



# **Waves for mc<sup>2</sup>**

## User Manual

Version: 10.8.0/1

Exported on: 11 April, 2024

To obtain the latest documentation for Lawo products, please visit:

<https://docs.lawo.com/>



#### Copyright

All rights reserved. Permission to reprint or electronically reproduce any document or graphic in whole or in part for any reason is expressly prohibited, unless prior written consent is obtained from the Lawo AG.

All trademarks and registered trademarks belong to their respective owners. It cannot be guaranteed that all product names, products, trademarks, requisitions, regulations, guidelines, specifications and norms are free from trade mark rights of third parties.

All entries in this document have been thoroughly checked; however no guarantee for correctness can be given. Lawo AG cannot be held responsible for any misleading or incorrect information provided throughout this manual.

Lawo AG reserves the right to change specifications at any time without notice.

© Lawo AG, 2024



## Table of Contents

1	Waves for mc <sup>2</sup> - General Information.....	5
1.1	Waves for mc <sup>2</sup> - About this Documentation.....	6
1.2	Waves for mc <sup>2</sup> - Important Safety Instructions.....	7
2	Waves for mc <sup>2</sup> - Product Overview.....	8
2.1	Key Facts.....	8
2.2	Waves Integration.....	8
3	Waves for mc <sup>2</sup> - Installation and Setup.....	9
3.1	Waves for mc <sup>2</sup> - Installation Instructions.....	10
3.2	Waves for mc <sup>2</sup> - Unpacking.....	11
3.3	Waves for mc <sup>2</sup> - Prerequisites.....	17
3.4	Waves for mc <sup>2</sup> - Network and SFP Requirements.....	21
3.5	Waves for mc <sup>2</sup> - Remote Desktop Connection Options.....	22
3.6	Waves for mc <sup>2</sup> - Host PC Setup.....	25
3.7	Waves for mc <sup>2</sup> - Waves Products Installation.....	31
3.8	Waves for mc <sup>2</sup> - GlobCon Installation.....	41
3.9	Waves for mc <sup>2</sup> - TightVNC Installation.....	44
3.10	Waves for mc <sup>2</sup> - Management IP Setup.....	48
3.11	Waves for mc <sup>2</sup> - Enable Waves Integration.....	52
3.12	Waves for mc <sup>2</sup> - System Setup.....	57
3.13	Waves for mc <sup>2</sup> - DirectOut Converter Setup.....	74
4	Waves for mc <sup>2</sup> - Operation.....	86
4.1	Waves for mc <sup>2</sup> - Operating Principles.....	87
4.2	Waves for mc <sup>2</sup> - Connecting the Signals.....	91
4.3	Waves for mc <sup>2</sup> - Saving and Loading Settings.....	98
4.4	Waves for mc <sup>2</sup> - User Button Functions.....	104
5	Waves for mc <sup>2</sup> - Additional Information.....	106
5.1	Waves for mc <sup>2</sup> - License Transfer.....	107
5.2	Waves for mc <sup>2</sup> - Plugins Installation.....	111
5.3	Waves for mc <sup>2</sup> - Offline Setup of Axis Scope PC.....	113
6	Waves for mc <sup>2</sup> - Useful Links.....	121



The **Waves SoundGrid Plugin Server** is a chargeable option for Lawo's mc<sup>2</sup> mixing consoles. It allows Waves plugins to be controlled directly from the console's Central GUI and reset by snapshots and productions.

The option can be added to the following products:

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

This manual describes how to install and configure the components, and operate the plugins from the console.



# 1 Waves for $mc^2$ - General Information

Before you begin, please read the following information.

- [Waves for  \$mc^2\$  - About this Documentation](#)
- [Waves for  \$mc^2\$  - Important Safety Instructions](#)


## 1.1 Waves for mc<sup>2</sup> - About this Documentation

This documentation represents the latest state of information. Subject to availability, manuals covering former versions are provided via the [Lawo Download-Center](#) (after login).


### General Safety & Important Notes

When working with our hardware components, it is important to read and observe all of the instructions provided in the "[General Safety Information for Lawo Equipment](#)" booklet delivered with your devices.

The same symbols are used in the product documentation so please look out for them as follows. The letter in brackets before the signal word denotes the language version: e.g. (E) = English.


 **(E) WARNING** - warnings or mandatory actions.


These instructions **must always be observed** to ensure the personal safety of the user, and to protect your system and the work environment from potential damage.


 **(E) IMPORTANT NOTE** - important information for proper functioning.


### Other Informational Icons

When reading about our software or the general operation, you may also see the following icons.

 General information and points of clarification. Please take note.

 Useful tips and shortcuts. Feel free to follow if you like.

 Notes. To avoid getting stuck, make sure you follow.

 Important actions. To keep the system operational, you should always follow.

### Further Information

Mechanical drawings and data sheets (including weights and dimensions) are available from the [Lawo Download-Center](#) (after login). We also recommend that you carefully observe the release notes for your product/system.

### Lawo User Registration

For access to the [Lawo Download-Center](#), and to receive regular product updates, please register at: [www.lawo.com/registration](http://www.lawo.com/registration).

### Contact Details

If you need further assistance, the Lawo Support Department can be contacted by email at [support@lawo.com](mailto:support@lawo.com), or by telephone during normal working hours - please visit the [Support](#) area of the Lawo website for the most up-to-date contact details.



## 1.2 Waves for mc<sup>2</sup> - Important Safety Instructions

When working with our hardware components, please read and observe all of the instructions provided in the "General Safety Information for Lawo Equipment" booklet delivered with your devices.

Click on the link below to read or download the booklet as a pdf.

[Lawo\\_Safety.pdf](#)

## 2 Waves for mc<sup>2</sup> - Product Overview

The **Waves SoundGrid Plugin Server** is a chargeable option requiring additional hardware. It allows Waves plugins to be controlled directly from the Central GUI and reset by the console's productions and snapshots.



*Waves FX integration*

### 2.1 Key Facts

- All audio processing takes place on a dedicated DSP server from Waves that supports high plugin counts, low latency and up to 256 channels.
- The server is controlled remotely, from a host PC, running the Waves SuperRack SoundGrid software.
- Operators can define up to 64 "Racks" (mono, stereo or surround), which connect to the mc<sup>2</sup> console via MADI.
- Each Rack can be fitted with up to eight plug-ins, selected from the Waves plug-in bundle purchased with your system.
- An I/O interface (the EXBOX.SG from DirectOut) converts proprietary SoundGrid layer 2 network to optical MADI (for the connection to the mc<sup>2</sup> MADI port).

For more information about what is included, see [Waves for mc<sup>2</sup> - Unpacking](#).

### 2.2 Waves Integration

- All settings, including the Rack configuration, plugin assignments and parameters, are stored in a SuperRack session on the host PC.
- Input and output connections are made from the console's **Signal List** display, enabling Racks to be used for different types of function: channel inserts, aux sends and FX returns, etc.
- The SuperRack user interface is switched to the console's Central GUI via a remote desktop connection.
- Operators can then use the console touch-screen, or trackball and left/right-mouse buttons, to add Racks, assign plug-ins and adjust parameters.
- Some of the Waves SuperRack functions can be operated from the console's Central User Buttons.
- The session and snapshots (in Waves) are linked to the production, snapshot folder and snapshots (in the mc<sup>2</sup> console).

For more information about the operation, see [Waves for mc<sup>2</sup> - Operating Principles](#).





## 3 Waves for mc<sup>2</sup> - Installation and Setup

This chapter describes how to install and configure the system.


- [Waves for mc<sup>2</sup> - Installation Instructions](#)
- [Waves for mc<sup>2</sup> - Unpacking](#)
- [Waves for mc<sup>2</sup> - Prerequisites](#)
- [Waves for mc<sup>2</sup> - Network and SFP Requirements](#)
- [Waves for mc<sup>2</sup> - Remote Desktop Connection Options](#)
- [Waves for mc<sup>2</sup> - Host PC Setup](#)
- [Waves for mc<sup>2</sup> - Waves Products Installation](#)
- [Waves for mc<sup>2</sup> - GlobCon Installation](#)
- [Waves for mc<sup>2</sup> - TightVNC Installation](#)
- [Waves for mc<sup>2</sup> - Management IP Setup](#)
- [Waves for mc<sup>2</sup> - Enable Waves Integration](#)
- [Waves for mc<sup>2</sup> - System Setup](#)
- [Waves for mc<sup>2</sup> - DirectOut Converter Setup](#)

### 3.1 Waves for mc<sup>2</sup> - Installation Instructions

We recommend that you read all of this chapter in full before starting the installation.

 **(E) WARNING**

Please read and observe ALL of the [Lawo - Important Safety Instructions](#) BEFORE installing or servicing any component.

 **(F) AVERTISSEMENT**

Veuillez lire et respecter TOUTES [les consignes de sécurité importantes](#) AVANT d'installer ou d'entretenir un composant.

Once you are ready to begin, please complete the tasks in the following order.

- [Unpack](#)
- [Check the Prerequisites and Download the Software](#)
- [Prepare the Waves Host PC](#)
- [Install the Waves Products](#)
- [Install GlobCon](#)
- [Install TightVNC \(optional; required for a VNC remote desktop connection\)](#)
- [Configure the Management IP of the Waves Host PC](#)
- [Enable the Waves Integration on the Console](#)
- [Setup the System \(for operation\)](#)
- [Configure the EXBOX.SG converter \(for the MADI I/O\)](#)

If you need further assistance, the Lawo Support Department can be contacted by email at [support@lawo.com](mailto:support@lawo.com), or by telephone during normal working hours - please visit the [Support](#) area of the Lawo website for the most up-to-date contact details.



## 3.2 Waves for mc<sup>2</sup> - Unpacking

The Waves SoundGrid plugin server option consists of several devices, accessories, software products and licenses.

### Packing List

The shipment is divided into three main packages: 1x Waves Extreme Server C, 1x Waves Axis Scope computer and 1x DirectOut converter. Optionally, a Waves rack shelf may be ordered (for the Axis Scope computer and Extreme Server C).

Please check the contents of the packing boxes, and in the event of any transport damage, contact your local Lawo representative or email [support@lawo.com](mailto:support@lawo.com).

A list of serial numbers for all components is included with the shipment. Please keep this list for your records.

### Included

The following items are included as standard:

- **1x Waves Extreme Server C** - supplied with:
  - 1x IEC C13 female - Schuko male power cable,
  - 1x Power cable IEC C13 female – type B male.
- **1x Waves Axis Scope computer** - supplied with:
  - 1x IEC C13 female - Schuko male power cable,
  - 1x Power cable IEC C13 female – type B male,
  - 1x USB Mini docker station.
- Software (installed on Waves Axis Scope computer):
  - Windows 10 Pro
  - Waves V13
  - Waves Central application
- Licenses (on Waves Axis Scope computer):
  - Waves SuperRack licence
  - Waves Platinum plugins bundle licence
- **1x DirectOut EXBOX.SG converter** - supplied with:
  - 2x power supply,
  - 1x supply with IEC female - Schuko male power cable,
  - 1x CAT6 cable
  - 1RU DirectOut rack shelf - for the DirecOut converter
  - 1x Multimode Fiber SC-LC cable

**Please note:** The SC optical media port on the EXBOX.SG comes (as standard) as a multimode type. If a single mode type is required, then this must be requested before placing the order.

### Optional

The following accessories must be ordered separately:

- **1x 2RU Waves rack shelf** - for the Waves Axis Scope computer and Extreme Server C.

### Items (not included)

The following items are not included and must be provided by the customer or installer:

- Management switch
- Video monitor with HDMI or DisplayPort input, FullHD (1920x1080).
- 1x Power cable IEC C13 female - Shuko male for video monitor (minimum 2m – 78.74 ")
- 1x USB keyboard (cable)
- 1x USB mouse (cable)
- 1x USB 3.0 – Ethernet 1Gb/s network adapter



- HDMI cable (1m – 39.37 ") or DisplayPort cable (1m – 39.37 ")
- 2x Cat5e/Cat6 cables (1m – 39.37 ")
- 1x Cat5e/Cat6 cables (2m – 78.74 ")
- 1x Supply with IEC female - Schuko male power cable (minimum 1m)
- 2x Power cable IEC C13 female – type B male (minimum 78.74 ") (Only for North America)

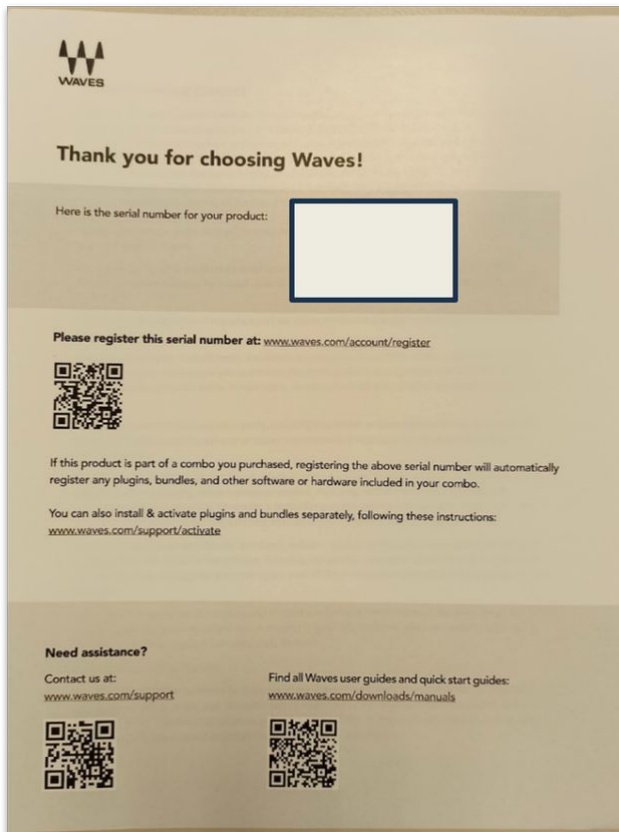
**Please note:** The cables included with the delivery are sufficient for the system setup. If longer cables are required, then please exchange the cables to meet the installation needs.

### **Package Contents**

The images below show the contents of each package (for reference).

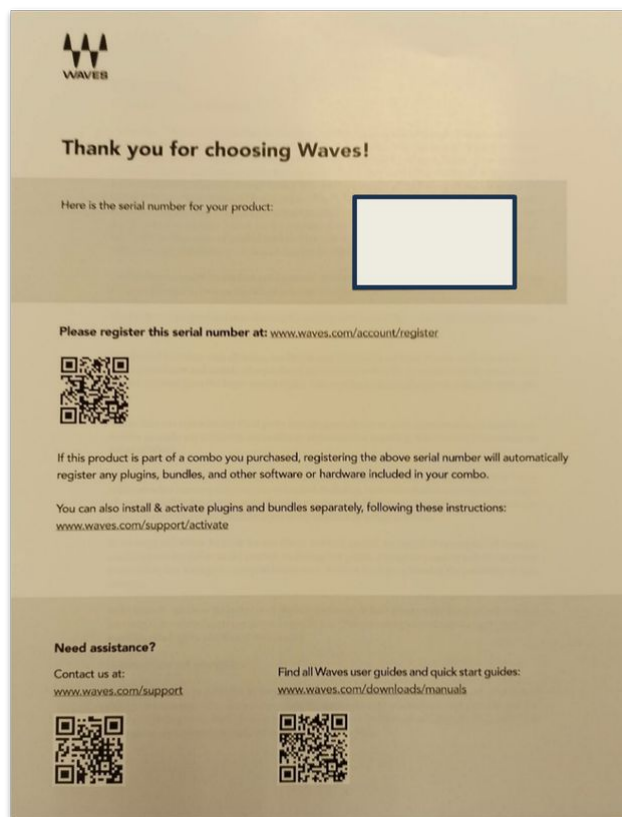


### Waves Extreme Server C Package Content






## Waves Axis Scope Package Content





## Waves Software License Certificate

5234786  
237026\_25



### SOFTWARE LICENSE CERTIFICATE

**Waves Soundgrid System Extreme**  
498-5309-000 Waves Platinum Bundel:  
SN:

**498-5317-000 Waves Superrack Software License:**  
SN:

Please create/access your account at [www.waves.com](http://www.waves.com) and choose the Register New Product option. Enter the serial number above to register your software.  
Please install and activate the license using the instructions from this link - <http://www.waves.com/support/activate>

Vorstand:  
Präsident, Claudia Nisank  
Vizepräsidentin der Administration  
Prof. Dr. Ulrike Mack

HRB 177330 Amtsgericht Mannheim  
Stz. der Geschäftsführung, Ruckel  
Stz. 16 Nr. 0435049000  
VEEE, Ray, An. DE22199871

Commerzbank AG, Bilanz  
SWIFT: COBDE33HAN  
IBAN DE44 9629 0031 0002 6302 00

EW-Bank, Stuttgart  
SWIFT: EWBA3333  
IBAN DE18 6202 0701 7415 5008 37

### DirectOut Package Content

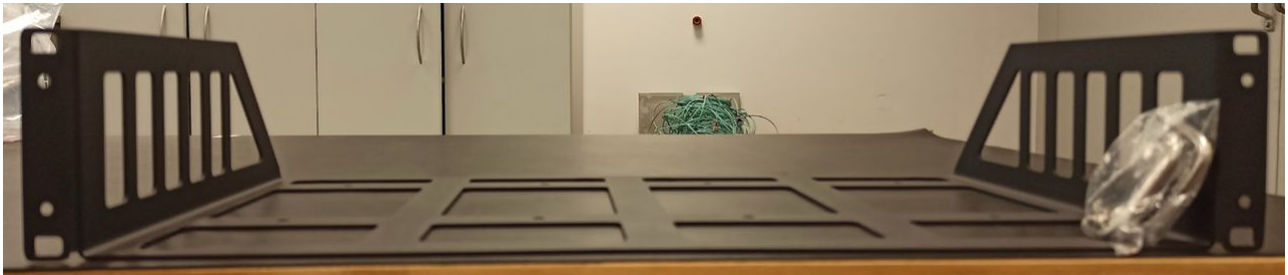


The 1RU DirectOut rack shelf is included.



### Waves Rack Shelf (optional accessory)

The 2RU Waves rack shelf is optional (for the Axis Scope computer and Extreme Server C).







### 3.3 Waves for mc<sup>2</sup> - Prerequisites

Please read the following important information before you begin.

#### Important Notices

- It is assumed that the default user AXIS is in use. The Waves system is not tested with another local user.
- The Waves Axis Scope PC can be configured either locally or remotely.
- An internet connection for the Waves Axis Scope PC is recommended but not mandatory.
- For remote configuration, there are two possibilities:
  - If an internet connection is present, you can use a remote desktop software such as TeamViewer or AnyDesk. To use AnyDesk, it is important to follow the steps described [here](#).
  - If an internet connection is not present, then the PC can be prepared by opening a Windows Remote Desktop connection from another PC (as described [here](#)). For the remaining steps, you will need to use the offline method (described [here](#)).
- For local configuration without an internet connection, you will need to use the offline method (described [here](#)).

**Please also note:** During operation, the Waves host PC is switched to the console's Central GUI using the **PLUGIN** button (on the console). The remote desktop connection can be configured in one of two ways: using Windows Remote Desktop (integrated in Windows) or TightVnc (a VNC remote desktop software). To choose the best option for your installation, please read the pros and cons (described [here](#)). To use VNC, you will need the TightVNC software (listed below).

#### Software Downloads

It is recommended to download the following software before you start the setup.

- **Waves Central** - required to manage the Waves products.

(Link: <https://www.waves.com/downloads/central>)

- **Waves Account** - required to install and activate the Waves products.

How to launch Waves Central and create a new account is described [here](#).

- **DirectOut GlobCon software** - required to configure the EXBOX.SG converter.

(Direct download link: <https://storage.googleapis.com/globcon-web-api.appspot.com/globcon-1.13.2.exe>)

- **TightVNC software** - required for a VNC remote desktop connection to the mc<sup>2</sup> console.

(Direct download link: <https://www.tightvnc.com/download/2.8.81/tightvnc-2.8.81-gpl-setup-64bit.msi>)

- **Notepad++** - recommended for the TCL file configuration.

(Direct download link: <https://github.com/notepad-plus-plus/notepad-plus-plus/releases/download/v8.5.7/npp.8.5.7.Installer.x64.exe>)

- **PuTTY or MobaXTerm (Home free edition)** - recommended for ssh connection to mc<sup>2</sup> control system

(PuTTY Direct download link: <https://the.earth.li/~sgtatham/putty/latest/w64/putty-64bit-0.80-installer.msi>)

(MobaXTerm Direct download link: [https://download.mobatek.net/2362023122033030/MobaXterm\\_Portable\\_v23.6.zip](https://download.mobatek.net/2362023122033030/MobaXterm_Portable_v23.6.zip))

#### Remote Configuration

If the Waves Axis Scope PC has an internet connection, then it can be configured using a remote desktop software. The following options are recommended:

- **TeamViewer**

(Direct download link: <https://download.teamviewer.com/full>)

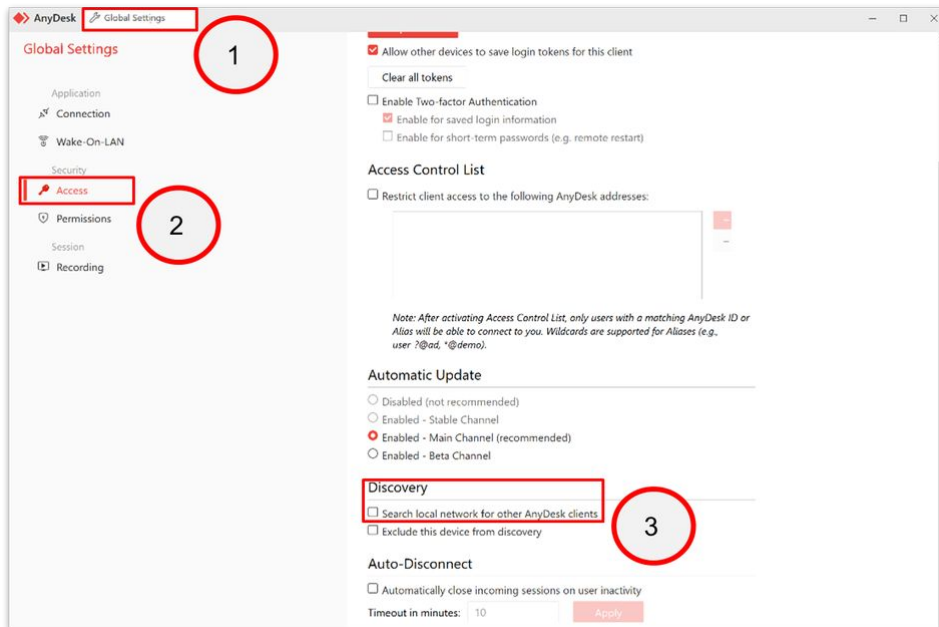
- **AnyDesk**

(Direct download link: [https://anydesk.com/it/downloads/thank-you?dv=win\\_exe](https://anydesk.com/it/downloads/thank-you?dv=win_exe))

## Using AnyDesk

For security reasons, you may wish to use AnyDesk, instead of TeamViewer. In this instance, it is necessary to disable the "Discovery" function (in AnyDesk).

- Go to: **Global Settings\Access\Discovery**, and uncheck the following box: "**Search local network for other AnyDesk clients**"



If this step is not in place, the discovery process between the Lawo console and Waves SuperRack could not work.

## Windows Remote Desktop Configuration

If the Waves Axis Scope PC has a management network connection, then it can be remotely configured using a Windows Remote Desktop session.

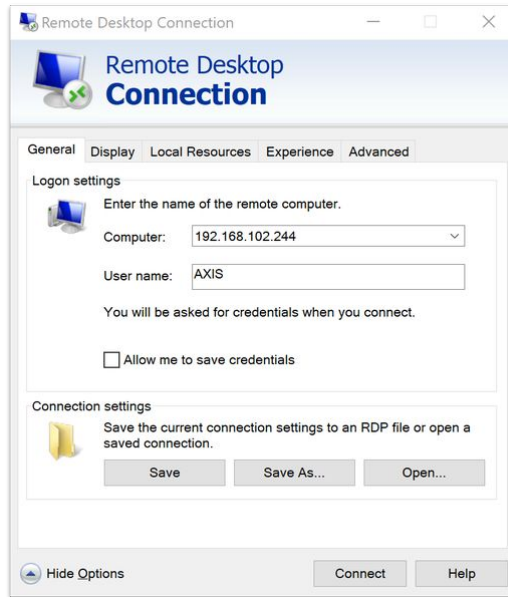
### **Important:** Start by checking the following points:

- To open a remote session, the jump PC must be connected to the management network.
- To open a remote session, the jump PC must have a static IP address in the same subnet of the management network.
- Execute a ping command from the jump PC to the AXIS Scope PC to check the network connection.
- Create in your PC (or in the jump PC) a Windows Remote Desktop connection and enable the remote audio playback functionality.

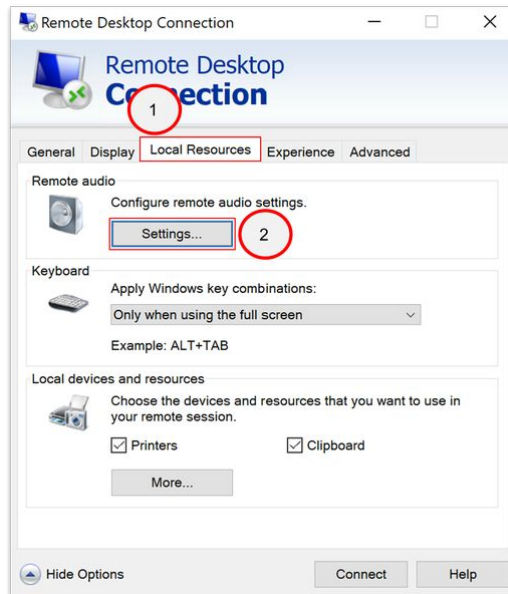
If the steps above are not in place, the GlobCon software will not be able to discover the EXBOX.SG card.

To configure the Windows Remote Desktop Connection:

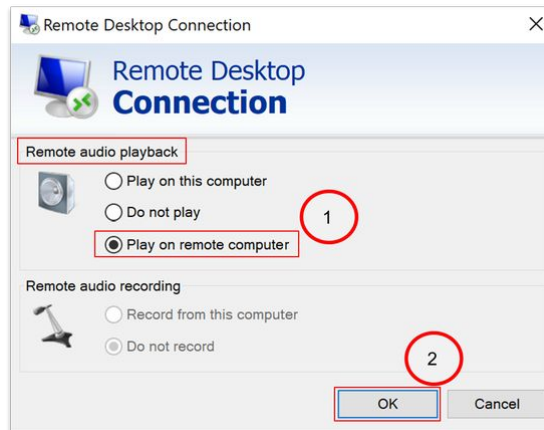
- In the "General" tab, define the "Logon settings":
  - In the "Computer" field, enter the IP address of the Waves Axis Scope PC. The default IP address = **192.168.102.244**
  - In the "User Name" field, enter **AXIS**



- Go to "Local Resources" and, under "Remote audio", click on **Settings**.

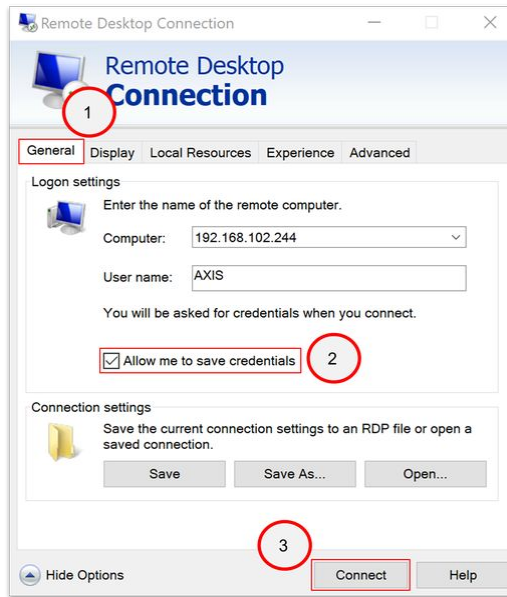


- Under "Remote audio playback", choose the **Play on remote computer** option and click on **OK** to confirm.



- Go back to the "General" tab.
- Enable the **Allow me to save credentials** option.

- Click on **Connect** and, when requested, insert the password **AXIS**



### 3.4 Waves for mc<sup>2</sup> - Network and SFP Requirements

This topic describes the requirements for the Lawo management network switch, the Waves SoundGrid audio network switch and the SFP (fitted to the console's MADI I/O port).

Please see [Waves for mc<sup>2</sup> - System Setup](#) for more information about how the system is cabled (for the final installation).

#### Lawo Management network switch (configuration)

In order for the Waves SoundGrid system and Lawo console to communicate, the Lawo management network switch must be configured with the following settings:

- IGMP enable.
- The default discovery mode is UDP-Multicasting between Lawo console and Waves SuperRack.
- The handshake connection from/to the Lawo console and the Waves SuperRack happens on Multicast-IP 232.5.5.5, port 50001

#### Waves SoundGrid audio network switch (specification)

The DirectOut EXBOX.SG converter comes with an integrated network switch that can be used for the Waves SoundGrid audio network.

If you choose NOT to use the integrated switch, then a Waves supported switch must be used. Please follow the link below for a list of supported switched for Waves SoundGrid systems.

<https://www.waves.com/support/network-switches-for-soundgrid-systems>

**⚠ Important:** If the switch is not in the Waves supported switch list, then it needs to be properly configured (so as to permit the correct passage of audio packets).

#### SFP Specification (for the MADI I/O port)

Audio is transferred between the Lawo console and Waves SoundGrid server using MADI.

On the Lawo console side, any available MADI SFP I/O port can be used as long as the SFP meets the specification below.

**⚠ Important:** The Waves system has been tested with the following model of SFP (fitted to the console's Local I/O MADI port).

Part No.	Data Rate	Fiber	Distance *(note2)	Interface	Temperature	DDMI
EOLS-1303-2M-DI	155Mbps	MMF	2km	LC	Industrial	YES

Note\*: For the latest certification information, please check with Eoptolink.

Note2: 2Km with 50/125um and 62.5/125um MMF@500MHz.km.





### 3.5 Waves for mc<sup>2</sup> - Remote Desktop Connection Options

This topic describes the options for the remote desktop connection.

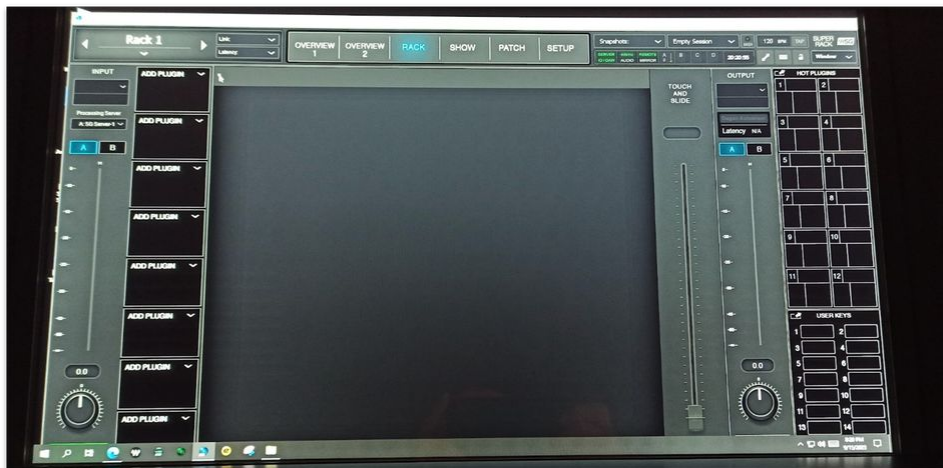
#### Introduction

During operation, the Waves host PC is switched to the console's Central GUI using the **PLUGIN** button (on the console's SCREEN CONTROL panel). The remote desktop connection can be configured in one of two ways: using Windows Remote Desktop (integrated in Windows) or TightVnc (a VNC remote desktop software).

The images below show how the Waves SuperRack user interface looks, when it is switched to the console's Central GUI. Note the differences in the Central GUI side panel and status bar.



Waves SuperRack on Central GUI (via Windows Remote Desktop)



Waves SuperRack on Central GUI (via VNC remote desktop)

## Windows vs VNC Remote Desktop

To choose the best option for your installation, please read the pros and cons below.

### Windows Remote Desktop

- Slower.
- The Waves Super Rack and plugins view is not optimal.
- The Central GUI side panel (for monitoring or access/assign) remains in view.
- No access to the Waves host PC desktop.
- You can use the following physical controls on the SCREEN CONTROL panel to interact with the plugins: rotary control, up/down arrows and Enter button.
- The Waves host PC does not need to be connected to an external monitor.

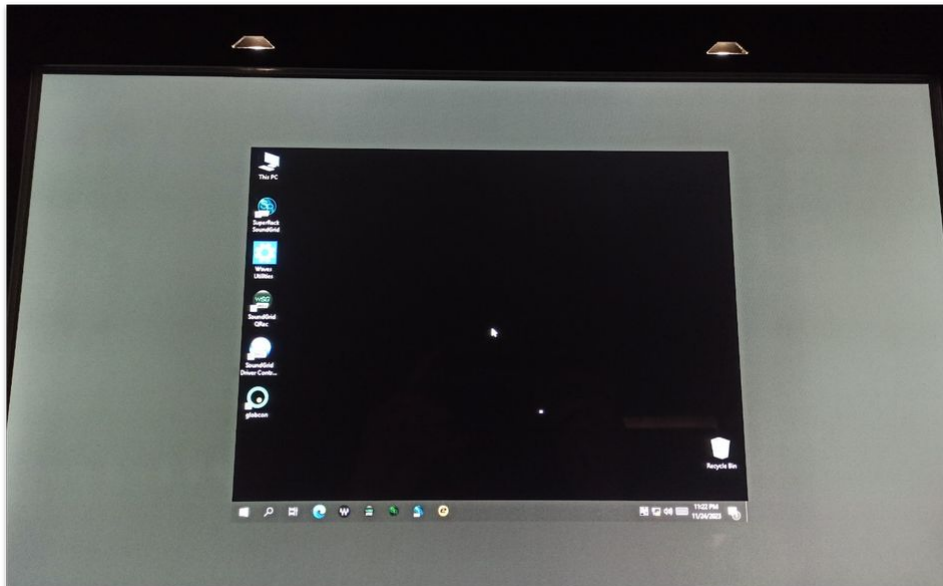
### VNC Remote Desktop

- Faster.
- Better Waves SuperRack and plugins view.
- The Central GUI side panel is not present.
- It is possible to access the Waves host PC desktop.
- The physical controls on the SCREEN CONTROL panel (listed above) cannot be used with the plugins.
- The Waves host PC must be connected to an external monitor OR you can use a FULLHD HDMI headless adapter.

The image below shows the FULLHD HDMI headless adapter (for VNC). Note that the adapter is not tested with 4K HDMI.



**Please note:** If you do not connect an external monitor or FULLHD HDMI headless adapter, then the Waves SuperRack user interface appears on the Central GUI at too small a resolution.

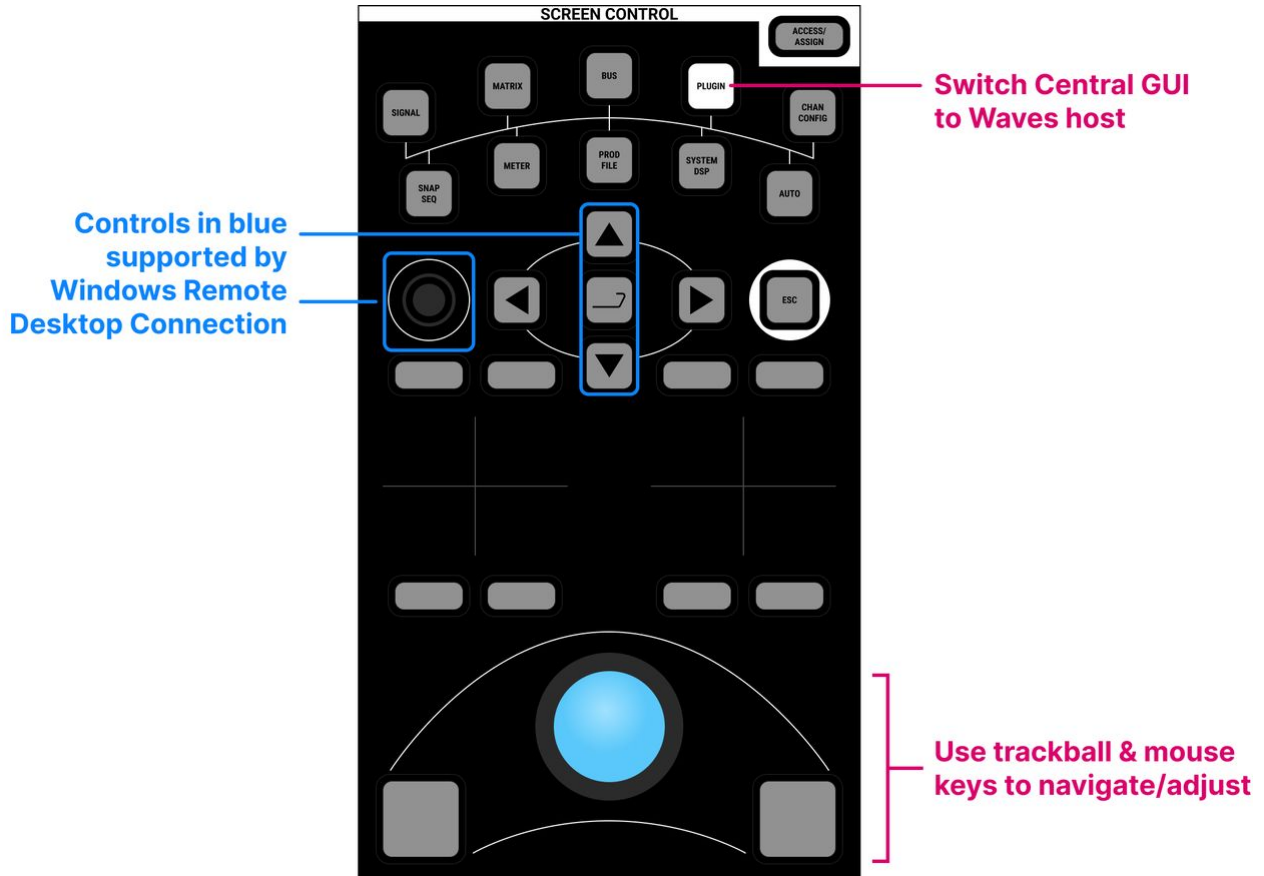




### SCREEN CONTROL Panel (functionality)

For both Windows and VNC, you can adjust the plugin parameters using the console's touch-screen, or trackball and left/right mouse buttons.

If a Windows Remote Desktop Connection is used, then it is possible to use the up/down arrow keys, Enter button and rotary control to interact with the plugins. If a VNC remote desktop connection is used, then these controls are not supported.



### Configuring the Remote Desktop Connection

The remote desktop connection is configured by the "**90-Waves.tcl**" file (stored on the console's control system). The file syntax specifies one of the remote desktop options: either Windows Remote Desktop or VNC. How to install the correct file is described [later](#).

If you wish to use the VNC option, then you will need the TightVNC remote desktop software (described [here](#)).



### 3.6 Waves for mc<sup>2</sup> - Host PC Setup

This topic describes how to prepare the Waves Axis Scope PC.

#### Introduction

The Waves Axis Scope PC is configured using a series of command lines. The commands must be executed using the Windows PowerShell terminal (as described below). There are two possible scenarios:

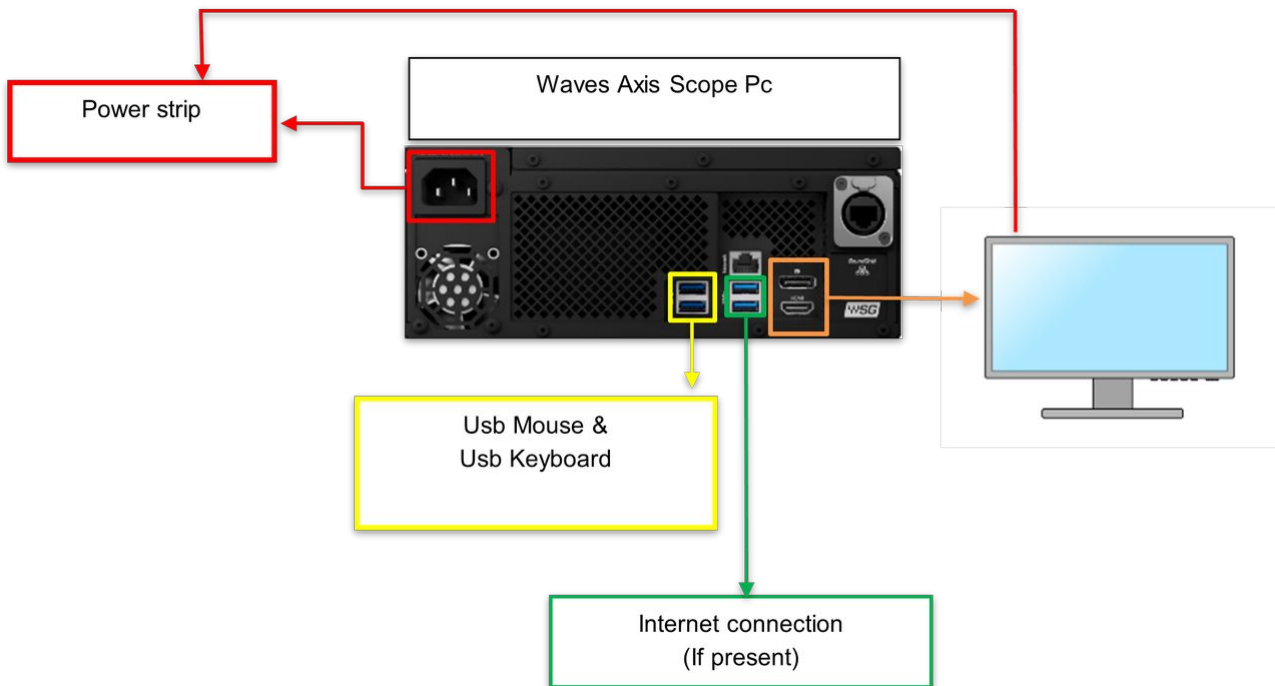
- either, create a text file (with the commands) and transfer this to the Waves Axis Scope PC (via a USB memory device). You can then copy and paste the commands from the text file.
- or, copy and paste the commands directly from this web page.

The rest of this topic describes the method followed by the commands.

#### Device Connections (for initial setup)

The diagram below shows the connections required for the initial setup.

Power, Video, Keyboard and Mouse are mandatory. The internet connection is recommended (to allow the commands to be copied from this web page, and/or remote configuration of the Waves Axis Scope PC).



## Power On

1. Before applying power to the PC, check the internet connection and apply power to the video monitor.
2. Power up the Axis Scope PC (with the internet Ethernet cable connected).
3. The image below shows the desktop (at the first start up).

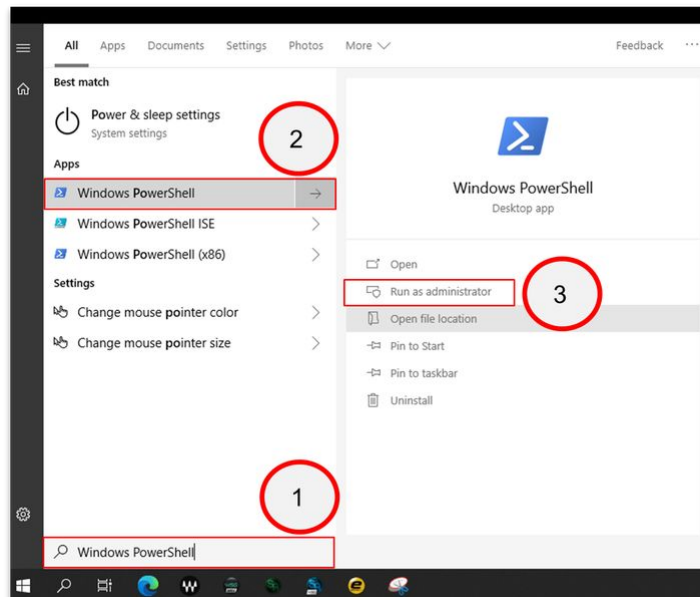


## Executing the Commands

The Waves Axis Scope PC has only an administrator user with the name "AXIS" without any password.

To execute the commands:

1. Go to Windows start menu.
2. Using the search bar, enter "Windows PowerShell".
3. Select "Run as administrator".



4. Copy and paste the command lines into the Windows PowerShell terminal. This can be done globally or individually, line by line. It is important to enter the full syntax for each line.
5. The Waves Axis Scope PC restarts automatically (after the `restart` command).



