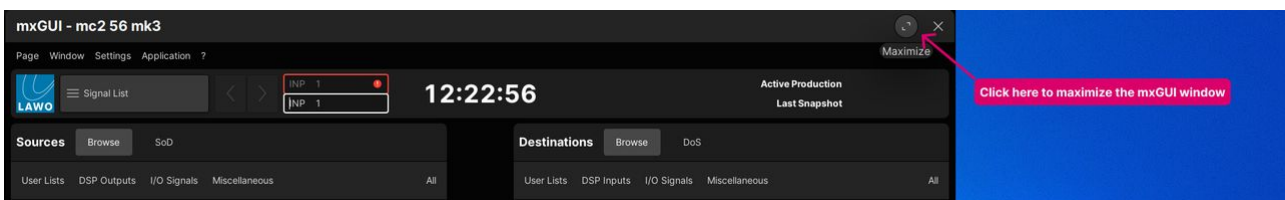
4. Make a selection (e.g. **mc<sup>2</sup>56 MK3**) and click **Start**.

The mxGUI operating window opens and the software loads its warm start data (i.e. the settings saved at the last shutdown). The software is ready to use once you see the **Signal List** display. An example is shown below.

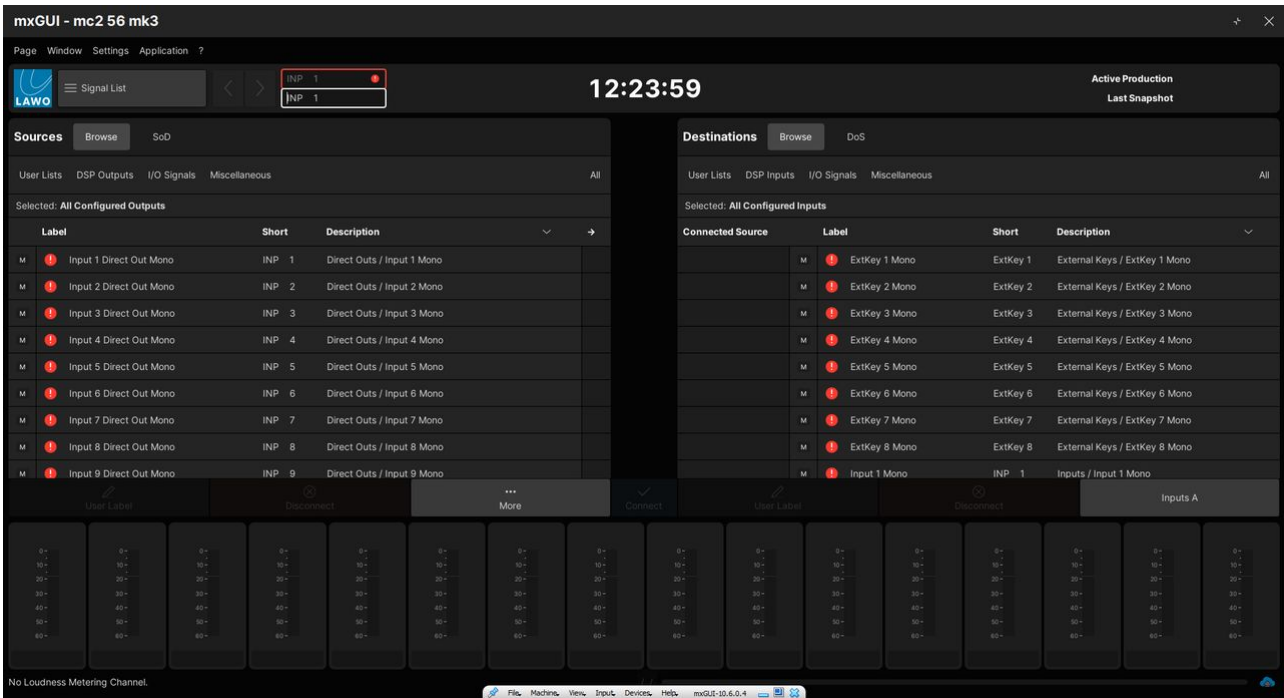


5. Before moving on, it is recommended to adjust the size of the operating window.

Select the **Maximize** icon (at the top right of the display) to fit the mxGUI operating window to the virtual machine view.



In **Seamless** mode, there is usually nothing further to do.

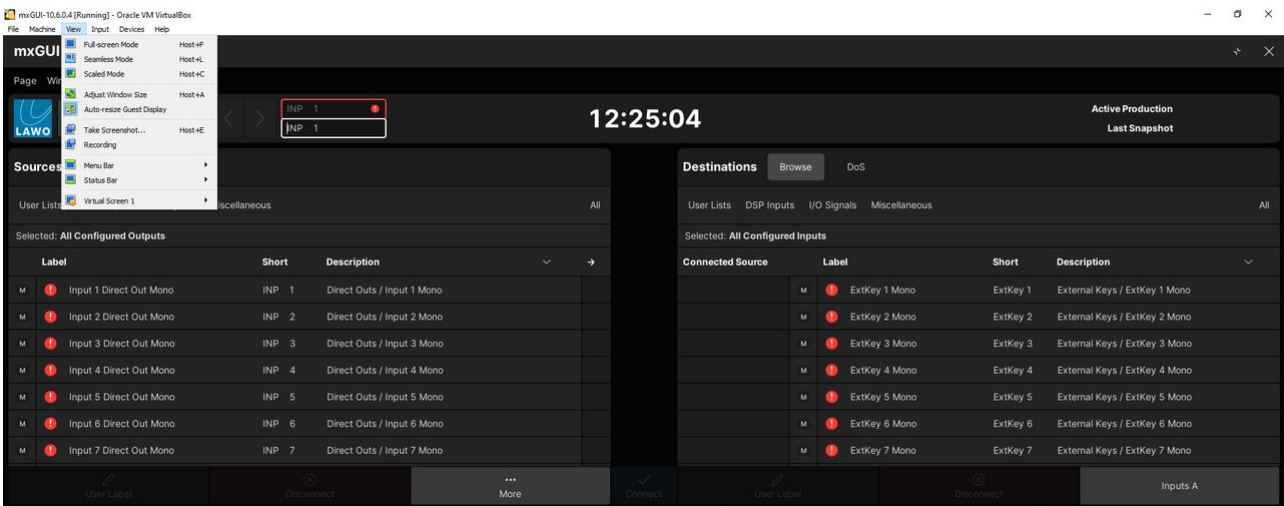


### Changing the View

In VirtualBox, there are four possible viewing modes: **Fullscreen**, **Seamless**, **Scaled** or **normal**.

Either **Fullscreen** or **Seamless** view are recommended as they scale the mxGUI operating window to fit your display. **Fullscreen** uses the full screen available; **Seamless** view allows mxGUI to fit alongside other applications.

To change the view, press the correct keyboard shortcut (e.g. Host + L) to go back to normal mode (as shown below) and select an option from the **View** menu.



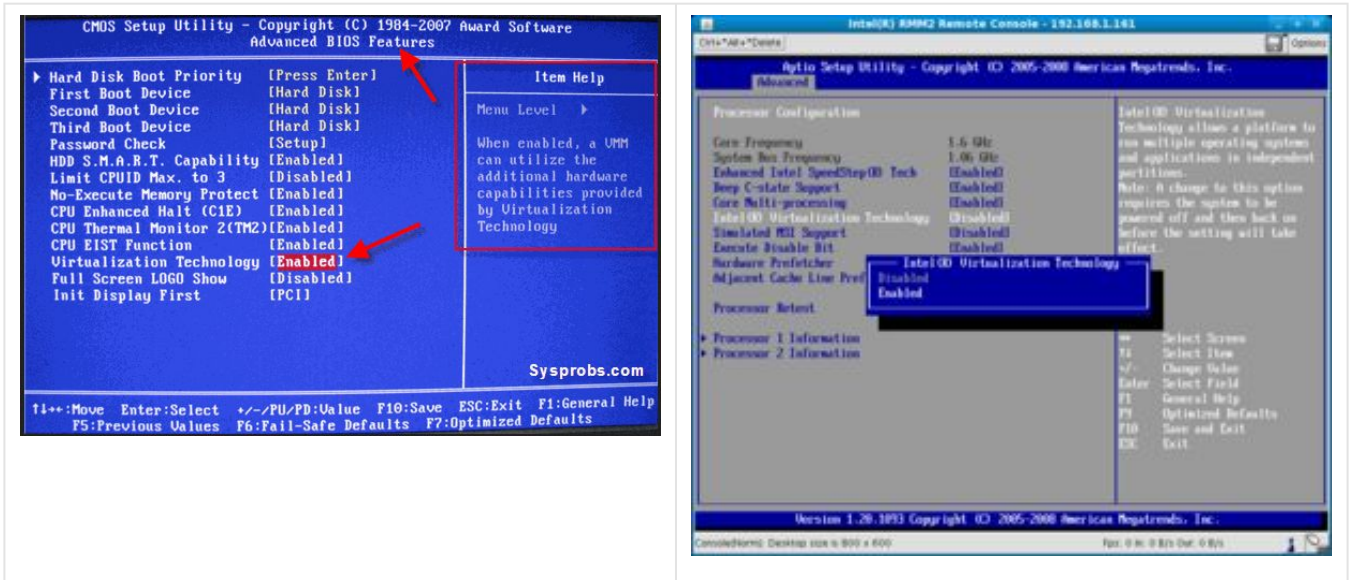
## Troubleshooting

In order for mxGUI to start correctly on a host PC, virtualization must be activated in the BIOS system. Follow the instructions below to enable this option.

### BIOS Setup for a Windows PC

1. Consult your PC's documentation for details on how to enter the BIOS setup.
2. Look for the Virtualization option and set it to **Enabled**.

The screenshots below show two example systems.



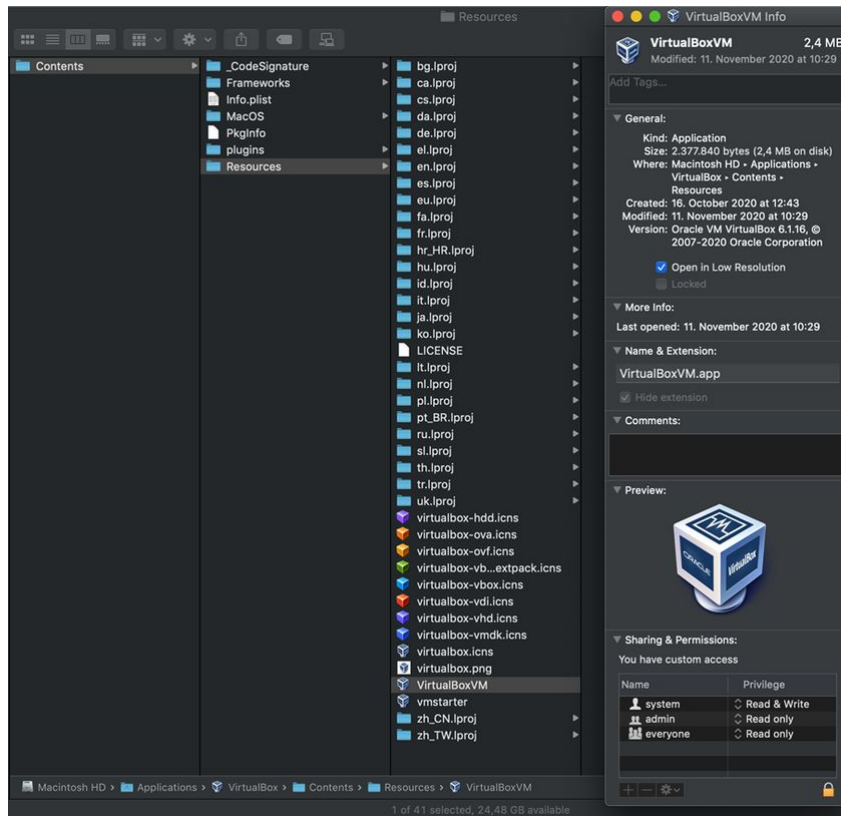
3. Remember to save any changes and then exit the BIOS.
4. Restart the PC and then start mxGUI.

When using mxGUI on mac OS-based systems with a retina display, it is necessary to adjust the resolution used by the macOS to run VirtualBox. Follow the instructions below to adjust the resolution.

### OS Setup for a MAC with Retina Display

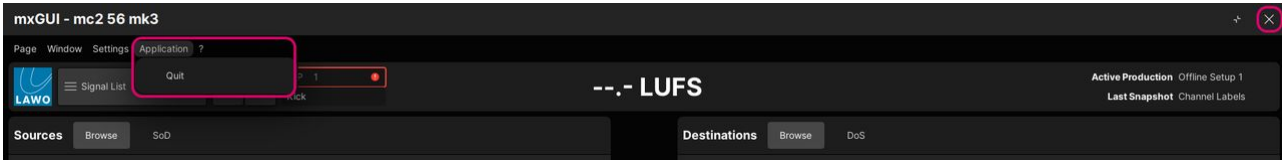
1. Go to **Applications**, right-click **VirtualBox** and select **Show Package Contents**.
2. Select **Contents** → **Resources** → **VirtualBoxVM** and press **COMMAND + I** (on the keyboard).
3. Enable the option **Open in Low Resolution**.

The screenshot below shows an example system.



## Closing mxGUI

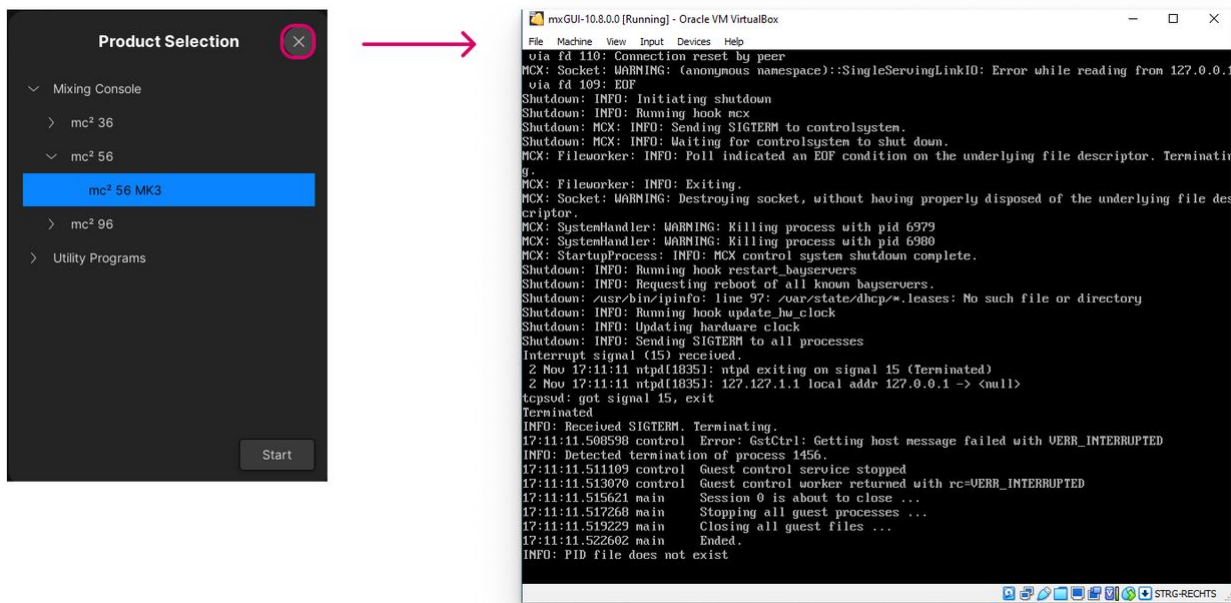
1. To close the current emulation, select **Application → Quit** (from the main menus), or click on the close icon (at the top right of the display).



The emulation closes and the software returns to the 'Product Selection' window. If you are running offline, then the latest settings are saved to the local control system (on your computer).

2. From here click on the close icon (top right) to close the software and the virtual machine.

This takes a few seconds, during which time, the progress is shown on-screen.

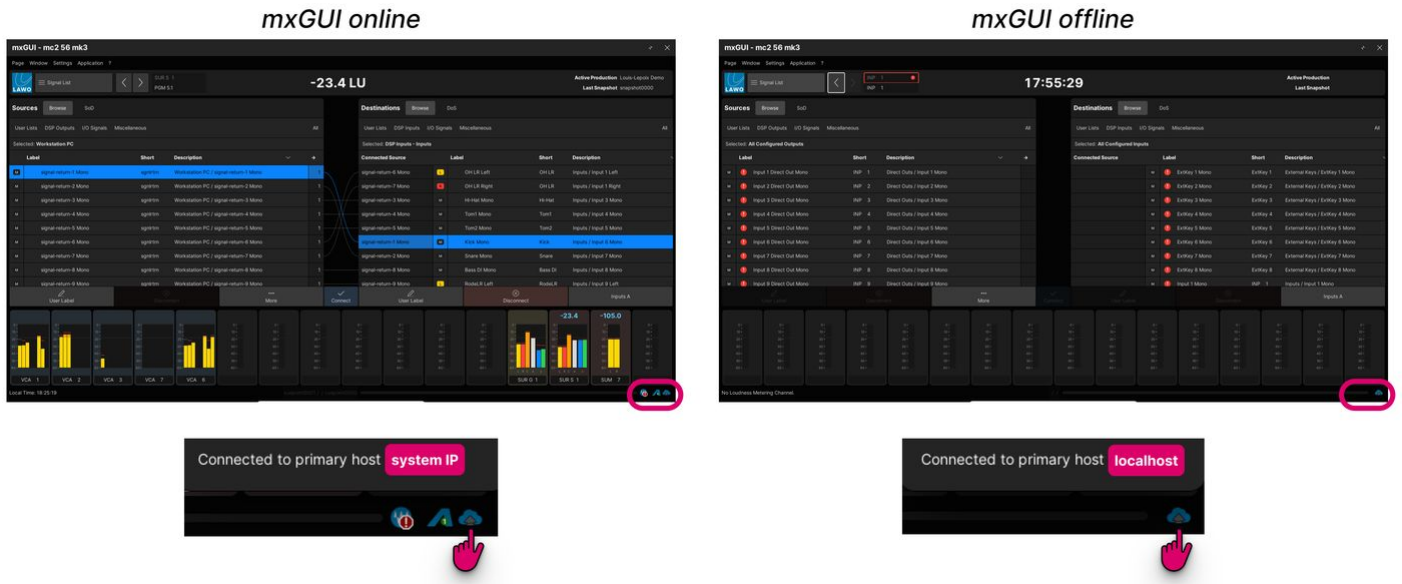


3. When the virtual machine window closes, the shutdown is complete.

### 3.2 mxGUI - Online and Offline Status

mxGUI has two modes of operation: online or offline.

You can interrogate the current status by hovering over the connection icon at the bottom right of the display.



In **online mode**, mxGUI connects to the mc<sup>2</sup> control system via the IP network (and so you will see the IP address of the connected system). You can use this mode to remotely operate the system from the mxGUI displays. Any changes take immediate effect, and all user data is stored on the mc<sup>2</sup> system.

In **offline mode**, mxGUI runs an emulation of the mc<sup>2</sup> control system (and so you will see that mxGUI is connected to the "localhost"). You can use this mode to prepare settings offline, save them into a production (stored on the mxGUI computer), and then transfer this to the system at a later time. In this instance, all user data is stored locally on the mxGUI computer (on the "Local Control System").

Both modes are described in more detail later. For now, it is useful to know that:

- By default, mxGUI starts in offline mode. You can use the **Reconnect** option (in the Settings → Connection window) to modify this behaviour.
- A very basic configuration is included with the mxGUI installer (and this is why, initially, the offline **Signal List** has no external signals).
- Before you can build an offline setup that includes signal routing, you will need to open a online connection to the system (to synchronize the **Signal List**).