## Command Lines (required)

The required commands are as follows. The meaning of each line is explained at the [end](#) of this topic.

```
1 Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\W32Time\Parameters" -name "Type" -value NoSync
   -Type STRING
2 Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\tzautoupdate"
   -name "Start" -value 4 -Type DWORD
3 net user AXIS AXIS
4 Set-LocalUser -name "AXIS" -PasswordNeverExpires 1
5 net user AXIS | findstr /C:expires
6 netsh advfirewall set allprofiles state off
7 Set-ItemProperty -Path "HKLM:\System\CurrentControlSet\Control\Terminal Server"
   -name "fDenyTSConnections" -value 0
8 New-Item -Path "HKCU:\Software\Policies\Microsoft\Windows\Explorer"
9 New-ItemProperty -Path "HKCU:\Software\Policies\Microsoft\Windows\Explorer" -Name
   "DisableNotificationCenter" -Value 1 -Type DWORD
10 Restart-Computer
```

**Please note:** if you want to change the name of the computer, replace the last line with the one below.

```
1 Rename-Computer -Name "NEW COMPUTER NAME" -Restart -Force
```

## Command Lines (for Windows Automatic Logon)

The following commands are optional. They can be used to activate the Windows automatic logon.

```
1 Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Windows
   NT\CurrentVersion\Winlogon" -name "AutoAdminLogon" -type Dword -value 1
2 Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Windows
   NT\CurrentVersion\Winlogon" -name "DefaultUserName" -type String -value "AXIS"
3 Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Windows
   NT\CurrentVersion\Winlogon" -name "DefaultPassword" -type String -value "AXIS"
```

For more information about the Windows Automatic Logon, see the following reference link:

<https://learn.microsoft.com/en-us/troubleshoot/windows-server/user-profiles-and-logon/turn-on-automatic-logon>



## Command Line Meanings

The meaning of each command is described below. You can use these code blocks to copy and paste the lines individually.

### Command #1

```
Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\W32Time\Parameters" -name "Type" -value NoSync -Type STRING
```

Disables the "Set time automatically" on Waves Axis Scope computer.

### Command #2

```
Set-ItemProperty -Path "HKLM:\SYSTEM\CurrentControlSet\Services\tzautoupdate" -name "Start" -value 4 -Type DWORD
```

Disables the "Set time zone automatically" on the Waves Axis Scope computer.

### Command #3

```
net user AXIS AXIS
```

Assigns the password AXIS to the AXIS user.

### Command #4

```
Set-LocalUser -name "AXIS" -PasswordNeverExpires 1
```

Sets the password to "never expires".

### Command #5

```
net user AXIS | findstr /C:expires
```

Checks that command #4 was executed correctly.

### Command #6

```
netsh advfirewall set allprofiles state off
```

Disables all Windows firewall profiles.



### Command #7

```
Set-ItemProperty -Path "HKLM:\System\CurrentControlSet\Control\Terminal Server" -name "fDenyTSConnections" -value 0
```

Enables the Windows Remote Desktop.

### Command #8

```
New-Item -Path "HKCU:\Software\Policies\Microsoft\Windows\Explorer"
```

Creates a new registry key in the Windows registry.

### Command #9

```
New-ItemProperty -Path "HKCU:\Software\Policies\Microsoft\Windows\Explorer" -Name "DisableNotificationCenter" -Value 1 -Type DWORD
```

Creates a new key property in the Windows registry to disable the notifications center.

### Command #10

```
Restart-Computer
```

OR

```
1 Rename-Computer -Name "NEW COMPUTER NAME" -Restart -Force
```

Restarts the computer OR renames the computer and then restarts it.

## Windows Auto Logon Command Line Meanings

### Command #1

```
1 Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon" -name "AutoAdminLogon" -type Dword -value 1
```

Activates the Windows Auto Logon.

### Command #2

```
1 Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Windows NT\CurrentVersion\Winlogon" -name "DefaultUserName" -type String -value "AXIS"
```



Sets the user name for the Windows Auto Logon.

### Command #3

```
1 Set-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Windows  
NT\CurrentVersion\Winlogon" -name "DefaultPassword" -type String -value "AXIS"
```

Sets the password for the Windows Auto Logon.

### 3.7 Waves for mc<sup>2</sup> - Waves Products Installation

This topic describes how to install and activate the Waves products on the Axis Scope PC.

- i** Waves Central is the centralized management tool (from Waves). In the Lawo/Waves plugin server installation, it is used to register and activate the following products and licenses: Waves Axis Scope PC, Waves Extreme Server C, Waves SuperRack SoundGrid software and the Waves Plugins Bundle.

There are five steps to complete.

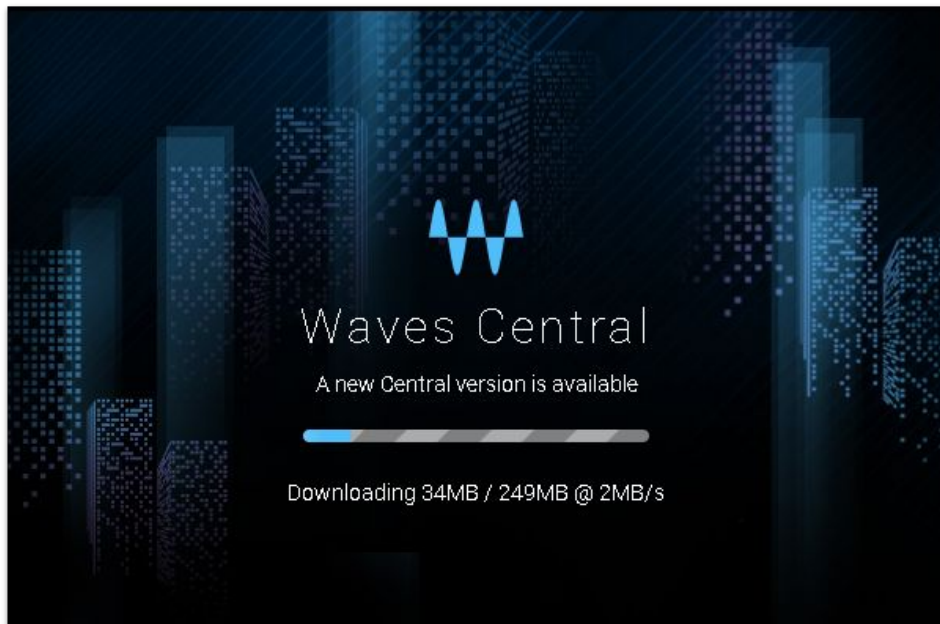
1. Launch Waves Central.
2. Log in to your Waves account:
  - either using your existing Waves account credentials,
  - or by creating a new Waves account.
3. Register the Waves products.
4. Install the Waves plugins.
5. Add Waves SuperRack SoundGrid to the Windows automatic startup programs.

#### Step 1: Launch Waves Central

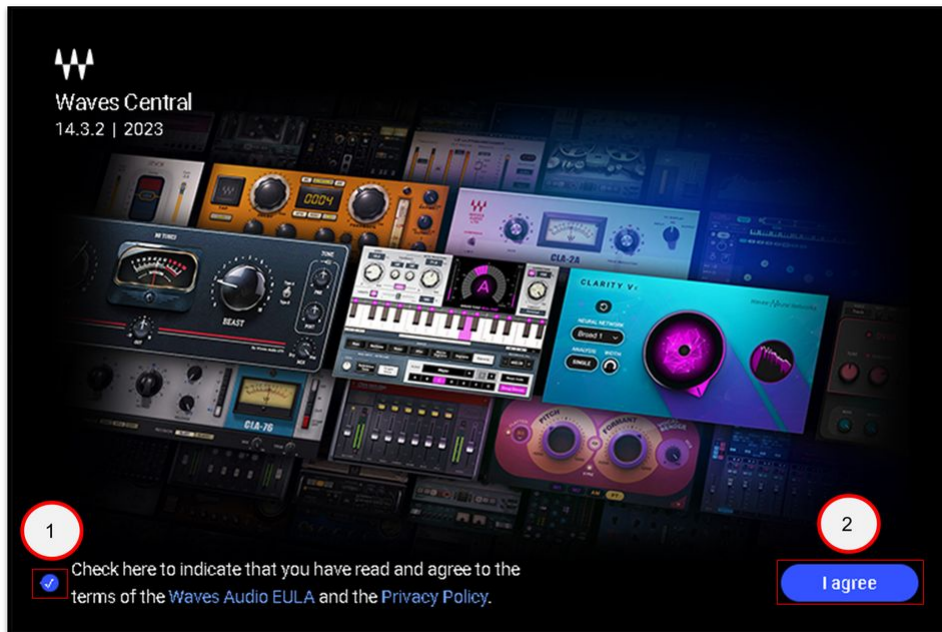
- Start **Waves Central** from the task bar.



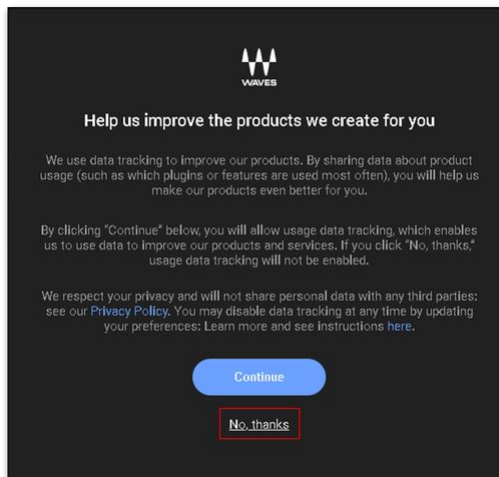
- At the first start up, the application updates itself automatically.



- At the end of update, you will see a window like this. Accept the "**Waves Audio EULA**" and click on "**I agree**" to continue.



- At first start up of Waves Central, the following message box appears. Click on **“No, thanks”**.





## Step 2: Login to Waves

For the next step, you will need your Waves account credentials.

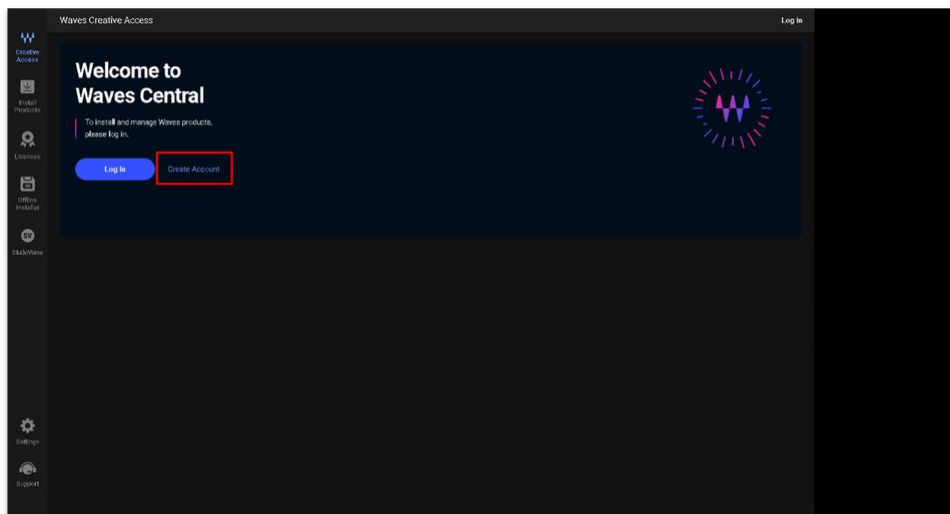
- Important:** Before logging in, it is important to **check that the time zone, date, time (of the PC) are correct**, otherwise a login issue can occur. For more information, please refer to the following link:

<https://www.waves.com/support/waves-central-errors-and-troubleshooting>

If you are an existing Waves user, then please skip to [here](#). Otherwise, follow the steps below to create a new Waves account.

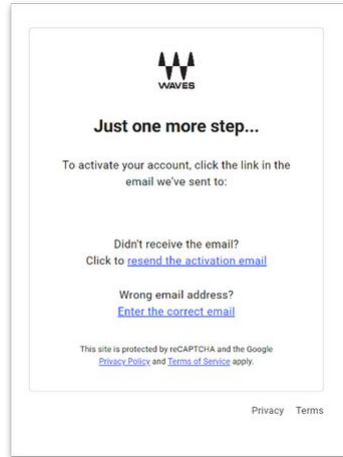
### Create a New Waves Account

- Start Waves Central and click on "**Create Account**".

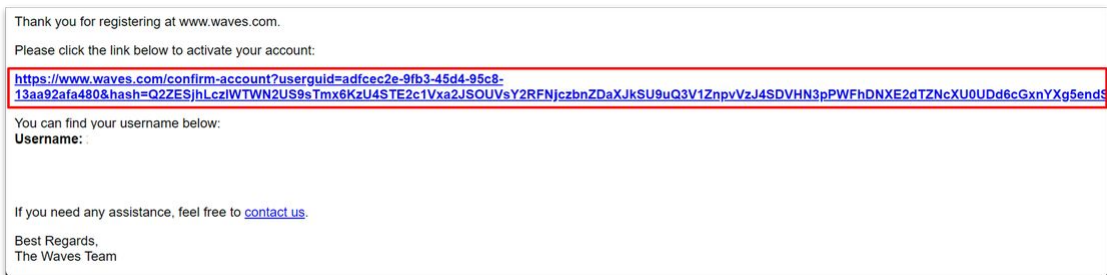


- This opens a web page (in your default browser) with the following dialog box:

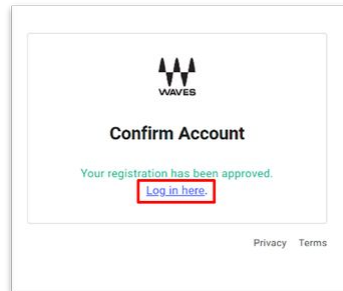
- Enter the email address and password that you wish to use, and click on "**Submit**".
- The following page appears (confirming that a "registration" email has been sent).



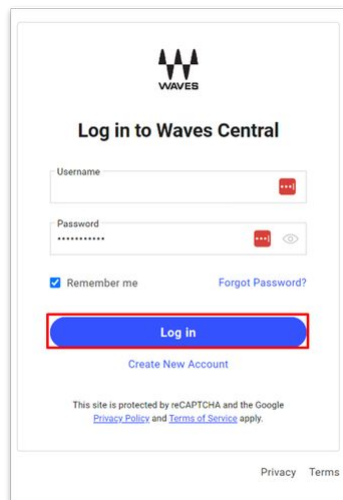
- Check your email for a "Mail from the Waves Team" and click on the hyperlink (to activate your account):



- You are now redirected to a page to confirm your account. Click on "Log in here" to continue.

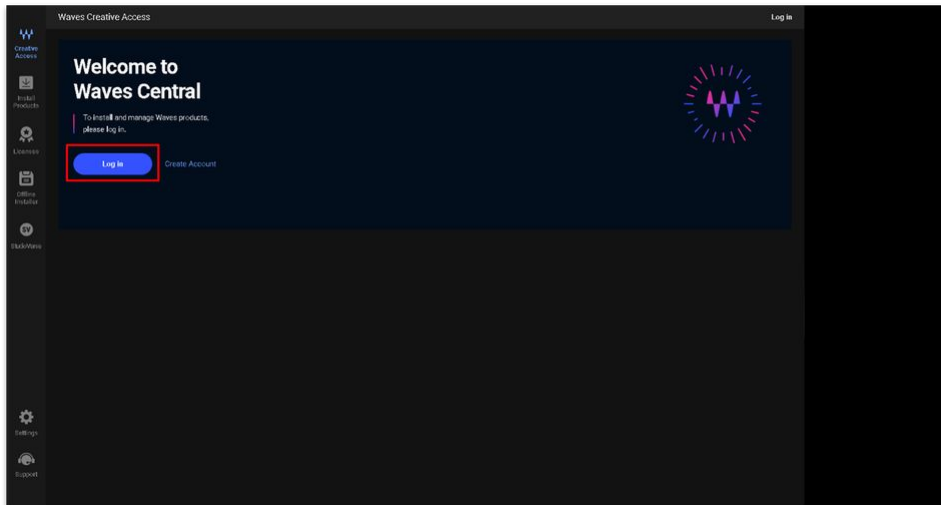


- At the login page, you can now enter your Waves account credentials and **Log in** (as described below).



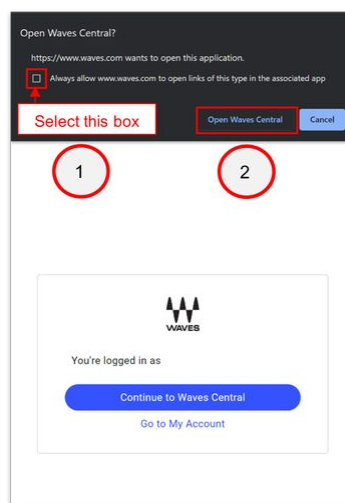
## Login to Waves Central

- From the Waves Central "Welcome" screen, click on "Log in".

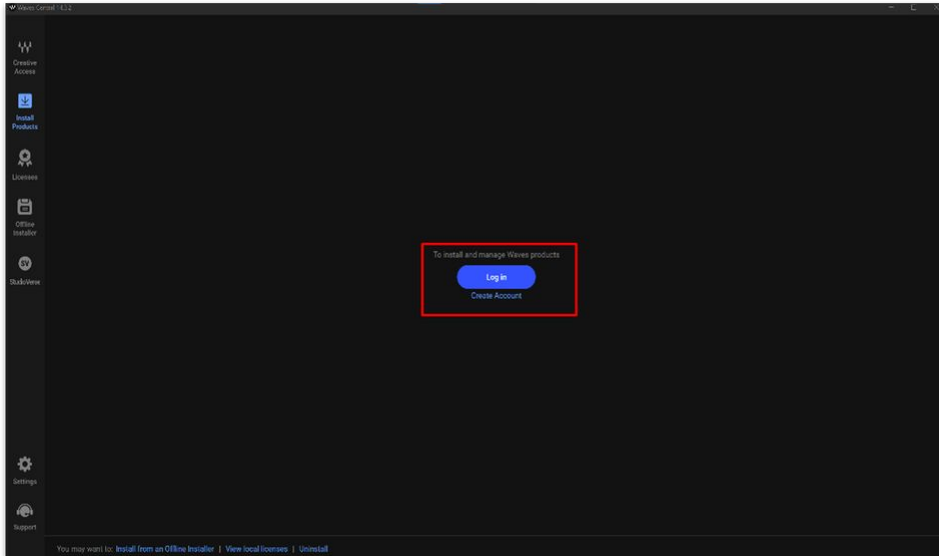


- Enter your Waves account credentials and click on "Log in".

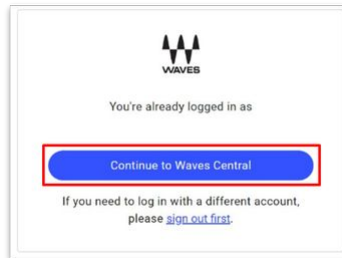
- The following dialog box appears.
  - Enable the option: "**Always allow [www.waves.com](\"http://www.waves.com\") to open links this type in the associated app**"
  - Then click on "**Open Waves Central**" to continue.



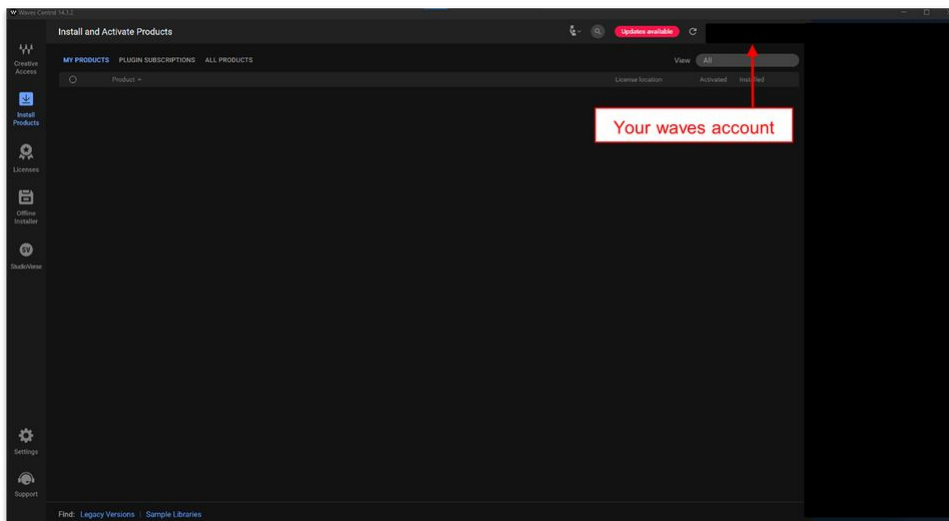
- You are now redirected to Waves Central where you need to click on "Log in" again.



- This opens a web page (in your default browser) with the following dialog box. Click on "**Continue to Waves Central**".



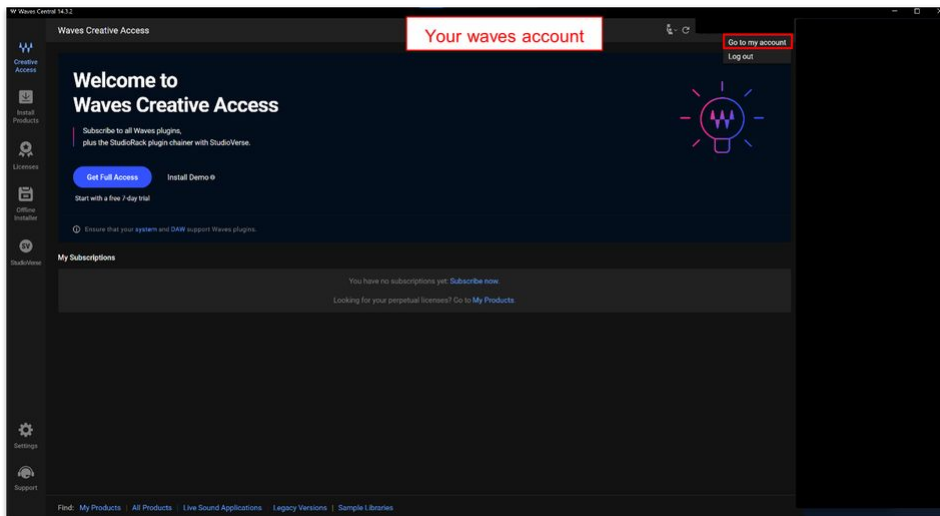
- Following a successful login, the Waves Central page should look like this:



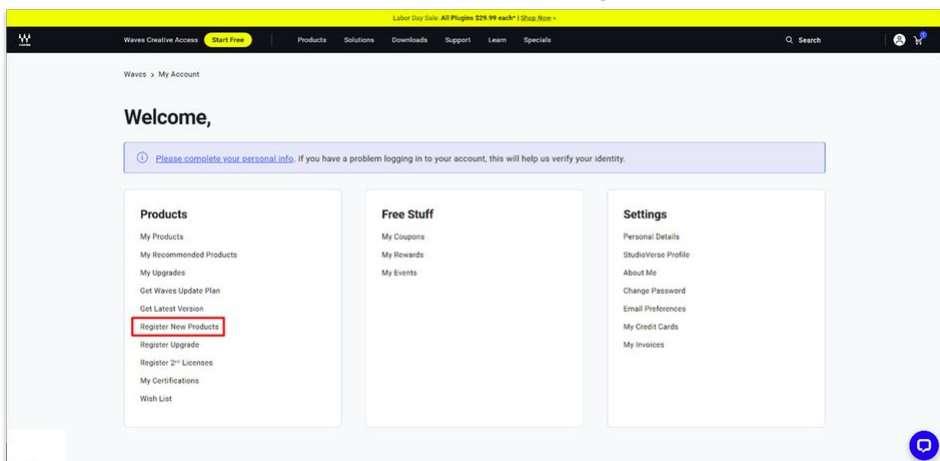
### Step 3: Register the Waves Products

The next step is to register the Waves products, included with the plugin server option, to your Waves account.

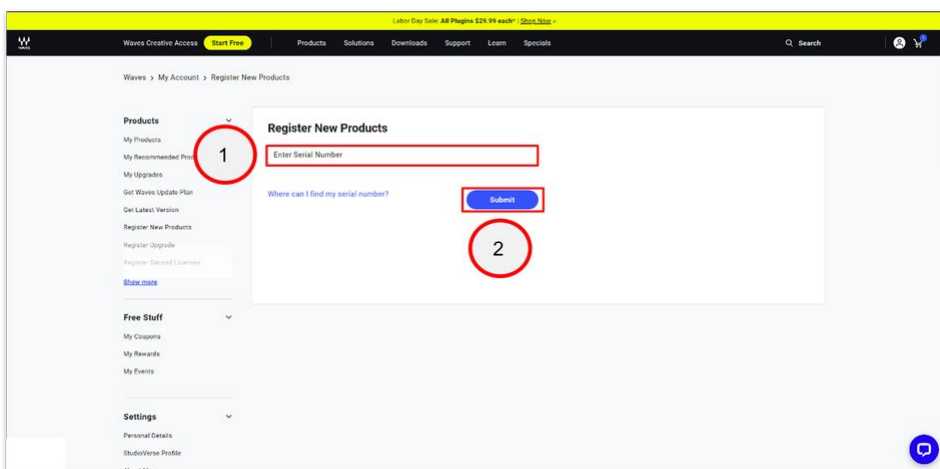
- If not already open, start Waves Central and login.
- Click on your Waves account name and select **"Go to my account"**



- This opens your Waves account (in your default browser). Click on **"Register new products"**.



- At the next page, you need to register each product by entering the serial or license numbers (included with the shipment).



- Enter the serial number of Waves Axis Scope PC and click on **"Submit"**
- Enter the serial number of Waves Extreme Server C and click on **"Submit"**
- Enter the license number of Waves SuperRack and click on **"Submit"**

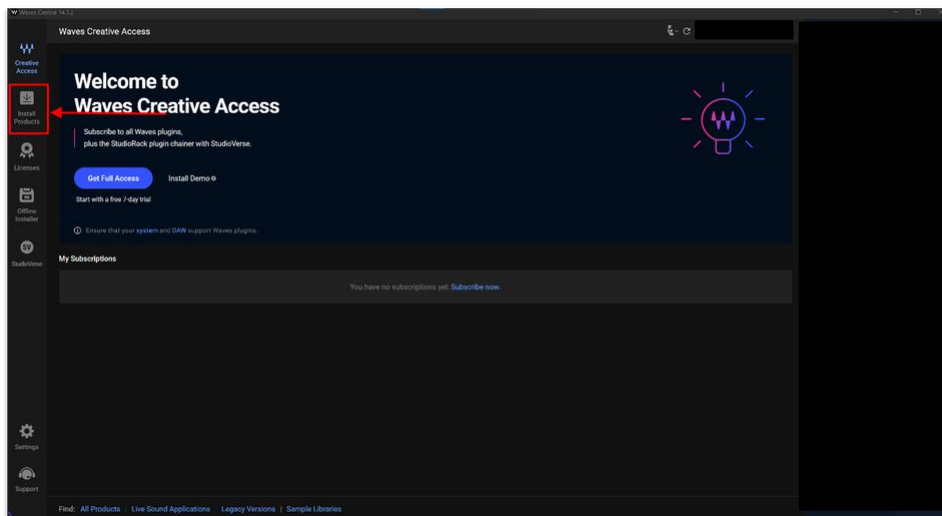


- Enter the license number of your Plugins Bundle and click on "**Submit**"
- After entering all the products, go back to Waves Central and close it.

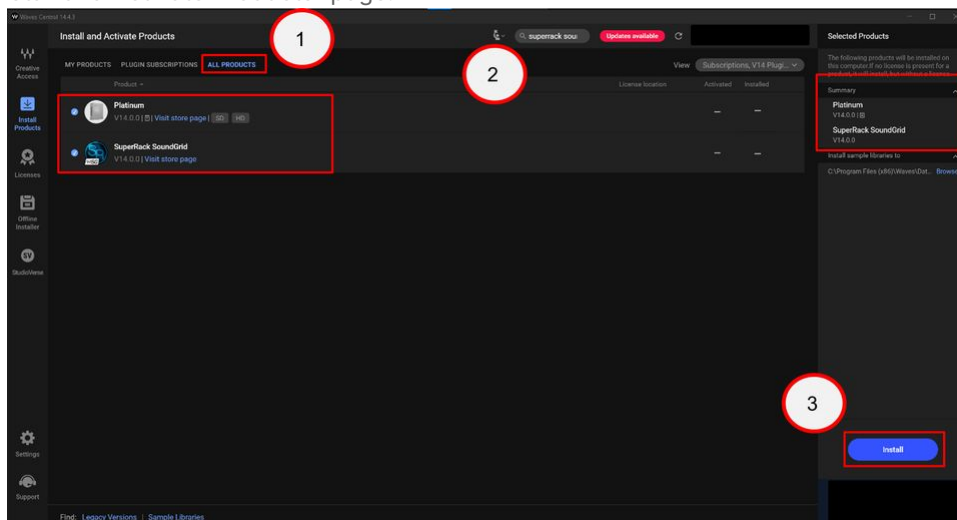
## Step 4: Install the Plugins

The next step is to install the Waves plugins. This is done in Waves Central by "installing" two products: the **SuperRack SoundGrid** and the plugin bundle license (e.g. **Platinum**).

- Start Waves Central and click on "**Install products**".



- This opens the "Install and Activate Products" page.



- a. Select "**ALL PRODUCTS**" (at the top of the page)
  - b. Go to the search bar and type in "**SuperRack SoundGrid**" and select it. Then repeat for your license bundle: e.g. type in "**Platinum**" and select it.
  - c. Click on **Install** (to install the selected products).
- At the end of the installation, you must restart the Waves Axis Scope PC (by clicking on "**Restart**").

**i** Installing the **SuperRack SoundGrid** product installs all the required I/O modules and firmware for the EXBOX.SG

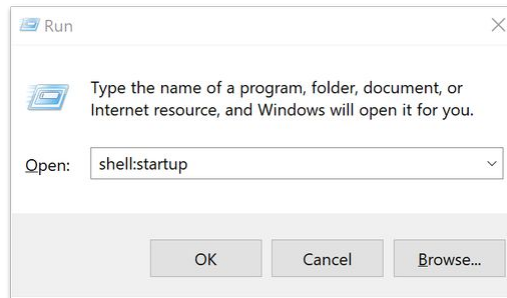
### Step 5: Add SuperRack to the Startup Programs

The final step is to add the Waves SuperRack SoundGrid software to the list of automatic startup programs (in Windows). This ensures that the Waves software starts automatically whenever the PC boots up.

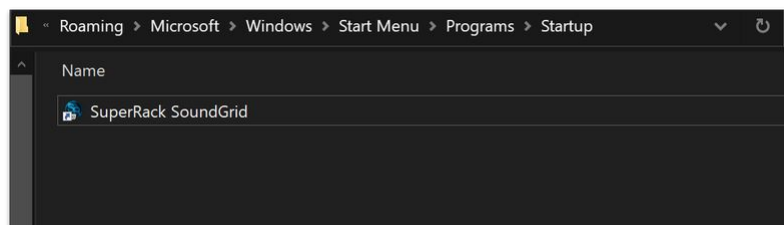
- Press the Windows Logo Key + R (on your keyboard).



- In the "Run" box, type "**shell:startup**" and press Enter (or click **OK**).



- Windows opens the "automatic startup programs" folder. Copy & Paste the **SuperRack SoundGrid** startup icon into this folder.



- When the PC next starts up, the **Waves SuperRack SoundGrid** software will start automatically.



### 3.8 Waves for mc<sup>2</sup> - GlobCon Installation

This topic describes how to download and install the GlobCon software on the Waves Axis Scope PC.

**i** GlobCon is a global control software platform from DirectOut. In the Lawo/Waves plugin server installation, it is required to configure the routing and synchronization options for the EXBOX.SG converter (as described [later](#)).

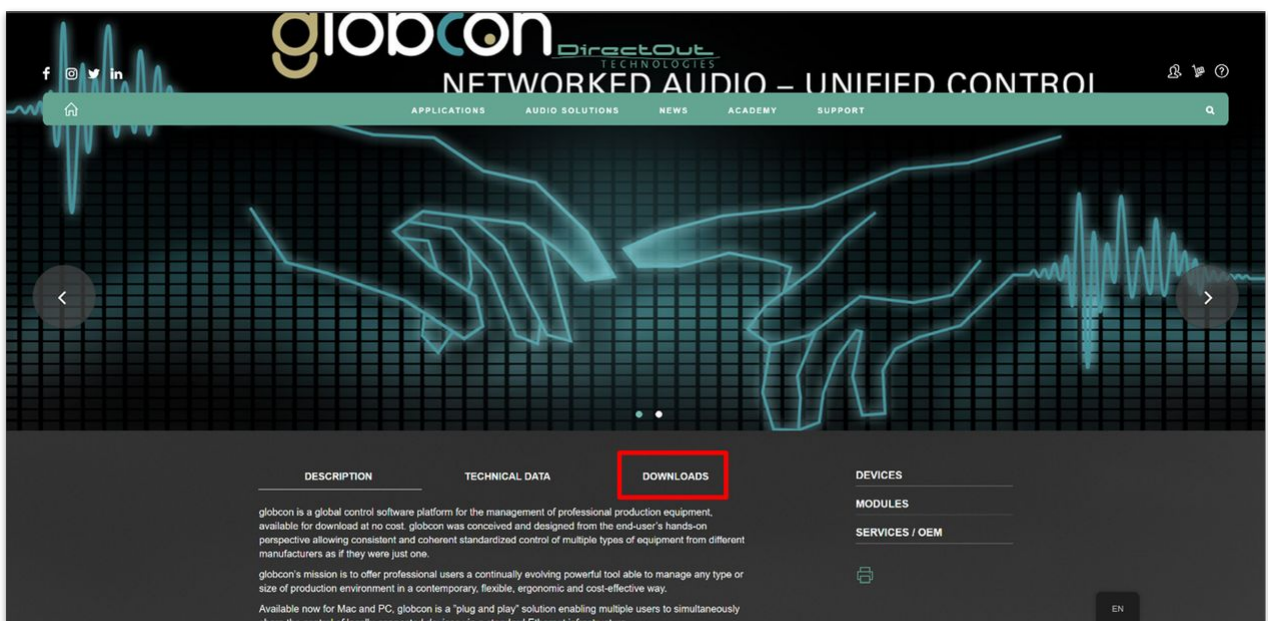
#### Step 1: Download the GlobCon Installer

Start by downloading the GlobCon installer directly from this link:

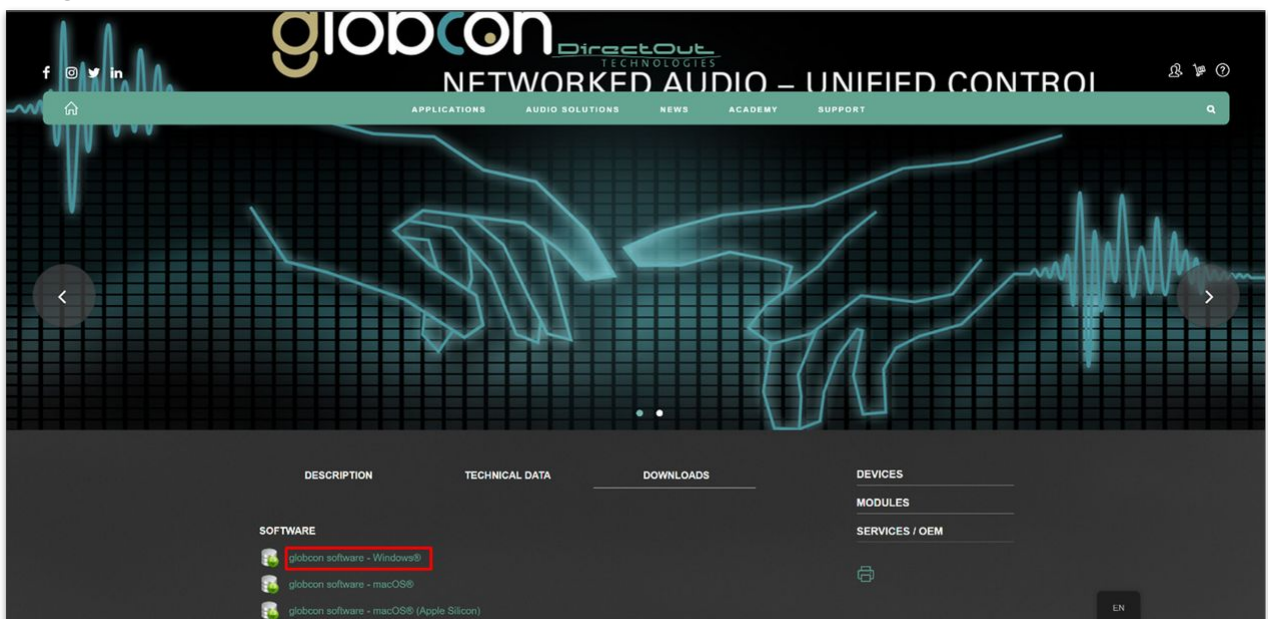
<https://storage.googleapis.com/globcon-web-api.appspot.com/globcon-1.13.2.exe>

Alternatively, you can open your browser and:

- Go to [GLOBCON - Free Audio Control Software \(directout.eu\)](https://www.directout.eu)
- Click on **"Downloads"**.



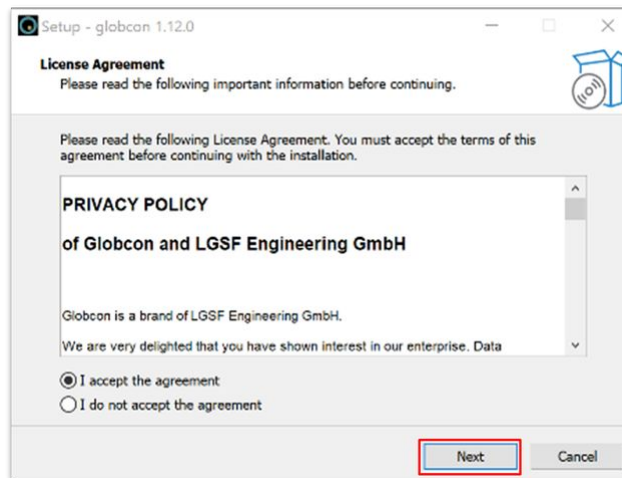
- Click on **"globcon software – Windows"**.



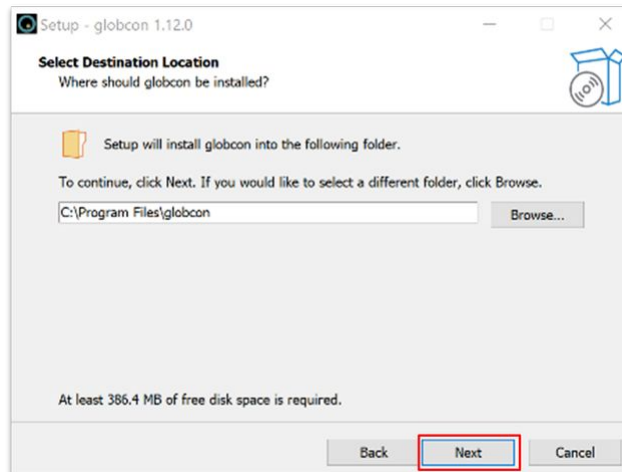
## Step 2: Install the GlobCon Software

Then follow the steps below to install the software.

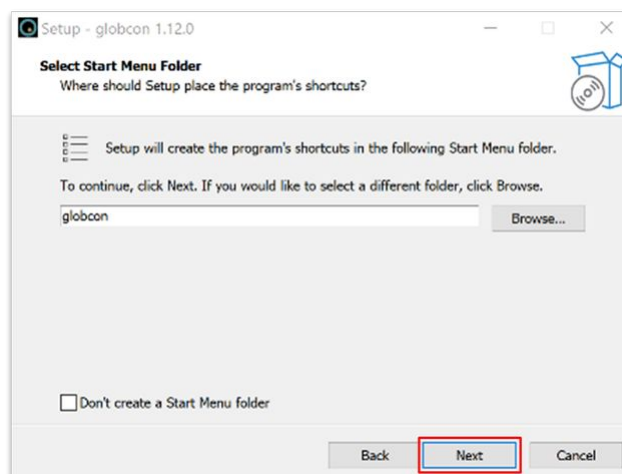
- Go to the Downloads folder and double click on "**globcon-1.12.0.exe**".
- Select "**I accept the agreement**" and click on "**Next**".



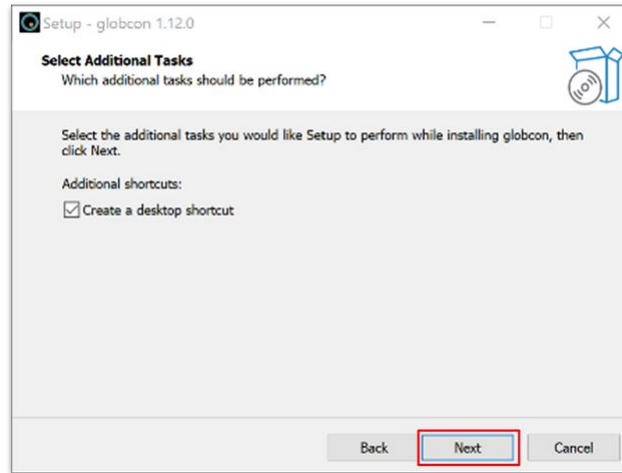
- Click on "**Next**".



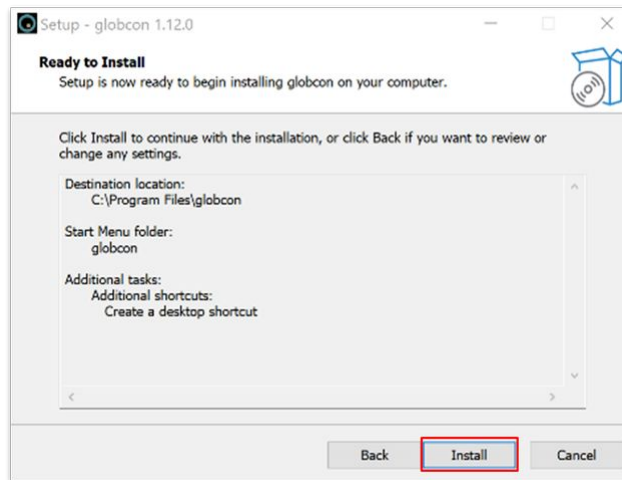
- Click on "**Next**".



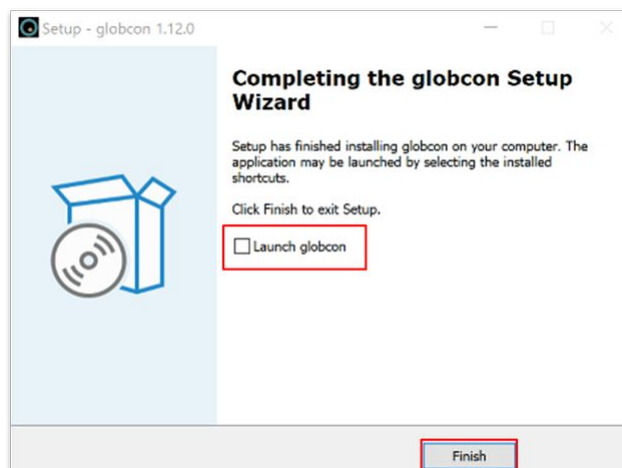
- Select "**Create a desktop shortcut**" and click "**Next**".



- Click on "Install".



- Deselect "Launch GlobCon" and click "Finish".



- Following a successful installation, the **GlobCon** icon can be found on the desktop.



## 3.9 Waves for mc<sup>2</sup> - TightVNC Installation

This topic describes how to download and install the TightVNC software on the Waves Axis Scope PC. You will need to do this if you wish to use VNC for the remote desktop connection.

**Please note:** this step can be skipped if you are using a Windows Remote Desktop connection.

The remote desktop options are explained in more detail [here](#).