### 3.3 mxGUI - Operating Principles

The mxGUI operating window is virtually identical to the Central GUI on an mc<sup>2</sup> console, except for the main menus at the top of the display and some additional pages.

This topic describes the elements that are new to mxGUI users.

- [Main Menu](#)
- [Available Pages](#)
- [Adjusting Settings](#)
- [Strip Assign display](#)
- [Access/Assign window](#)
- [File Transfer display](#)
- [Shared Folder](#)

#### Main Menu

In the current release, there are five main menus.

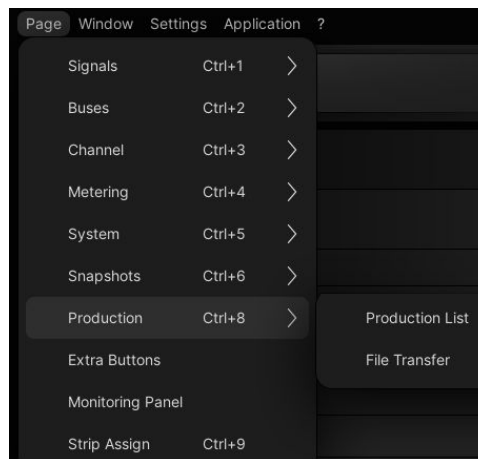
- **Page** - provides access to the available pages.
- **Window → Access/Assign** - opens the '[Access/Assign](#)' window (to perform access/assign operations).
- **Settings → Connection** - opens the '[Connection](#)' window (to get online or offline).
- **Application → Quit** - [closes](#) the current emulation.
- **? → Info** - shows information about the mxGUI release.

#### Available Pages

Most of the mxGUI displays are identical to the ones on the console. You can learn more about these [here](#).

The exceptions are the [Strip Assign](#) and [File Transfer](#) displays which appear only in mxGUI. The **File Transfer** display replaces the **File** display on the console GUI. It can be found under **Production** (as shown below).

To change page, click on the **Page** (main menu) or page icon (beside the Lawo logo). Or use one of the keyboard shortcuts (shown in the page menu).



#### Adjusting Settings

Settings are adjusted in the same way as on the Central GUI. Instead of touching an option, you can use the mouse and keyboard on your computer.

- Left-click to enable a button or option.
- Right-click to reveal the context menu (if applicable).
- Left-click on a text field to edit a name.
- Click on the up/down arrows beside a parameter, or use the keyboard up/down cursor keys, to adjust the value.



- ✓ If you have a mouse wheel, then this can be used to adjust a parameter value, or scroll up/down a list, once it is in focus.

You can use any of the usual console [Keyboard Shortcuts](#) to speed up the page navigation and editing of parameters.

## Strip Assign display

The **Strip Assign** display provides a virtual representation of the console fader strips. You can use this to check what channels are assigned to the surface, select a fader and adjust levels and mutes.

1. Open the display by selecting **Strip Assign** from the page menu.

The vertical "strips" represent the physical fader strips on the console. If you hover at the bottom of the display, a horizontal scroll bar appears. This can be used to scroll left and right to see all available faders.



2. Working from top to bottom, each "strip" provides:

- **Strip #** – identifies the fader strip. Note that main fader strips are marked as **Main #**.
- **Meter** – channel meter. Right-click to change the meter mode or pick-up point.
- **Flip** – layer flip. Click to switch to the alternate layer.
- **Sel** – fader select. Click to select the fader strip (to change the channel in access).
- **Mute** – channel mute. Click to mute the channel.
- **Level (in dB) & Fader** – channel level. There are two ways to adjust the level.
  - Click on the **dB** field and type in a value or scroll the mouse wheel up/down.
  - Click and drag up/down on the fader.
- **Label** – short label (identifies the channel). The labels can be switched globally using the LABEL buttons in the **Access/Assign** window.

If you open the **Access/Assign** window (as described below), you can use the **Sel** buttons to change fader strip assignments, copy audio parameters, create a couple group, etc.

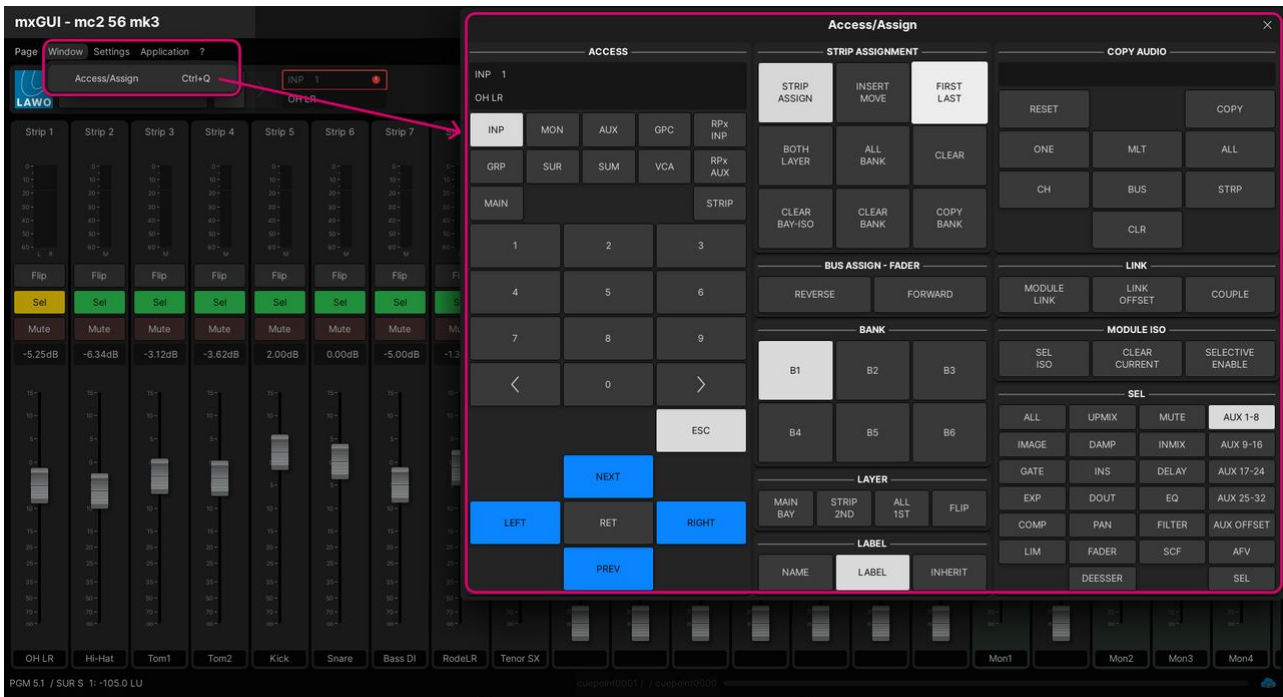
## Access/Assign window

The **Access/Assign** window can be floated above any of the main pages. It provides a virtual representation of the console centre section control panels. You can use this to perform a range of operations including strip assignment, bus assignment, and bank and later switching.

1. Select **Window → Access/Assign** (or press CTRL + Q) to open the window.

This is a floating window and so its position can be moved as required.

In the example below, it is being used to perform a **FIRST LAST** fader strip assignment in conjunction with the **Sel** buttons on the **Strip Assign** display.



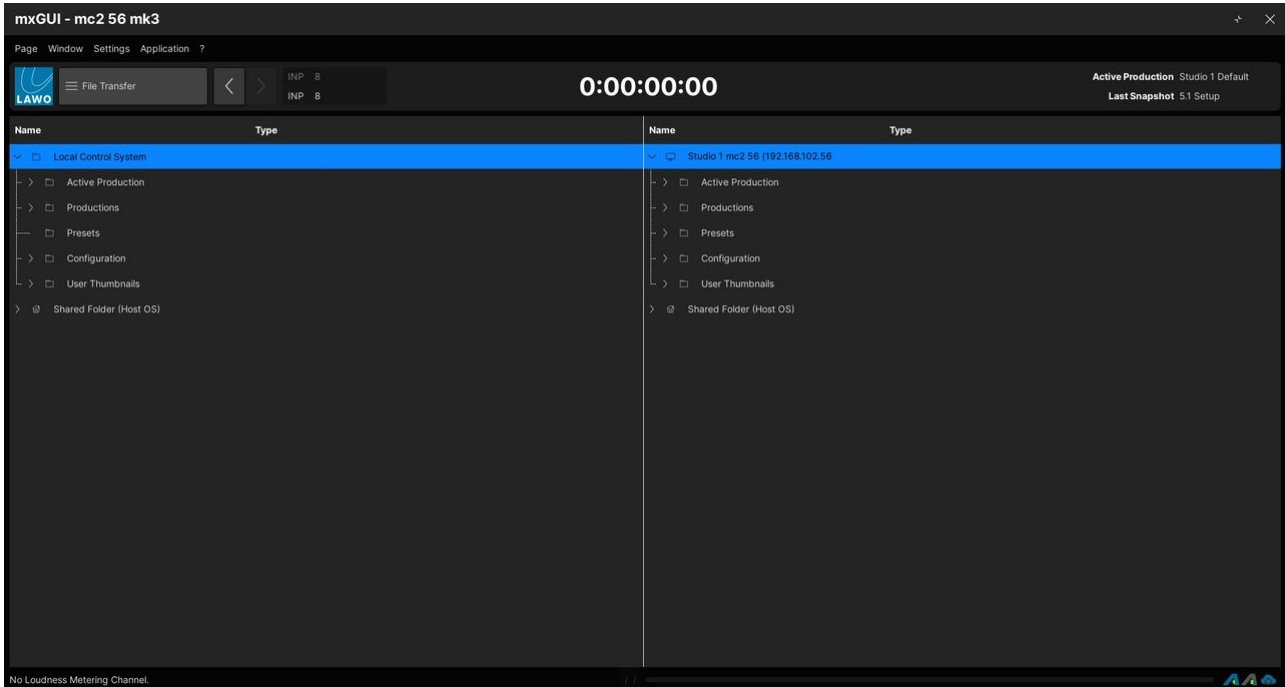
The on-screen controls work in exactly the same way as on the console front panel. Please click on the links below for more information about each function.

- **ACCESS** – shows/selects the channel in access. See [Access/Assign](#).
- **STRIP ASSIGNMENT** - assigns channels to fader strips. See [Fader Strip Assignment](#).
- **BUS ASSIGN - FADER** – these are the [FADER FORWARD Assign](#) and [FADER REVERSE Assign](#) functions.
- **BANK** and **LAYER** - switches [Banks](#) and [Layers](#) globally.
- **LABEL** – switches the fader strip [Labels](#).
- **COPY AUDIO** – used to copy or reset audio parameters. See [Copy & Reset](#).
- **LINK** – used to create [link](#) or [couple](#) groups.
- **MODULE ISO** – used to [isolate](#) DSP modules from snapshot loads.
- **SEL** – replicates the **SEL** buttons on the Central Control Section. See [Selecting Channel Parameters](#).

## File Transfer display

The **File Transfer** display is used to transfer files between the local control system (on the mxGUI computer), the online system (if connected) and the shared folder (in your host operating system). It can be used to backup user data or prepare mxGUI for offline working.

1. Open the display by selecting **Production** → **File Transfer** from the page menu.



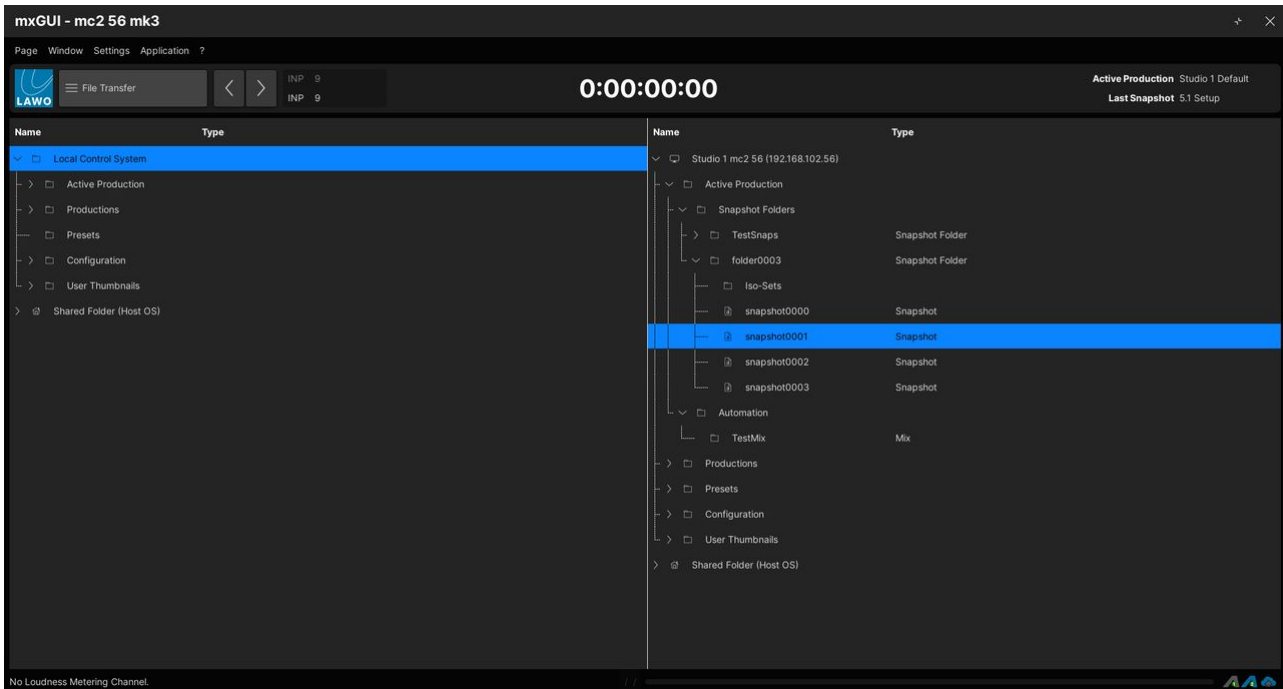
On the left is the **Local Control System** (used when mxGUI is offline) and the **Shared Folder (Host OS)**.

On the right is the remote control system (if a system is connected) and the **Shared Folder (Host OS)**.

The remote control system provides access to the data stored on the mc<sup>2</sup> system, and so this only appears when mxGUI is online. The system is identified by the Name and Primary IP entered in the '[Settings](#) → [Connection](#)' window.

The **Shared Folder (Host OS)** appears on both sides of the display so that it can accept files from either the local or remote system.

- Open or close directories by double-clicking on the directory name (or click on the arrow beside the directory name).



The data structure is the same for both the local and remote control system. They contain the following parent folders.

- **Active Production** – contains the snapshots and mixes stored in the active production.
- **Productions** – contains all zipped productions (as a complete file).
- **Presets** – contains all module and channel presets.
- **Configuration** – contains the custom function template files.
- **User Thumbnails** - contains images for the user label thumbnails.

Each file and folder is clearly marked with its **Type** – e.g. production, channel preset, EQ preset, etc. The **Type** is important as files can only be transferred to a valid destination. For example, you cannot transfer a snapshot into the **Automation** folder!

It is possible to resize the display areas (by clicking and dragging on the vertical separator bar) OR sort files by Name or Type by clicking on the column headers.

- To transfer a file (or folder), select a valid source and destination. Then right-click, and select **Transfer**.

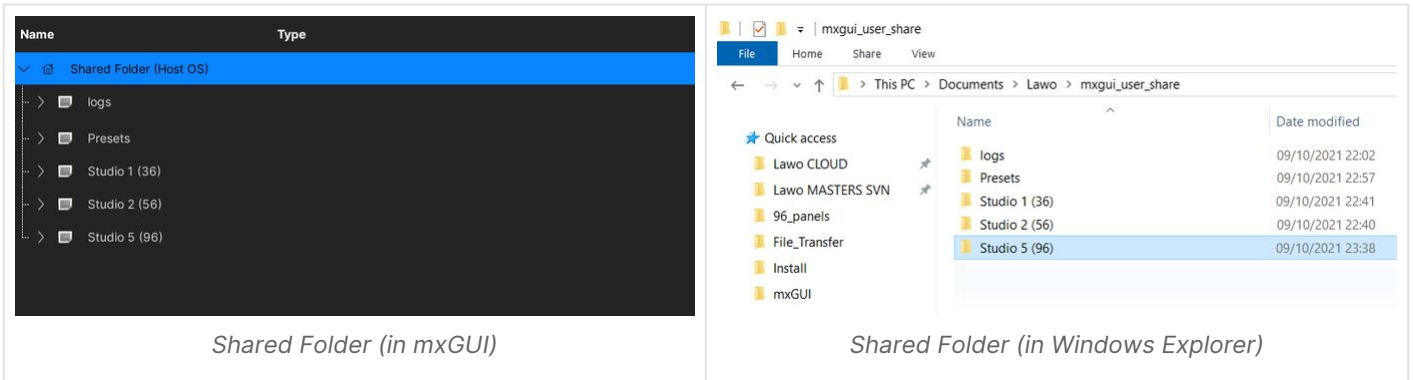
Transfers can be made from left to right or right to left. If an operation is not permitted, then the **Export** or **Import** option is greyed out.

If a file with the same name already exists, then a copy is made and a suffix added to the file name. e.g. (0001).

## Shared Folder

The **mxgui\_user\_share** folder can be used to copy user data to and from your host operating system. For example, to transfer a production to a USB memory stick or make a backup of your system's user data.

To use this function, the folder must be defined within the virtual machine (as described [earlier](#)). The **mxgui\_user\_share** folder will then appear in both mxGUI and your host operating system.



## Operations in mxGUI

From mxGUI, you can perform some basic file management tasks.

1. Right-click on the Shared Folder and select **New Folder**.

A new folder is added with a generic name.

2. Type to rename the folder.

You can create folders within folders simply by right-clicking on the sub folder name.

3. Right-click on the file or sub folder and select **Delete**. Then select **OK** to confirm.

Note that the **Delete** option is only available for files and folders in the **Shared Folder**.

To delete a file from the local (or remote) control system, you must open the relevant page. For example, to delete a production, open the **Productions** display; to delete a preset, open the **Main Display**; etc.

## Operations in the Host OS

From your host operating system, you can perform any of the usual file management tasks: create folder, move or delete files, etc.

Note that each file has a specific file extension which should not be modified, otherwise the file cannot be loaded by the mc<sup>2</sup> system.

## File Types & Extensions

The import and export functions can be used to transfer any of the following file types.

Note that it is not possible to transfer the **Active Production** or **Presets** folders.

File Type	File Extension	Description
Production	.lpn	This is a zipped file that must be transferred to/from the <b>Productions</b> folder. The contents cannot be opened externally. To access individual elements, such as a snapshot or folder, you will need to load the production on the mc <sup>2</sup> system and then open the <b>Active Production</b> folder.
Snapshot Folder	.lsf	This is an individual snapshot folder (containing snapshots and cuelists). This is a zipped file that must be transferred to/from the <b>Active Production</b> folder. The contents cannot be opened externally. To access individual elements, such as a snapshot, you will need to load the production on the mc <sup>2</sup> system and then open the <b>Active Production</b> and the <b>Snapshot Folder</b> .
Snapshot	.lsn	This is an individual snapshot file. It must be transferred to/from a <b>Snapshot Folder</b> in the <b>Active Production</b> folder.
Mix	.lau	This is an individual mix (containing mix passes). It must be transferred to/from the <b>Active Production</b> folder.
Channel Preset	.pch	This is an individual channel preset. It must be transferred to/from the <b>Presets</b> folder.
EQ Preset	.peq	As above, but for the individual DSP modules. In each case, the module is described by the file type/extension.
Compressor Preset	.pco	
etc.		
Complete Configuration Set	.lcf	This is a zipped file that is created when you transfer the <b>Configuration</b> folder. It contains all of the system's custom functions. Note that the custom functions cannot be transferred individually and so this file is useful for global backup and restore purposes only.
User Thumbnail	.jpg	This is an individual user thumbnail image that complies with the permitted image requirements. For more information, please export and read the README.txt file contained in the <b>User Thumbnails</b> folder.