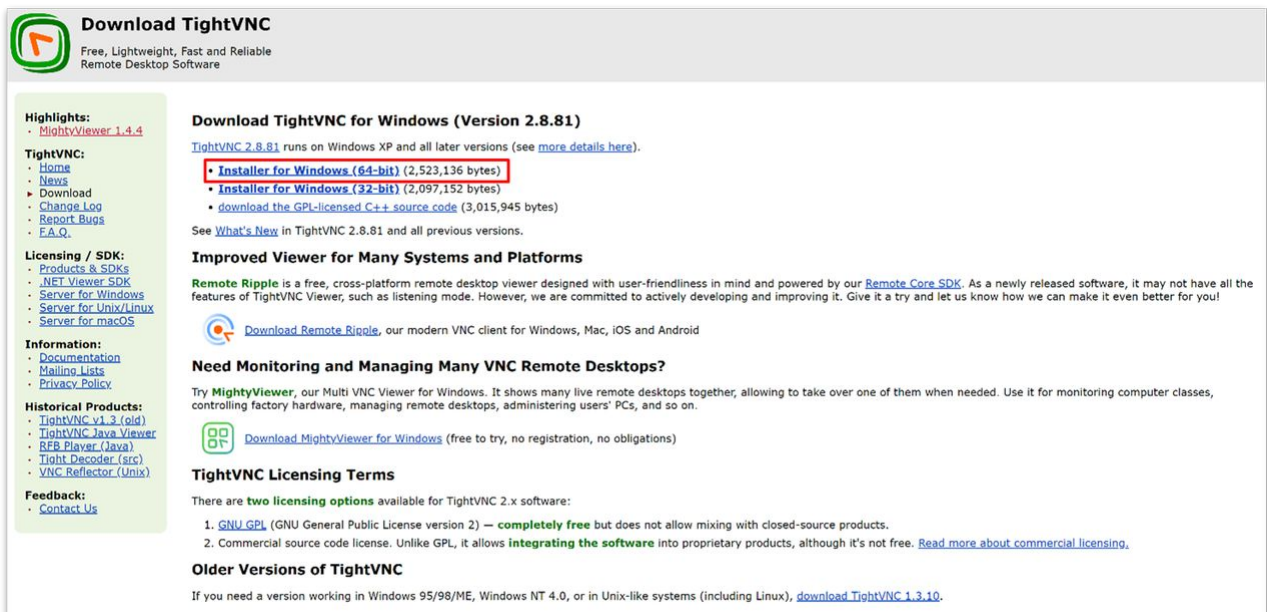
### Step 1: Download the TightVNC Installer

Start by downloading the TightVNC installer directly from this link:

<https://www.tightvnc.com/download/2.8.81/tightvnc-2.8.81-gpl-setup-64bit.msi>

Alternatively, you can open your browser and:

- Go to <https://www.tightvnc.com/download.php>
- Click on "Installer for Windows (64-bit)"



**Download TightVNC**  
Free, Lightweight, Fast and Reliable Remote Desktop Software

**Highlights:**  
• [MightyViewer 1.4.4](#)

**TightVNC:**  
• [Home](#)  
• [News](#)  
• [Download](#)  
• [Change Log](#)  
• [Report Bugs](#)  
• [FAQ](#)

**Licensing / SDK:**  
• [Products & SDKs](#)  
• [.NET Viewer SDK](#)  
• [Server for Windows](#)  
• [Server for Unix/Linux](#)  
• [Server for macOS](#)

**Information:**  
• [Documentation](#)  
• [Mailing Lists](#)  
• [Privacy Policy](#)

**Historical Products:**  
• [TightVNC v1.3 \(old\)](#)  
• [TightVNC Java Viewer](#)  
• [RFB Player \(Java\)](#)  
• [Tight Decoder \(src\)](#)  
• [VNC Reflector \(Unix\)](#)

**Feedback:**  
• [Contact Us](#)

**Download TightVNC for Windows (Version 2.8.81)**  
[TightVNC 2.8.81](#) runs on Windows XP and all later versions (see [more details here](#)).

- **Installer for Windows (64-bit)** (2,523,136 bytes)
- **Installer for Windows (32-bit)** (2,097,152 bytes)
- [download the GPL-licensed C++ source code](#) (3,015,945 bytes)

See [What's New](#) in TightVNC 2.8.81 and all previous versions.

**Improved Viewer for Many Systems and Platforms**  
**Remote Ripple** is a free, cross-platform remote desktop viewer designed with user-friendliness in mind and powered by our [Remote Core SDK](#). As a newly released software, it may not have all the features of TightVNC Viewer, such as listening mode. However, we are committed to actively developing and improving it. Give it a try and let us know how we can make it even better for you!

[Download Remote Ripple](#), our modern VNC client for Windows, Mac, iOS and Android

**Need Monitoring and Managing Many VNC Remote Desktops?**  
Try **MightyViewer**, our Multi VNC Viewer for Windows. It shows many live remote desktops together, allowing to take over one of them when needed. Use it for monitoring computer classes, controlling factory hardware, managing remote desktops, administering users' PCs, and so on.

[Download MightyViewer for Windows](#) (free to try, no registration, no obligations)

**TightVNC Licensing Terms**  
There are **two licensing options** available for TightVNC 2.x software:

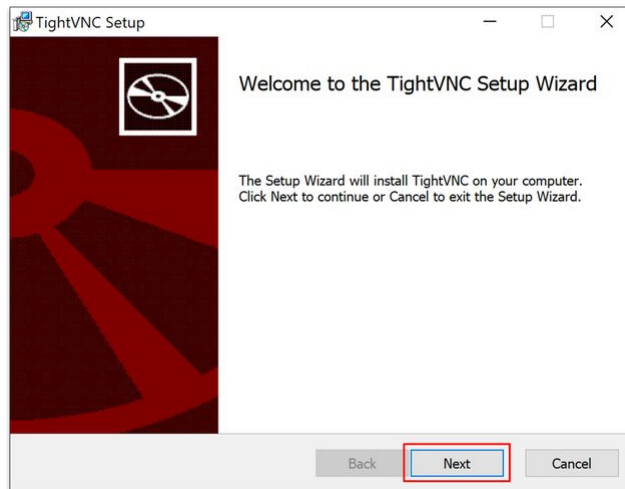
1. **GNU GPL** (GNU General Public License version 2) — **completely free** but does not allow mixing with closed-source products.
2. Commercial source code license. Unlike GPL, it allows **integrating the software** into proprietary products, although it's not free. [Read more about commercial licensing](#).

**Older Versions of TightVNC**  
If you need a version working in Windows 95/98/ME, Windows NT 4.0, or in Unix-like systems (including Linux), [download TightVNC 1.3.10](#).

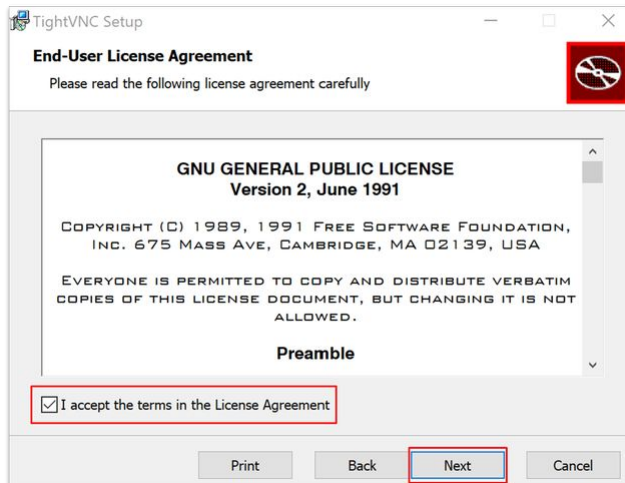
## Step 2: Install the TightVNC Software

Then follow the steps below to install the software.

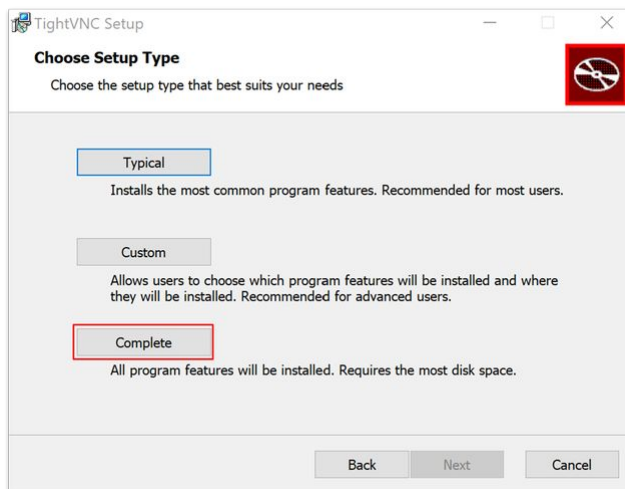
- Go to the Downloads folder and double click on "**tightvnc-2.8.81-gpl-setup-64bit.msi**".
- The installer starts... click on "**Next**".



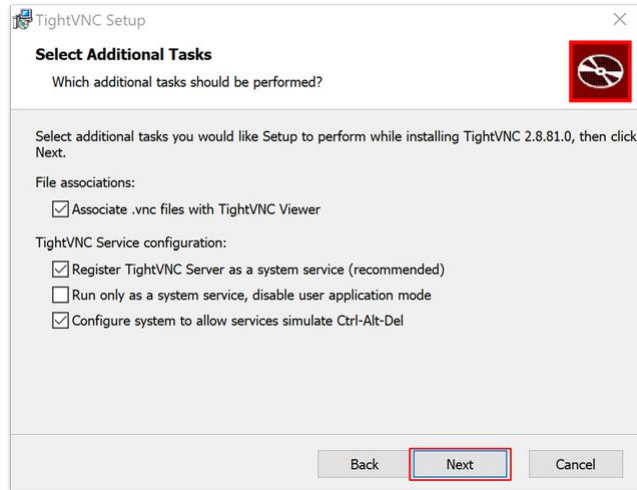
- Accept the terms of the License Agreement and click on "**Next**".



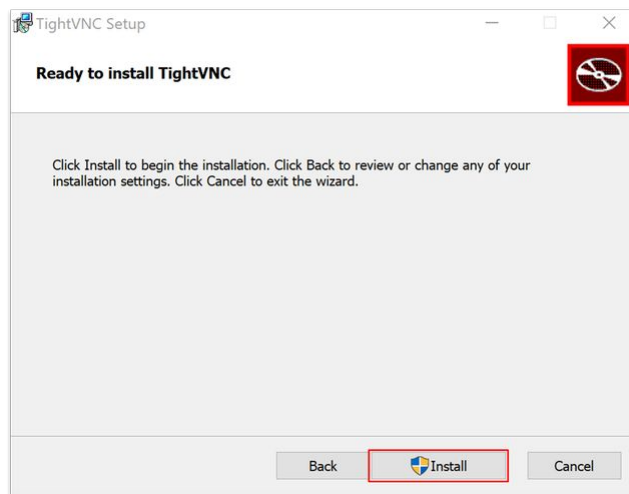
- Select "**Complete**".



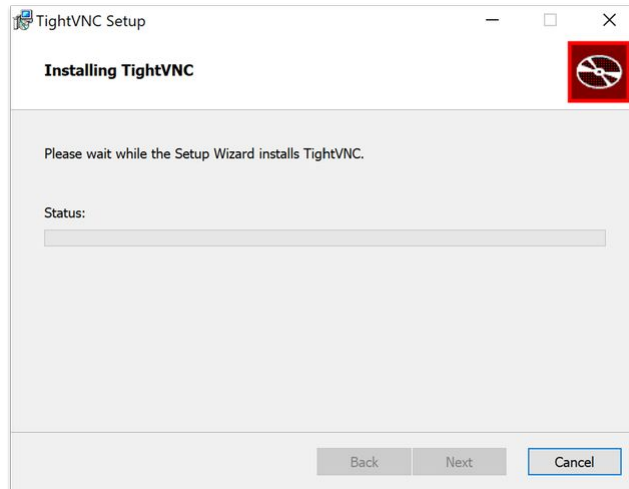
- Click on "**Next**".



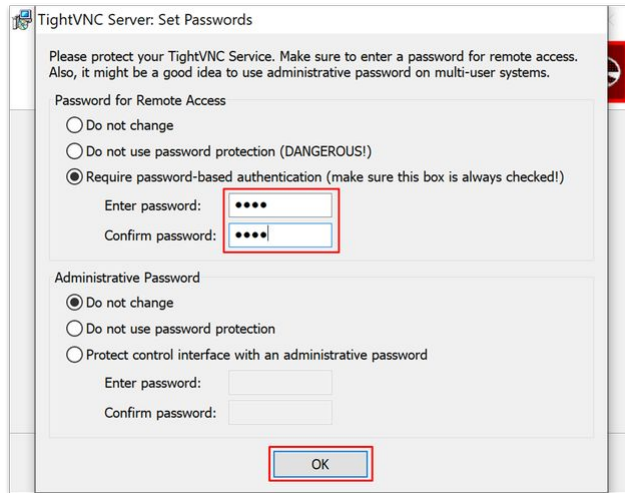
- Click on **"Install"**.



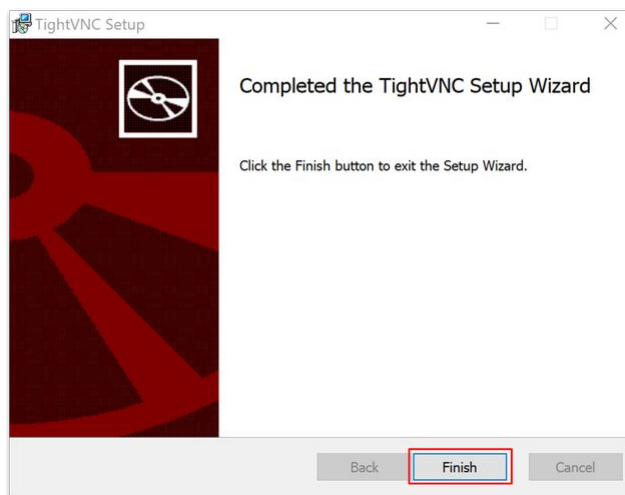
- Once the installation starts, the progress is shown in the next screen.



- At the next dialog box, insert the password **"AXIS"** and click **"OK"**.



- Click on "**Finish**".



- The dialog box closes and the installation is complete.

### 3.10 Waves for mc<sup>2</sup> - Management IP Setup

This topic describes how to configure the management network settings of the Waves Axis Scope PC.

#### Introduction

To establish the network communication between the Lawo console and SuperRack SoundGrid, the Waves Axis Scope PC must be assigned a **static IP address that is in the same network as the mc<sup>2</sup> control system**.

In this topic, we use the standard Lawo management network subnet (**192.168.102.0/24**), and an IP address of **192.168.102.244** for the Waves Axis Scope PC. The network settings should be adapted for your installation.

✔ You can check the current IP of the mc<sup>2</sup> control system using the IP Address fields in the **System Settings** page.

**Important:** The Waves Axis Scope PC has two network interfaces: one for the Lawo management network and one for the Waves SoundGrid server. The connectivity of a complete system is described later. For now, it is useful to identify each interface (in the Waves PC Network Settings):

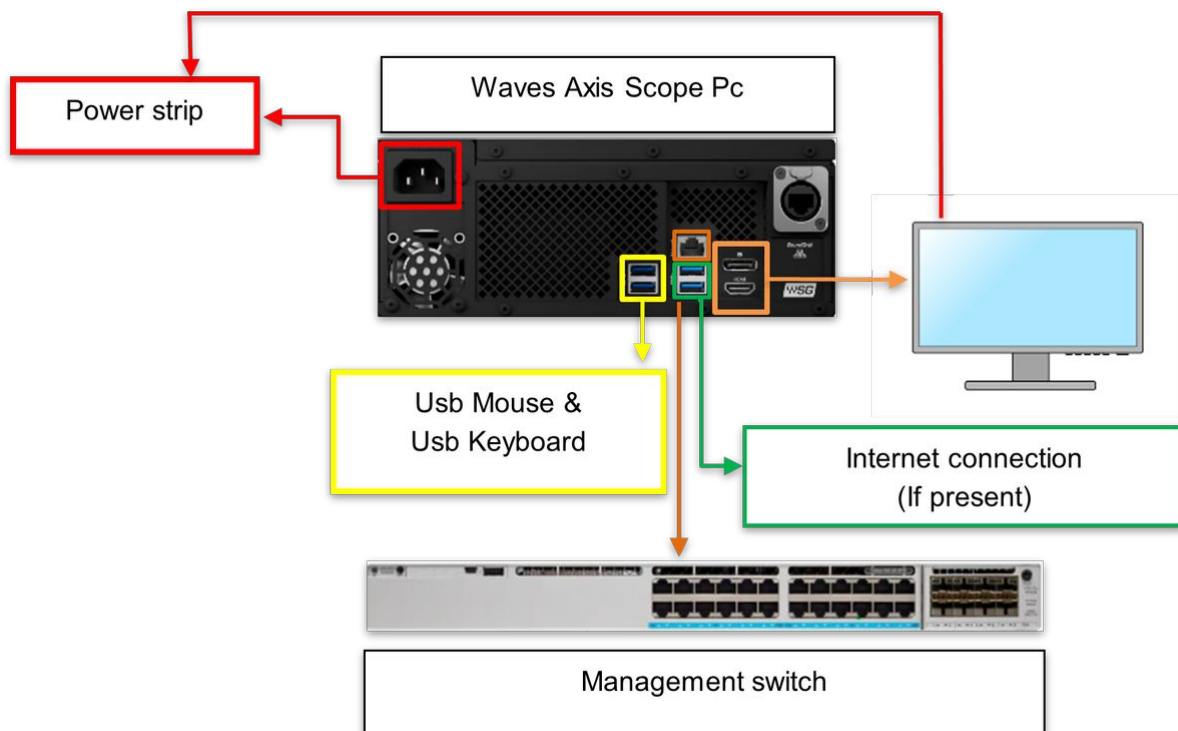
- Management Ethernet interface = "Intel® I211 Gigabit Network Connection".
- SoundGrid Ethernet interface = "Intel® Ethernet Connection I219-V".

#### Device Connections (for IP setup)

The diagram below shows the connections required.

Power, Video, Network, Keyboard and Mouse are mandatory. The internet connection is recommended (to allow remote configuration of the Waves Axis Scope PC).

It is assumed that the mc<sup>2</sup> control system is connected to the management switch (to allow the network communication to be tested once the setup is complete).





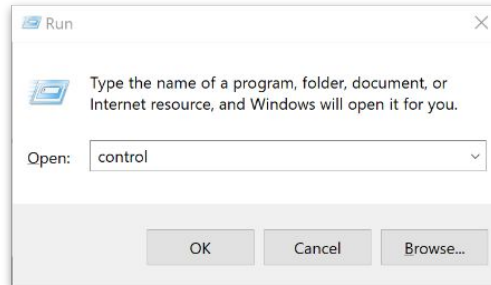
## IP Configuration

Follow the steps below to configure the management network interface on the Waves Axis Scope PC.

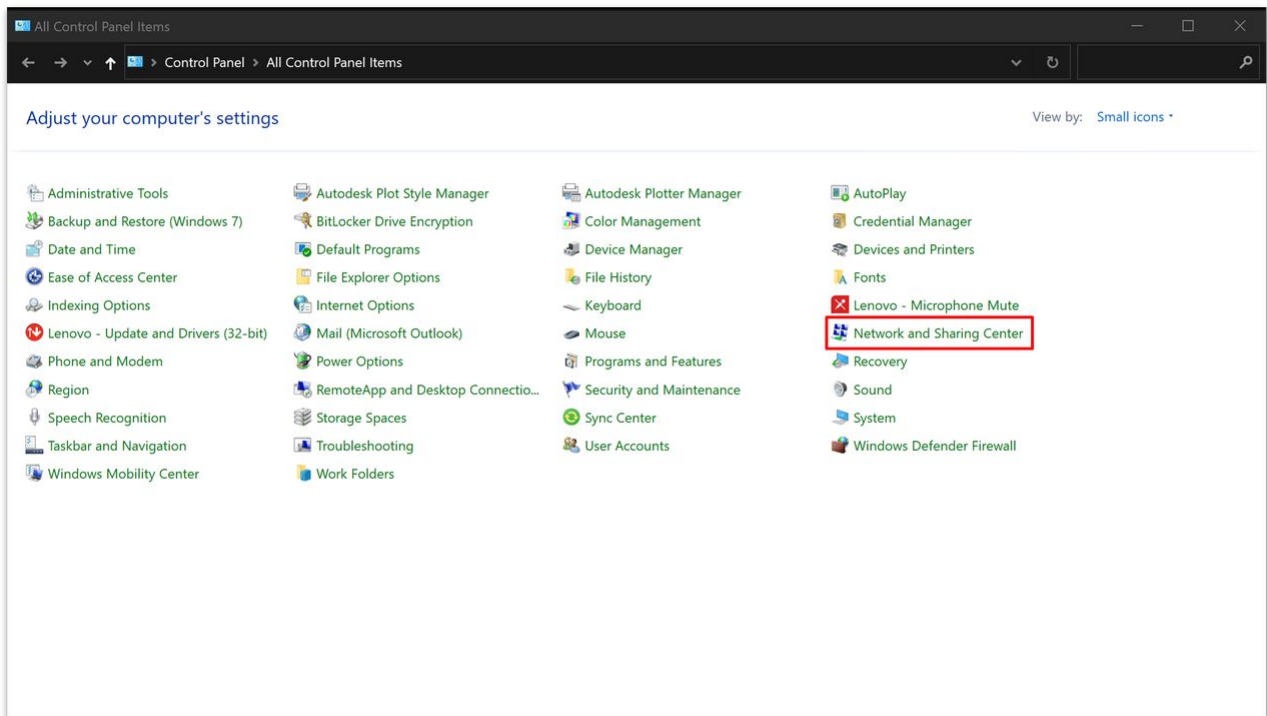
- Press the Windows Logo Key + R (on your keyboard).



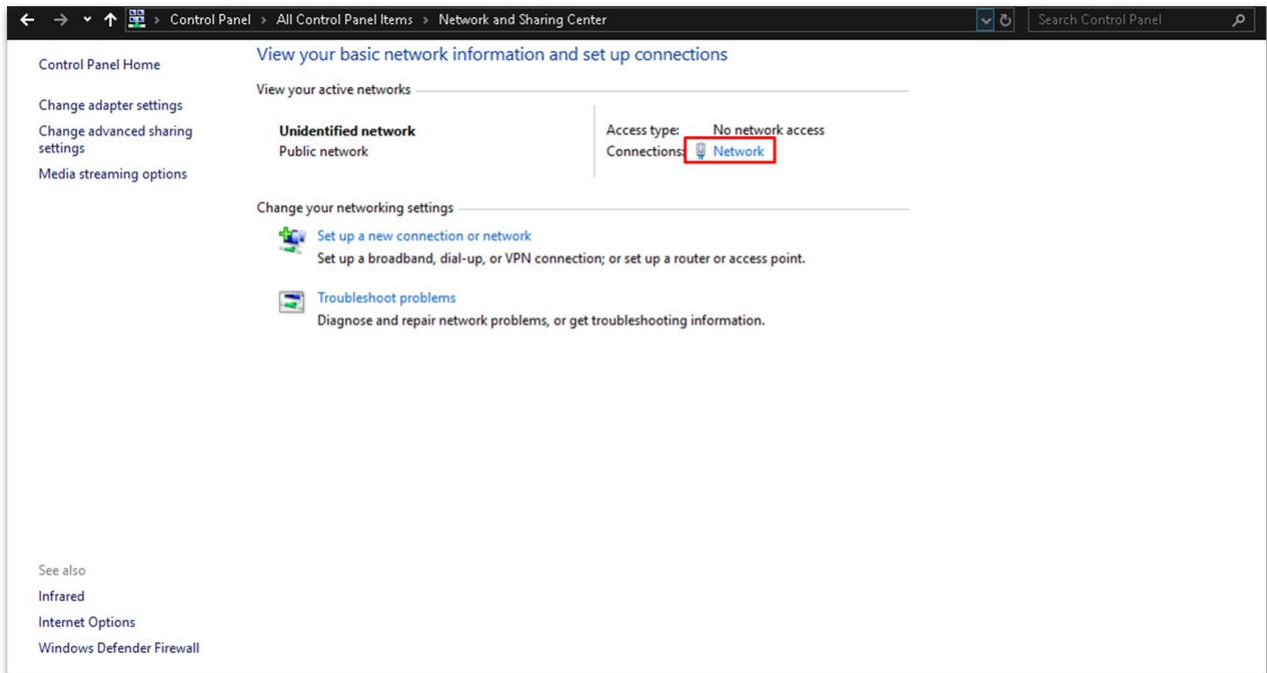
- In the "Run" box, type "**control**" and press Enter (or click **OK**).



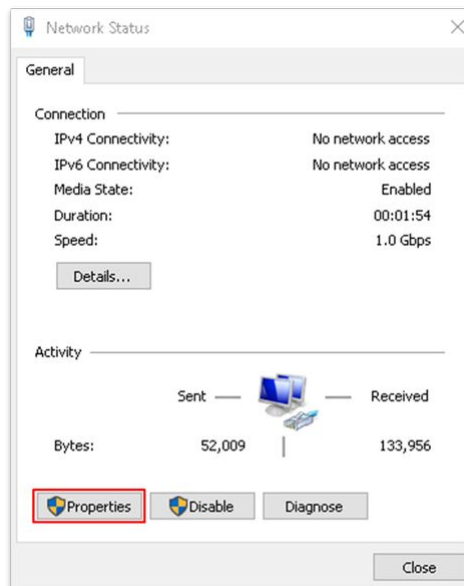
- Click on "**Network and Sharing Center**".



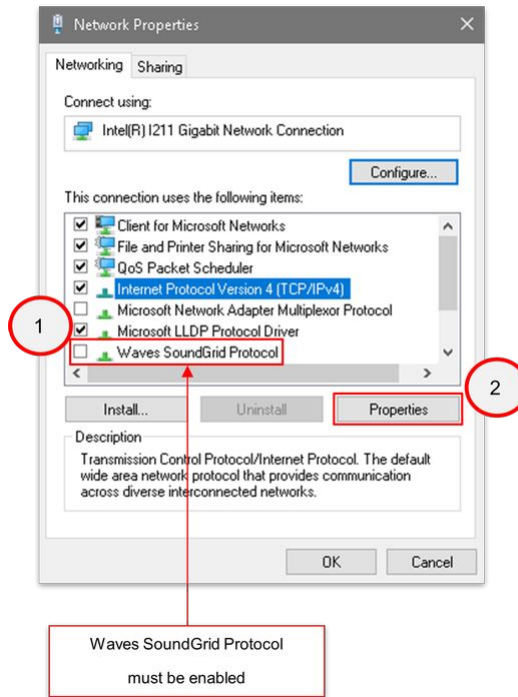
- Click on "**Network**".



- This opens a dialog box for the network card. Click on "**Properties**".

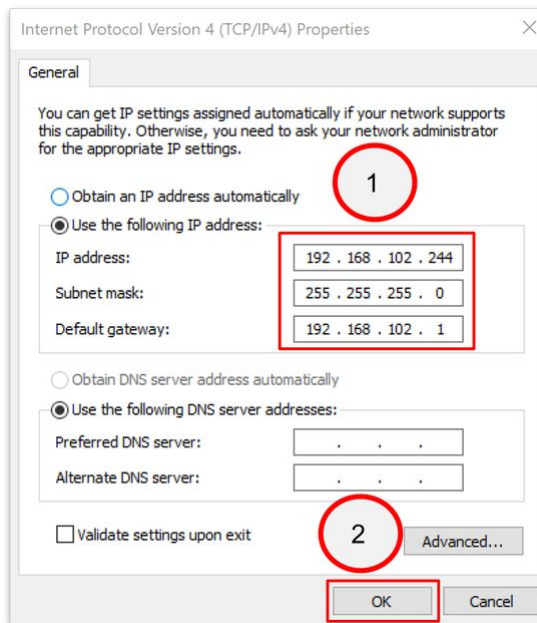


- At the next dialog, there are two steps.
  - Check that the "**Waves SoundGrid Protocol**" option is enabled. If not, enable it.
  - Then select "**Internet Protocol Version 4 (TCP/IPv4)**" and click on "**Properties**".



**⚠ Please note:** It is important to make sure that the **"Waves SoundGrid Protocol"** option is enabled. Otherwise, **the NIC will not appear** in the SuperRack's network **"Port"** menu or **"Remote console control"** module.

- At the next dialog, select **"Use the following IP address"** and complete the fields as follows.
  - In the **IP address** field, type in 192.168.102.244
  - The **Subnet mask** field will autocomplete.
  - In the **Default gateway** field, type in 192.168.102.1
  - Click on **"OK"** to confirm.



Now test the connection by executing a ping command to the mc<sup>2</sup> system IP address.

## 3.11 Waves for mc<sup>2</sup> - Enable Waves Integration

This topic describes how to enable the Waves integration on the Lawo console.

### Introduction

On Lawo's mc<sup>2</sup> consoles, many of the options are configured using Tool Command Language (\*.tcl) files. The TCL files are stored on the mc<sup>2</sup> control system and are read when the system starts up.

To enable the Waves integration, a single file is required: "**90-Waves.tcl**". If this file is not present, or its contents are incorrect, then the Waves integration will not work.

There are four steps to complete.

1. Download one of the TCL files (supplied) onto your service computer.
2. Check and, if necessary, edit the TCL file contents.
3. Save the file using the correct filename.
4. Transfer the TCL file to the mc<sup>2</sup> control system (using a secure SSH connection).

**⚠ Important:** If your console has an external control system (XCS), then you will need to repeat the steps on both the main and redundant control system.

### Step 1: Download the TCL file

Click on one of the links below to download the correct TCL file for your system.

There are two versions of the file available, depending on the type of remote desktop connection you wish to use.

- "[90-Waves-RDP.tcl](#)" - for a Windows Remote Desktop Connection.
- "[90-Waves-VNC.tcl](#)" - for a VNC remote desktop connection.

If you wish to use the VNC option, then you will need the TightVNC remote desktop software (described [here](#)).

For more information about the remote desktop connection options, see [Waves for mc<sup>2</sup> - Remote Desktop Connection Options](#).

### Step 2: Check the TCL file contents

Using a suitable TCL file editor (such as **Notepad++**), open the file and check its contents.

Please note:

- "GUI\_PLUGIN\_PAGE\_REMOTE\_CONNECTION\_TYPE 0 **0**" creates a Windows Remote Desktop connection.
- "GUI\_PLUGIN\_PAGE\_REMOTE\_CONNECTION\_TYPE 0 **1**" creates a VNC remote desktop connection.
- The line "GUI\_PLUGIN\_PAGE\_REMOTE\_CONNECTION\_SERVER\_IP" should be adapted to fit your network. By default, the standard IP address of **192.168.102.244** is used.

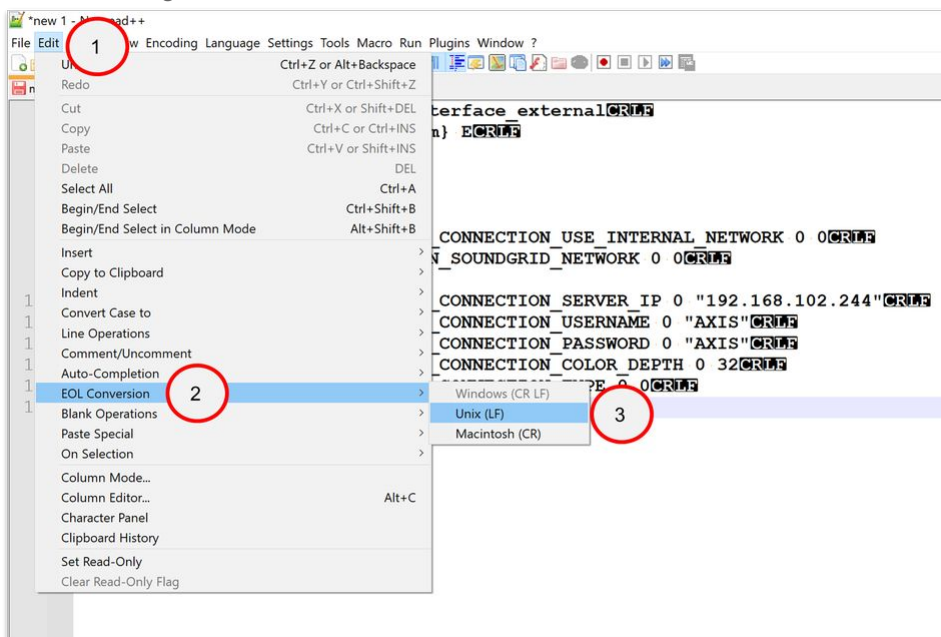
If you need to edit the file, then it is important to check that the EOL (end of line) is correctly formatted in UNIX. Otherwise, this can create some strange behaviour in the system. This is done as follows.

- Enable "**Style line endings**".

```

1 exec echo eth0 > /var/run/eth_interface_external
2 catch {exec killall multirack_com}
3 if {$E != ""} {
4     puts stderr "ERROR $E"
5 }
6
7 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_USE_INTERNAL_NETWORK 0 0
8 mcx_event AP_WAVES_INTEGRATION_ON_SOUNDGRID_NETWORK 0 0
9
10 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_SERVER_IP 0 "192.168.102.244"
11 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_USERNAME 0 "AXIS"
12 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_PASSWORD 0 "AXIS"
13 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_COLOR_DEPTH 0 32
14 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_TYPE 0 0
15
    
```

- Check the End Of Line formatting as follows.



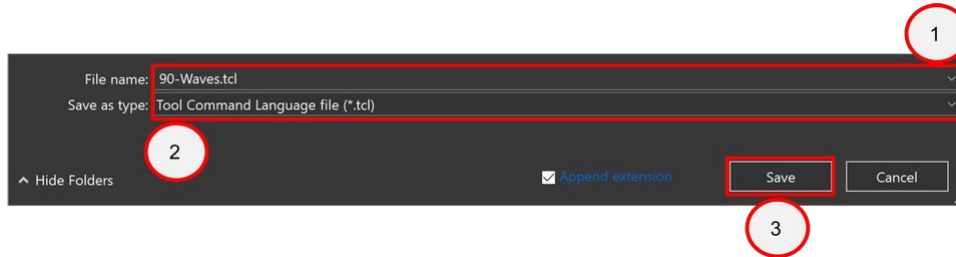
- Go to the "Edit" tab.
  - Select "EOL Conversion".
  - Select "Unix (LF)".
- After selecting "Unix (LF)", the text appears as shown in the screenshot below.

```

1 exec echo eth0 > /var/run/eth_interface_external
2 catch {exec killall multirack_com}
3 if {$E != ""} {
4     puts stderr "ERROR $E"
5 }
6
7 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_USE_INTERNAL_NETWORK 0 0
8 mcx_event AP_WAVES_INTEGRATION_ON_SOUNDGRID_NETWORK 0 0
9
10 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_SERVER_IP 0 "192.168.102.244"
11 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_USERNAME 0 "AXIS"
12 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_PASSWORD 0 "AXIS"
13 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_COLOR_DEPTH 0 32
14 mcx_event GUI_PLUGIN_PAGE_REMOTE_CONNECTION_TYPE 0 0
15
    
```

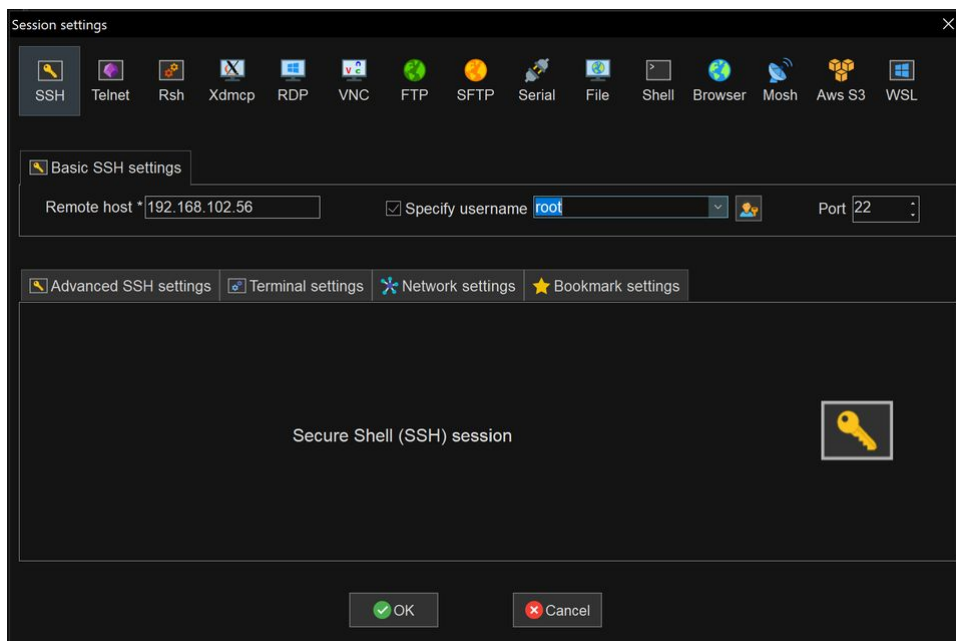
### Step 3: Save the file as "90-Waves.tcl"

Once you are happy with the contents of the file, it must be saved using the correct filename: "**90-Waves.tcl**" and type: "**Tool Command Language (\*.tcl)**".



### Step 4: Transfer the TCL file to the mc<sup>2</sup> control system

The prepared file can now be copied to the mc<sup>2</sup> control system using a secure SSH connection. In the example below, we are using **MobaXterm** to open the SSH connection.



1. On your computer, start a suitable ssh application.

We recommend using **PUTTY** or **MobaXterm**, a free ssh/telnet client for Windows. The latest version can be downloaded from the internet.

2. Enter the **Host Name or IP address** of the mc<sup>2</sup> control system and login using the following credentials:  
username = **root**  
password = **hong**

3. Press Enter and you will see the "**Welcome to.... Lawo mcx shell**".

Now transfer the file from your computer to the mc<sup>2</sup> control system by entering the following commands. It is important to enter the full syntax in the same line, and press Enter to execute the command.

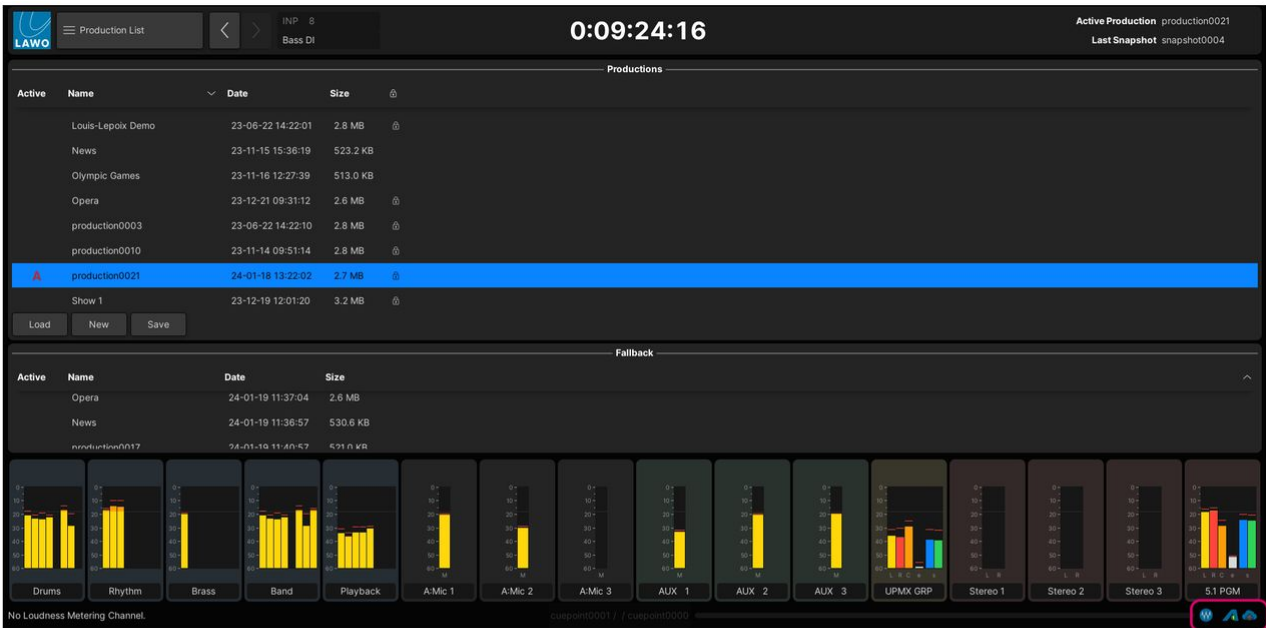
- Execute this command (to change directory).

```
cd /data/config/mcx/
```





If the setup was executed correctly, an icon for the Waves system will appear (as shown below). At this stage, the Waves system is offline (as there is no network communication) and so the **W** icon appears with a red warning symbol.



Waves (online)



Waves (offline)



The Lawo console is now ready to connect to the Waves SuperRack SoundGrid.

**Please note:** The Waves system will remain offline until the devices are connected via the network AND the console is assigned as the Waves SoundGrid SuperRack controller. These parts are described in steps 1 and 8 of the next topic: [System Setup](#).





## 3.12 Waves for mc<sup>2</sup> - System Setup

This topic describes how to set up the system once the Waves Axis Scope PC and Lawo console are prepared.

There are eight steps to complete.

1. Connect the devices.
2. Setup the Waves SuperRack SoundGrid.
3. Update the Waves Extreme Server C firmware.
4. (Optional): Add another Waves Extreme C Server.
5. Update the DirectOut EXBOX.SG firmware.
6. Assign the DirectOut EXBOX.SG to digital clock.
7. Assign the DirectOut EXBOX.SG to SoundGrid MIDI.
8. Assign the Lawo Console as the Waves SuperRack SoundGrid controller.



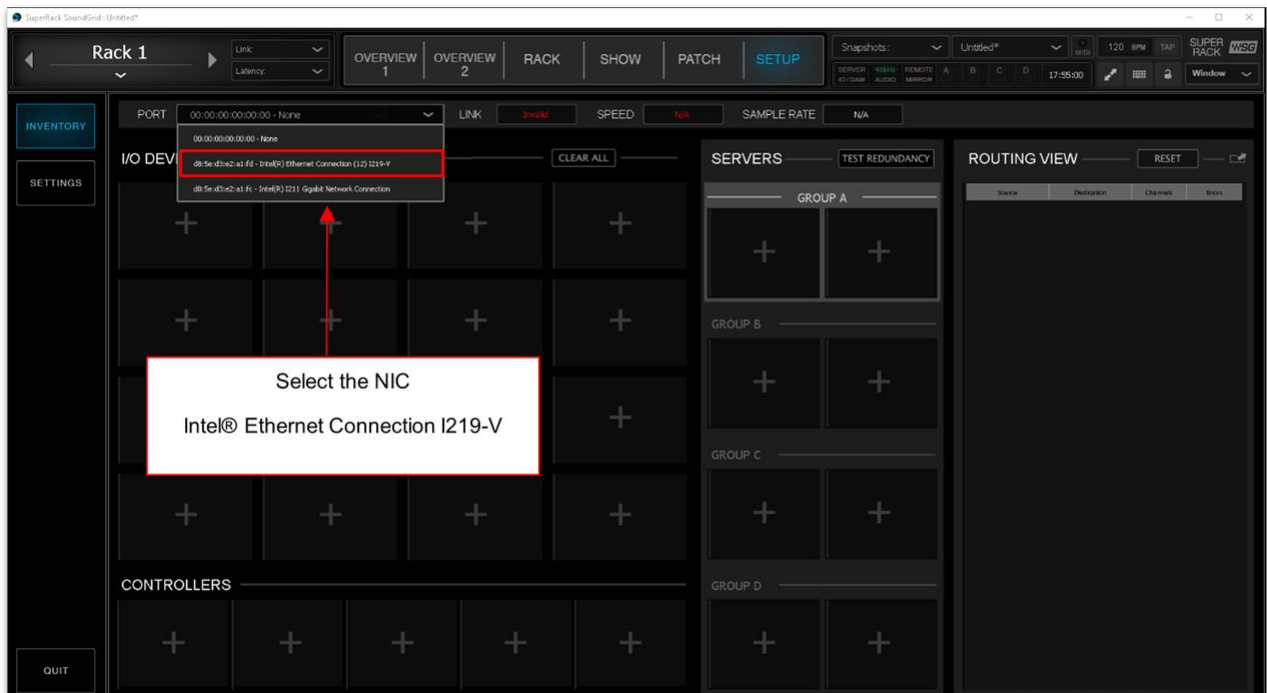
## Step 2: Setup the Waves SuperRack SoundGrid

Once all of the devices are connected and powered, you can start the setup by adding the DirectOut converter and Waves server to the Waves SuperRack SoundGrid application.

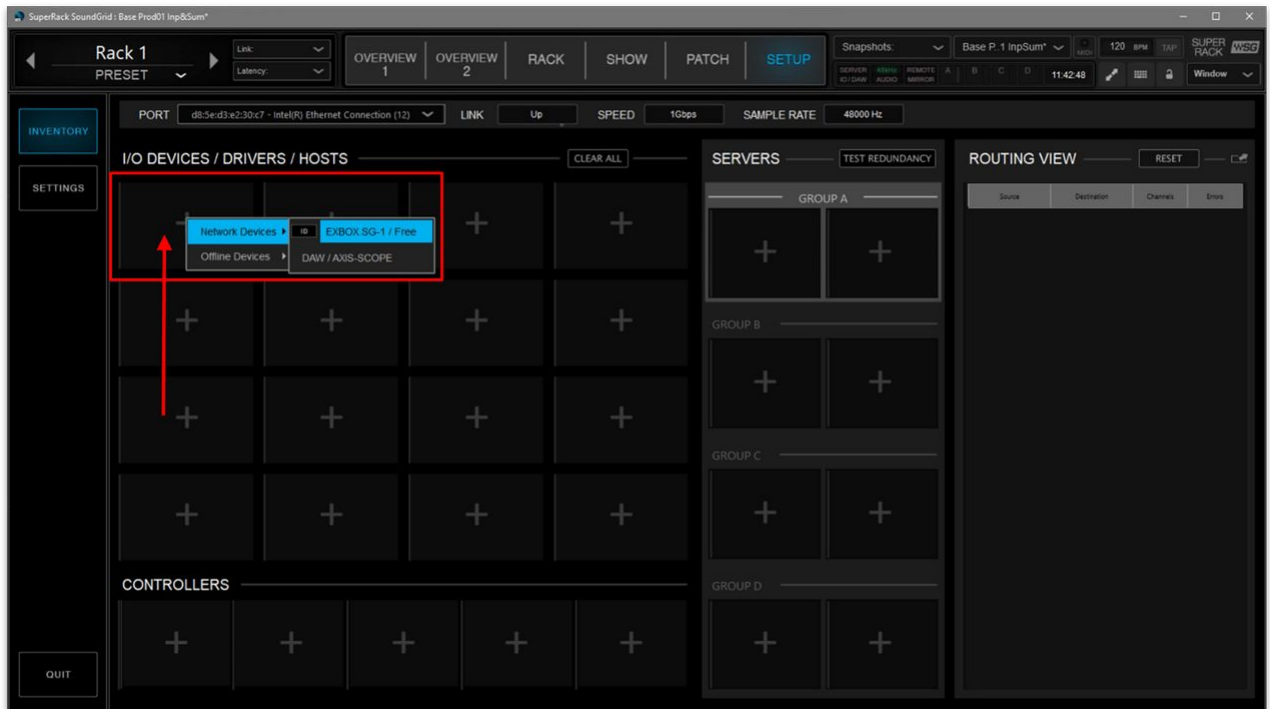
- Double click on the icon "**SuperRack SoundGrid**" (to start the application).



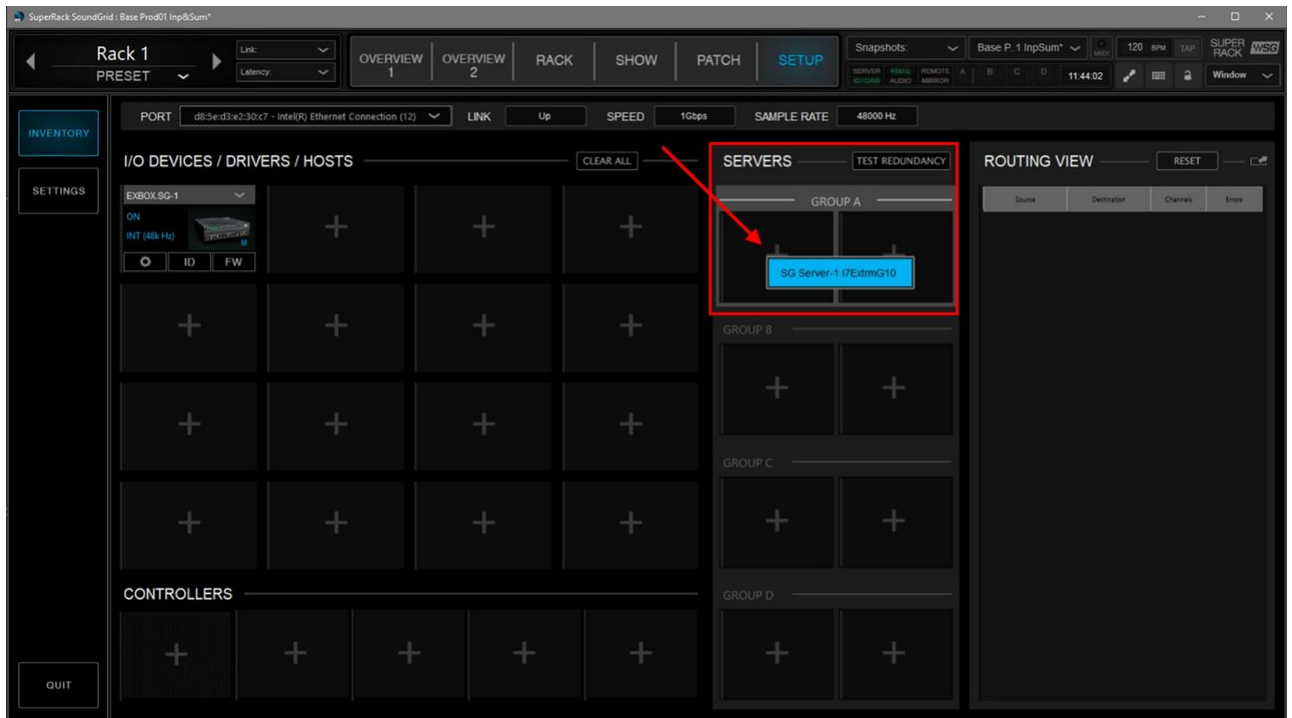
- Click on "**SETUP**".
- Select "**Intel(R) Ethernet Connection(12) I219-V**".



- Add the EXBOX.SG device as follows.
  - Click on the first box under "**I/O DEVICES / DRIVERS / HOSTS**".
  - Add the **EXBOX.SG**



- Under "**I/O DEVICES / DRIVERS / HOSTS**" you will see the device: **EXBOX.SG-1**.
- Repeat the process to add the Waves Extreme Server C.
  - Click on the first box under "**SERVERS**" - "**GROUP A**".
  - Add the Waves Extreme Server C.



- Under "**SERVERS**" - "**GROUP A**" you will see the device: **SG Server-1**.

### Step 3: Update the Waves Extreme Server C firmware

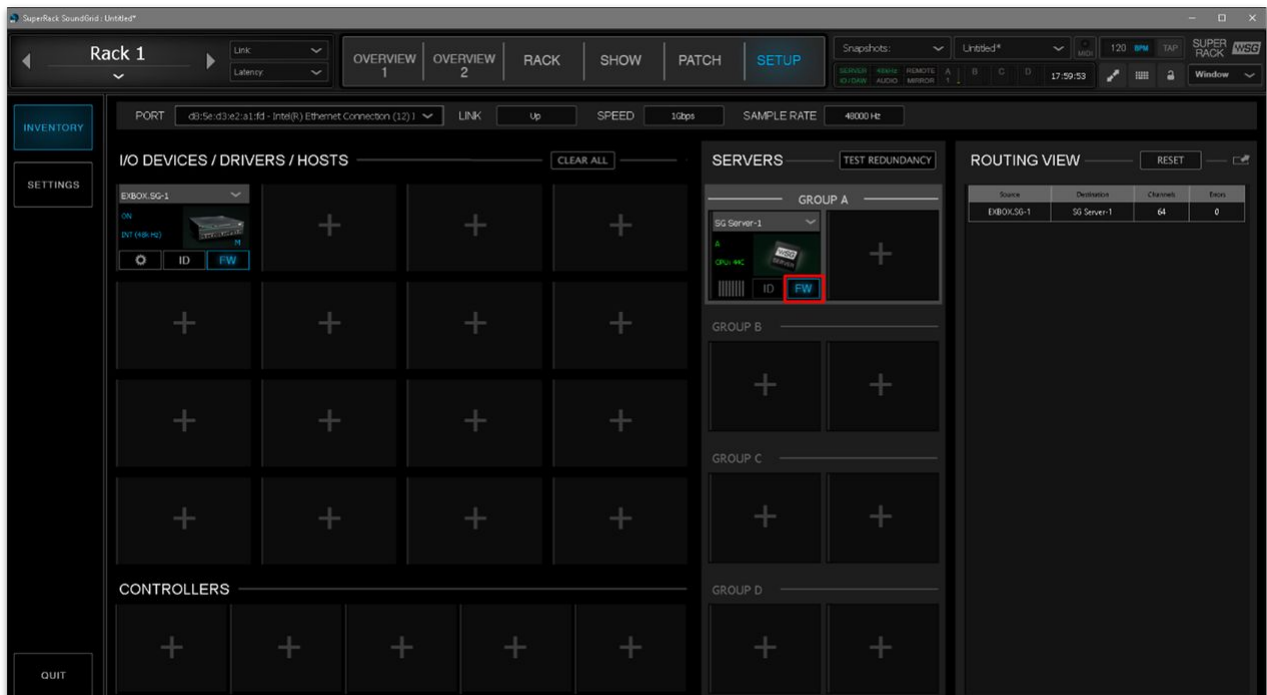
The next step is to check and, if necessary, update the firmware of the Waves server.

For the **SG Server**, the "**FW**" LED is lit in blue, red or gray to indicate whether an update is required:

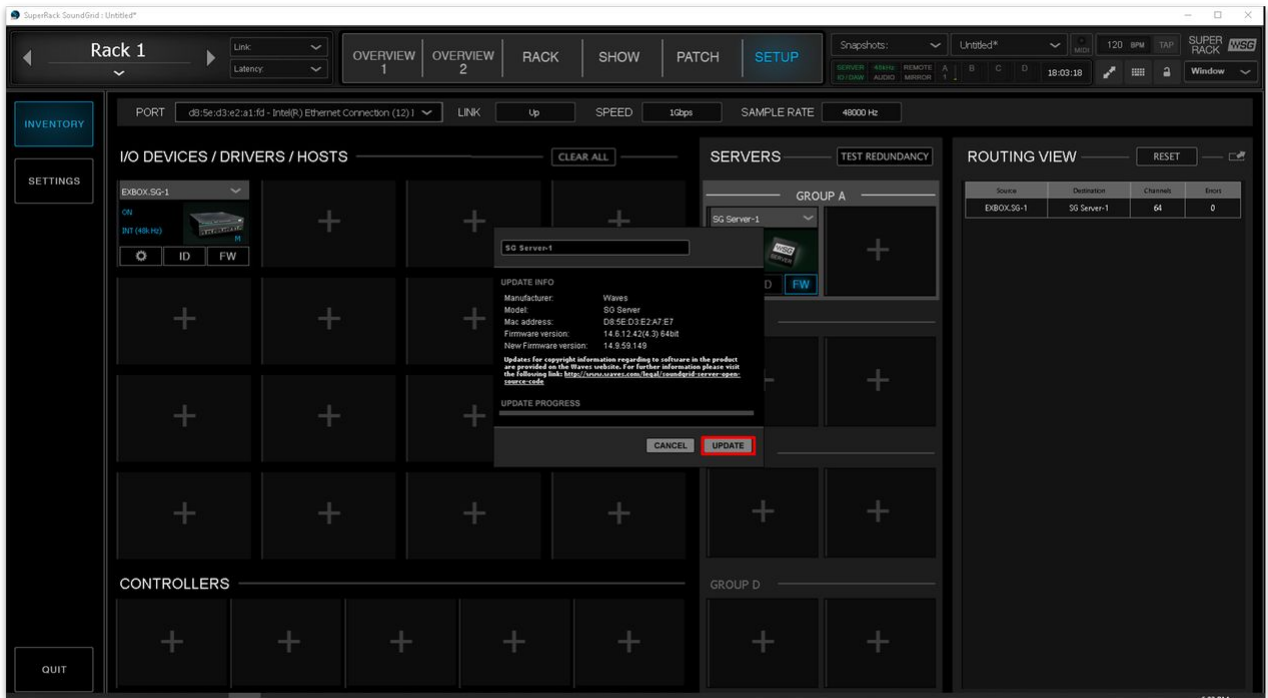
- "**FW**" (blue) = the server firmware is compatible with the version of SuperRack, but there is a newer firmware available. An update is recommended but not necessary.
- "**FW**" (red) = the server firmware is not compatible with the version of SuperRack. **An update of the server firmware is mandatory.**
- "**FW**" (gray) = the server firmware is compatible with the version of SuperRack, and is the latest version. In this instance, there is no action required and you can skip to [Step 4](#).

If you need to update the firmware, then follow the instructions below.

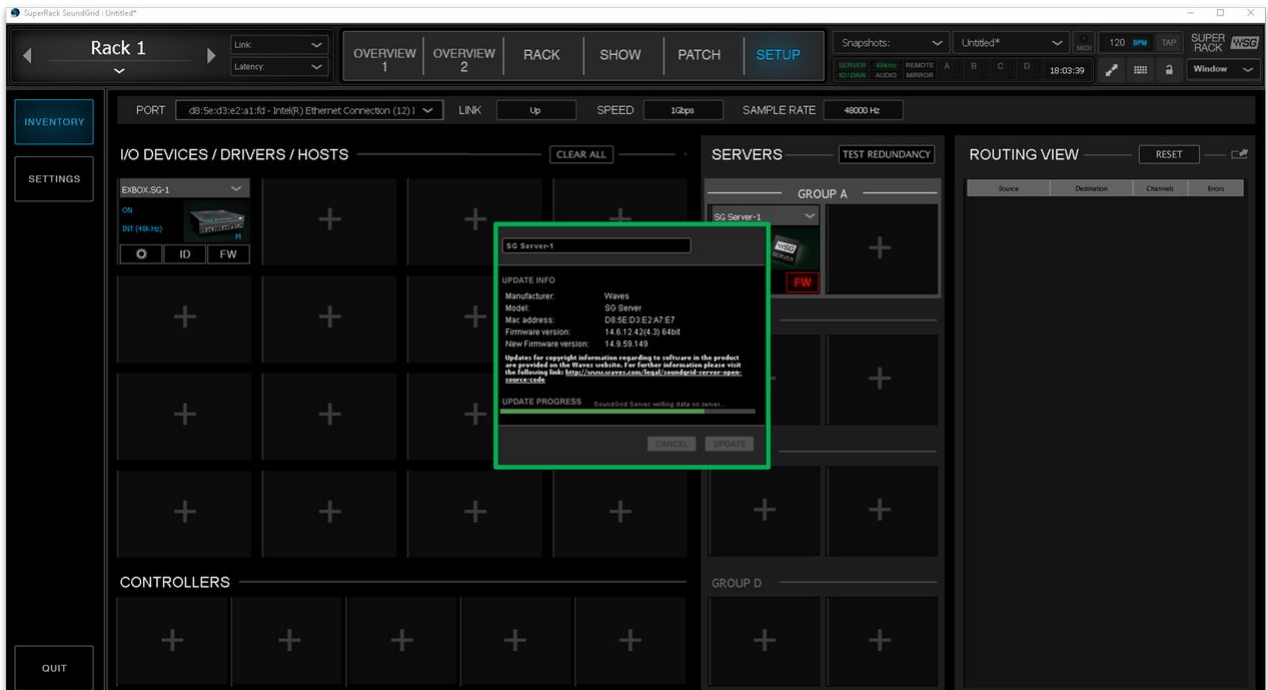
- For the **SG Server**, click on "**FW**".



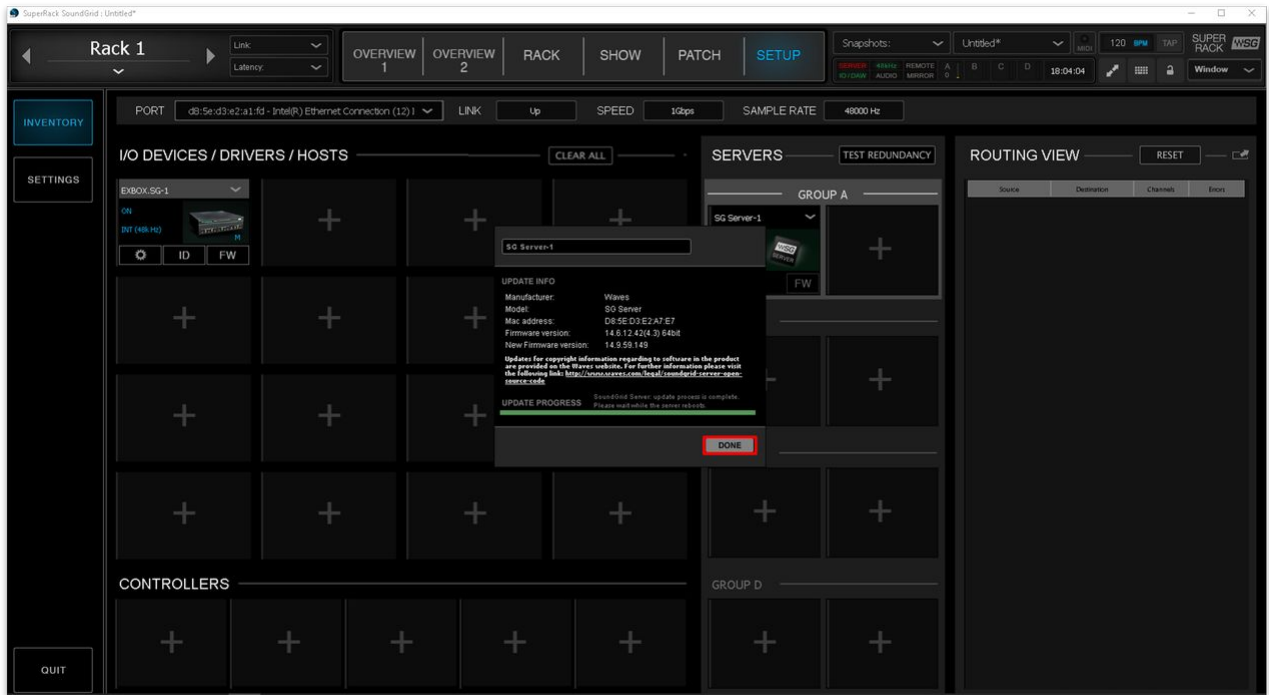
- Click on "**UPDATE**".



- The firmware update process starts...



- At the end of the update, click on "DONE".



- After a firmware update, the Waves Extreme Server C reboots itself.
- After the reboot, check the color of the "FW" LED: either blue or gray are fine to continue.

#### Step 4 (optional): Add another Waves Extreme C Server

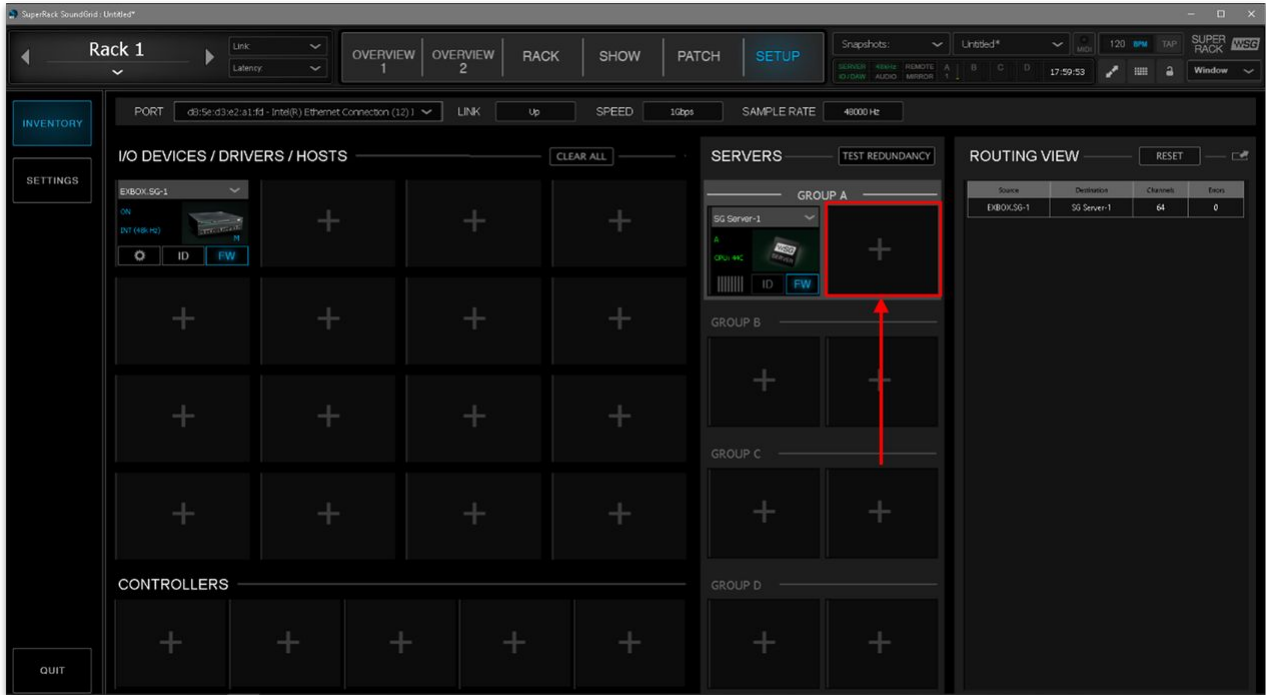
If you need to add more servers, then follow the instructions below. Otherwise, skip to [step 5](#).

There are two instances when you may have more than one Waves Extreme C server: for redundancy or to add more resources. In each case, the server(s) must be added to Waves SuperRack SoundGrid configuration.

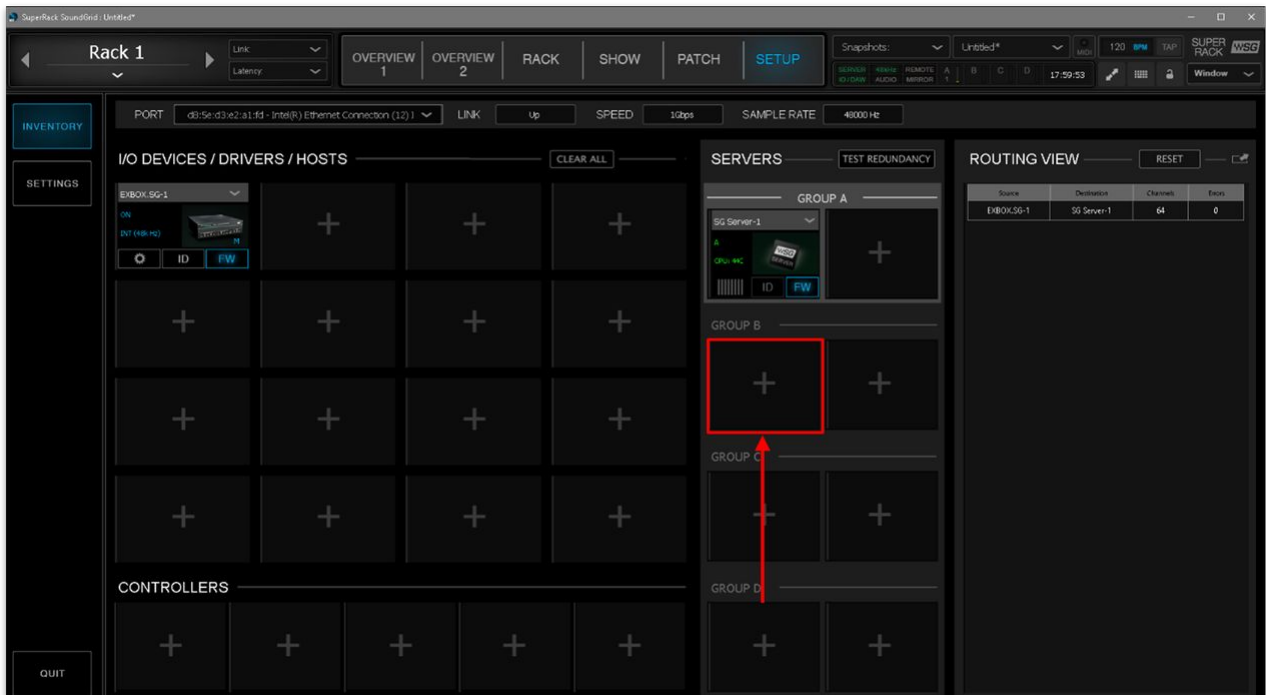
Note that it is important to add the server to the correct box, as this determines its functionality: for each Group, the first box (on the left) is used for the main resources, while the second box (on the right) is used for redundancy.

For example:

- To add a second server for redundancy, use the second box under "SERVERS" – "GROUP A".



- To add a second server to add more resources, use the first box under "SERVERS" – "GROUP B".



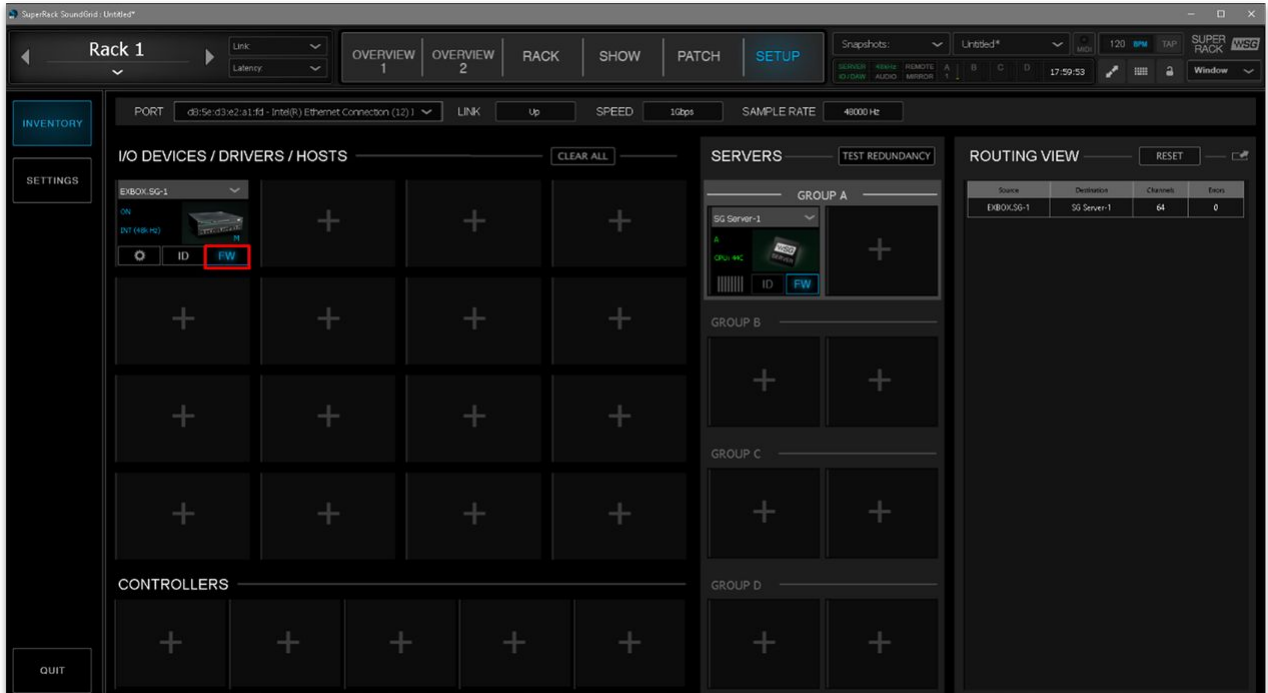
- In each case, you should check and update the firmware of the server (by following the instructions in [Step 3](#)).



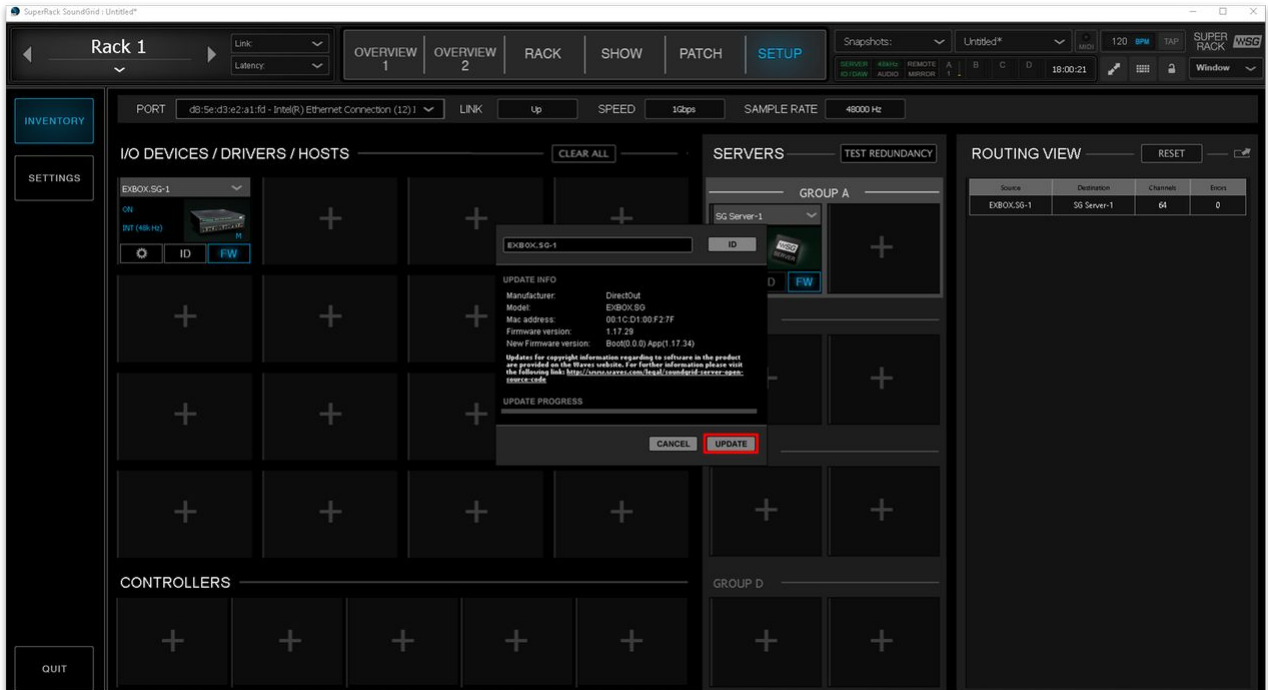
### Step 5: Update the DirectOut EXBOX.SG firmware

The next step is to update firmware of the DirectOut converter.

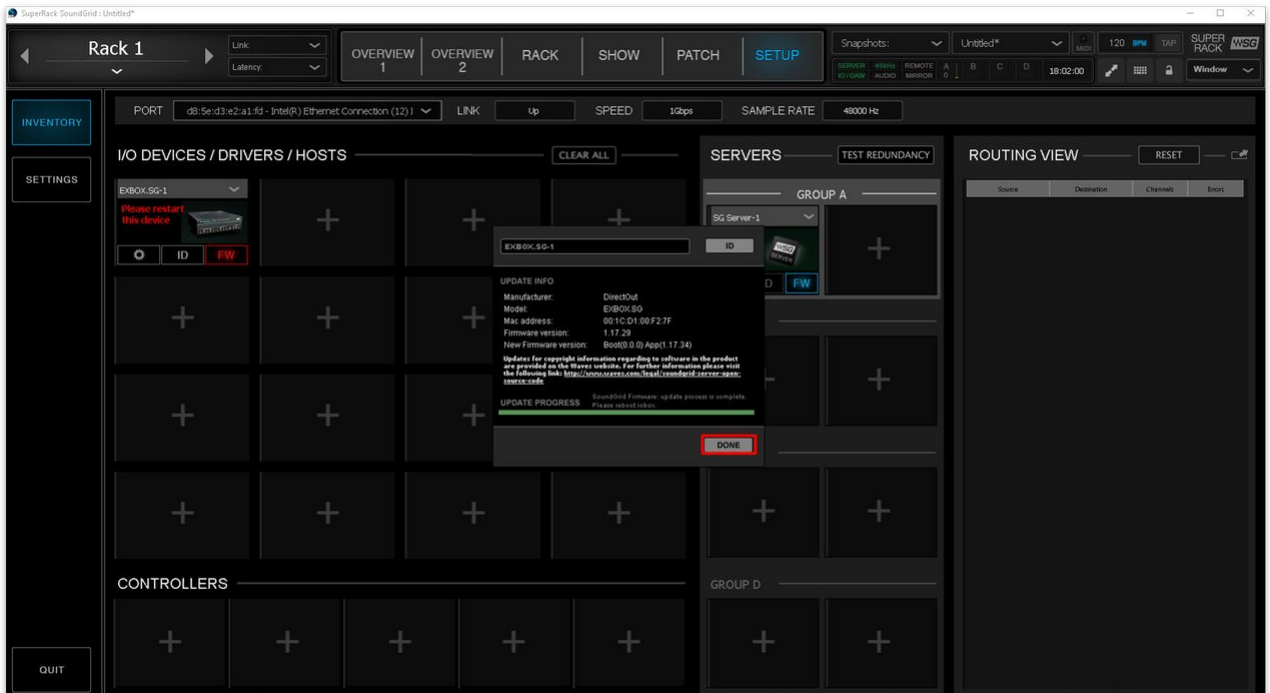
- For the **EXBOX.SG**, click on **"FW"**.



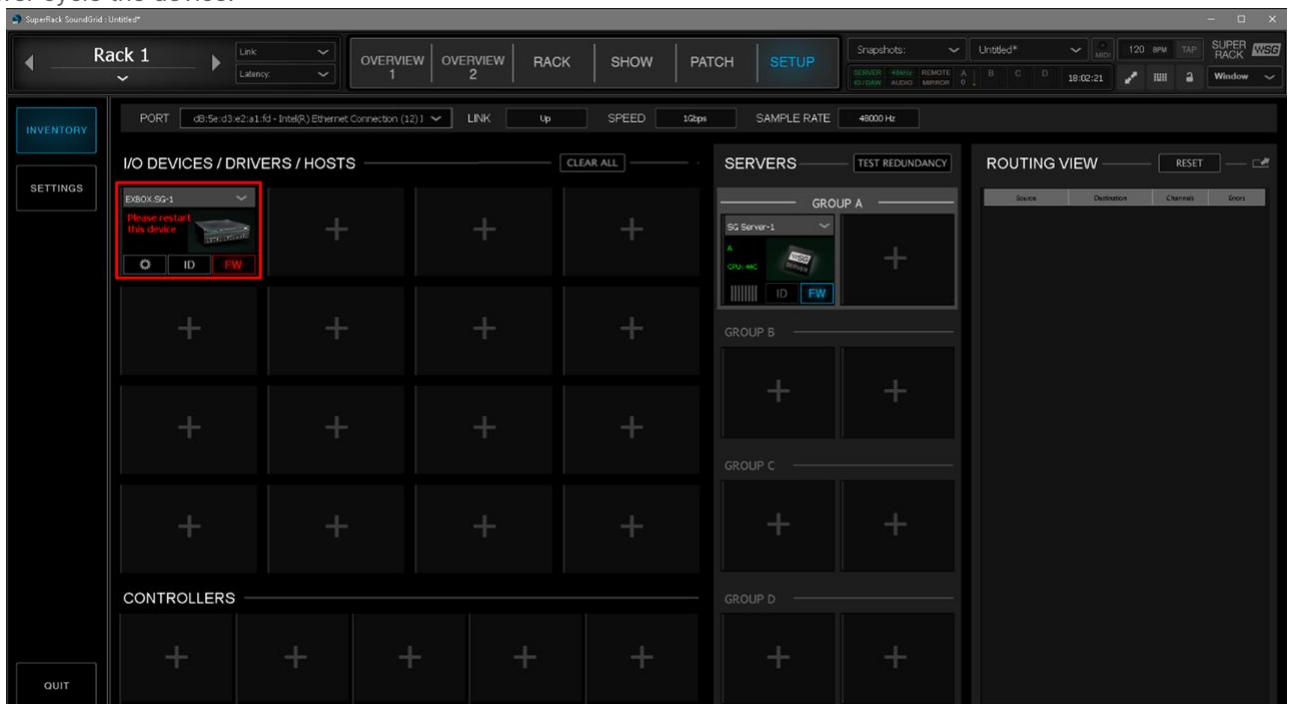
- Click on **"UPDATE"**.



- The update process starts...
- At the end of the update, click on **"DONE"**.



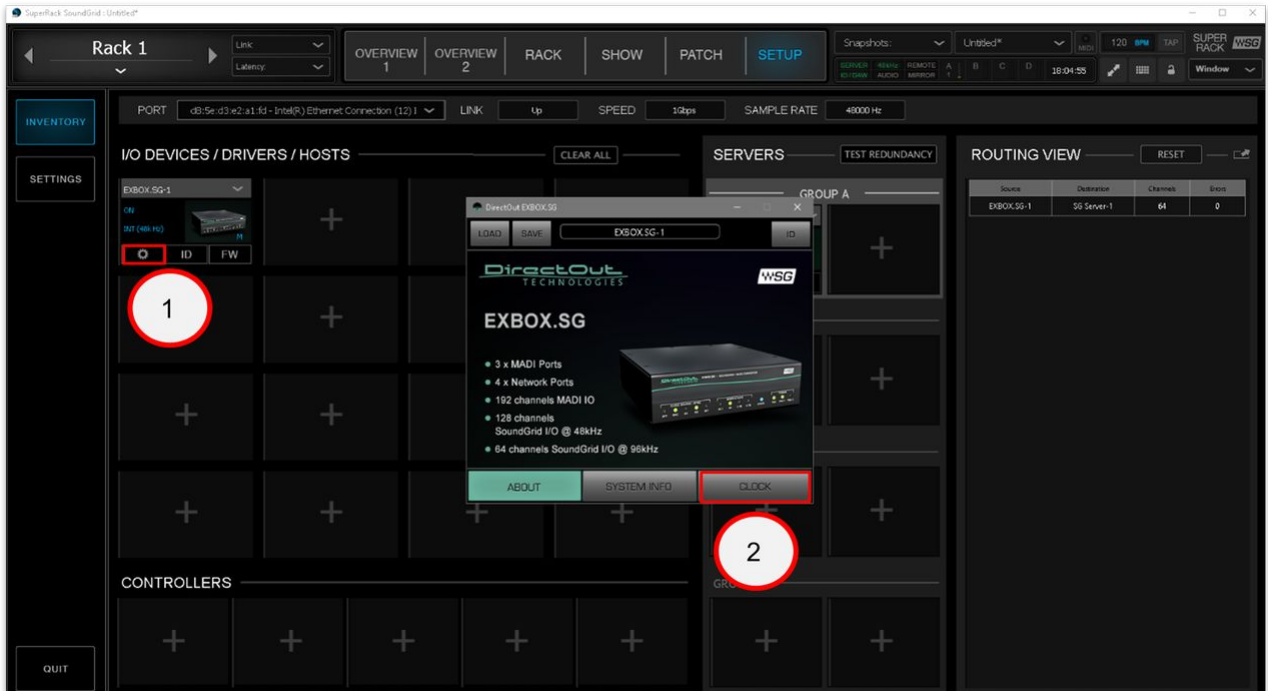
- After a firmware update, the EXBOX.SG must be restarted. Disconnect the two power supplies from the EXBOX.SG to power cycle the device.



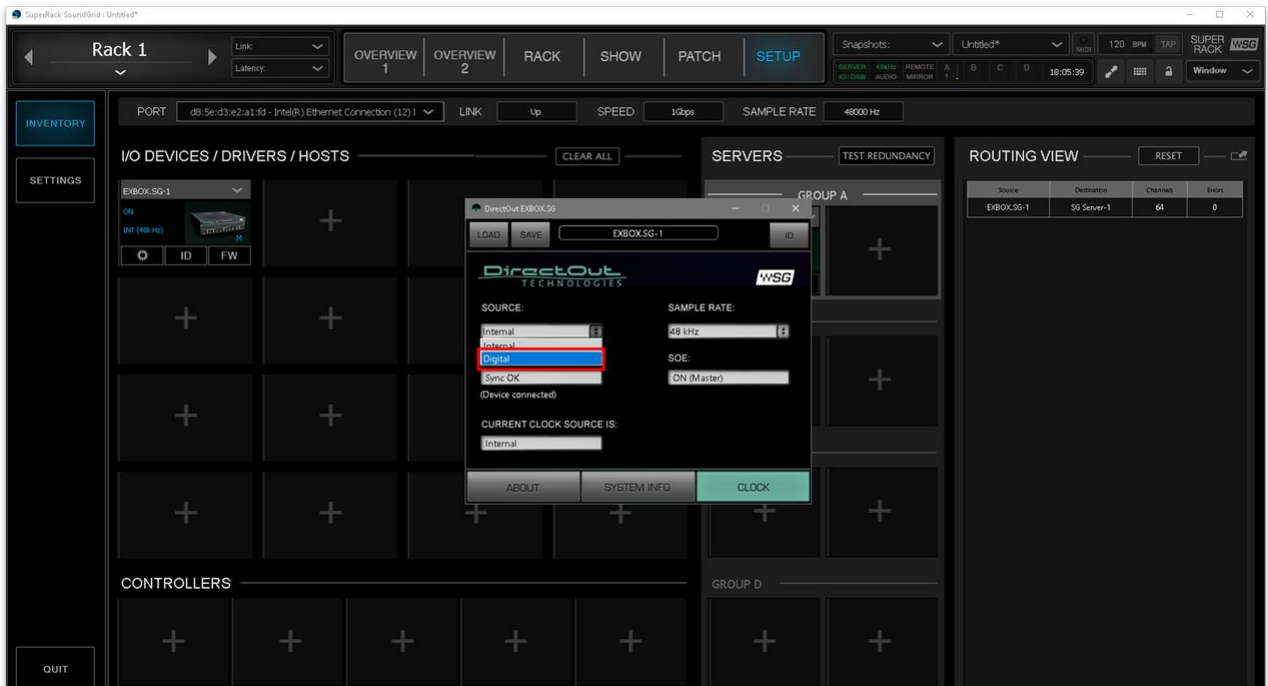
### Step 6: Assign the DirectOut EXBOX.SG to digital clock

The DirectOut converter must now be set to digital clock.

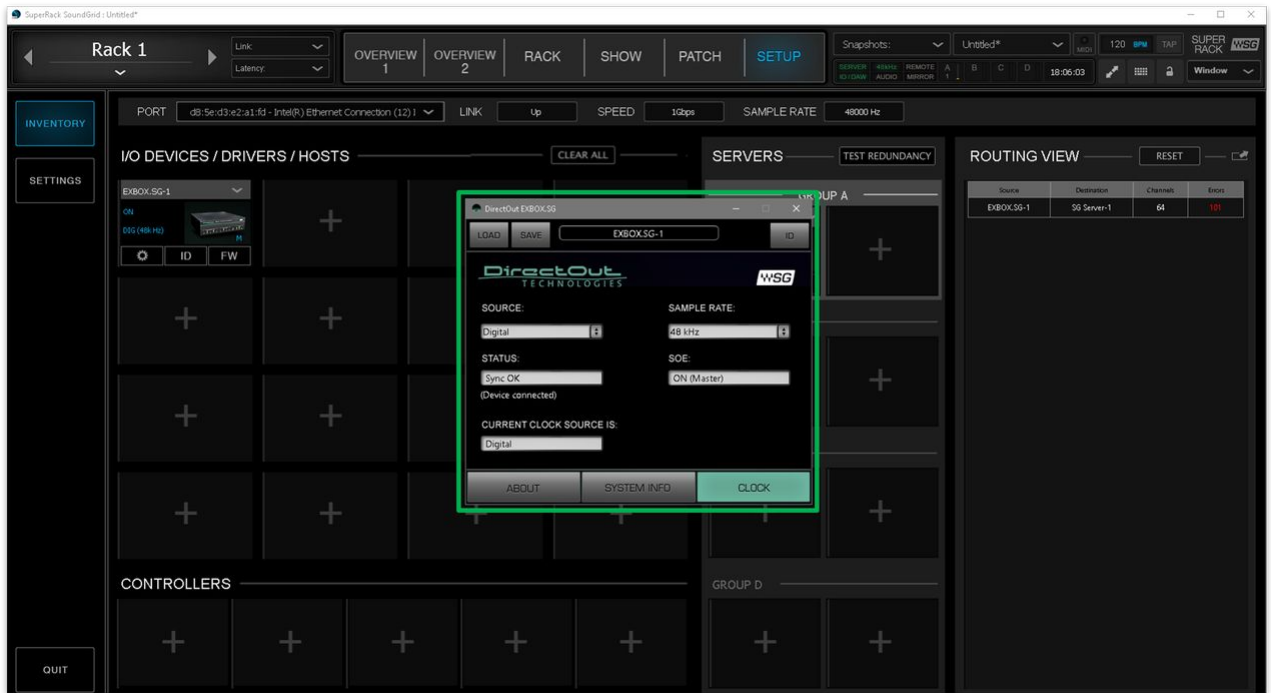
- For the EXBOX.SG, click on the settings icon and then click on **"CLOCK"**.



- In the **"SOURCE"** drop-down menu, select **"Digital"**.