File Type	File Extension	Description
Log	.log	<p>This is a system logfile (visible only on the console's <b>File</b> display).</p> <p>The logs can be useful for diagnostic purposes and should be exported and emailed to Lawo support should you encounter a system problem.</p>

### 3.4 mxGUI - Remote Operation

Online mode can be used to remotely operate a console from the mxGUI displays. In this mode, the software opens a connection to the remote system via the IP network. Once online, all changes take immediate effect and are made to the mc<sup>2</sup> control system.

Please note:

- mxGUI cannot connect to more than one system at a time. If there is an existing online connection, then this is cancelled automatically before a new connection is made.
- It is possible to prepare several connections (to different consoles) as long as they use the same emulation.

#### Network Requirements

The mxGUI computer must be connected to the same management network as the mc<sup>2</sup> control system. Connections are made via TCP/IP Ethernet.

You must use a network switch and NOT a hub, and keep the management network separate from other traffic within the installation. The switch should support 1GB for best performance.

Lawo delivers a suitable network switch with the system. This could be replaced by any other suitable switch fabric that provides comparable performance.

Depending on the number of network connections, one mc<sup>2</sup> system can support up to 16 clients.

#### IP Settings

To establish a network connection to the mc<sup>2</sup> system, you will need to configure the network settings for your PC's LAN port.

The **IP Address** must be unique and set within the same range as that of the mc<sup>2</sup> control system (i.e. the first three fields must match). You can check the current settings for the system using the [IP Address](#) fields in the **System Settings** page.

The default IP addresses are:

- mc<sup>2</sup> 36 = 192.168.102.36
- mc<sup>2</sup> 56 = 192.168.102.56
- mc<sup>2</sup> 96 = 192.168.102.96
- mxGUI (local control system) = 192.168.56.101

The **Subnet Mask** should be identical to that of the mc<sup>2</sup> control system.

The default subnet mask = 255.255.255.0

A **Default Gateway** setting is required if data packets are to be redirected. For example, if the computer is connected via a network switch with Layer 3 routing capability.

If redirection is not required, then the Default Gateway can be left blank.

**To test the connection**, open a web browser application and enter the system's IP address into the URL field. e.g. 192.168.102.xxx - if the connection is successful, the mc<sup>2</sup> landing page appears.

#### Opening a Connection to the System

The instructions below describe how to get online.

1. Start mxGUI, making sure that you select the correct emulation.
2. Select **Settings** → **Connection** from the main menus.

The 'Connection' window appears.





This is a floating window and so you can move its position as required.

3. Click on **New** to create a new connection.

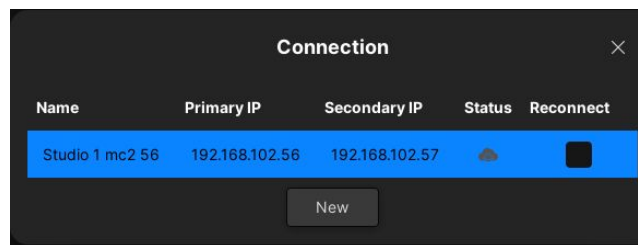
A new entry is added to the list of connections and given a default name: **New Host #**.

4. Optionally, you can edit the name by clicking on the **Name** field, or continue on to the next step.

5. Enter the IP address(es) of the mc<sup>2</sup> control system(s) into the **Primary IP** and **Secondary IP** fields.

- If there is a redundant control system, then you must complete both fields. The **Secondary IP** is always one digit higher than the **Primary IP**.
- If there is no redundant control system, then you can leave the secondary IP field blank or enter the same IP address into both fields.

In each case, type in the address and press ENTER to confirm.

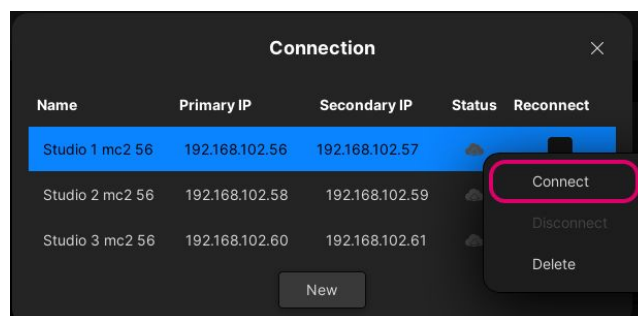


*Default IPs (for redundant control system)*

The connection is now prepared and you are ready to go online. At this point, you can repeat steps 3 to 5 to prepare more connections (for consoles of the same type/emulation).

Note that the current state of the 'Connection' window is stored when you close mxGUI and recalled when you next open the same emulation.

6. To connect to a system, right-click and select **Connect**.



7. An on-screen message appears - select **OK** to confirm (or **Cancel** to abort).

mxGUI now attempts to connect to the selected system. If the connection is successful, then the **Status** updates to show the "plugged in" icon.

If the connection fails, then the **Status** remains as "unplugged". In this instance:

- Check the network cabling and TCP/IP settings of your computer's network interface card.
- Check that mxGUI is compatible with the mc<sup>2</sup> system: same software versions and correct emulation.

8. Once you have a valid connection, you can close the 'Connection' window and use the main pages to operate the system.

Remember that mxGUI is now online and any changes are made immediately in real time!

### Reconnecting to a System

If mxGUI loses its connection to the online system, then the **Reconnect** option determines what happens when the network returns.

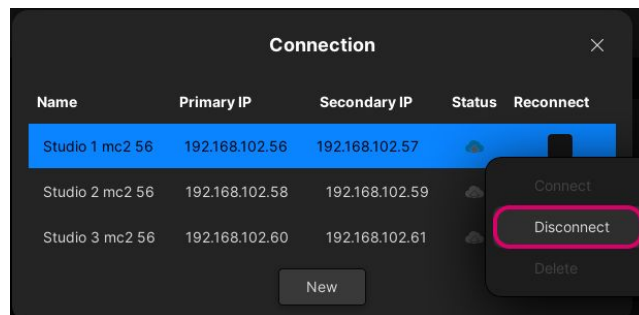
- **Reconnect** (off) - mxGUI stays offline until you right-click and select **Connect** (as described above).
- **Reconnect** (on) - mxGUI automatically reconnects once a valid network connection is detected.

You can use **Reconnect** to deal with short interruptions to the network communication, or force mxGUI to connect automatically to a system after startup.

### Disconnecting mxGUI

The instructions below describe how to disconnect mxGUI.

1. Select **Settings** → **Connection** to re-open the 'Connection' window.
2. Select the online system, right-click and choose **Disconnect**.



3. An on-screen message appears - select **OK** to confirm (or **Cancel** to abort).

mxGUI disconnects from the system and the **Status** of the connection returns to its "unplugged" state.

In this mode, mxGUI is offline and any changes are made to the local control system (on the mxGUI computer).

## 3.5 mxGUI - Offline Setup

In offline mode, mxGUI runs an emulation of the mc<sup>2</sup> control system on the host computer. You can use this mode to prepare settings offline and then transfer them to the system at a later time.

When running offline, all user data is stored locally on the mxGUI computer (on the "Local Control System"). A very basic configuration is included with the mxGUI installer (and this is why, initially, the offline **Signal List** has no external signals). Before you can build an offline setup that includes signal routing, you will need to open an online connection to the system (to synchronize the **Signal List**). It is also a good idea to transfer a production from the mc<sup>2</sup> system (to use as a starting point for the setup).

The recommended workflow is as follows.

- Open an online connection to the mc<sup>2</sup> system (to update the **Signal List** and transfer a production). This ensures that you have the correct external signals to work with and a useful production to load as a starting point.
- Settings can then be edited and saved (offline) in the usual manner. For example, use the **Production List** to load (and save) a production, the **Main Display** to load (and save) a preset, etc.
- Once the new files are prepared, they must be transferred back to the mc<sup>2</sup> system either via the network (by going online) or via a removable USB device (using a file export/import).
- The final step is to load the production or preset on the console.

The rest of this topic describes the main points in more detail.


### What can be Configured Offline?

Anything that can be saved on a real system can be saved offline (onto the mxGUI local control system).

- **Productions, Snapshots, Cuelists and Mixes** - as saved from the Productions, Snapshots, Cuelists and Mixes displays.
- **Presets** - module or channel presets as saved from the Main Display.
- **Custom Function Assignments** - the mapping of user buttons and other custom function assignments as defined in the [mc<sup>2</sup>56 - Custom Functions](#) display.

### Compatibility

- **Productions** can be loaded on any mc<sup>2</sup> system. If there is a difference in the hardware configuration, then settings are loaded on a best-effort basis (as described below).
- **Presets** can be loaded to any mc<sup>2</sup> system regardless of the configuration.
- **Custom Function Assignments** can be transferred to any mc<sup>2</sup> system. If the receiving system does not support the same User Panel, the custom function assignment can be edited from the **Custom Functions** display.

 Settings prepared offline are loaded on a best effort basis. So, for example, if the mc<sup>2</sup> system has fewer DSP channels than the number configured, settings are loaded to the available channels. Similarly, if the signals in the **Signal List** are different, then only the ones with a matching ID can be configured.

### Where are the Files Stored?

The **File Transfer** display provides access to the user data stored on the local control system. The parent folders are as follows.