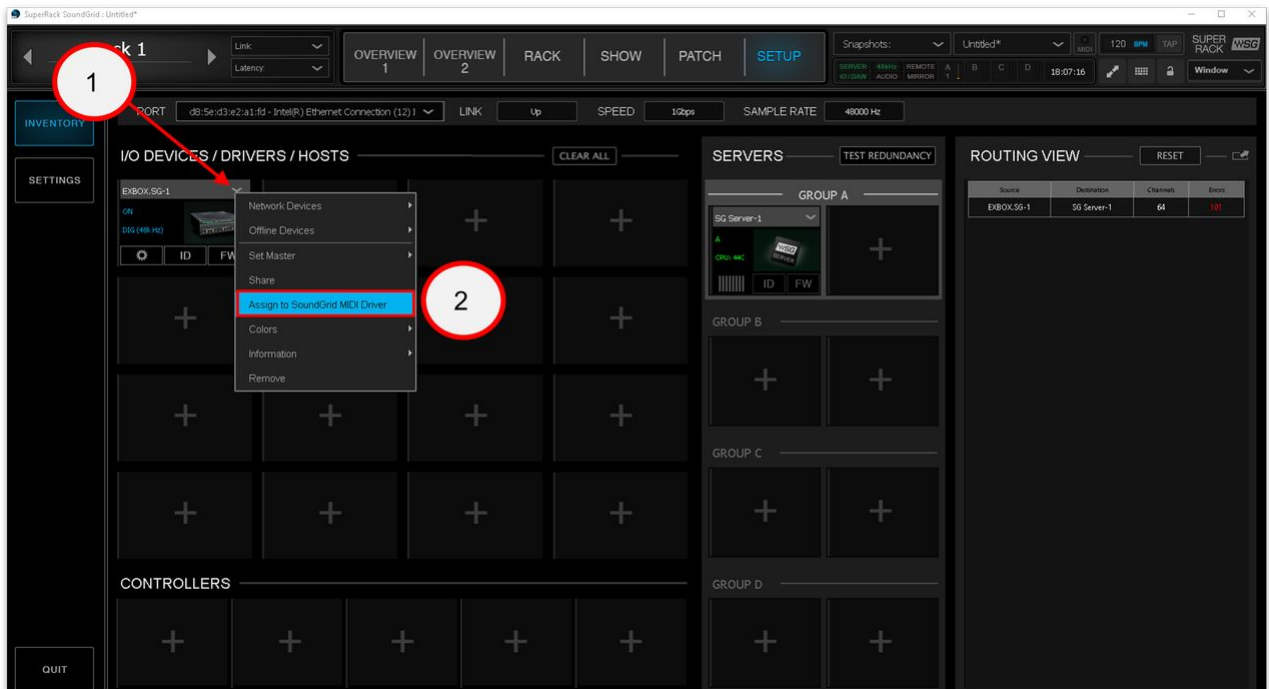
- The screenshot below shows how the options should look.



## Step 7: Assign the DirectOut EXBOX.SG to SoundGrid MIDI

The DirectOut converter must also be assigned to the SoundGrid MIDI driver as follows.

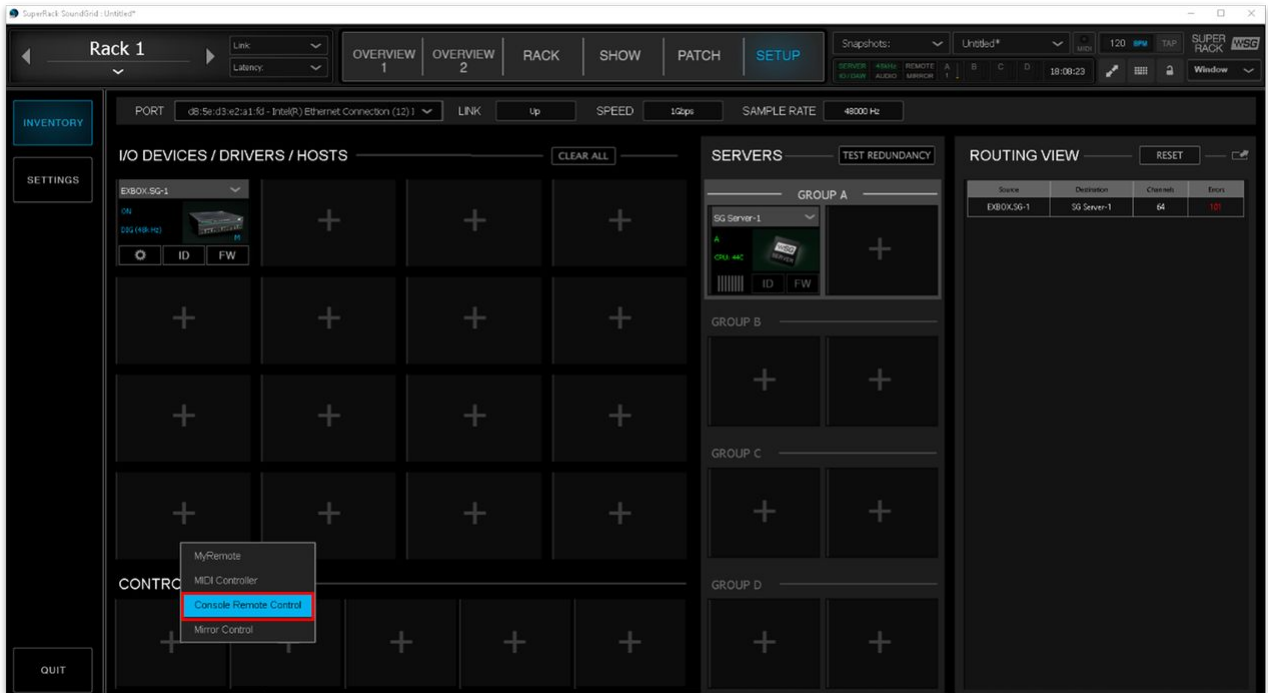
- Click on small arrow beside the **EXBOX.SG** name (to open the context menu), and select **"Assign to SoundGrid MIDI Driver"**.



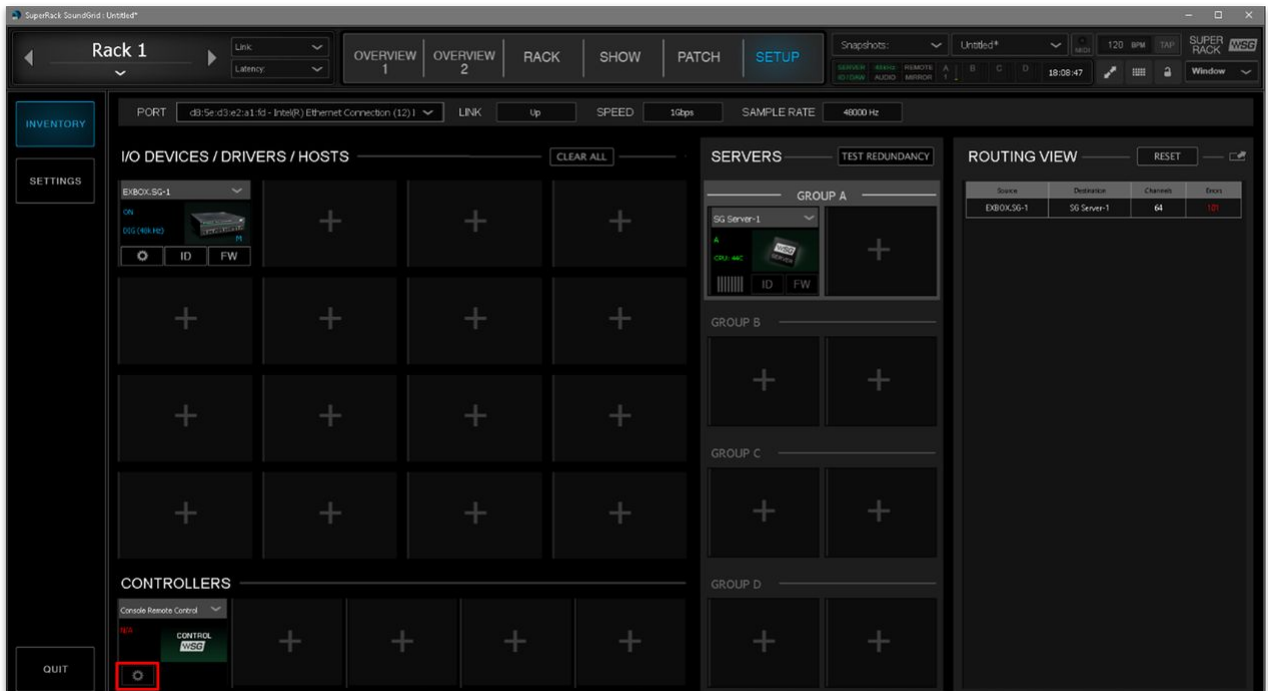
### Step 8: Assign the Lawo Console as the Waves SuperRack SoundGrid controller

The final step, in this section, is to assign the mc<sup>2</sup> control system as the controller of the Waves SuperRack SoundGrid.

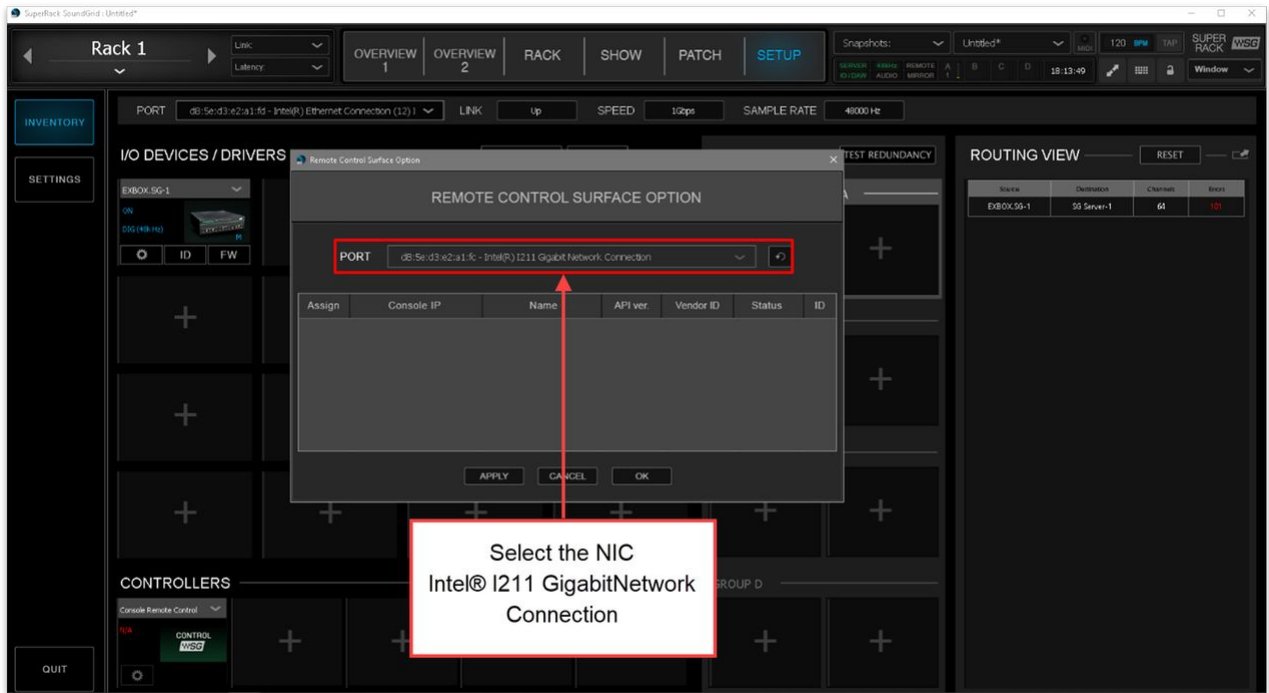
- Click on the "**CONTROLLERS**" tab and select "**Console Remote Control**".



- Select the settings icon.

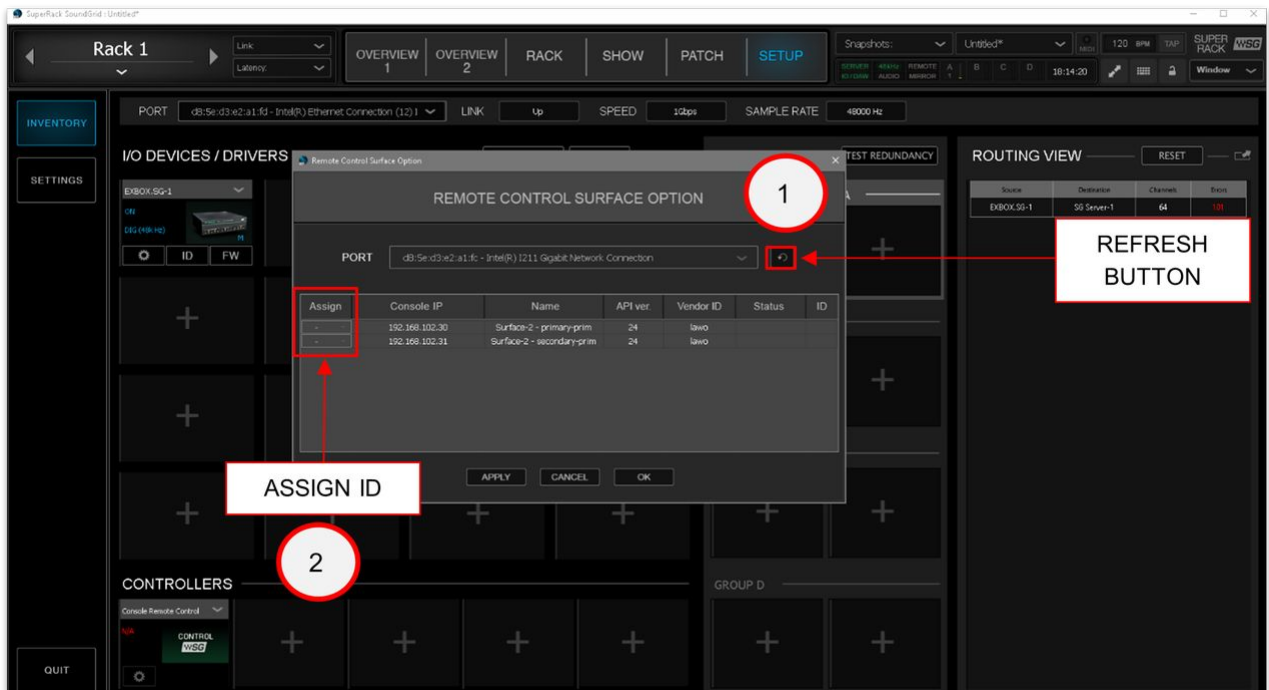


- Click on the "**PORT**" drop-down menu and select the "**Intel® I211 GigabitNetwork Connection**".

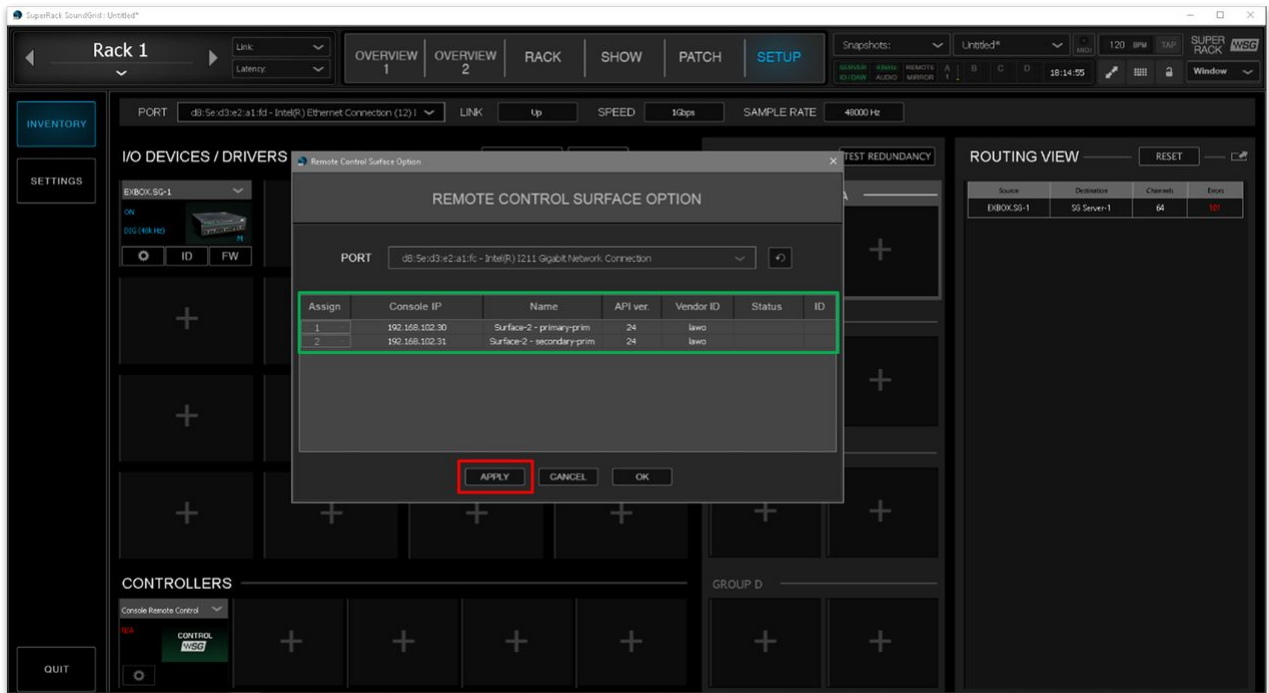


**⚠ Please note:** If the "Intel® I211 GigabitNetwork Connection" does not appear in the list of ports, then check that the "Waves SoundGrid Protocol" is enabled in the "Network Properties" for the NIC.

- Click on the refresh button (beside the port menu). The console's control system(s) now appear in the dialog box. In the example below, there are two entries: one for the primary and one for the secondary control system.
- Click on the "Assign" field to enter an ID number: ID 1 for the primary and ID 2 for the secondary control system.

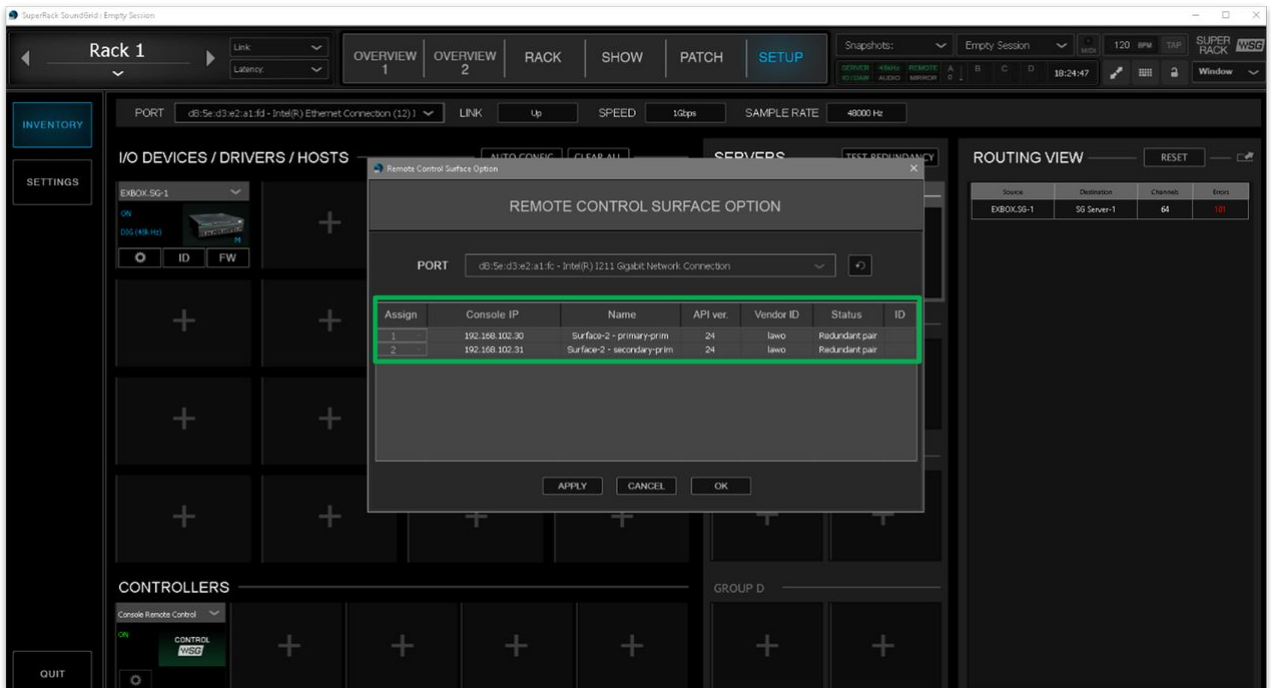


- Click on "Apply" to confirm.



- The mc<sup>2</sup> control system(s) are now correctly connected to the SuperRack SoundGrid.

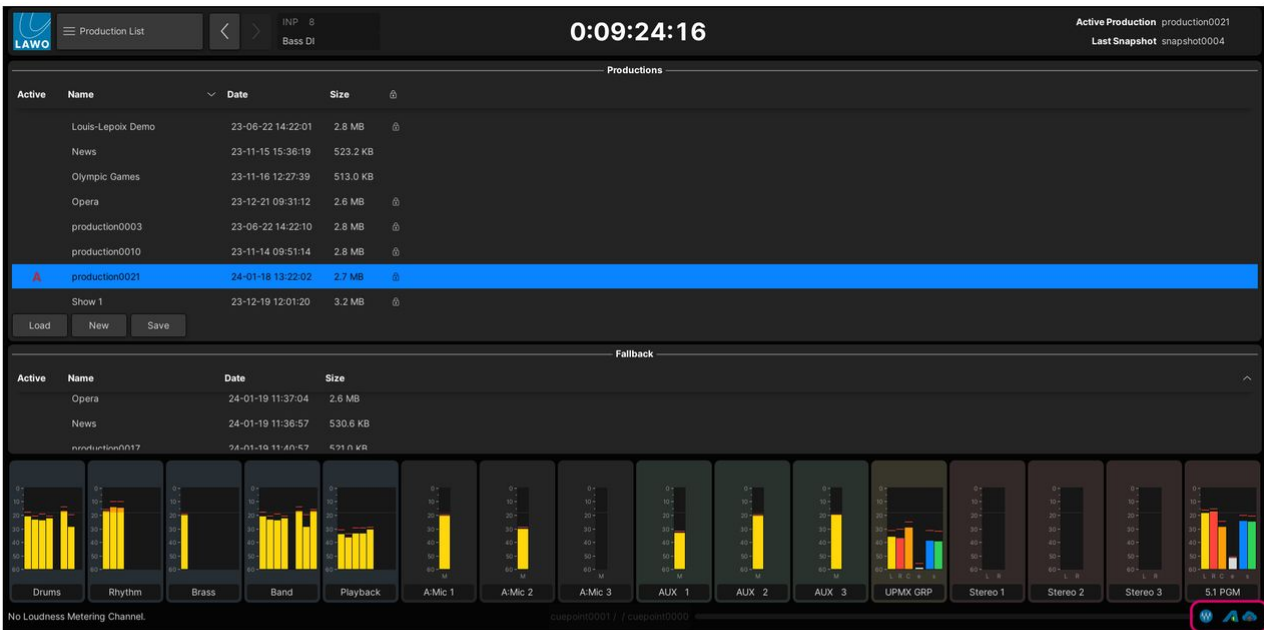
On the Waves side, the "Remote Control Surface Options" dialog box should update to look something like this:







On the console side, the Waves icon (at the bottom right of the Central GUI) updates. It should now be blue to show that the management network connection is online.



Waves (online)



Waves (offline)



### 3.13 Waves for mc<sup>2</sup> - DirectOut Converter Setup

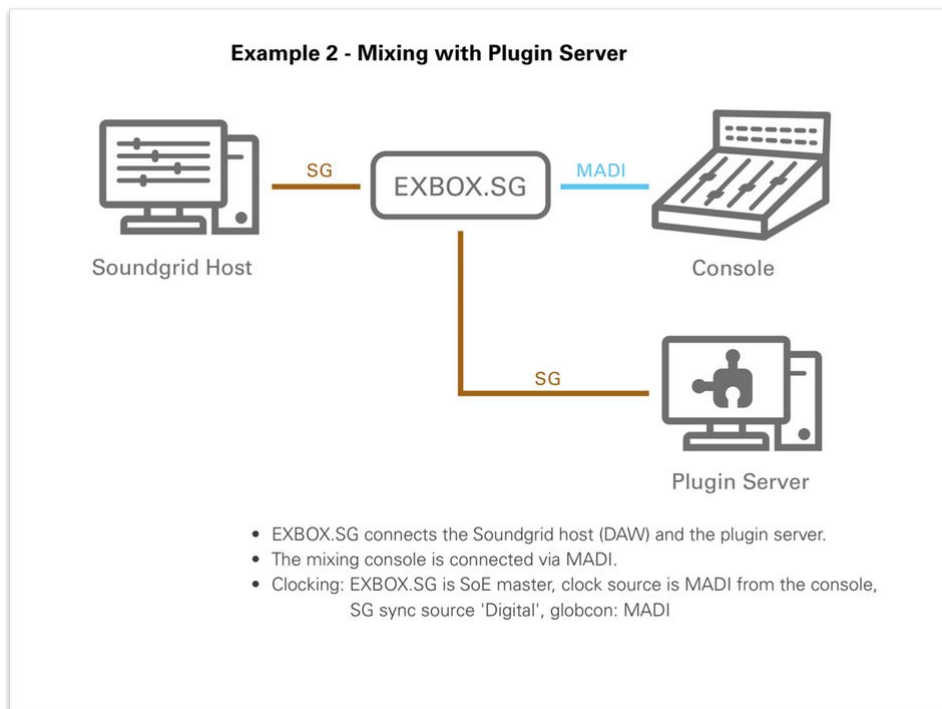
This topic describes how to setup the DirectOut EXBOX.SG converter. To do this, you will need the GlobCon software described [earlier](#).

There are three steps to complete.

1. Add the EXBOX.SG device to GlobCon.
2. Setup the routing and synchronization for the EXBOX.SG device (in GlobCon).
3. Save the settings (in the GlobCon project).

Please note:

- The instructions below follow the advice in the DirectOut EXBOX user manual. The image below is taken from the EXBOX manual and shows the recommended connections and clock setup.



- For the MADI connection to the "console", we are using the console's local I/O MADI port, but this is not mandatory. Any available MADI SFP port can be used, as long as the SFP meets the required specification ([described here](#)).

## Step 1: Add the device (to GlobCon)

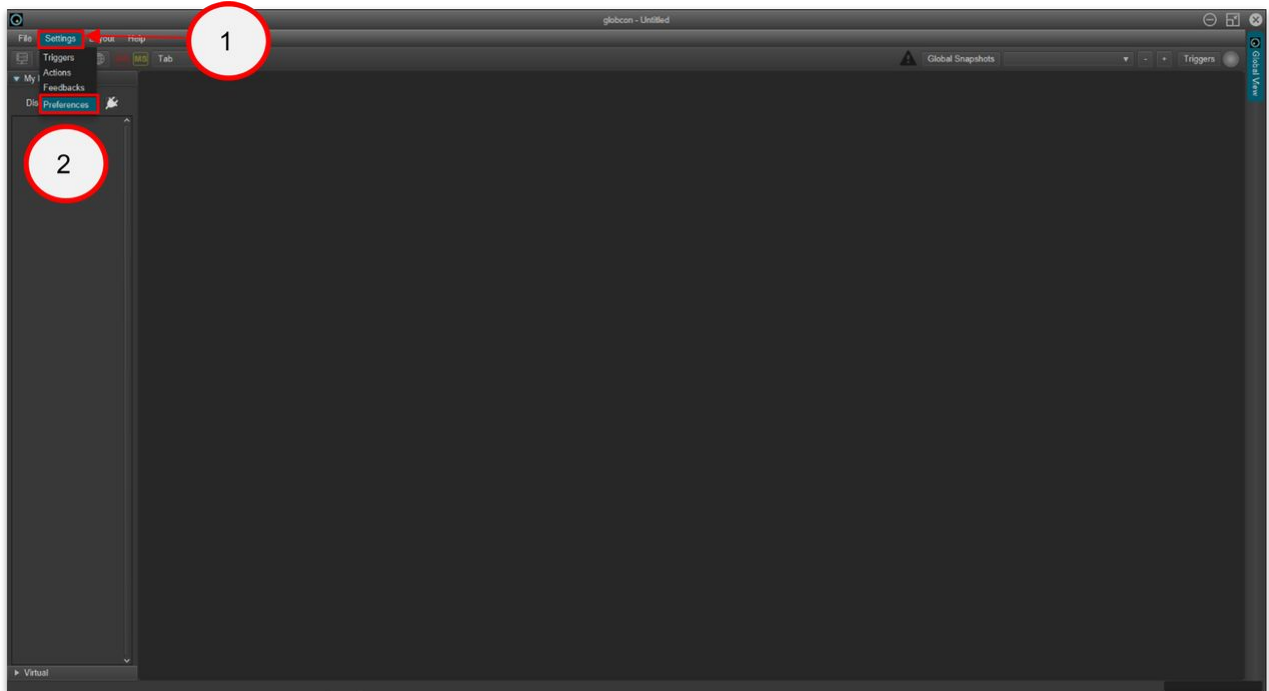
The first step is to add the EXBOX.SG device to GlobCon (as a MIDI device).

**Please note:** If you are configuring the Waves Axis Scope PC using a Windows Remote Desktop Connection, then it is important to enable the "Remote audio playback" option before establishing the remote connection. See [Waves for mc<sup>2</sup> - Prerequisites: Windows Remote Desktop](#).

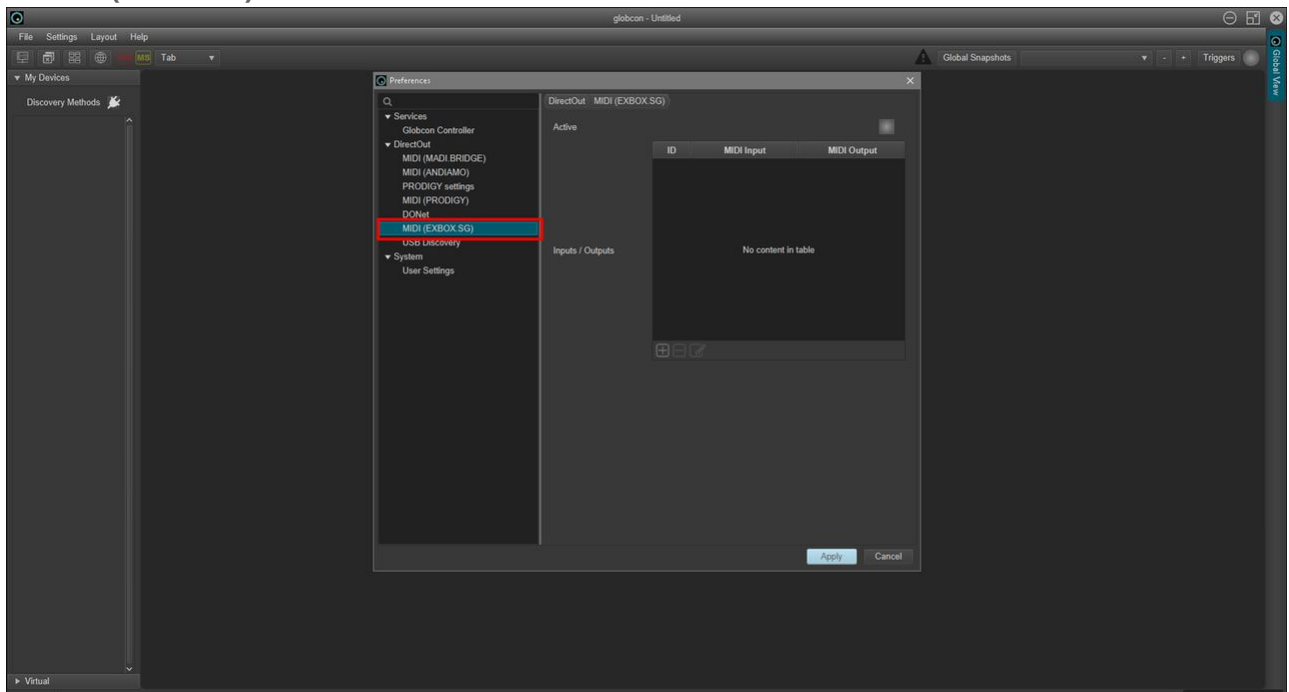
- Double click on the "**GlobCon**" icon (to start the application).



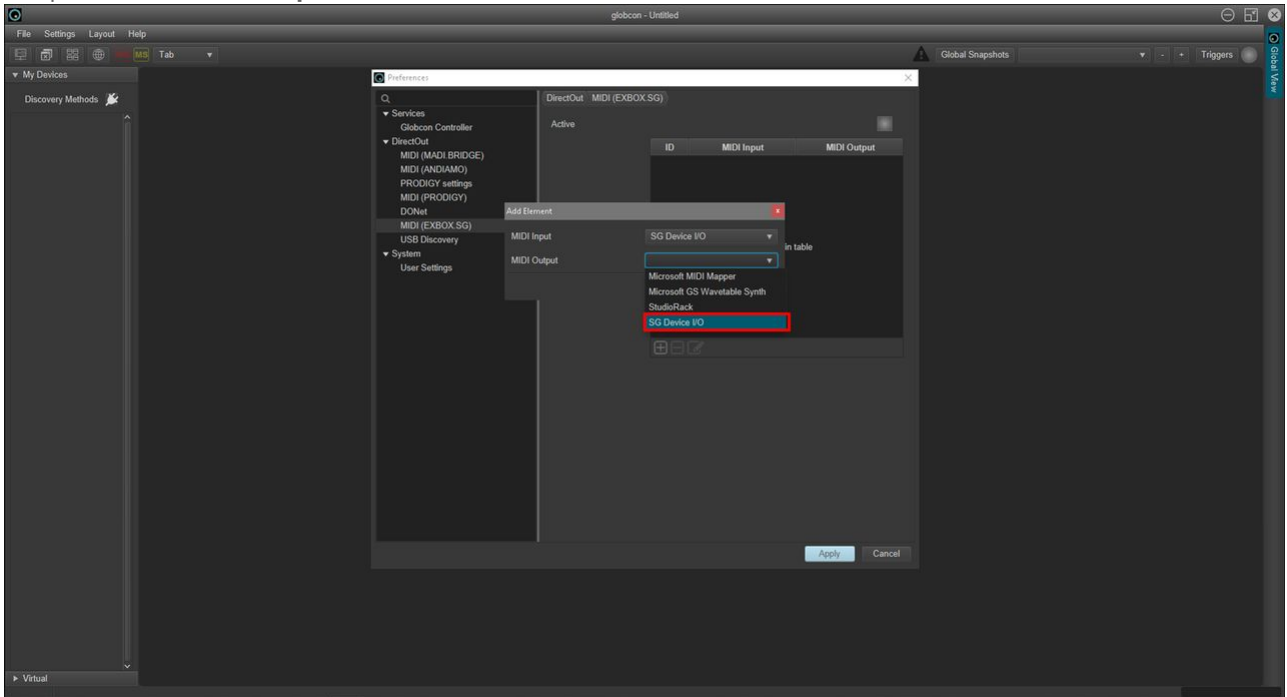
- Go to "**Settings**" and click on "**Preferences**".



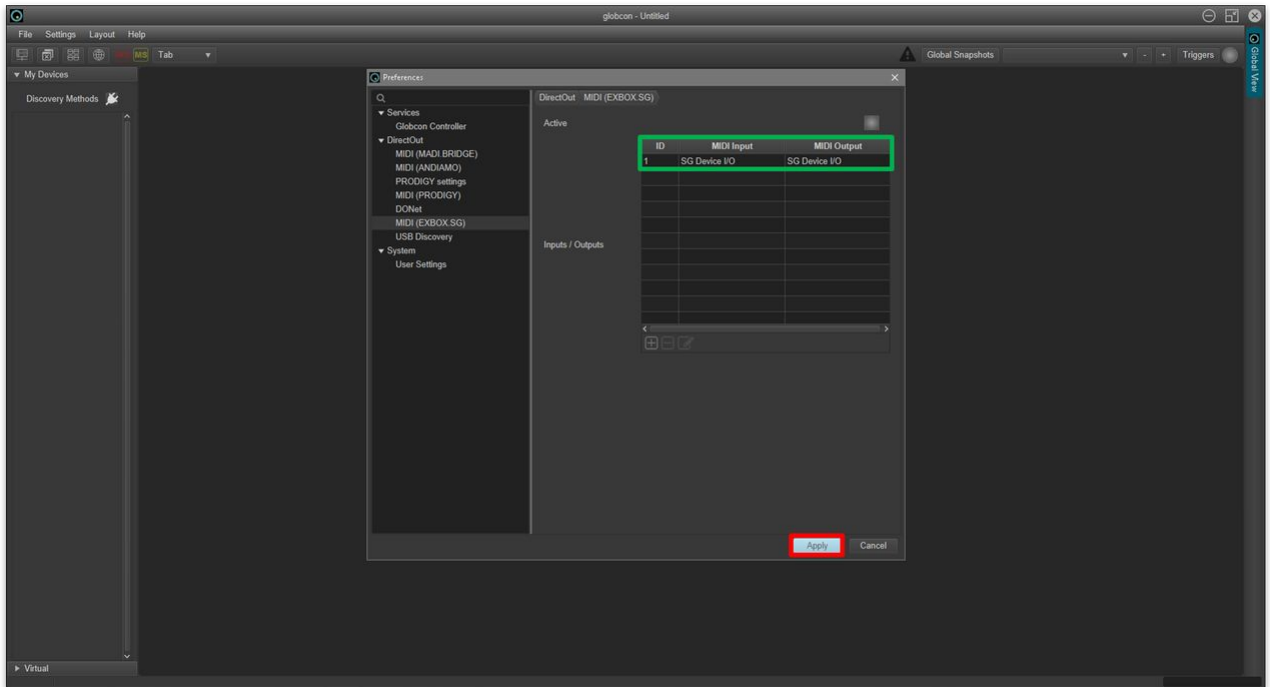
- Select "**MIDI (EXBOX.SG)**".



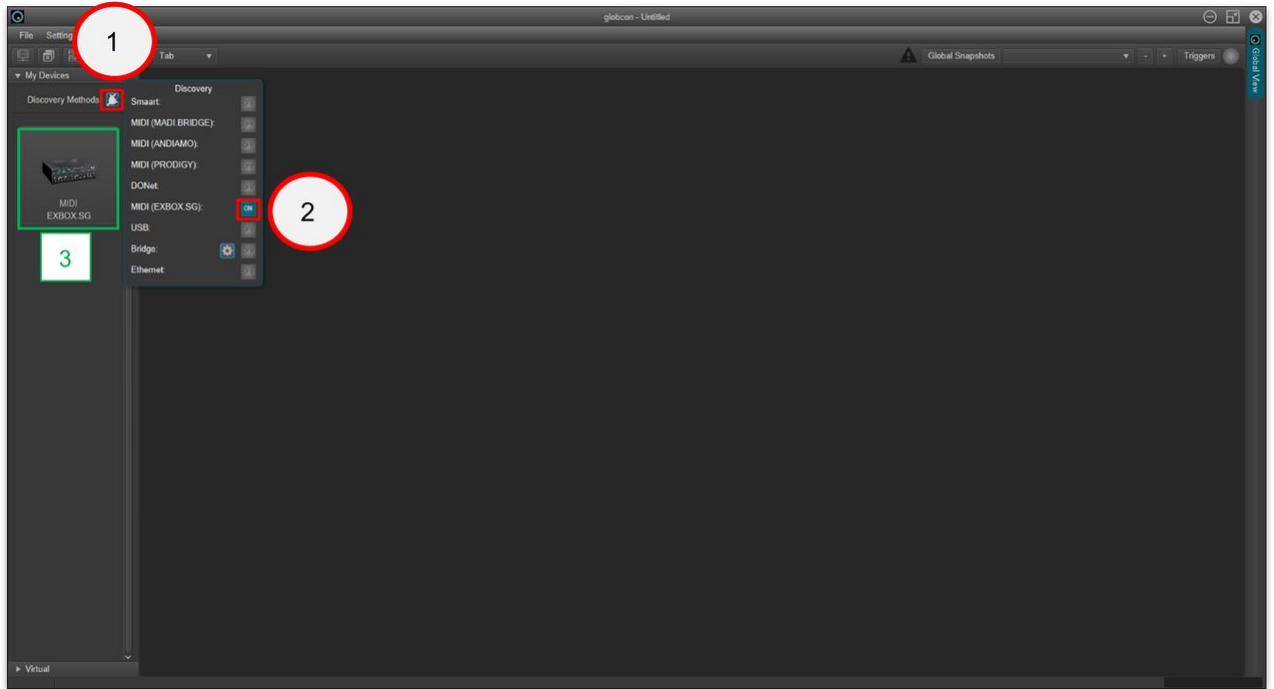
- Click on "**MIDI input**" and select "**SG Device I/O**" from the drop-down menu.
- Then repeat for the "**MIDI output**".



- Click on "**Apply**" to confirm.



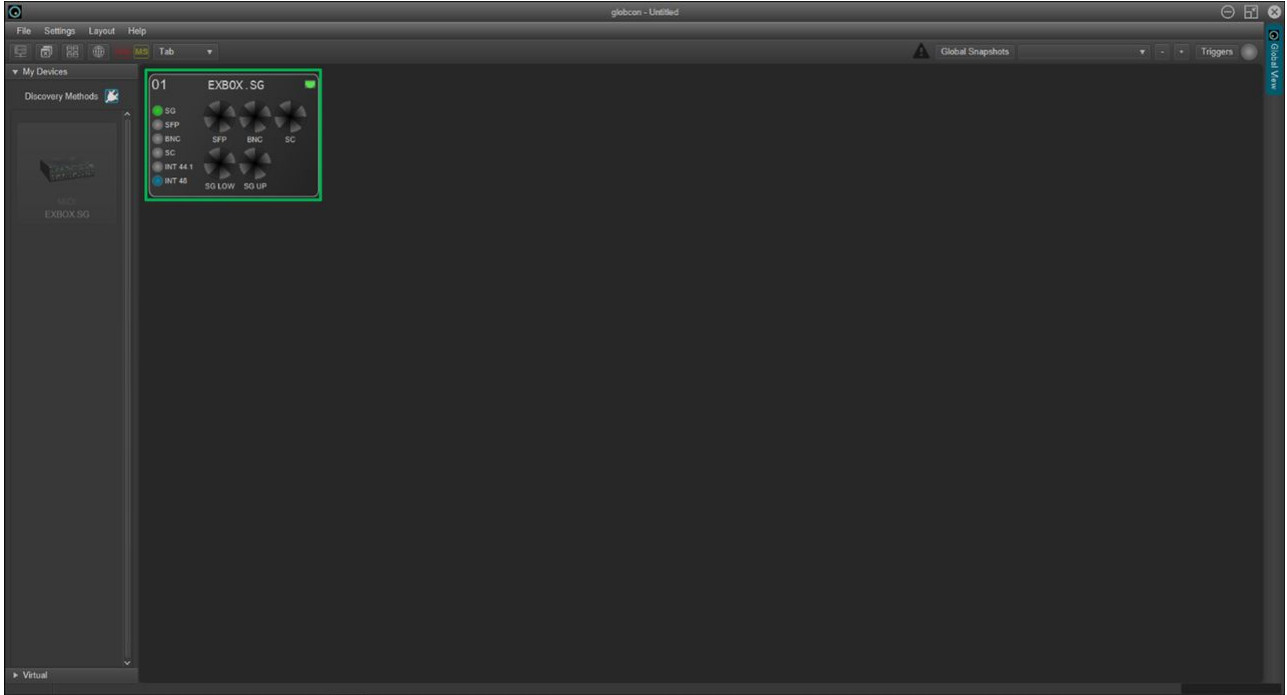
- Now enable the discovery of the device as follows:
  - a. Click on the "**Discovery Methods**" icon.
  - b. Click "**ON**" on MIDI (EXBOX.SG).
  - c. The EXBOX.SG appears in the "**My Devices**" list (in the left-hand column).



## Step 2: Setup the routing and synchronization (in GlobCon)

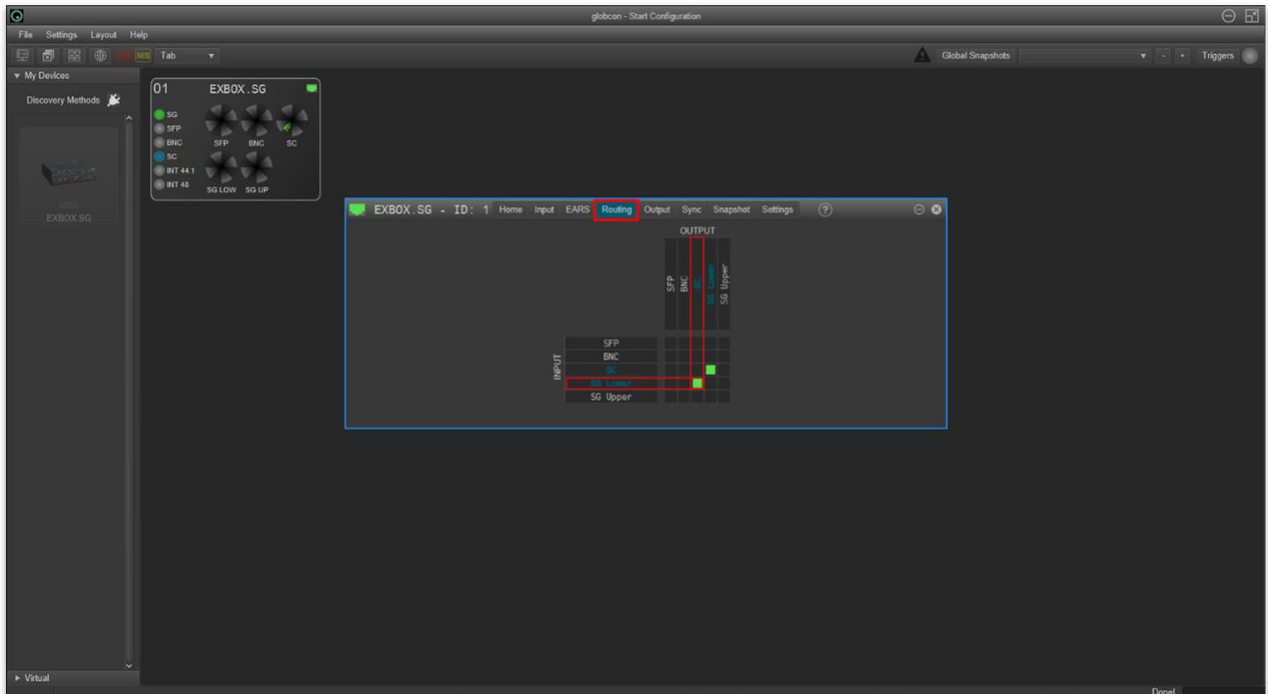
Once the EXBOX.SG device is added, you can configure its routing and synchronization as follows.

- Select the "EXBOX.SG" device and click on the "Routing" tab.

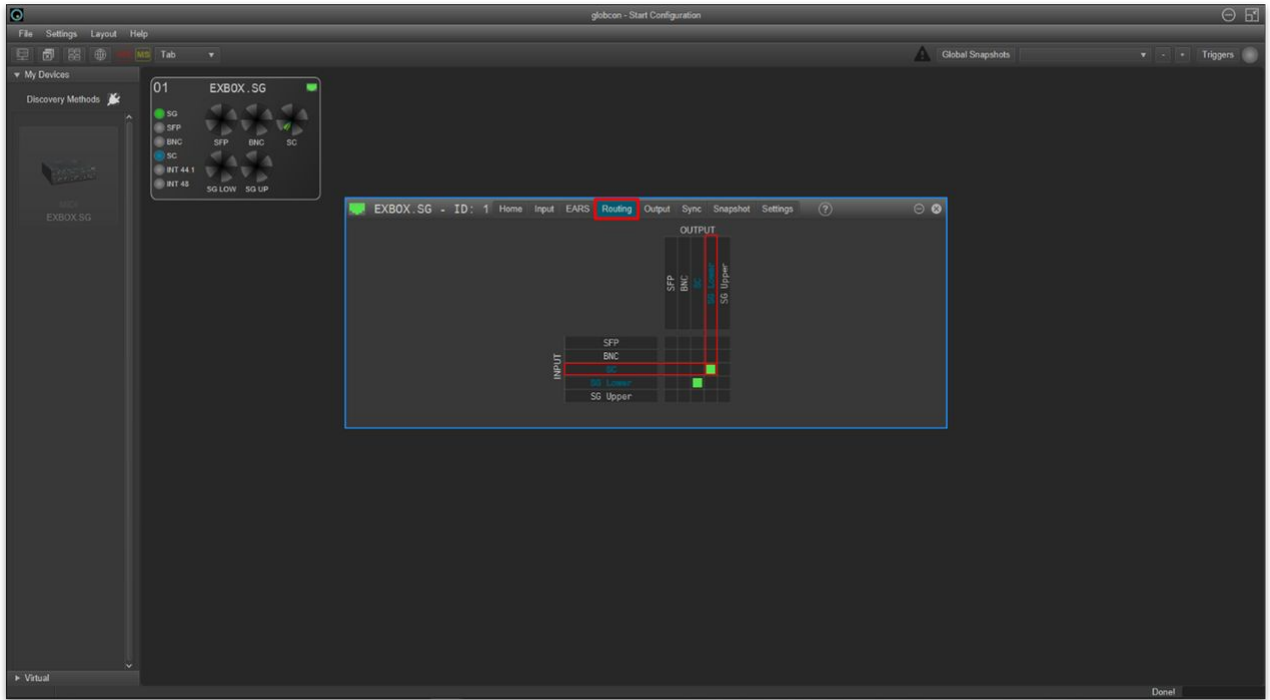


**Please note:** The instructions below assume that the EXBOX.SG card is connected to the Lawo console through the SC MADI port.

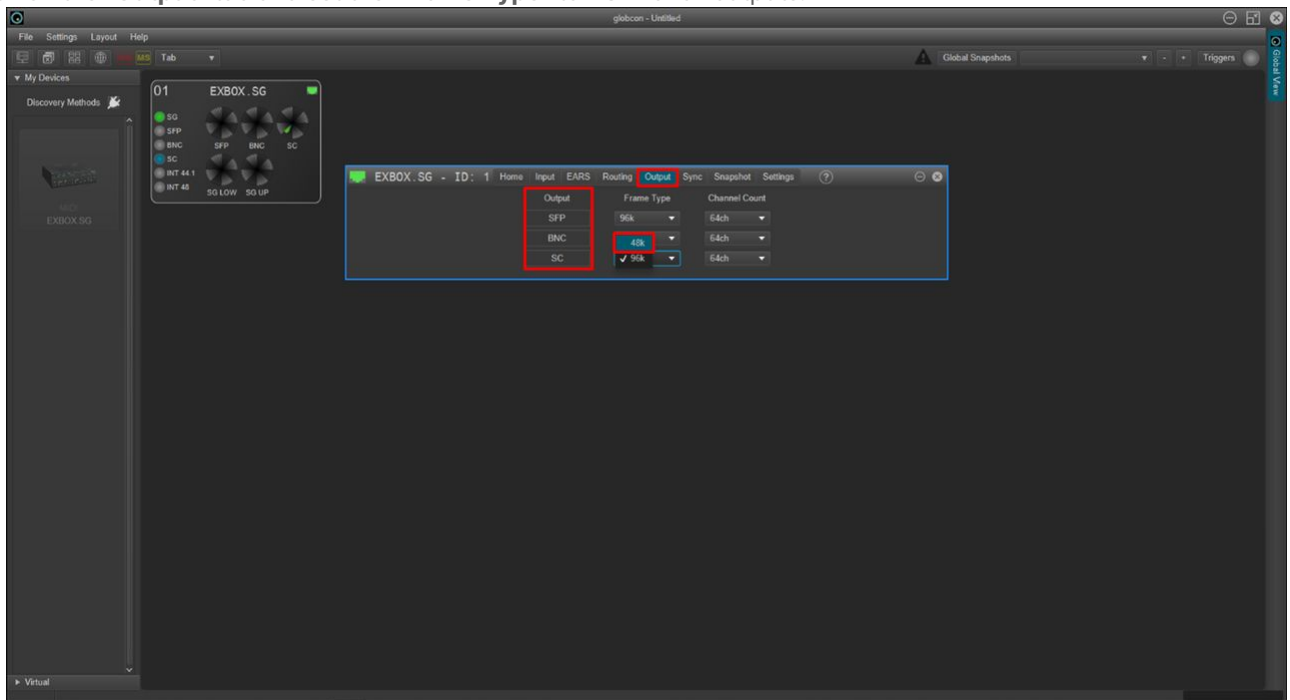
- Route the input "SG Lower" to the "SC" output.



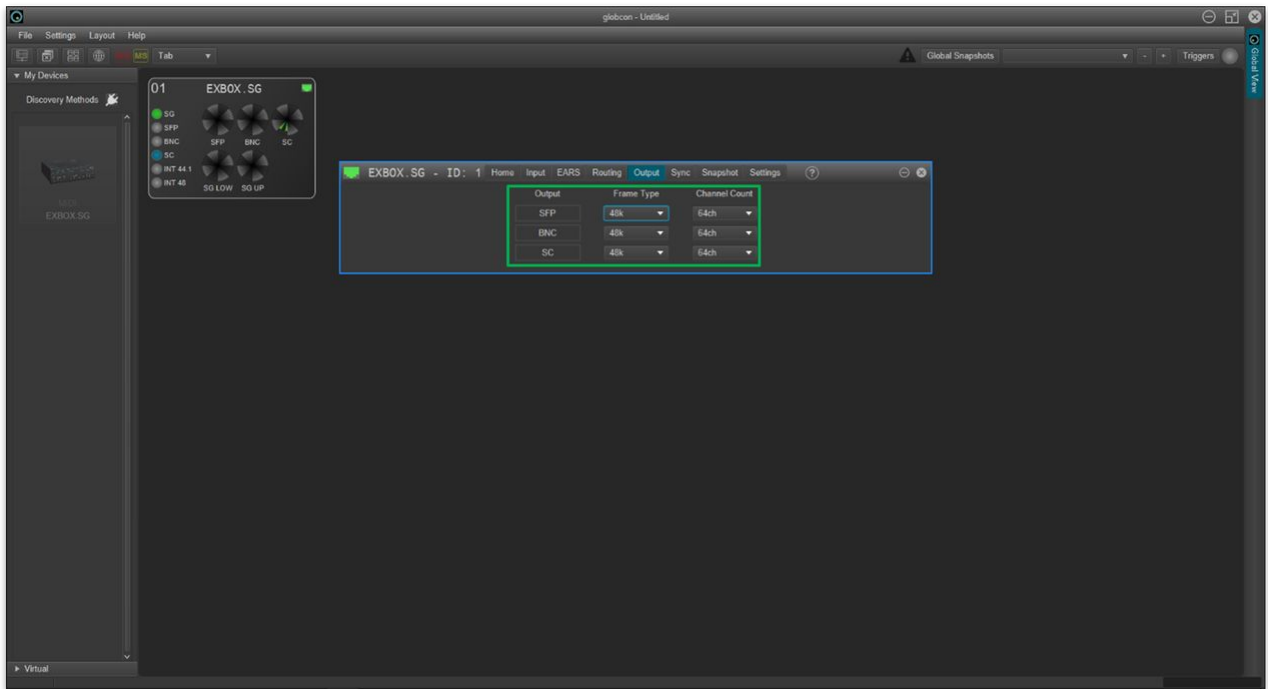
- Route the input "SC" to the "SG Lower" output.



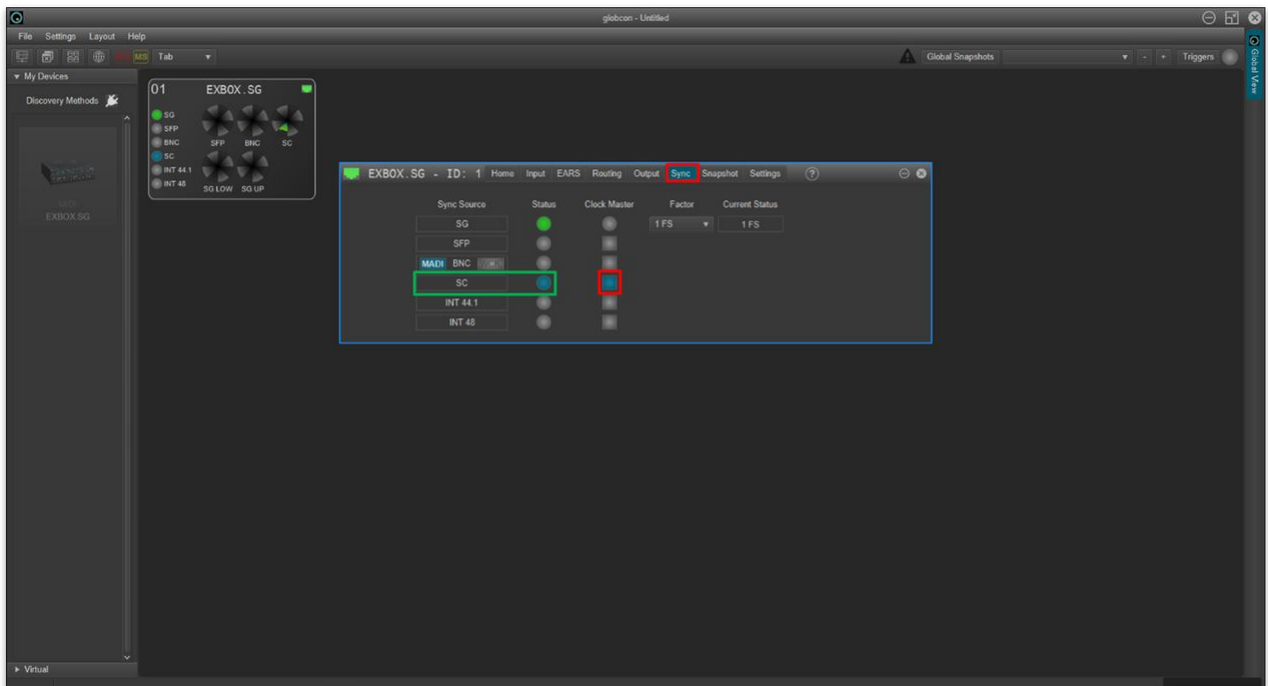
- Click on the "Output" tab and set the "Frame Type" to 48K for all outputs.



- The options should look like this.



- Next, click on the "Sync" tab and select the "SC" port as the "Clock Master".



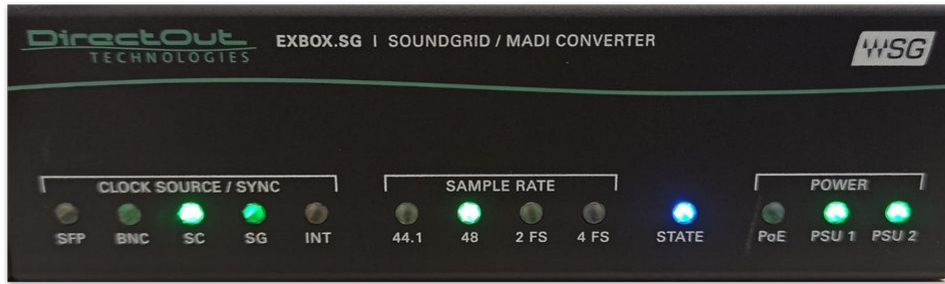
If it is not possible to set the "SC" port as the clock master, check the connection from the EXBOX.SG to the MADI device.

- Check the configuration by looking at the MADI I/O port (on the console's rear panel) and EXBOX.SG device.
  - The MADI port LOCK/ERR indicator should be lit (green) to indicate that there is a valid MADI signal.



- The indicators on the EXBOX.SG device should look like this.



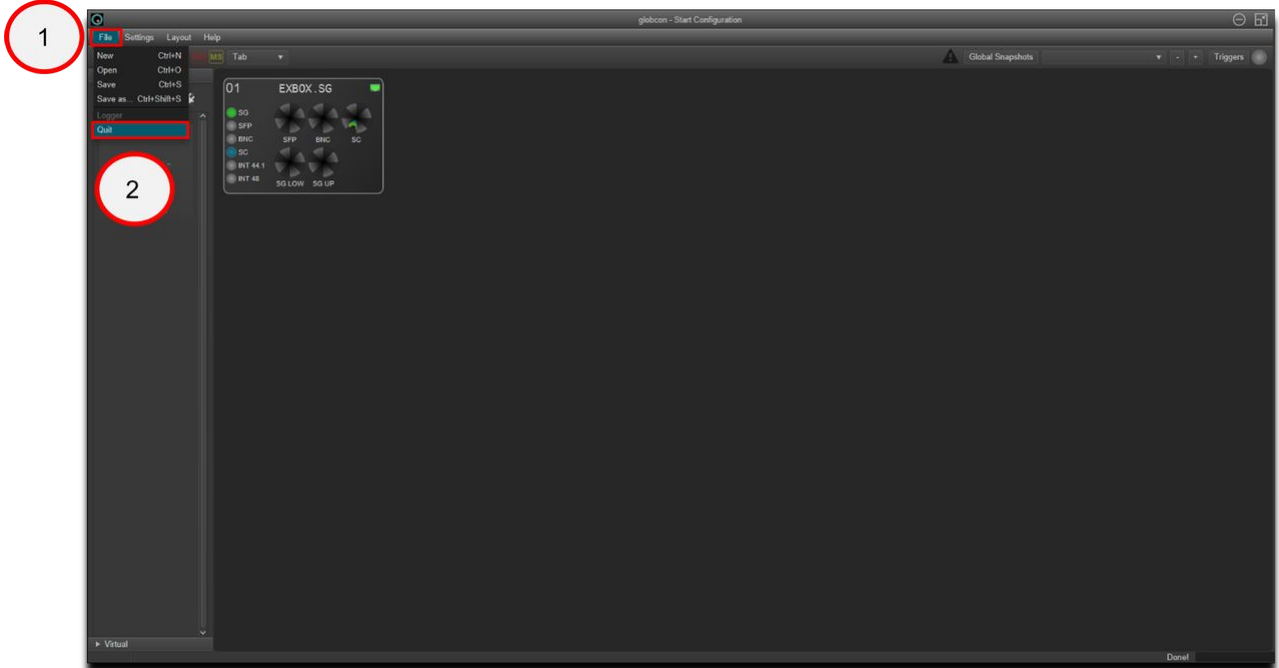


If the indicators look different, or you need further assistance, please refer to the [Additional Information](#) (at the end of this topic).

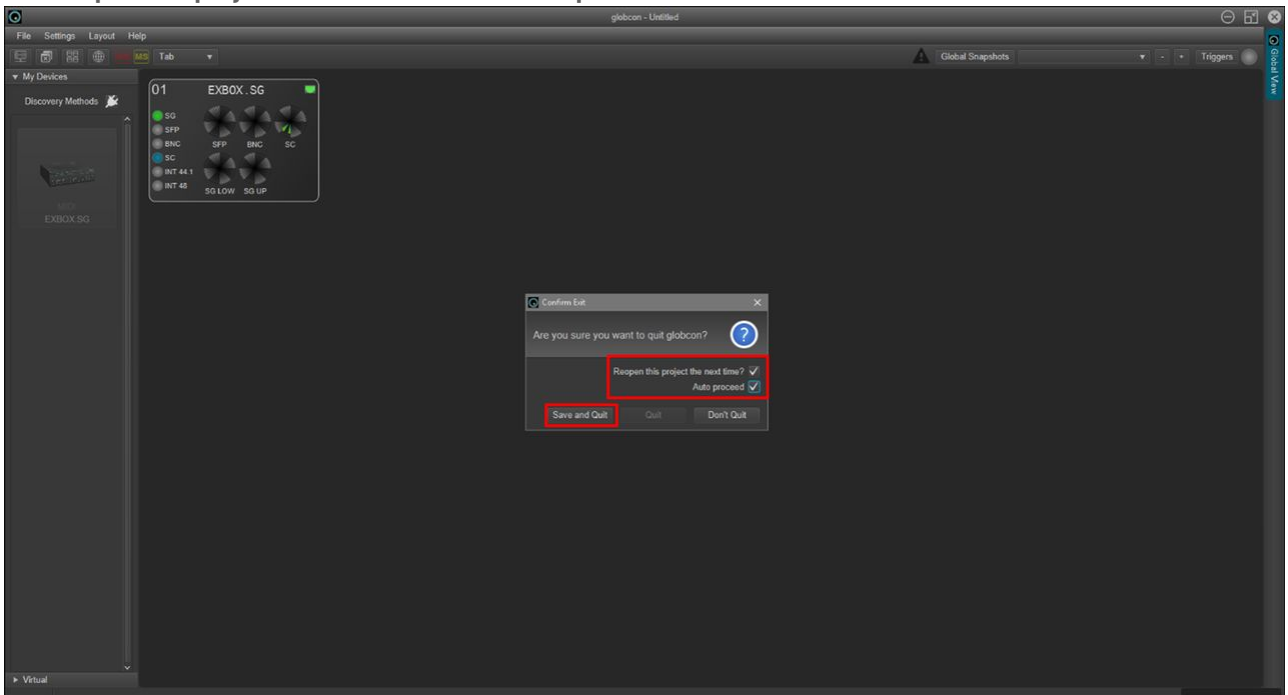
### Step 3: Save the settings (in the GlobCon project)

Once the device is correctly configured, the settings must be saved.

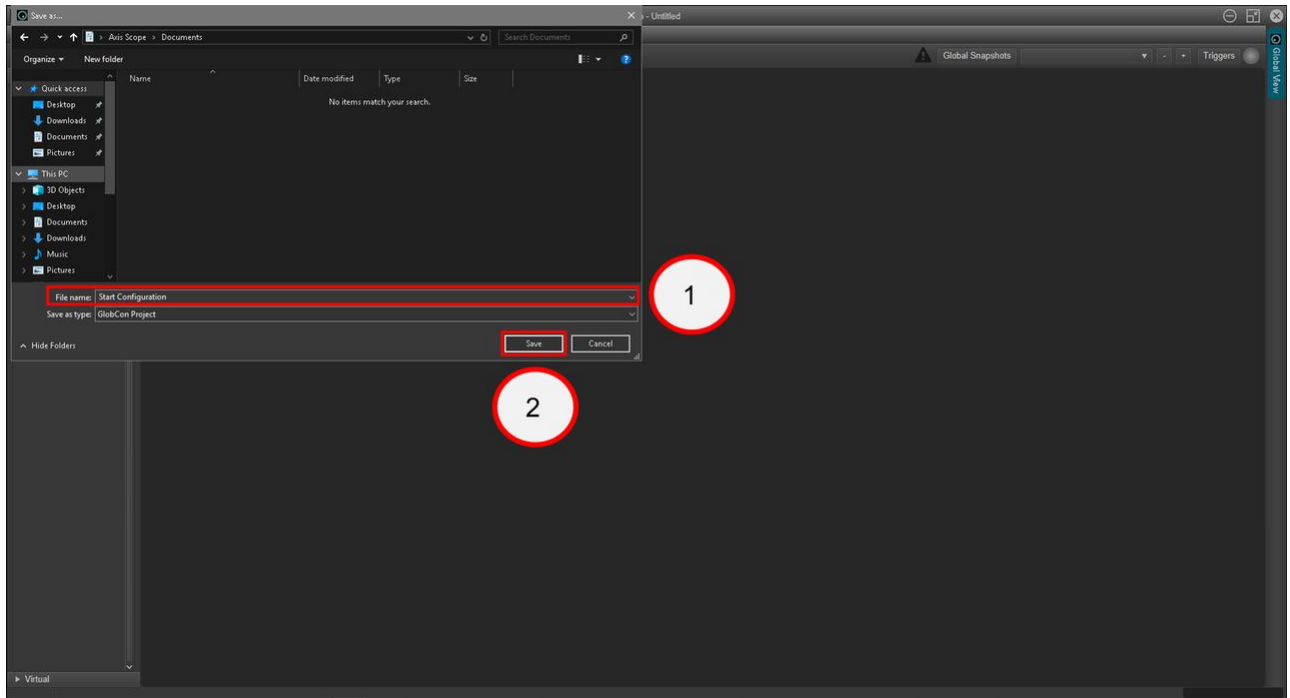
- Click on **"File"** and select **"Quit"**.



- Select **"Reopen this project the next time"** and **"Auto proceed"**.



- Click on **"Save and Quit"** - you are asked to enter a name for the project.
- Type in a name project and click on **"Save"**.



The settings saved in this project should now automatically load when the system next starts up.

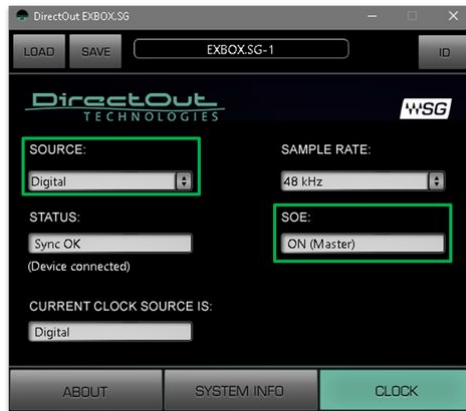
You are now ready to test the operation of the system (as described in the [next chapter](#)).

Or, continue reading for further information about the EXBOX setup.

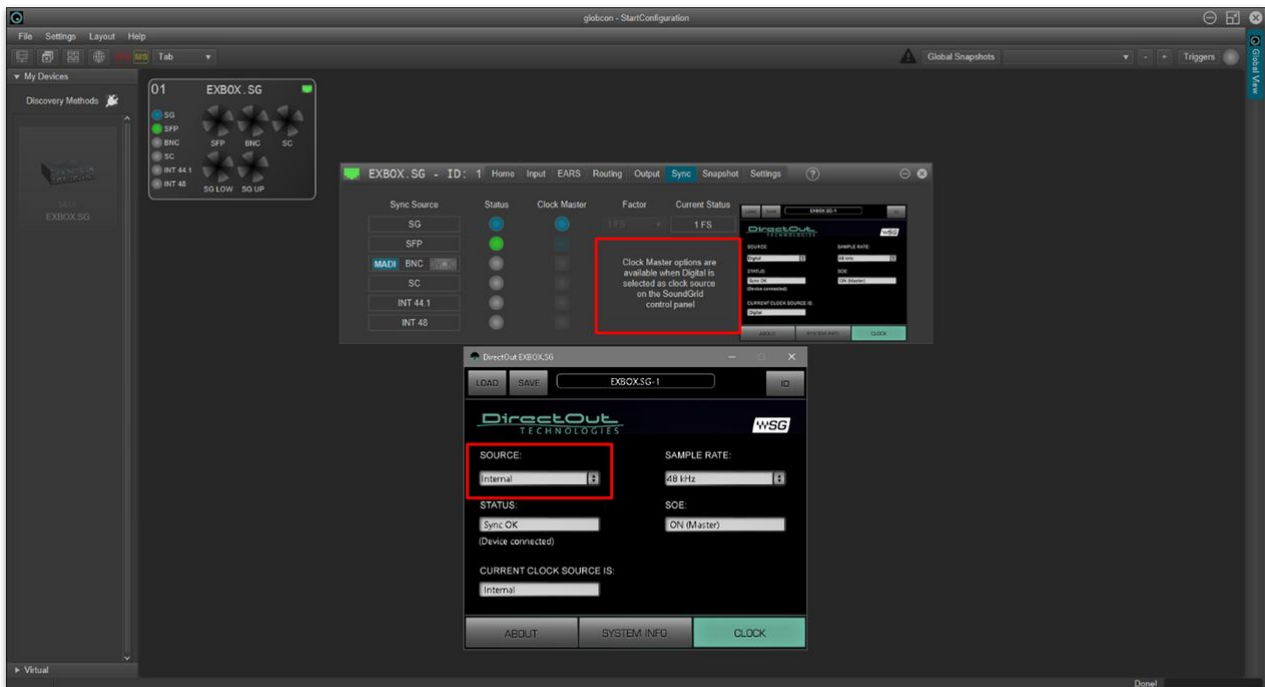
### Additional Information

To comply with the recommended connections and clock setup from DirectOut (described [earlier](#)), the settings in **Waves SuperRack** should look like this.

- EXBOX.SG **SOURCE** = "Digital" and **SOE** = "ON (Master)"

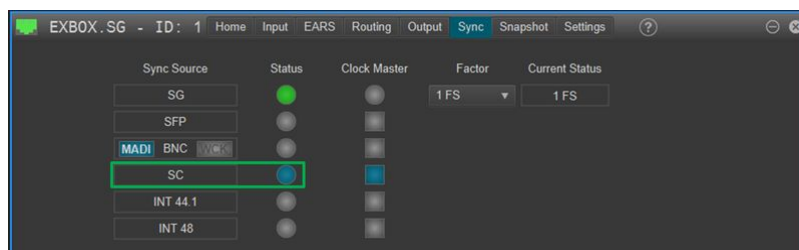


If the sync source is not set to "Digital", then the following screen appears in **GlobCon**:



The settings in GlobCon should look like this.

- EXBOX.SG "Sync" tab: "Clock Master" = the "SC" MADI input port (or the MADI input port used in your configuration).



The images below are taken from the EXBOX manual and show the specifications for the GlobCon tabs.

- GlobCon "**Routing**" tab specifications

SFP	MADI I/O (64 channels @ 1 FS, 32 channels @ 2 FS)
BNC	MADI I/O (64 channels @ 1 FS, 32 channels @ 2 FS)
SC	MADI I/O (64 channels @ 1 FS, 32 channels @ 2 FS)
SG Lower	Soundgrid channel 01 to 64 (@ 1 FS) or 01 to 32 (@ 2 FS).
SG Upper	Soundgrid channel 65 to 128 (@ 1 FS) or 33 to 64 (@ 2 FS).

- GlobCon "**Output**" tab specifications

Frame Type	Frame Format of MADI output (48 kFrame / 96k Frame)
Channel Count	Channel Mode of MADI output (64 ch / 57 ch / 56 ch)

- GlobCon "**Sync;**" tab specifications

Sync Source	Inputs that can be used for clocking (Soundgrid, MADI, word clock) or the internal clock generator (INT). See page 27.
Status	<p>Display of lock / sync status of the sync source</p> <ul style="list-style-type: none"> <li><input type="radio"/> (grey) = no signal lock</li> <li><input checked="" type="radio"/> (blue) = signal lock, clock master</li> <li><input checked="" type="radio"/> (green) = signal lock, in sync with clock master</li> <li><input type="radio"/> (blinking green) = signal lock, not in sync with clock master</li> </ul>
Clock Master	<p><b>Buttons to set the clock master</b></p> <p>Click the square to set the sync source. The setting becomes relevant when the 'SOURCE' in the Soundgrid control panel is set to 'Digital' - see page 37.</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> (grey) = not set as clock source</li> <li><input checked="" type="checkbox"/> (blue) = set as clock source</li> </ul>
Factor*	<b>Menu to set the scaling factor</b> (1 FS or 2 FS) in order to match the MADI IO with sample rate.
Current Status	Display of the current scaling factor.



## 4 Waves for mc<sup>2</sup> - Operation

This chapter covers the operation of the plugins from the mc<sup>2</sup> console once the setup is complete.

You can find more information about the Waves user interface in the "Waves SuperRack guide". The latest version is included in [Waves for mc<sup>2</sup> - Useful Links](#). Here we cover the integration with the Lawo console.

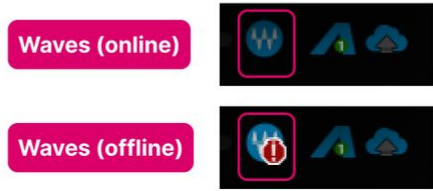
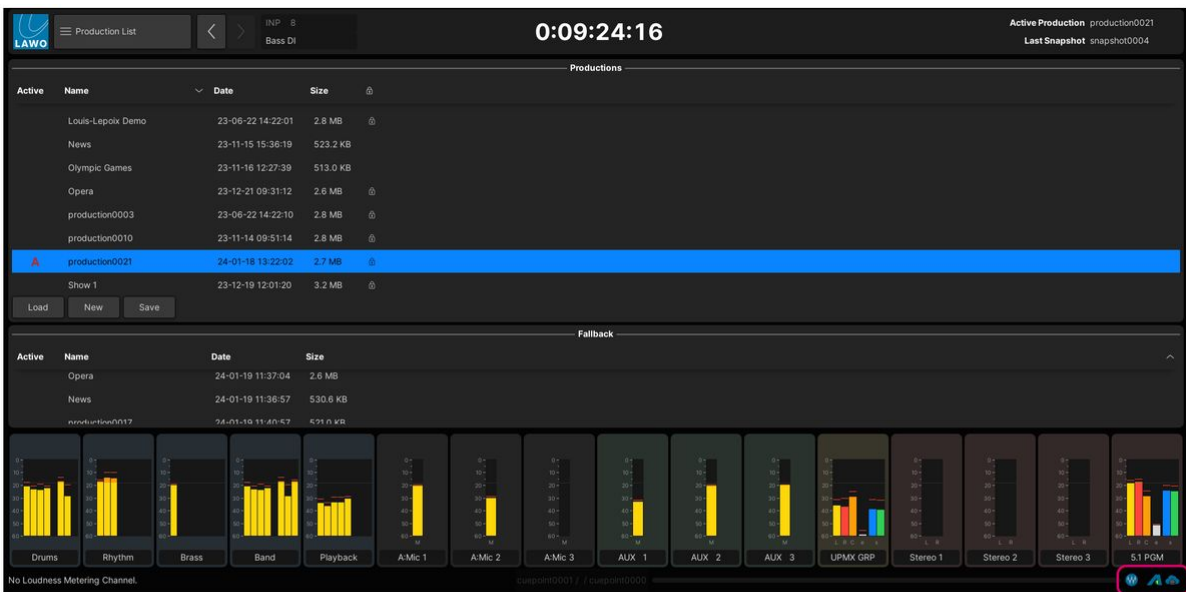
- [Waves for mc<sup>2</sup> - Operating Principles](#)
- [Waves for mc<sup>2</sup> - Connecting the Signals](#)
- [Waves for mc<sup>2</sup> - Saving and Loading Settings](#)
- [Waves for mc<sup>2</sup> - User Button Functions](#)

## 4.1 Waves for mc<sup>2</sup> - Operating Principles

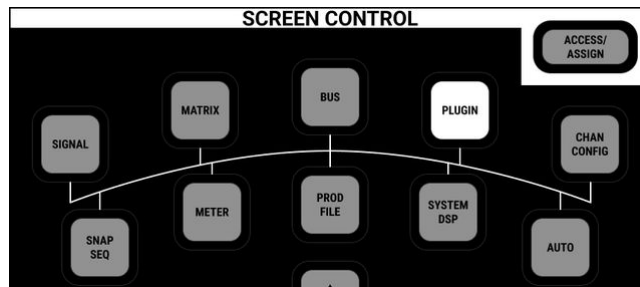
This topic describes how to view and control the Waves plugins from the console.

### First Steps

1. Check the network connection to the Waves host PC (using the **W** icon at the bottom right of the Central GUI).
  - Blue = the system is correctly configured and the host PC is online.
  - Red (warning indicator) = there is a problem with the network communication. Check that all of the components are connected and powered. Then check the steps in [System Setup](#).
  - Icon missing = the Waves integration is not enabled in the mc<sup>2</sup> control system. Check the steps in [Enable Waves Integration](#).

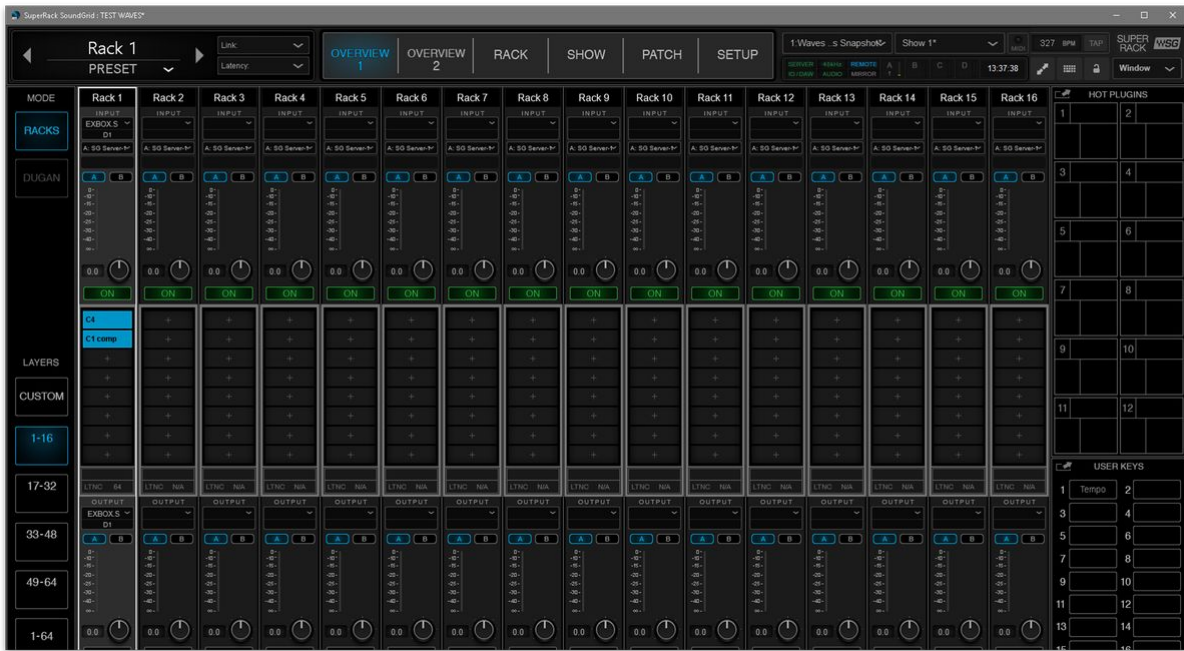


2. Press the **PLUGIN** button on the console's SCREEN CONTROL panel.



This button switches the console's Central GUI touch-screen, keyboard and trackball to the Waves host PC (via a Remote Desktop connection).

Providing the system is correctly configured, this happens automatically and so you should see the SuperRack user interface (on the Central GUI screen).



- If the Central GUI display does not switch, then the Remote Desktop connection has failed. Please check that there is a valid network connection to the Waves Axis Scope PC and that the remote desktop connection is correctly configured.
- If you can see the Waves PC desktop but not the application, then check that Waves SuperRack is started. How to add the application to the PC's startup programs is described [here](#).

**Please note:** There are some differences in how the UI looks and operates depending on the type of remote desktop connection. The pros and cons are described [here](#).

### User Data

Once there is a valid network connection between the mc<sup>2</sup> console and Waves SuperRack, the session and snapshots (in Waves) are linked to the production, snapshot folder and snapshots (in the mc<sup>2</sup> console). This is explained in more detail [later](#).

For now, it is useful to know that:

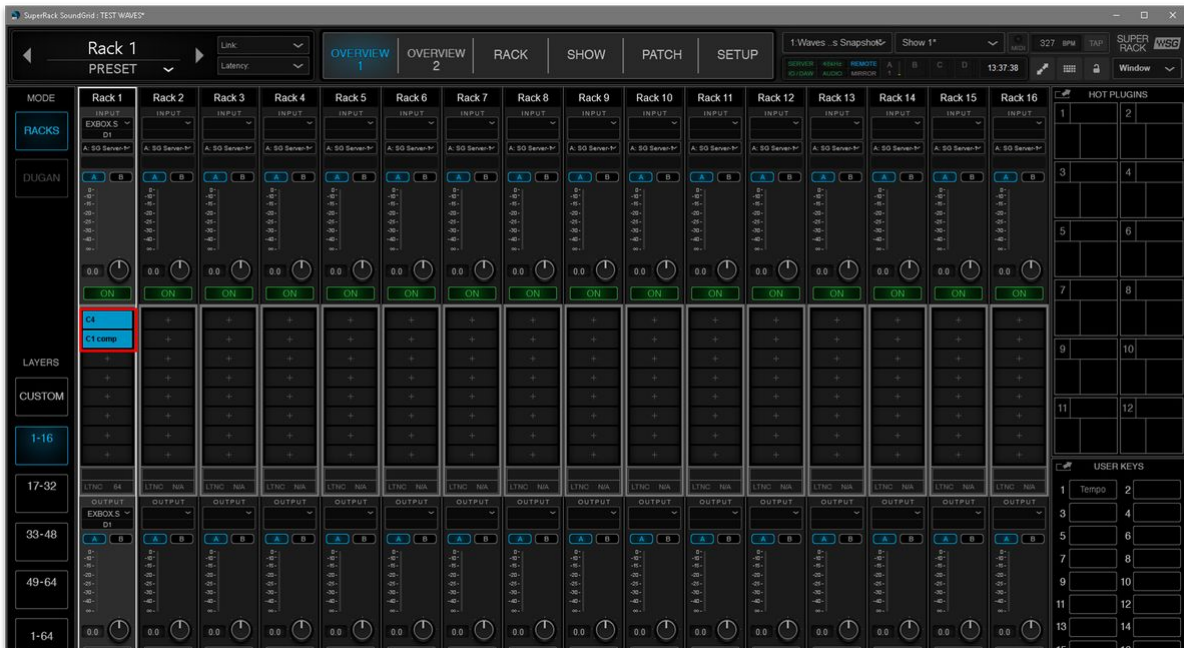
- If there is a SuperRack session (stored on the Waves PC) which corresponds to the current mc<sup>2</sup> production, the session opens.
- If there is a SuperRack snapshot (stored on the Waves PC) which corresponds to the current mc<sup>2</sup> snapshot, the snapshot loads.
- If there are no corresponding sessions to synchronise, then SuperRack opens with an empty session. In this instance, you should save or update the console production to create the parallel production/session link.

### Adjusting the Plugins

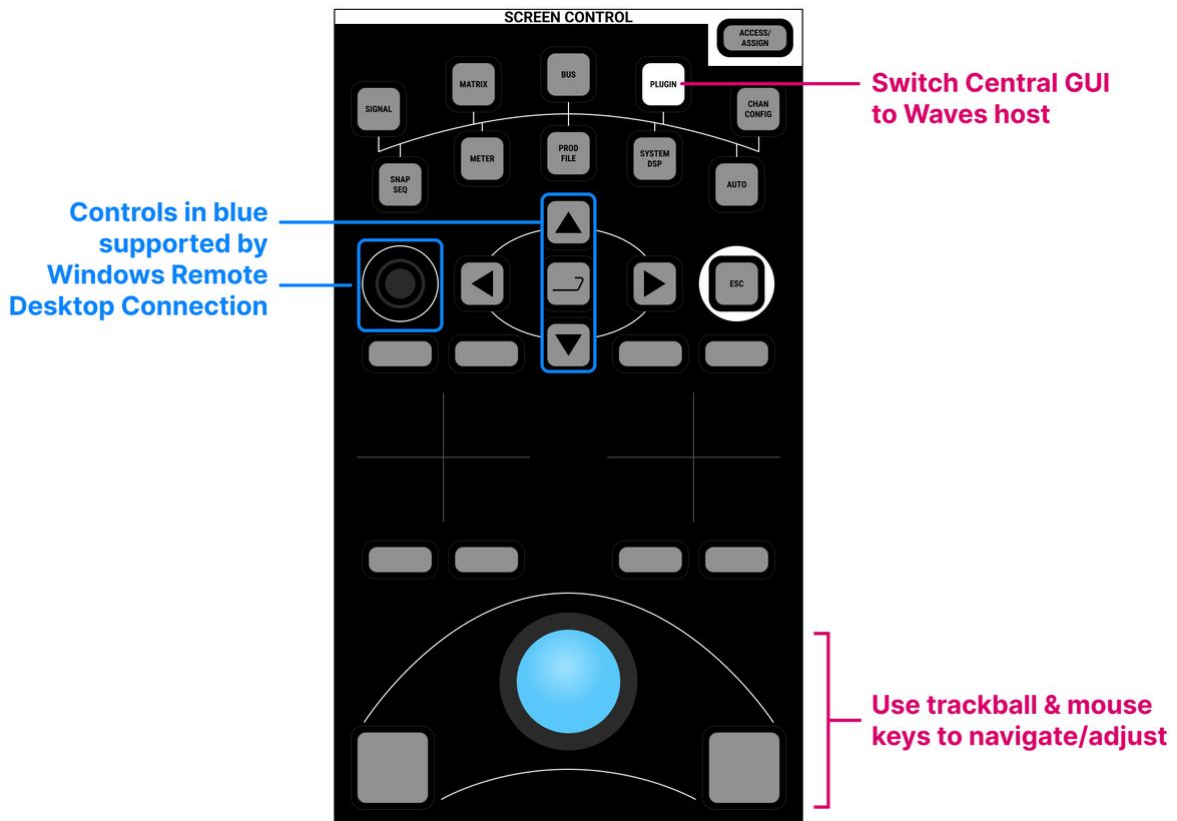
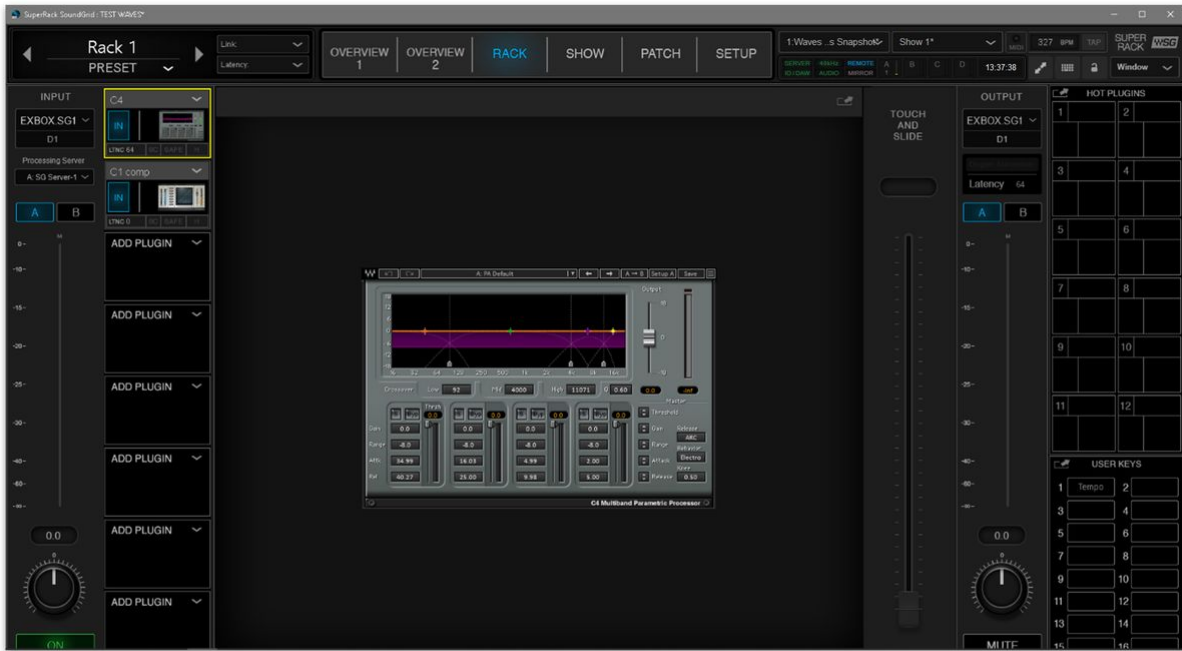
The SuperRack user interface supports a number of views, the two main ones being the overview and rack view.