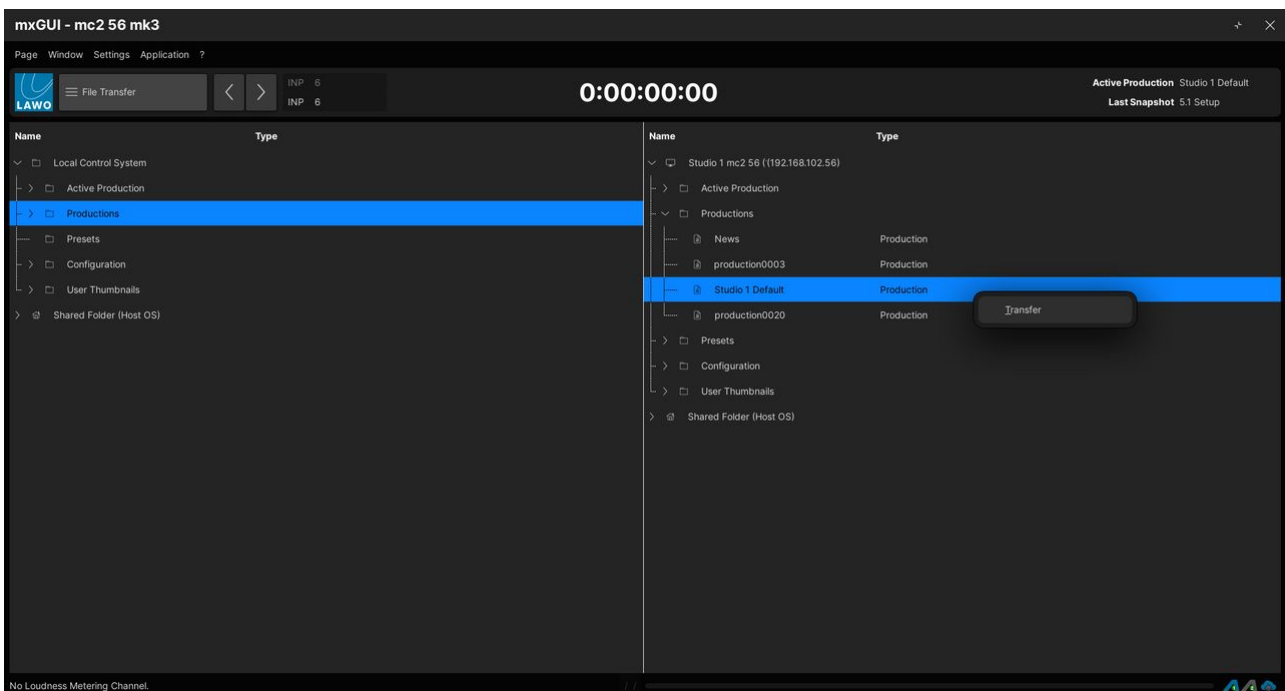
- **Active Production** - contains the snapshots and mixes stored in the active production.
- **Productions** - contains all zipped productions (as a complete file).
- **Presets** - contains all module and channel presets.
- **Configuration** - contains the custom function template files.
- **User Thumbnails** - contains images for the user label thumbnails.

## Preparing the mxGUI Computer

To prepare signal routing offline, it is important that the **Signal List** for the mxGUI emulation matches that of the mc<sup>2</sup> system. If not, any settings which are specific to external signals will not load. The simplest solution is to open an online connection to the mc<sup>2</sup> system. The HOME configuration will then automatically update the **Signal List** stored locally on the mxGUI computer. You only need to perform this operation once (providing there are no changes to the HOME configuration).

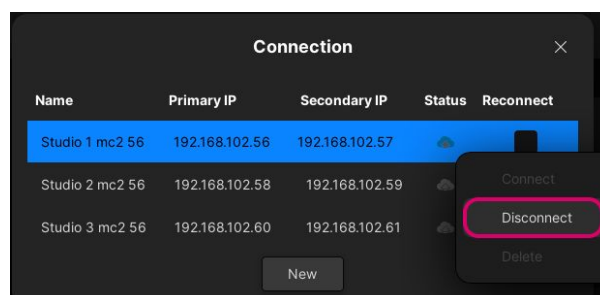
While online, it is a good idea to transfer a production from the mc<sup>2</sup> system (to use as a starting point for the setup). This can be done from the **File Transfer** display as follows.

1. Open the **File Transfer** display.
2. On the left, select the **Local Control System** → **Productions** folder as the destination.
3. On the right, select the remote control system (via its name and IP) and open the **Productions** folder.
4. Right-click on the production you wish to import and choose **Transfer** - the production is copied from right to left.

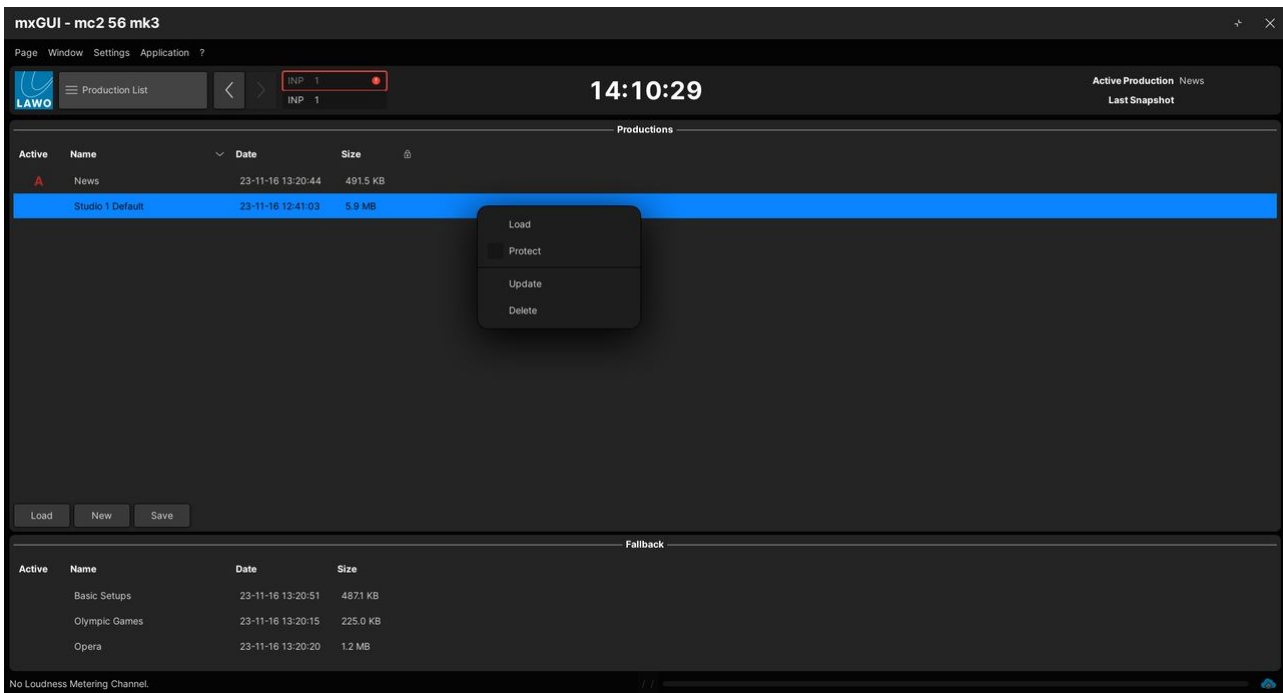


*File Transfer from online system (mc<sup>2</sup>56) to mxGUI*

Now open the **Settings** → **Connection** window and disconnect mxGUI from the mc<sup>2</sup> system (to run offline).



Open the **Production List** and load the production (using either the **Load** button or right-click context menu).



*Production List (on Local Control System)*

You are now ready to begin the offline setup.

## Editing and Saving Settings

The instructions below describe how to deal with different types of user data.

### Productions

It is recommended to modify an existing production if possible.

Use the **File Transfer** display to transfer a production from the online system (as described above). Then disconnect mxGUI and load the production from the **Production List**.

Once this is done, you can edit the parameters in the usual manner. For example:

- To edit signal routing and labels, open the **Signal List** display.
- To edit bus assignments, open the **Bus Assign** or **Buses Reverse** display.
- To adjust the channel levels, open the **Strip Assign** display.
- To edit the fader strip assignments, open the **Strip Assign** display and **Access/Assign** window.
- To save different variants of a setup, save some snapshots and/or snapshot folders.

Once you have finished editing, remember to save all of the changes by saving or updating a production.

### Presets

Module and channel presets are saved and loaded from the **Main Display**. They are stored on the local (or remote) control system as individual files in the **Presets** folder.

### Custom Functions

Custom Functions are programmed from the **Custom Functions** display. They are stored on the local (or remote) control system as individual files in the **Custom Template Instances** folder.

### Snapshots and Mixes

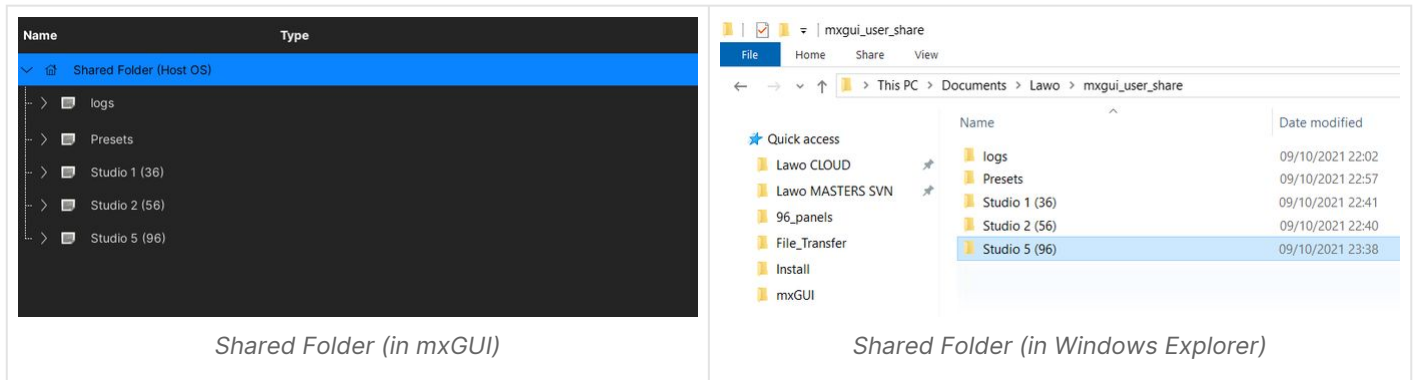
Snapshots and mixes are managed in the usual manner. They are saved and loaded automatically as part of a production. They can also be transferred as individual files by loading the relevant production and making a transfer to/from the **Active Production** folder.