The **Overview** shows all of the configured racks and their inserted plugins. From here, you can adjust the racks and add the plug-ins.



Switch to **Rack** view and double-tap/click on a plugin to open its visualisation. From here, you can adjust the plugin parameters using the console's touch-screen, or trackball and left/right mouse buttons.



**Please note:** If a Windows Remote Desktop Connection is used, then it is possible to use the up/down arrow keys, Enter button and rotary control to interact with the plugins. If a VNC remote desktop connection is used, then these controls are not supported.

✓ For faster navigation, some of the Waves SuperRack functions can be operated from the console's Central User Buttons. This is described later in [Waves for mc<sup>2</sup> - User Button Functions](#).



## 4.2 Waves for mc<sup>2</sup> - Connecting the Signals

Audio passes to and from the Waves SoundGrid server via MADI.

- On the console side, any available MADI SFP port can be used, as long as the SFP meets the required specification (described [here](#)). In the example below, we are using the console's local I/O MADI port.
- On the Waves side, the connection is made via the EXBOX.SG converter (from DirectOut).

In order to connect audio to and from the Waves system, there are two steps:

1. Check (and edit) the I/O patching in Waves SuperRack.
2. Connect signals to the MADI I/Os in the console's **Signal List**.

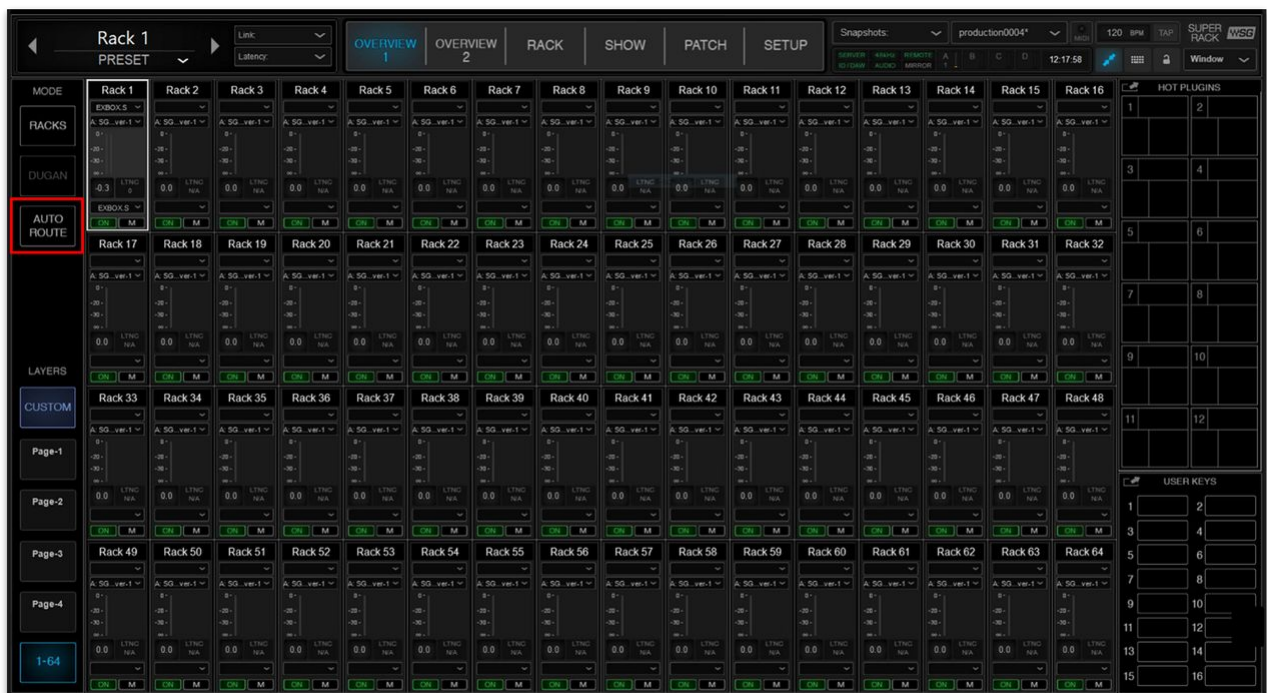
### Step One: Configure the I/O patching (in Waves)

In Waves SuperRack, there are two ways to setup the I/O patching: either automatically (using AUTO ROUTE) or manually (for each Rack).

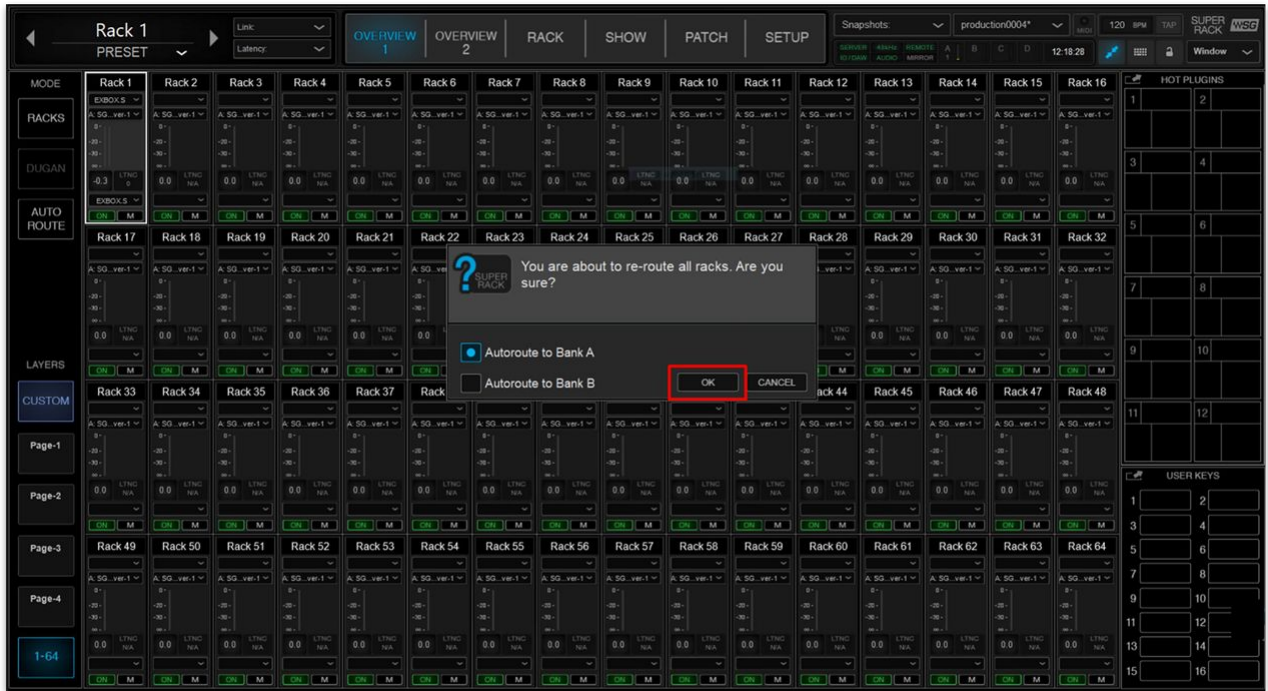
#### Using AUTO ROUTE

As a first step, it is recommended to use AUTO ROUTE to configure a 1:1 routing.

1. Open either "**OVERVIEW 1**" or "**OVERVIEW 2**" (at the top of the page).
2. Click on the "**AUTO ROUTE**" button (on the left).



3. Select "**OK**" (to confirm).



4. The Racks are patched incrementally on a 1:1 basis.

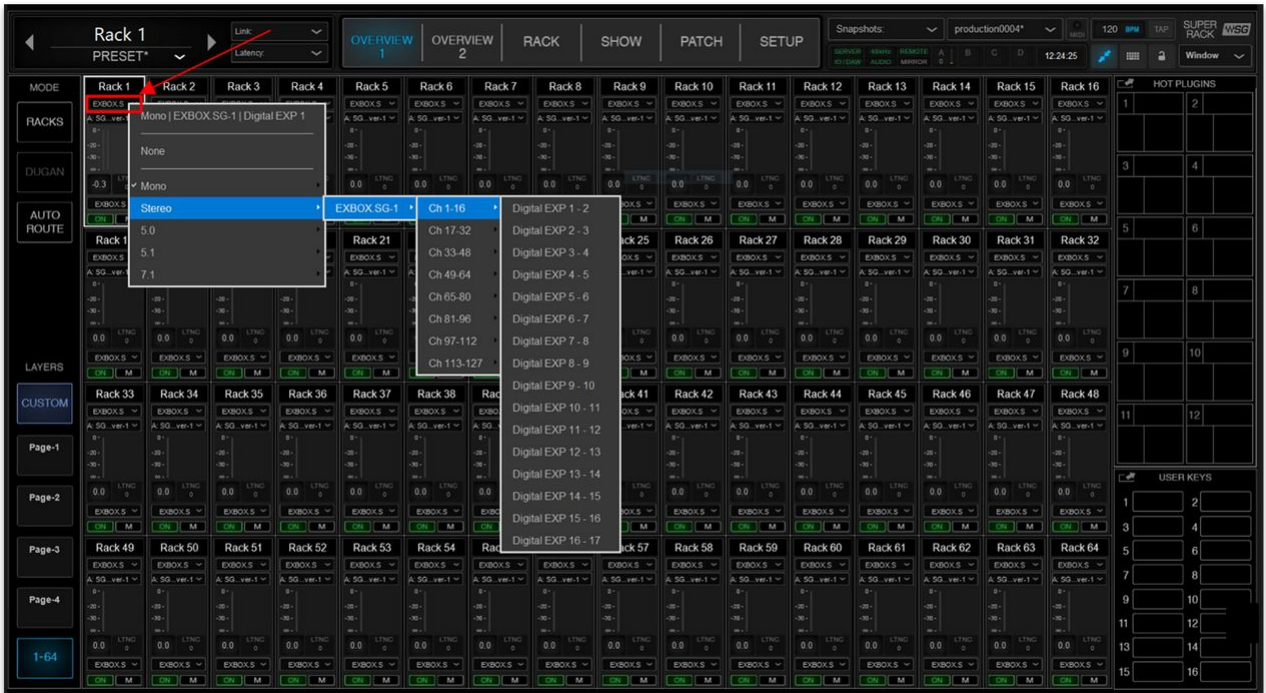


### Manual Patching

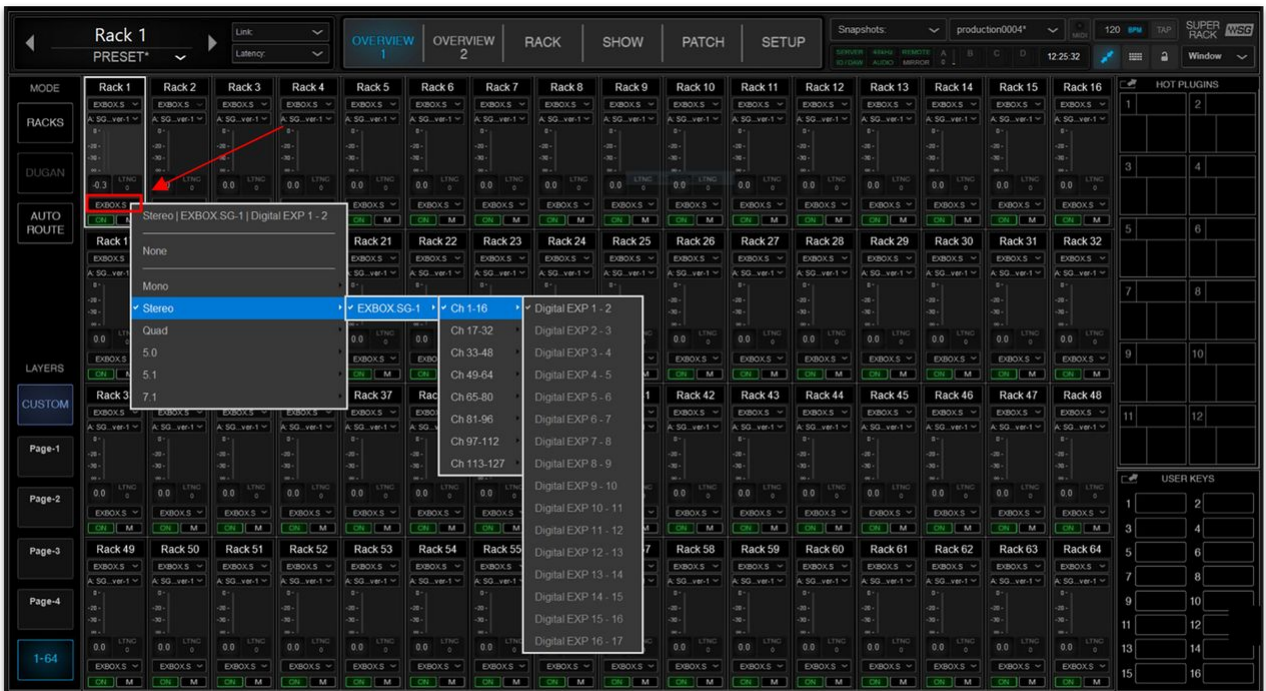
The I/O patching can be edited manually if, for example, you wish to change the format of a rack or reassign the I/O channels. This can be done from one of the "OVERVIEW" pages or directly from a rack.

To edit the patching from "OVERVIEW 1" or "OVERVIEW 2":

1. Click on the input box (under the label "Rack 1") and use the drop-down menus to select a channel format (e.g. Stereo) and then the channel(s) of the I/O device.

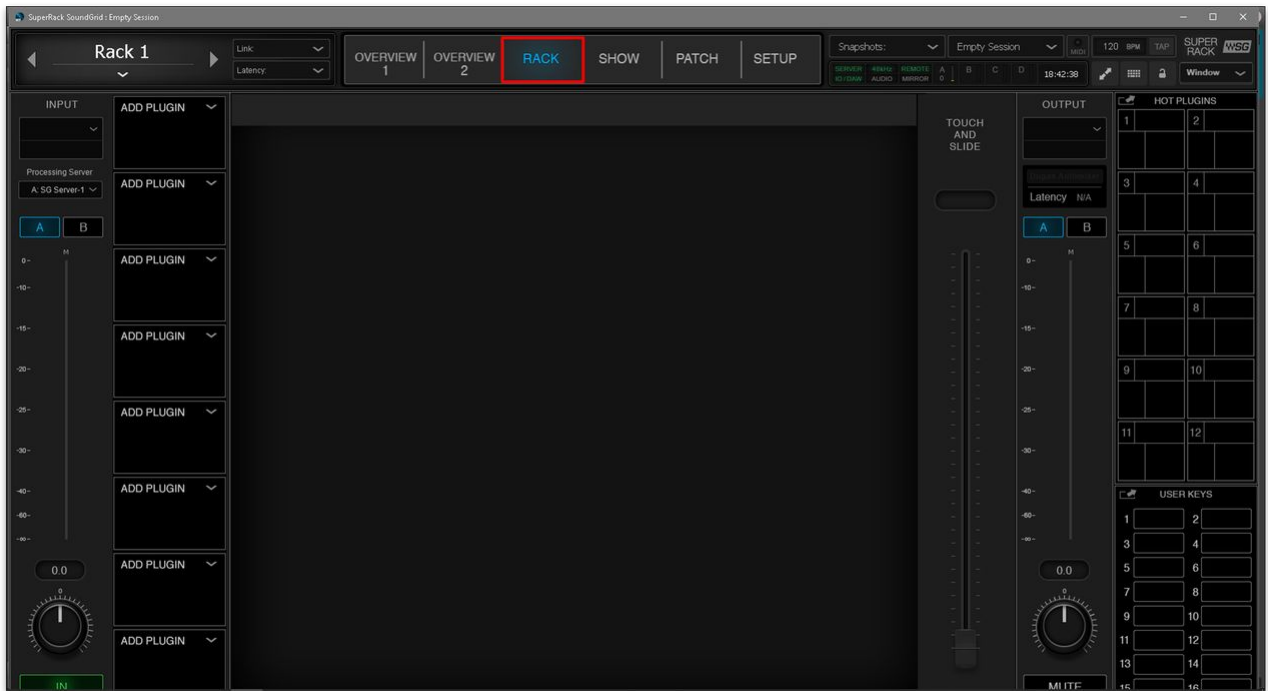


2. The output channel is assigned automatically (according to the input selection).
3. If you want to change the output channel, then click on the output box (above the rack ON button) and use the drop-down menu to make a selection.

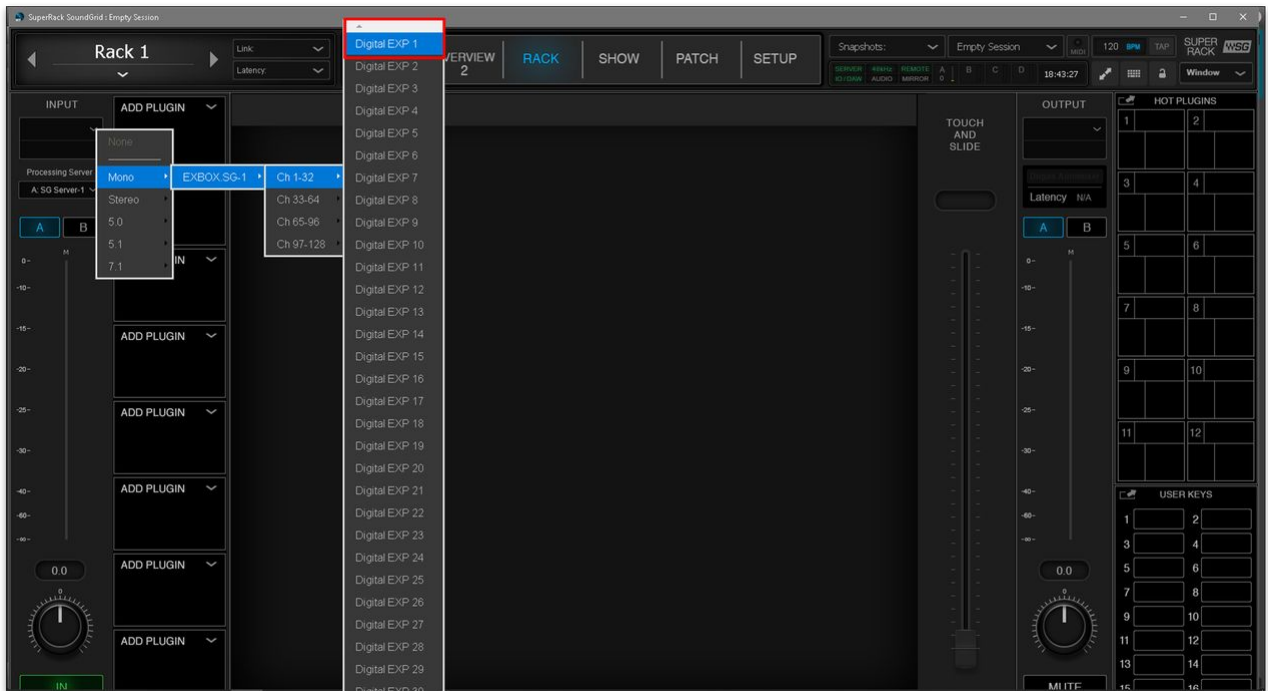


To edit the patching directly from the rack:

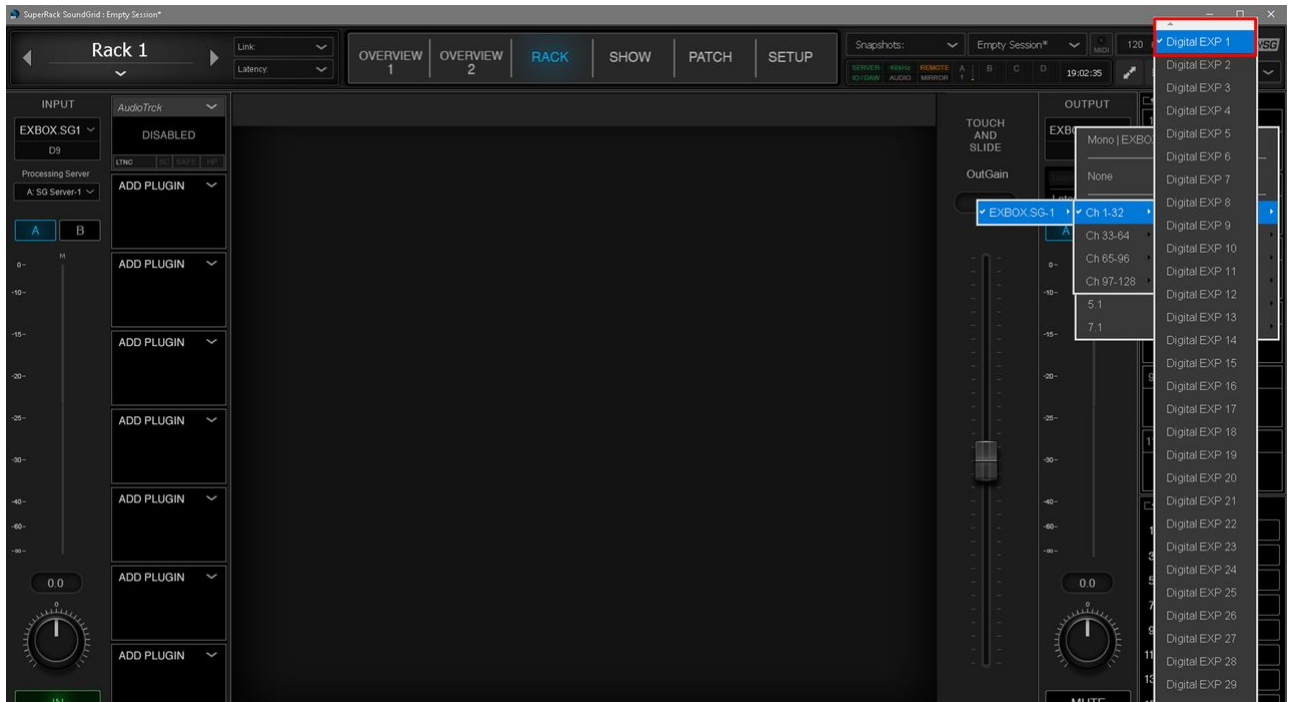
1. Click on **"RACK"** (to open the Racks view).



2. Click on **INPUT** (on the left) and use the drop-down menu to select a channel format (e.g. **Mono**) and then the channel of the I/O device.



3. The output channel is assigned automatically (according to the input selection).
4. If you want to change the output channel, then click on **OUTPUT** (on the right) and use the drop-down menu to make a selection.



The audio patching on the Waves side is now complete.

## Step 2: Connect signals to the MADI I/Os (on the console)

Once the Waves Rack I/O patching is configured, it's time to connect the audio signals to the corresponding MADI I/Os. This is done using the console's **Signal List** display.

In the example below, it is assumed that the Racks (in Waves) are patched on a 1:1 basis, so MADI in/out 1 (on the console) feeds Rack 1 (in Waves), MADI in/out 2 feeds Rack 2, and so on.

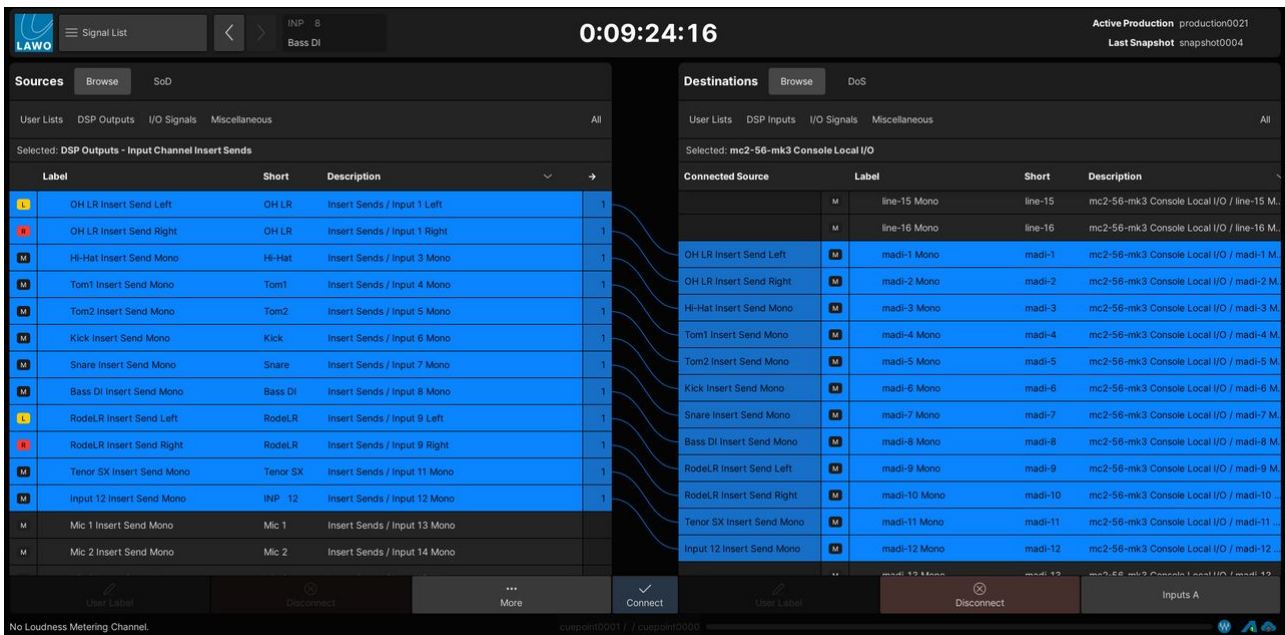
1. Open the **Signal List** display, on the Central GUI, using one of the following methods.
  - Press the **SIGNAL** button on the SCREEN CONTROL panel.
  - Select **Signals** → **Signal List** from the GUI page menu.
  - Press CTRL + 1 on the console keyboard.
2. Locate the **Sources** and **Destinations** from/to the Waves system.

Where the plugin server signals appear, and how they are named, depends on which MADI I/O port you are using and whether a User List has been created. In the example below, the signals are connected to the console's local I/O MADI port.

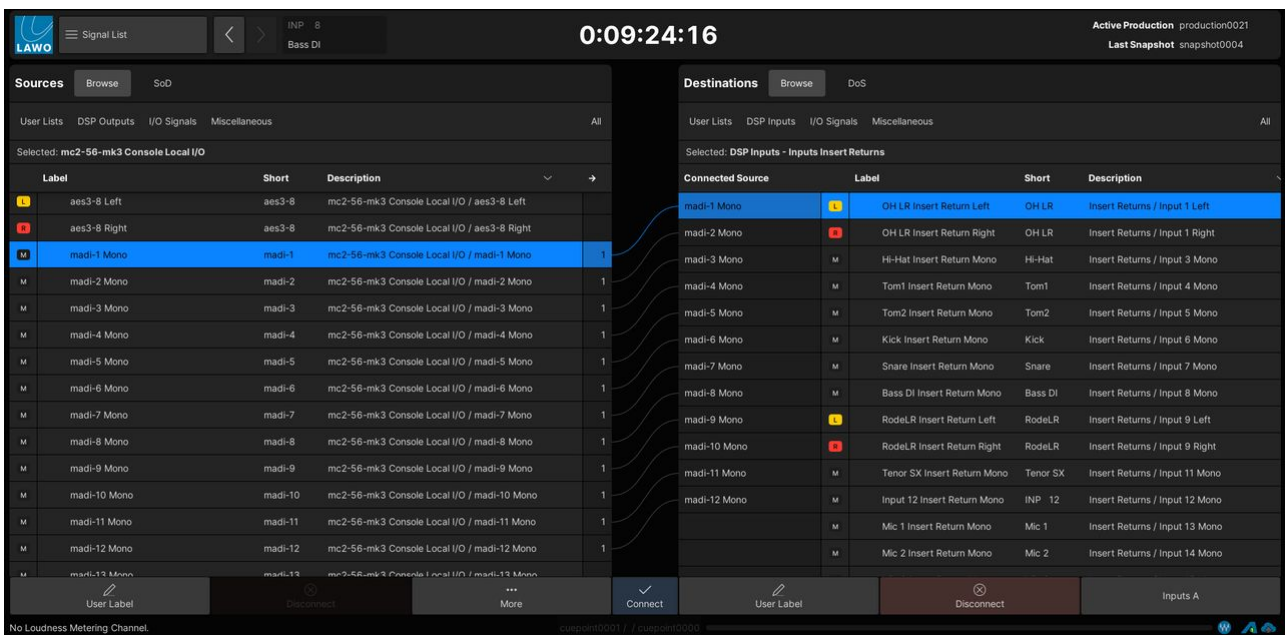
3. The signals are connected in the usual manner, so select a source and a destination, and press **CONNECT**.

For a channel insert, remember to connect both the insert send (to the Waves rack input) and the insert return (from the Waves rack output).

In the examples below, the insert sends and returns are prepared for the first twelve input channels.



Input channel insert sends → Waves Rack inputs (Local MADI I/Os)



Waves Rack outputs (Local MADI I/Os) → Input channel insert returns

4. Press **PLUGIN** (on the SCREEN CONTROL panel) to switch back to the Waves host PC.

If audio is present on your input channels, you should see level on the SuperRack meters. And, if the channel insert is switched on, you should hear the effect of the plugin processing.

5. The same method can be used to connect any type of signal to the Waves Racks: channel inserts, aux sends and returns, etc.

### Saving the I/O Configuration

On the console side, the connections made in the **Signal List** are saved and loaded by snapshots (unless a signal is isolated) and productions. In addition, it is possible to use Signal Routing Presets to save a specific set of connections.





On the Waves side, the I/O patching for the Racks is saved in sessions, but not in snapshots.

In practice, this makes it possible to save one version of the Waves I/O patching per session/production. If you need to make changes to the routing on-the-fly, then this should be done from the console side, using either a snapshot or signal routing preset.

### 4.3 Waves for mc<sup>2</sup> - Saving and Loading Settings

Once there is a valid network connection between the mc<sup>2</sup> console and Waves SuperRack, the session and snapshots (in Waves) are linked to the production, snapshot folder and snapshots (in the mc<sup>2</sup> console).

This works as follows:

- Whenever you save a console production, you create a SuperRack session.
- Whenever you save a console snapshot, a snapshot is added to the SuperRack session.

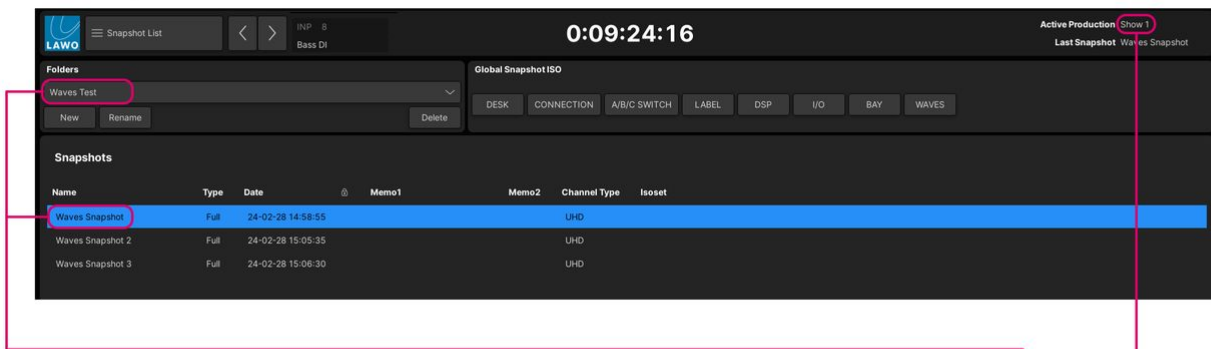
The Waves session files are stored locally on the Axis Scope PC (in the "C:\Users\Public\Waves Audio\SuperRack SoundGrid\Integrated Sessions" folder). The session takes its filename from the Lawo production.

**Important:** When a console is integrated with the Waves plugin server, it is necessary to perform a backup of this folder AND the mc<sup>2</sup> production to have a complete backup of the system.

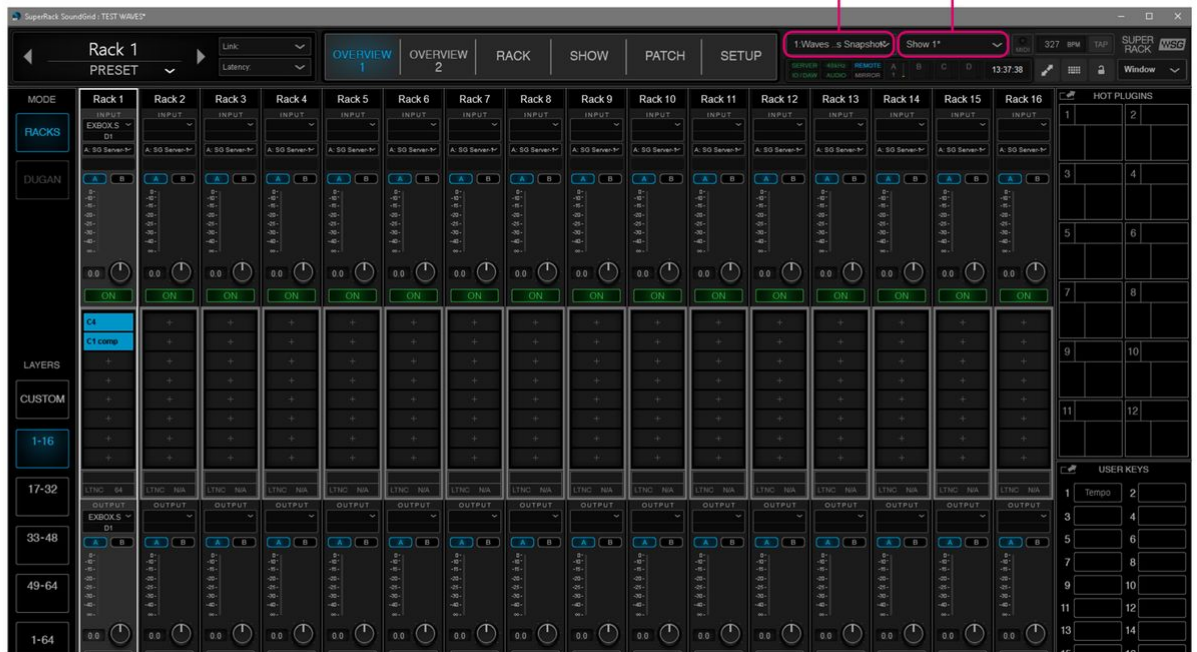
Snapshots store the plugin parameters and assignments, while other settings such as the rack configuration are stored in the sessions/production. This is explained in more detail below. When you load a production and snapshot on the console, the corresponding SuperRack session and snapshot load (if available). If there is no linked session or snapshot, then SuperRack does nothing.

The image below shows how the production, snapshot folder and snapshot (on the console) are linked to the session and snapshot (in Waves).

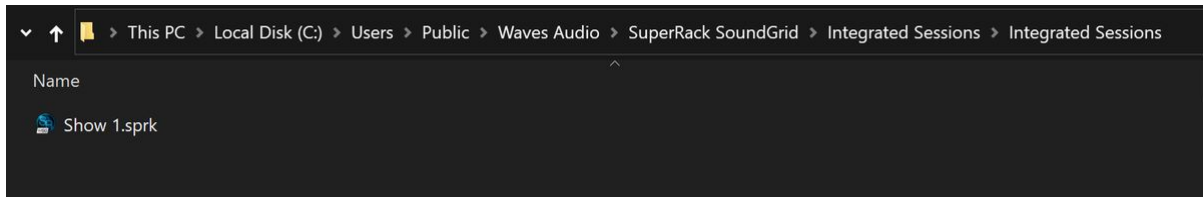
mc<sup>2</sup> Snapshot List



Waves SuperRack



The image below shows the location of the session file on the Waves Axis Scope PC.



### What's Stored in the Session/Production?

The following parameters are stored in the Waves SuperRack session (and, hence, in the console production):

- Inventory
- External patching
- Channel presets and rack configuration
- Plugin presets
- System preferences
- Settings
- User keys and hot plugins
- All user settings

### What's Stored in the Snapshot?

The following parameters are stored in the Waves SuperRack snapshot (and, hence, in the console snapshot):

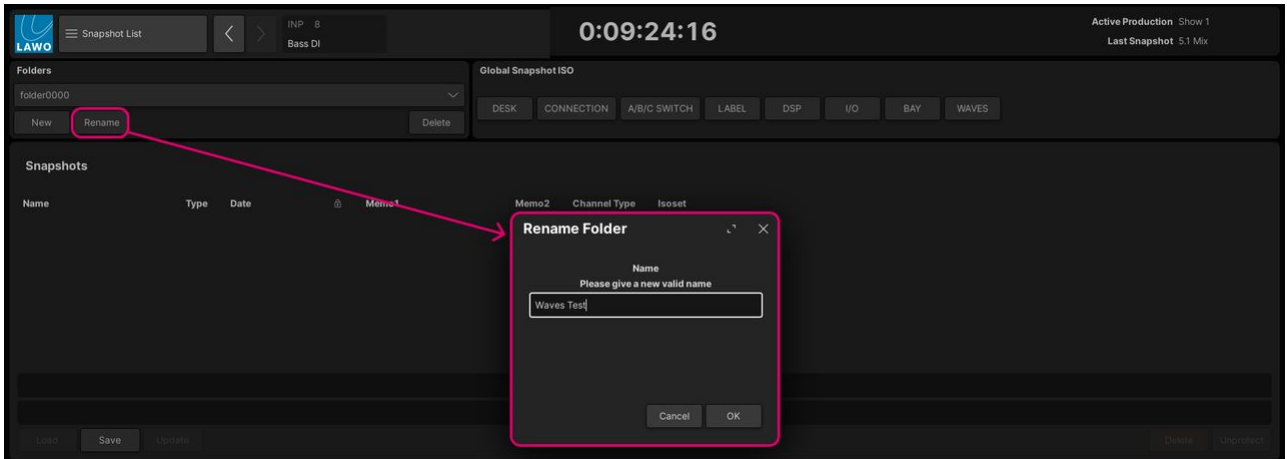
- Racks and their parameters (in, mute, gains, plugins, plugin sidechain)
- Plugins and their parameters
- Hot Plugin panel update
- Windows – what windows are open and where they are located on the screen.
- Dugan Automixer settings
- Global BPM

## Saving Plugin Parameters

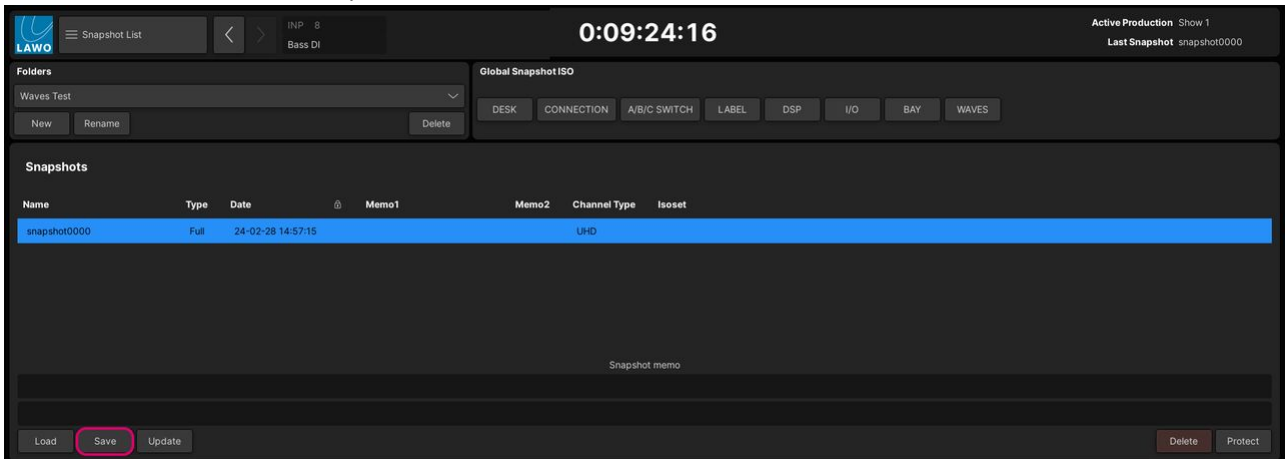
When you create a new production on the console, a new session is created in the Waves SuperRack. To save the Waves plugin parameters, you will need to save a new snapshot on the console as follows.

### Step 1 - Create a new snapshot

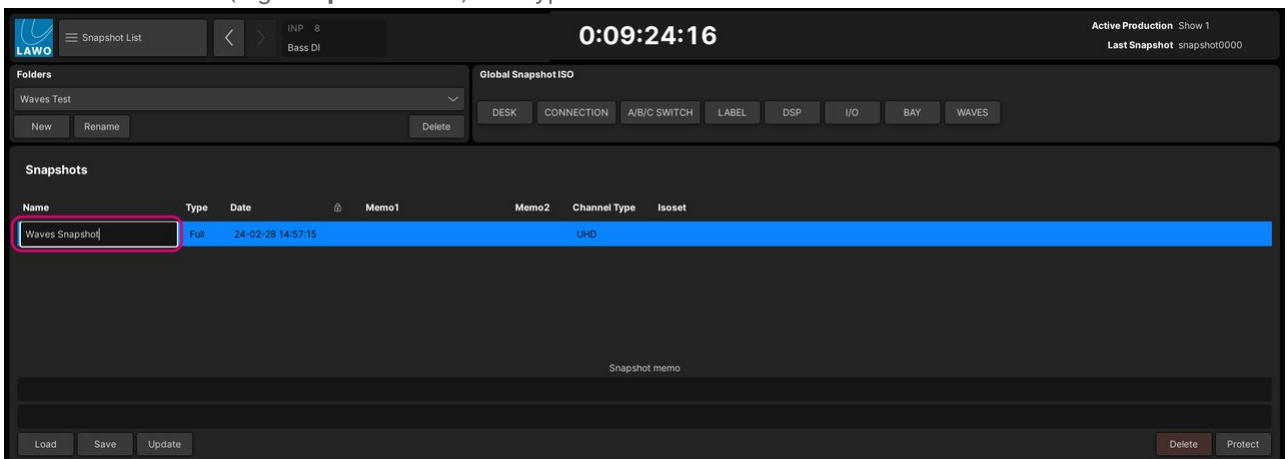
1. On the console's Central GUI, open the **Snapshot List** display.
2. Under "Folders", select **New** and then **Rename** (to create and name a new folder).