## Backing up the User Data

If you are going to prepare settings for a range of different systems, then it is a good idea to make a backup copy of the user data. This can be done using the shared folder that appears in both mxGUI and your host operating system.

1. Use either the **File Transfer** display or host OS to create a separate folder, inside the **Shared Folder**, for each mc<sup>2</sup> system.
2. Then within each studio's folder, create a sub folder for productions, custom functions, etc. This allows you to keep all the relevant files together for each studio.
3. Now use the **File Transfer** display to make a backup copy of all relevant user data.

In the example below, the **Shared Folder** contains a sub folder for each console plus a generic folder for all presets.



## Transferring Data to the System

Having prepared a file offline, the final step is to transfer this back to the mc<sup>2</sup> system. This can be done either by going online (and using the **File Transfer** display) OR by using a USB memory stick (to export and import the data).

### File Transfer

If you have a network connection to the system, then the first method is recommended. The instructions below describe how to transfer a production. Other types of file can be transferred in the same way; take care to select the correct destination folder in step 3.

1. Open an online connection to the mc<sup>2</sup> system.
2. Open the **File Transfer** display.
3. On the right, select the mc<sup>2</sup> system's **Productions** folder as the destination.
4. On the left, right-click on the production you wish to import and choose **Transfer** - the production is copied to the system.
5. Now go to the console and load the production from the **Production List** in the usual manner - your setup is recalled!

### USB Export/Import

If a network connection to the system is not possible, then you can use a USB memory stick to transport the file as follows.

1. Start by using the **File Transfer** display to copy the file from the **Local Control System** to the **Shared Folder (Host OS)**.
2. Open the **mxgui\_user\_share** folder (in the host operating system), and copy the file to the USB device.
3. Now connect the device to one of the console's USB ports and import the file (using the **File** display on the console).
4. Load the production from the **Production List** in the usual manner - your setup is recalled!



## 4 mxGUI - Utility Tools

This chapter describes the other utility tools that are included with mxGUI.

- [mxUpdater](#)

## 4.1 mxUpdater

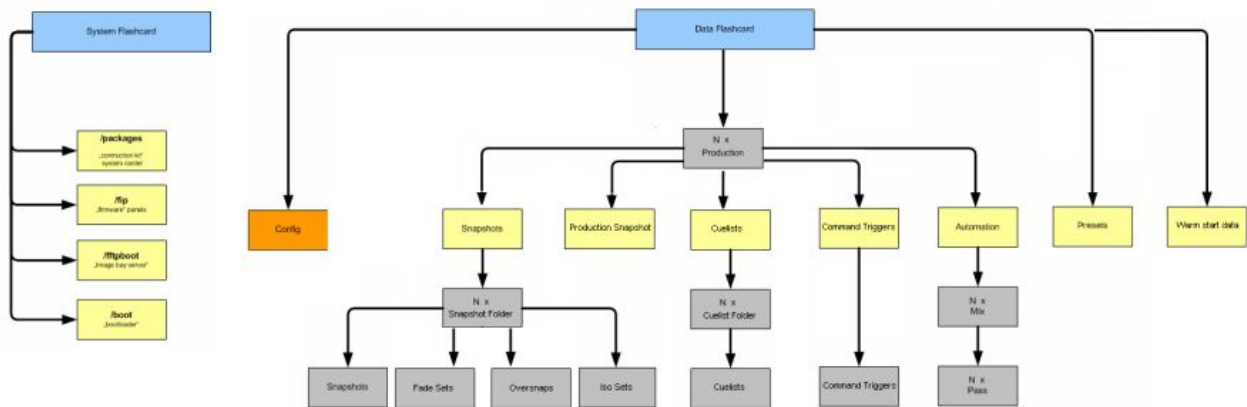
The **mxUpdater** utility can be used to update the mc<sup>2</sup> system software, or backup and restore its user data. In both cases, data is transferred to and from the mc<sup>2</sup> control system via the Management Network.

### Introduction

mxUpdater makes it easy to **update your system** whenever you install a new version of mxGUI. Note that it is only possible to update to the version that is concurrent with the mxGUI release. If you wish to update to a different version or downgrade the system, then you should use the auto update tool (described in the software release notes).

Independently, mxUpdater can be used to **backup all user data** on the system so that it can be **restored** at a later time.

The diagram below shows the data structure in more detail.



Note that:

- A software update affects only the System Flashcard (on the left), and does not alter any of your user data.
- A backup or restore affects only the Data Flashcard (on the right), and does not alter the current software version running on the System Flashcard.
- mxUpdater can be used to backup or restore the complete Data Flashcard only. If you wish to deal with individual files, such as a production, then use the [File Transfer](#) display (on mxGUI) or File display (on the console).

### Prerequisites

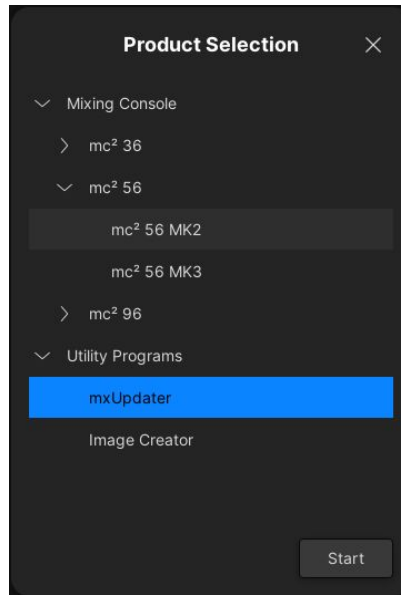
To use mxUpdater, you will need to set up the two mxGUI shared folders (as described [earlier](#)) and have a valid network connection to the mc<sup>2</sup> control system.

### First Steps

mxUpdater can be started from the mxGUI 'Product Selection' window.

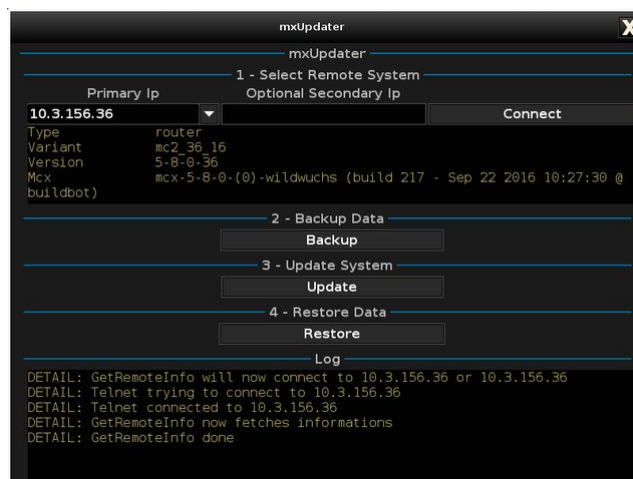
1. Start by [closing](#) mxGUI to return to the product launch options.
2. Select **Utility Programs** → **mxUpdater** and click on **Start**.



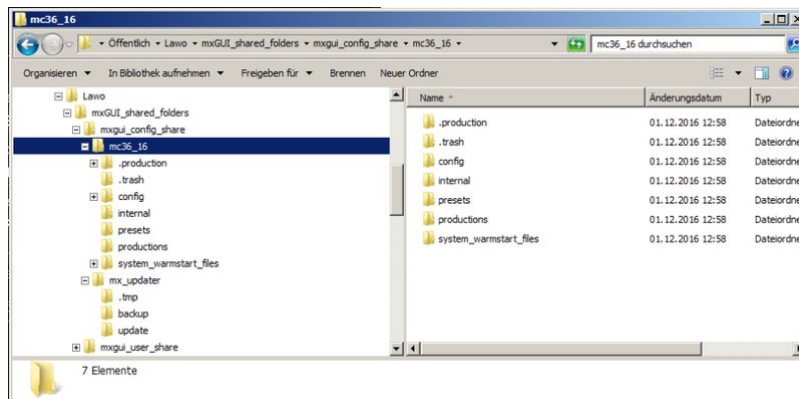


The program opens with an empty window.

- Under "1 - Select Remote System", enter the IP address of the mc<sup>2</sup> control system and click on **Connect**. If you have connected to a system previously, then its IP address can be selected from the drop-down list. After a successful connection you will see some information about the system in the mxUpdater window.



and the following files in the **mxgui\_config\_share** folder.



- You can now choose one of the following functions:
  - 2. Backup Data** - make a backup of the system's user data.

**3. Update System** - update the system software.

**4. Restore Data** - restore the system's user data.

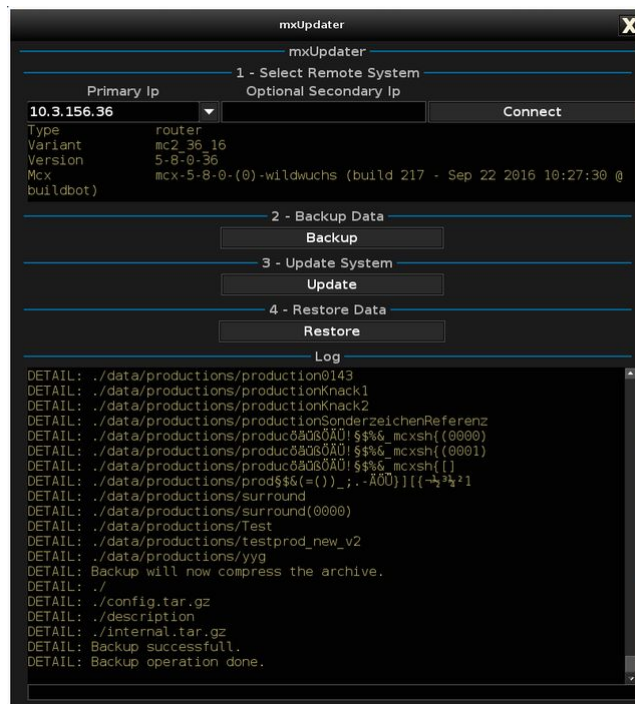
The rest of this topic describes each function in more detail.

### User Data Backup

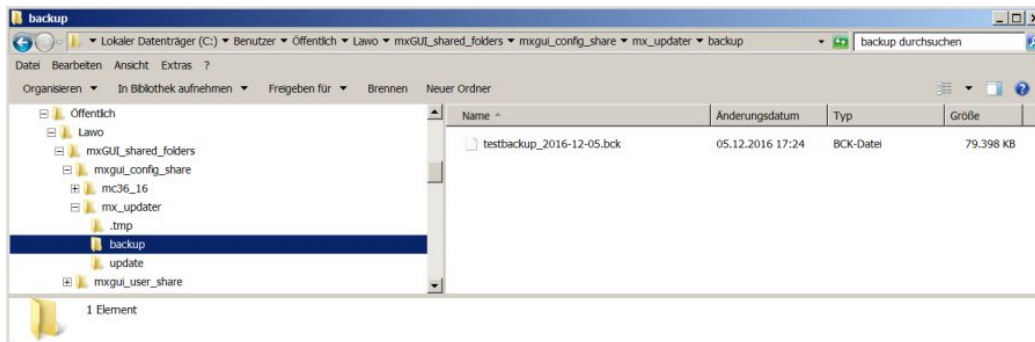
This function can be used to make a copy of the user data flashcard so that it can be restored at a later time. It is recommended to always save a backup before updating the software.

1. Under "2 - Backup Data", select **Backup**.
2. Enter a file name and then start the backup by clicking on **Save**.

Once the backup is complete, you will see the line **DETAIL: Backup operation done** in the "Log" area.



The backup file is stored on the mxgui computer in the **mxgui\_config\_share -> mxupdater -> backup** folder:

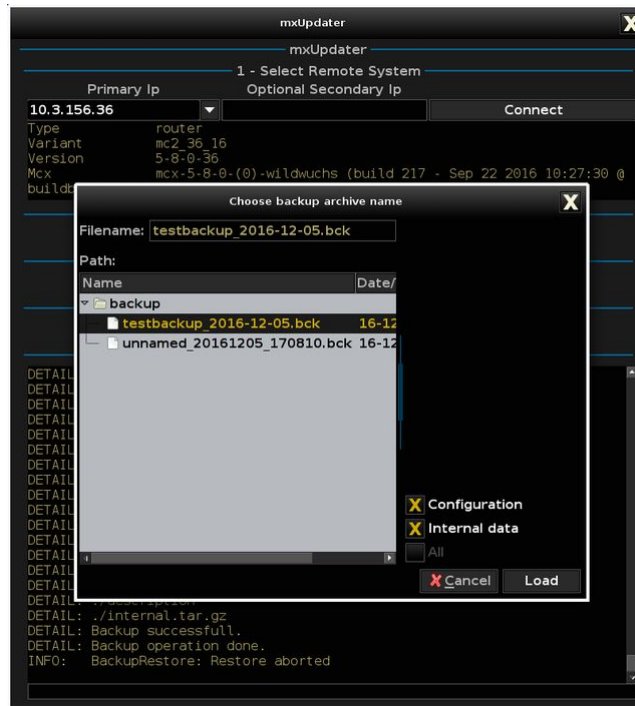


### User Data Restore

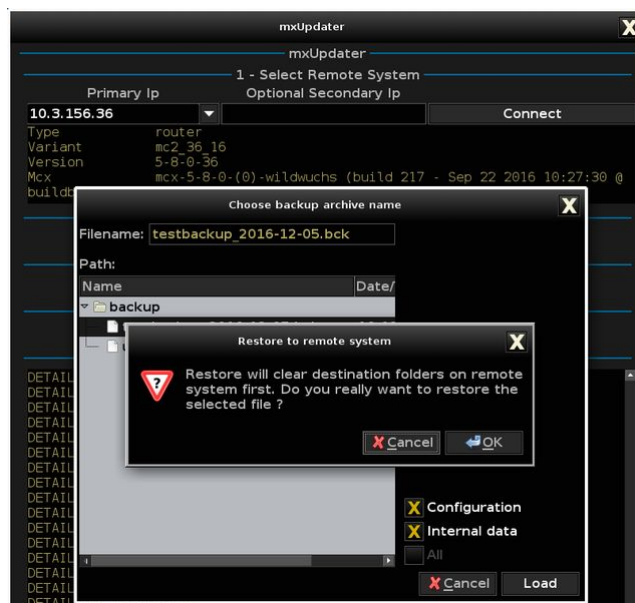
At any time you can use one of your backup files to restore the system's user data.

**⚠ Important:** This operation will overwrite all existing data on the data flashcard, including productions and configuration files. Therefore, it is a good idea to make a backup of the current user data (as described above) before beginning a restore.

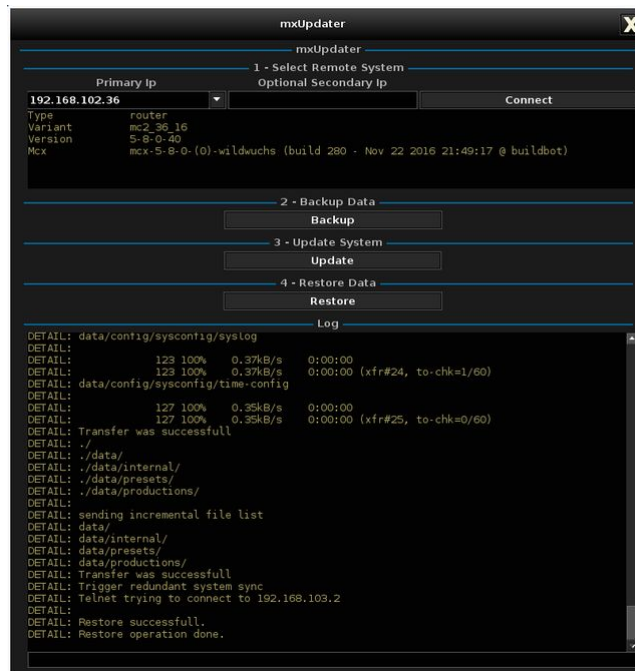
1. Under "4 - Restore Data", select **Restore**.
2. Select one of your backup files and click on **Load**.



3. Confirm the restore by clicking on **OK**.



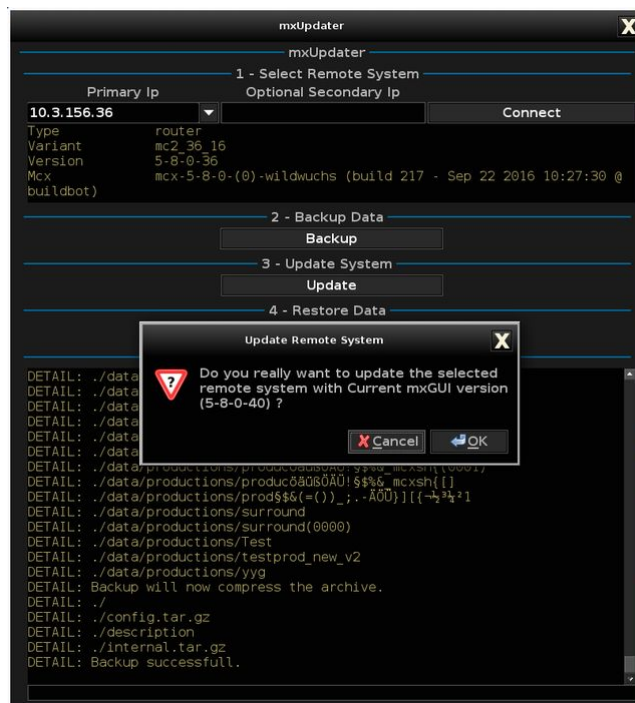
Once the restore is complete, you will see the line **DETAIL: Restore operation done** in the "Log" area.



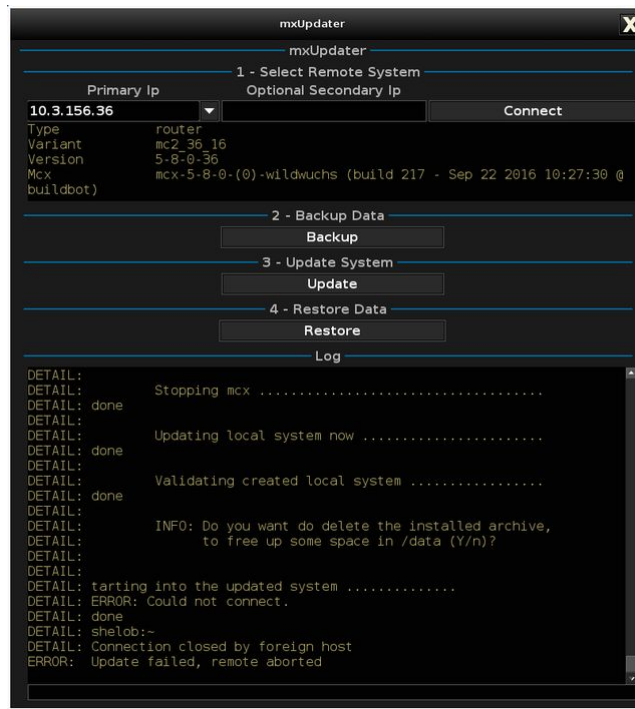
### mc<sup>2</sup> Software Update

mxUpdater can be used to update the mc<sup>2</sup> system to the version that is concurrent with the mxGUI release. Before using this option, it is recommended that you save a backup of all user data (as described above).

1. Under "3 - Update System", select **Update**.
2. Confirm the update by clicking on **OK**.



You will now see the progress of the upload, update and validation steps in the "Log" area. Once the update is complete, a system reboot is triggered:



Note that the last few "Log" lines, including **ERROR: Could not connect** and **ERROR: Update failed, remote aborted**, are a result of the reboot. These lines are normal and can be ignored.

3. After the reboot, the software update is complete.