3. Select **Save** to create the first snapshot.



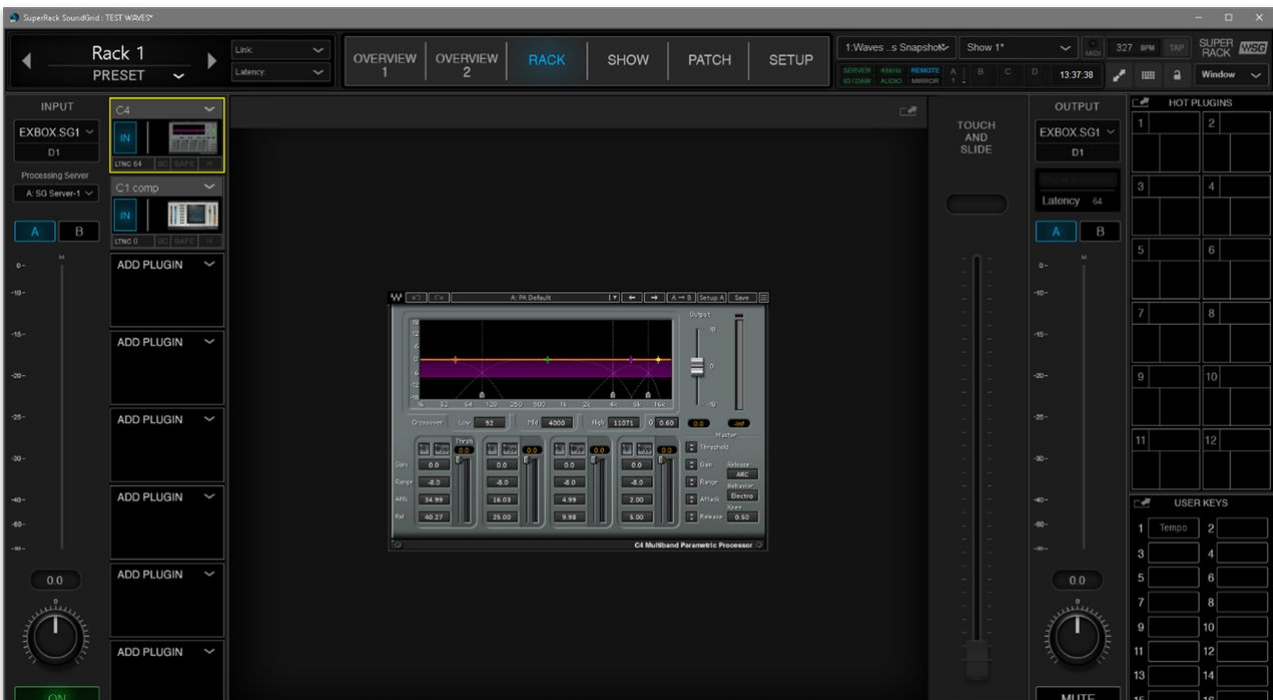
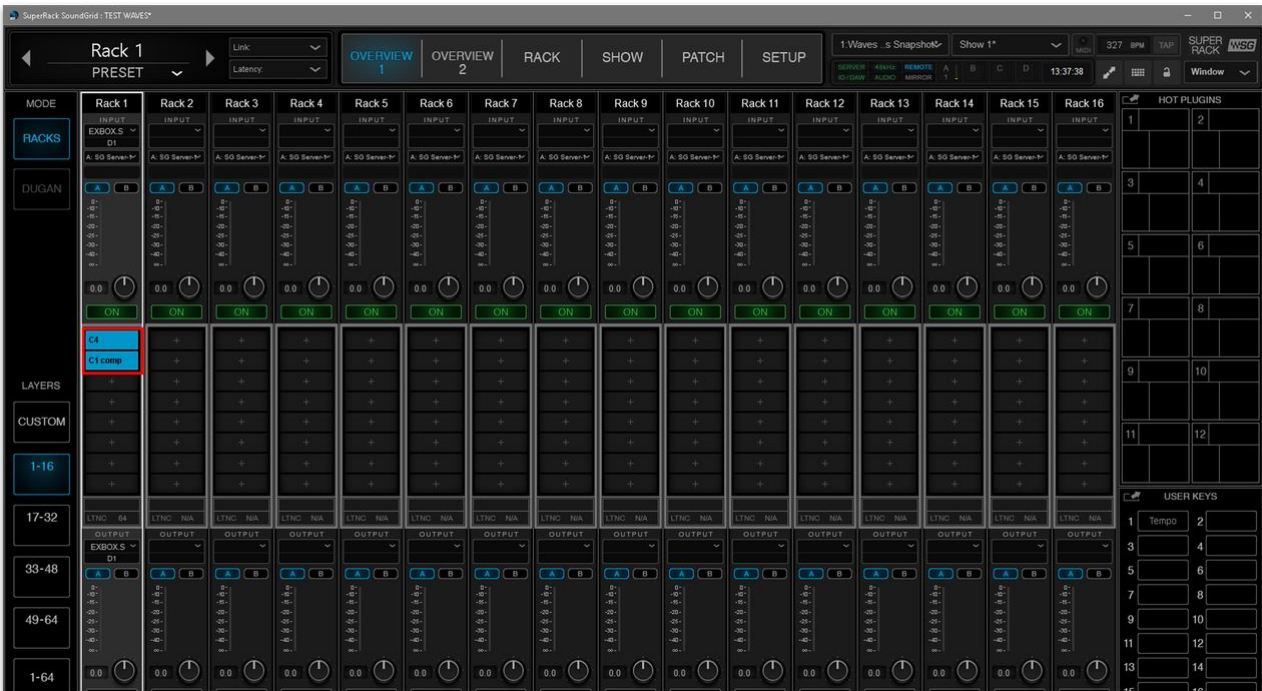
4. Click on the name field (e.g. **snapshot0000**) and type in a new name.



5. Press Enter to confirm (the new name).

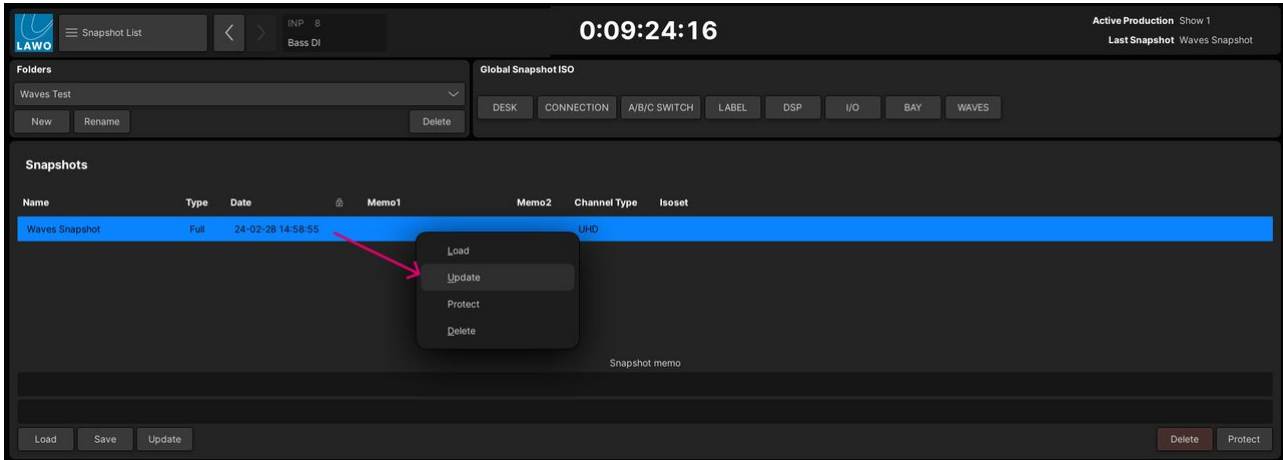
## Step 2 - Adjust the plugin parameters

Now go to the Waves SuperRack, add the plugins in the rack and edit the parameters. The screenshots below show an example.



### Step 3 - Update the snapshot and production

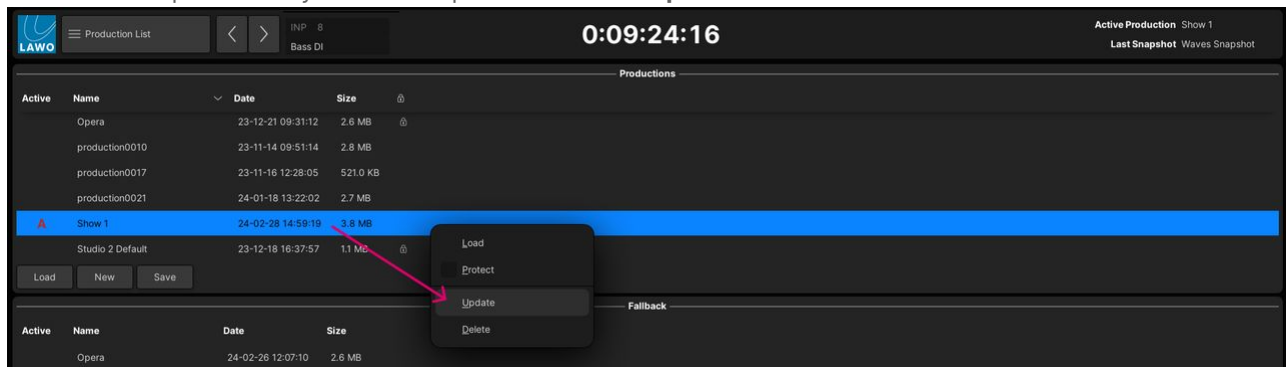
Now go back to the console's **Snapshots List**, select the snapshot (created earlier) and then choose **Update** to store your edits.



The selected snapshot is overwritten with the current settings. This includes all of the plugin parameters that are loaded to the Waves Racks.

**Important:** you must update (or save) a production after updating a snapshot.

1. On the console's Central GUI, open the **Production List** display.
2. Right-click on the production you wish to update and select **Update**.



3. You are asked to confirm by pressing **OK**.

Alternatively, you can update the active production at any time by pressing the PRODUCTION **UPDATE** button on the control surface.

All of the plugin parameters that are loaded to the Waves Racks are now saved in the snapshot (in a production). This means that they can be recalled, at any time, by a snapshot load.

## Editing Plugin Parameters

If you wish to store more than one version of the plugin parameters, then you will need to save more snapshots and then update the production (to save the new snapshots).

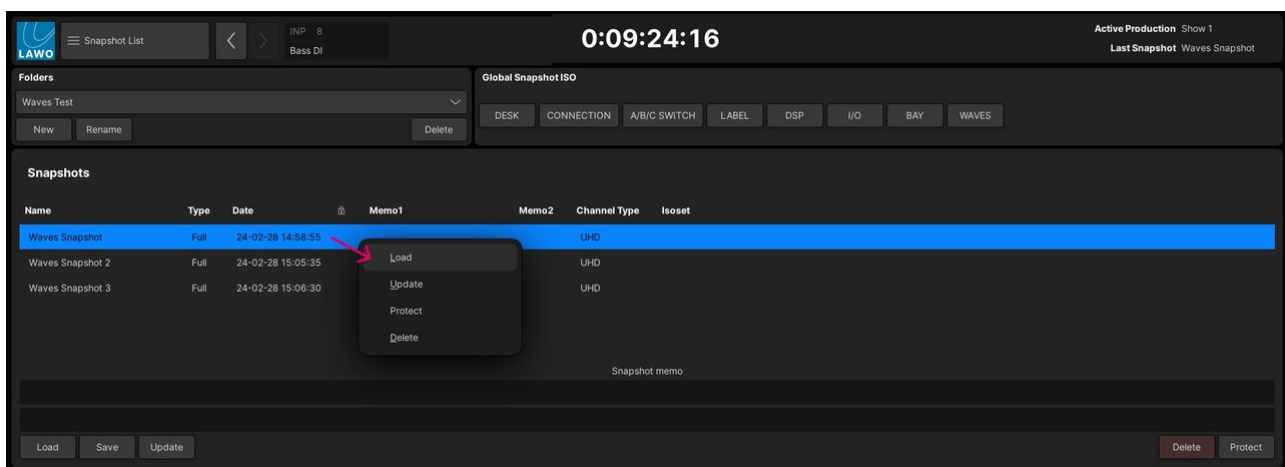
## Loading Plugin Parameters

The plugin parameters can be loaded at any time by loading a snapshot.

Note that the **WAVES** "Global Snapshot ISO" option (at the top right of the **Snapshot List** display) can be used to isolate all of the snapshot settings related to the Waves SuperRack. i.e. all of the plugin parameters.

To reset the plugin parameters:

1. Load the correct production (from the **Production List** display).
2. Open the **Snapshot List** display and choose the correct folder.
3. Check that the **WAVES** "Global Snapshot ISO" option is disabled.
4. Select the snapshot and then select **Load**.



Remember that the Waves Rack configuration is not reset by a snapshot load (as it is saved in the production/session).

## 4.4 Waves for mc<sup>2</sup> - User Button Functions

Some of the Waves SuperRack functions can be operated from the console's Central User Buttons. These can be found in the centre section of the console (as described in the topics below).

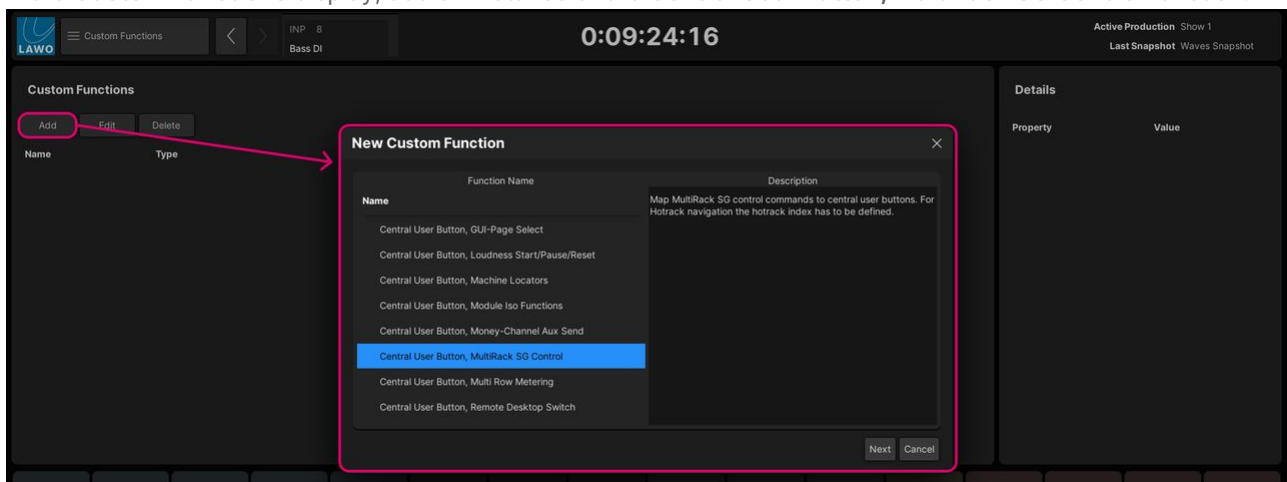
- [mc<sup>2</sup>36 - Central User Buttons](#)
- [mc<sup>2</sup>56 - Central User Buttons](#)
- [mc<sup>2</sup>96 - Central User Buttons](#)

To use this feature, you will need to create a custom function for each operation using the **Central User Button, MultiRack SG Control** function (in the [Custom Functions](#) display).

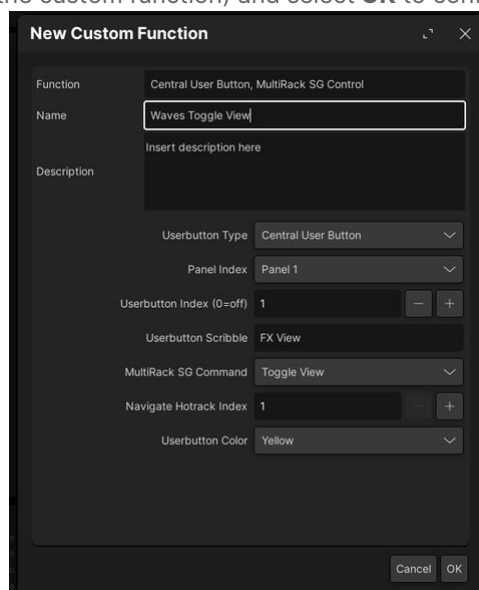
**⚠ Important:** Custom Functions are stored as part of the system configuration and not in productions. This means that any changes will affect all users.

### Programming the Central User Buttons

1. From the **Custom Functions** display, add an instance of the **Central User Button, MultiRack SG Control** function.

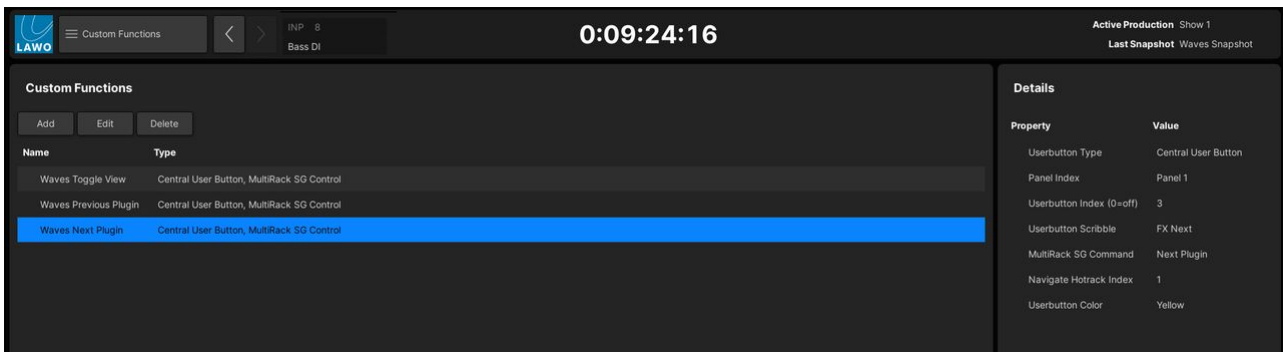


2. Configure the Central User Button you wish to use (via the **Userbutton Type**, **Panel Index** and **Userbutton Index** fields).
3. Then assign a function (using the **MultiRack SG Command** field). The available options are described below.
4. Optionally, you can edit the **Userbutton Scribble** and **Userbutton Color** fields.
5. Remember to enter a **Name** (to name the custom function) and select **OK** to confirm.



6. Repeat for each user button/function. An example configuration is shown below.





## Waves SuperRack - Supported Functions

Please note that, in the current release, not all of the functions in the **MultiRack SG Command** list work as expected. This is due to an outdated Waves API driver.

The following functions are working correctly:

- **Previous Plugin** and **Next Plugin** - within the selected Rack, scroll left and right through the inserted Plugins (in any view).
- **Toggle View** - switches the SuperRack operating window between Main and Rack view.
- **Disable Access Link**.

The following functions do NOT work as expected:

- **Previous Rack** and **Next Rack** - scroll through the available Racks (in any view). These functions are working in reverse.
- **Navigate Hot Rack** - this function carries an index which can represent any Rack number. When the button is pressed, the corresponding Rack is opened. This function is not working correctly.
- **Tap Tempo** - can be used to input a tempo by repeatedly pressing the user button. This function is not supported yet.

## Known Limitations

The following functions, supported by legacy systems, are not supported by the Waves SoundGrid plugin server package.

- Label transfer for Waves plugins.
- Rack-follows-Console-Channel-Select.



## 5 Waves for mc<sup>2</sup> - Additional Information

This chapter provides additional information that you may find helpful.

- [Waves for mc<sup>2</sup> - License Transfer](#)
- [Waves for mc<sup>2</sup> - Plugins Installation](#)
- [Waves for mc<sup>2</sup> - Offline Setup of Axis Scope PC](#)

## 5.1 Waves for mc<sup>2</sup> - License Transfer

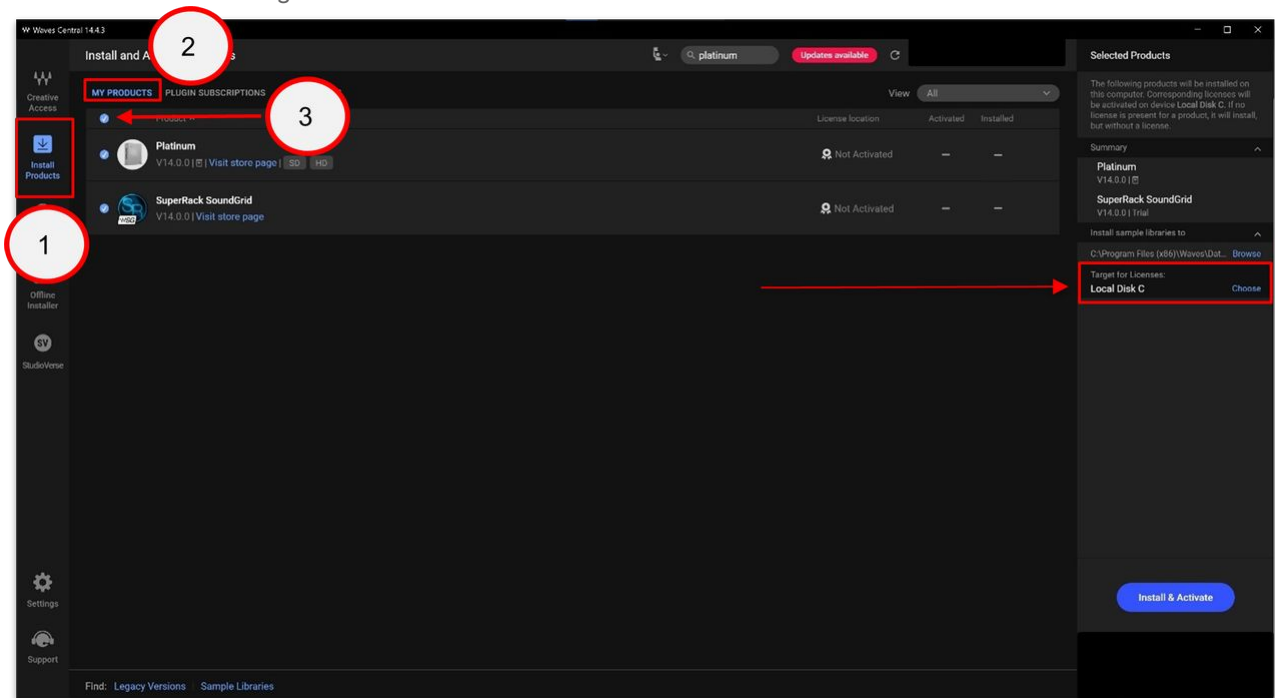
This topic describes how to transfer the Waves licenses to a different PC.

There are two possible methods: transfer from Waves Central OR from the local hard drive. In both cases, the licenses are transferred to a USB key.

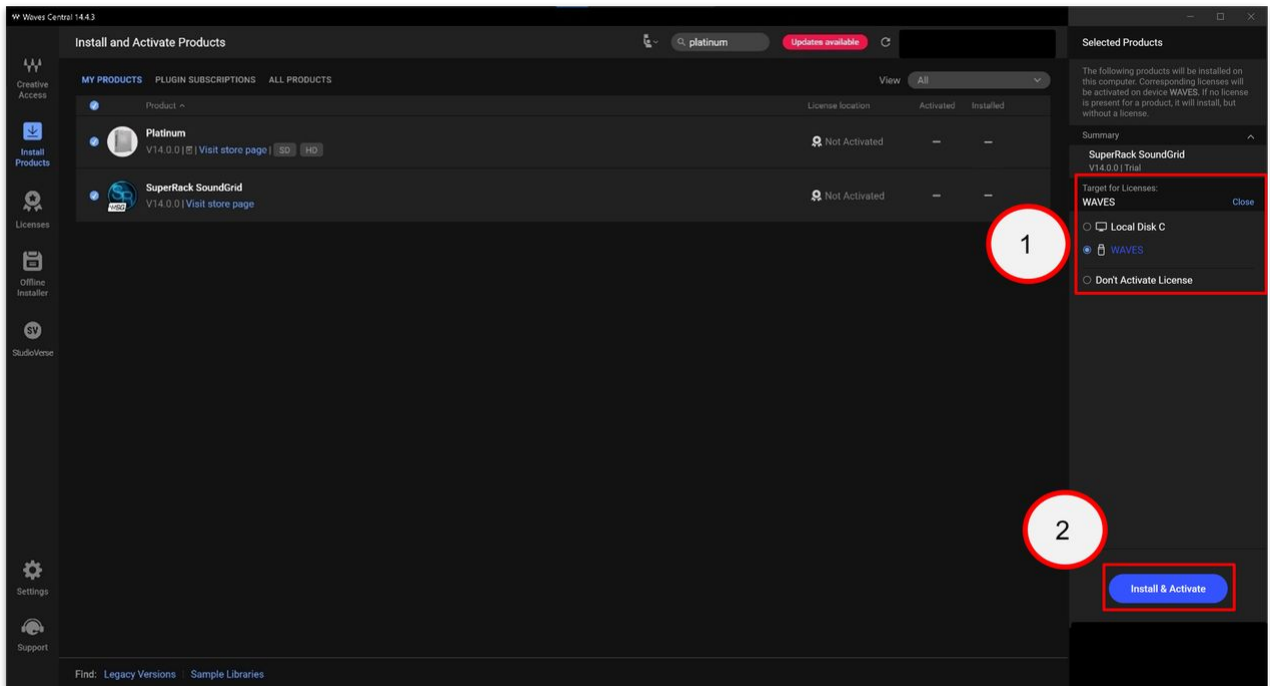
### Transfer licenses from Waves Central to USB Key

**Please note:** If the Waves products are not already installed, then this procedure installs them onto the target PC.

- Open Waves Central and go to **"Install Products"**.
- Select **"MY PRODUCTS"**.
- Select all of the products.
- Select **"Choose"** under "Target for Licences".



- Select your USB key .
- Select **"Install & Activate"**.



- Waves Central now installs the Waves products onto the target PC and activates the licences in the USB key.
- If new products are installed, you will need to restart the PC.
- Check that the licences are transferred to the USB key in the **"Licences"** menu.

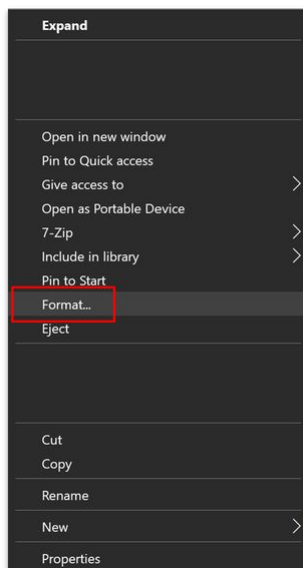
For more information, please see the Waves support at: <https://www.waves.com/support/install-activate-products-on-offline-computers>

### Move licenses from Local Hard Drive to USB Key

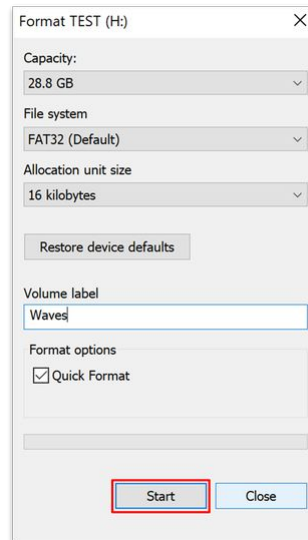
- Connect a suitable USB key to the Waves Axis Scope PC.
- Open Windows Explorer by pressing the Windows Key + E.



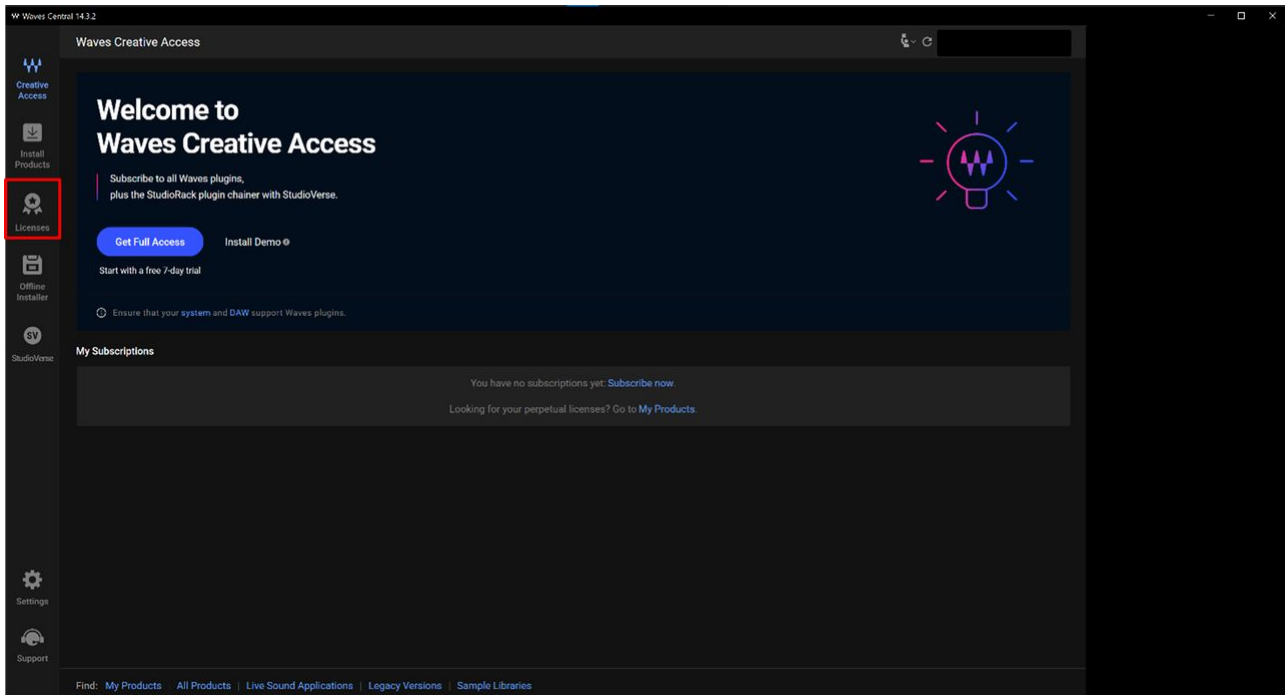
- Select the USB key.
- Right click and select **"Format"**.



- Insert a name of your choice for **"Volume label"** and click on **"Start"**.  
**Please note:** The USB key can also be formatted in Ex-Fat.

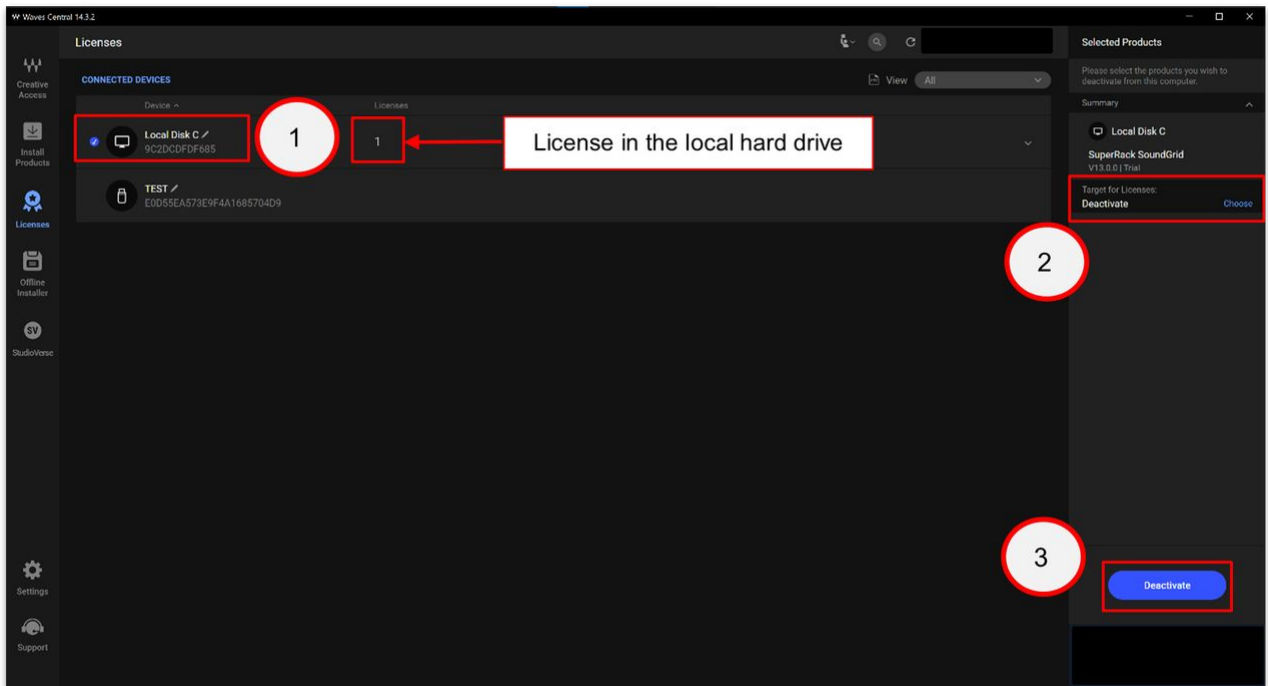


- Once the formatting is finished, click on "**Close**".
- Start Waves Central and click on "**Licences**".

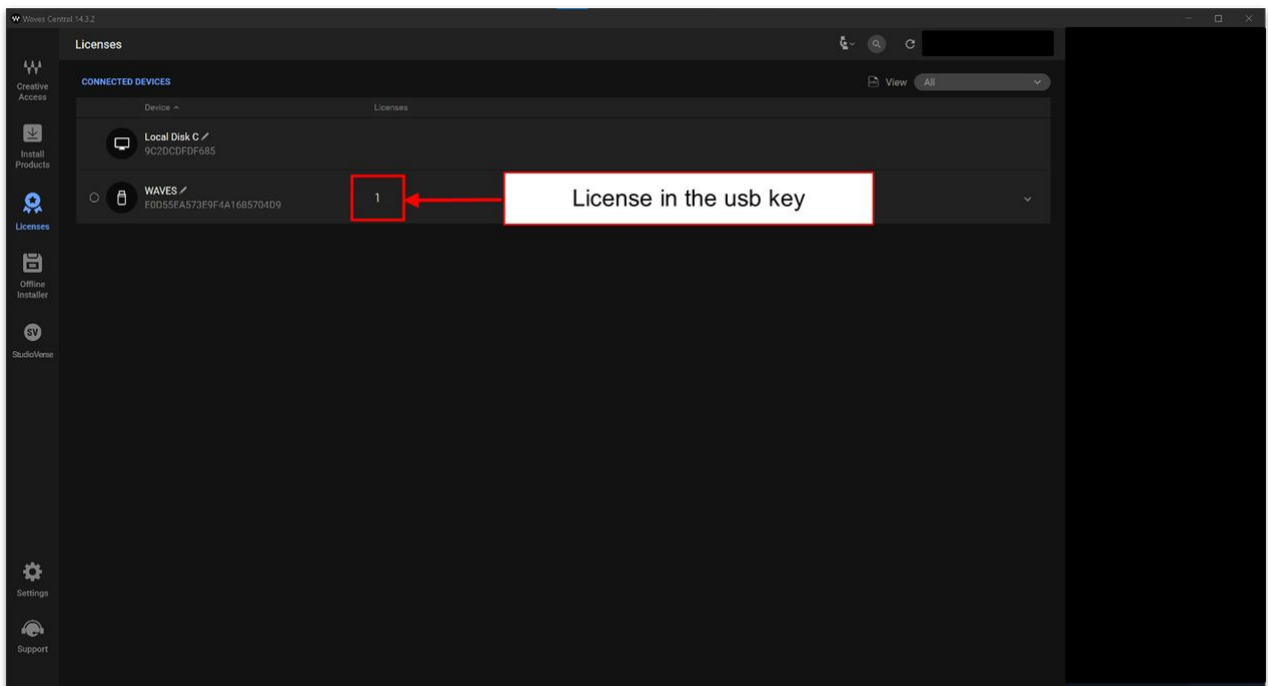


In this example, only one license is present in Waves Central.

- Under "**CONNECTED DEVICES**", select "**Local Disk C**".
- Click on "**Choose**".
- Click on "**Deactivate**".



- Select your USB key and click on "**Activate**".
- Waves Central now moves all of the licenses onto the USB key
- Check that the licences are transferred to the USB key in the "**Licences**" menu.



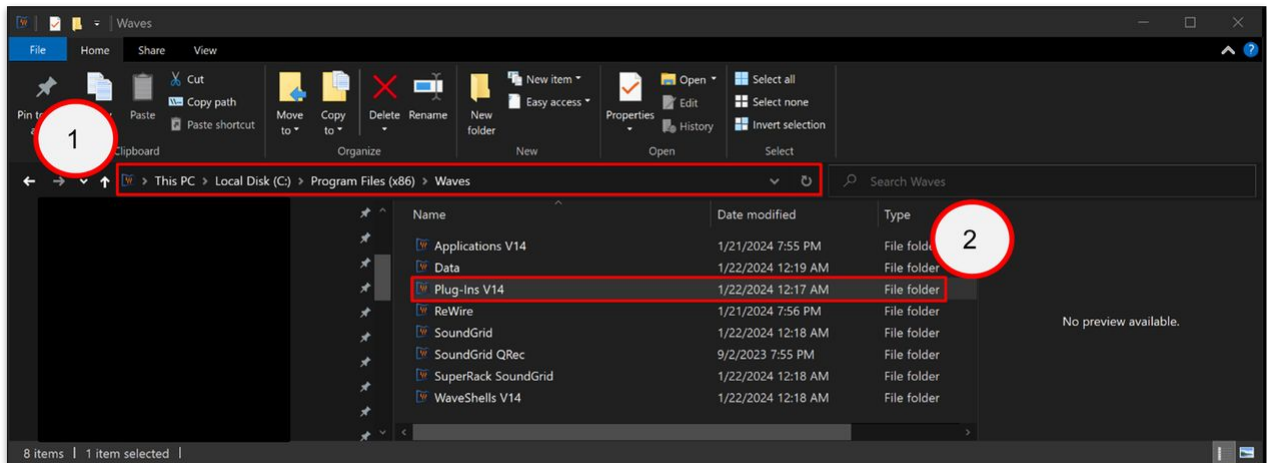
## 5.2 Waves for mc<sup>2</sup> - Plugins Installation

This topic describes how to uninstall and install the Waves plugins bundle. You will need to do this if you wish to use a different plugins bundle.

### Uninstall the Plugins

Please complete the steps below to uninstall the current plugins bundle.

- Go to "**C:\Program Files (x86)\Waves**".
- Select the folder for the plugins installation (e.g. "**Plug-Ins V14**" for the V14 bundle).
- Delete the folder.

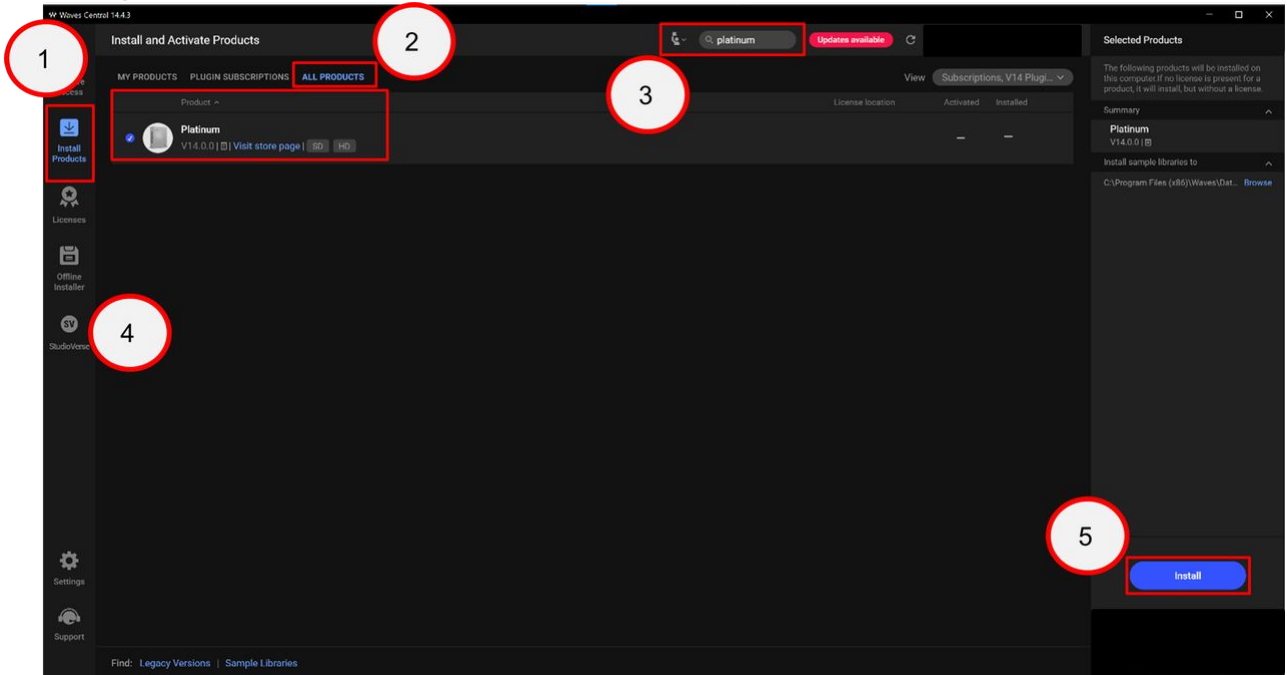


**Please note:** the same method can be used to uninstall a specific plugin. In this case, open the plugins folder and delete the plugin.

## Install the Plugins

Please complete the steps below to install the new plugins bundle.

- Open Waves Central.
- Go to **"Install Products"**.
- Go to **"ALL PRODUCTS"**.
- Use the search bar to find the plugins bundle you wish to install. Type in the name.
- Select the plugins and click on **"Install"**.





### 5.3 Waves for mc<sup>2</sup> - Offline Setup of Axis Scope PC

This topic describes how to setup the Waves host PC if it does not have an internet connection.

Before you start, please read the **Important Notices** in [Waves for mc<sup>2</sup> - Prerequisites](#) and prepare the software as follows:

- **Waves Central** - download and install on a computer with an internet connection.
- **DirectOut GlobCon** - copy to a USB key or transfer through Windows Remote Desktop.
- **TightVNC** - copy to a USB key or transfer through Windows Remote Desktop.

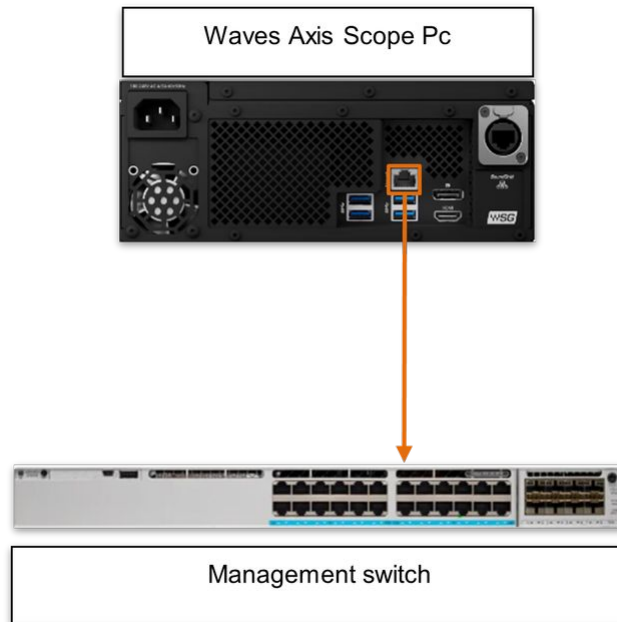
To complete the setup, there are four steps.

1. Configure the Management IP.
2. Configure the user password, disable the firewall and enable Windows Remote Desktop.
3. Create a Waves offline package installer.
4. Install the Waves products (using the offline installer).

#### Step 1: Configure the Management IP

The instructions below assume that you are on-site. If not, you will need the support of an on-site technician and remote computer (aka jump PC).

- Connect the management Ethernet interface of the Waves Axis Scope PC to the Management network switch.

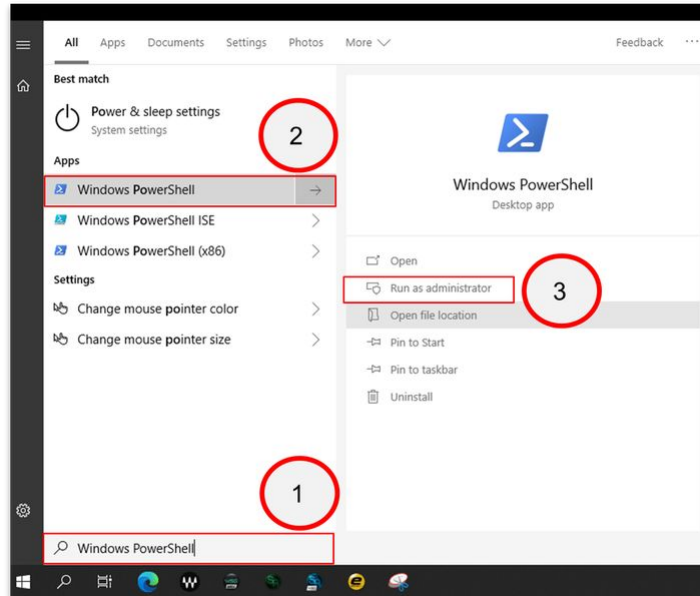


- Configure a static IP address for the Waves Axis Scope PC (as described in [Waves for mc<sup>2</sup> - Management IP Setup](#)).

## Step 2: Configure the password, firewall and Windows Remote Desktop

The next step is to define the AXIS user password, disable the firewall and enable Windows Remote Desktop.

1. Go to Windows start menu.
2. Using the search bar, enter "Windows PowerShell".
3. Select "Run as administrator".



4. Copy and paste the following commands into the Windows PowerShell terminal.

```
1 net user AXIS AXIS
2 Set-LocalUser -name "AXIS" -PasswordNeverExpires 1
3 netsh advfirewall set allprofiles state off
4 Set-ItemProperty -Path "HKLM:\System\CurrentControlSet\Control\Terminal Server"
   -name "fDenyTSConnections" -value 0
```

These commands set the password "AXIS" for the default user AXIS, set the password to not expire, disable the windows firewall and enable the Windows Remote Desktop

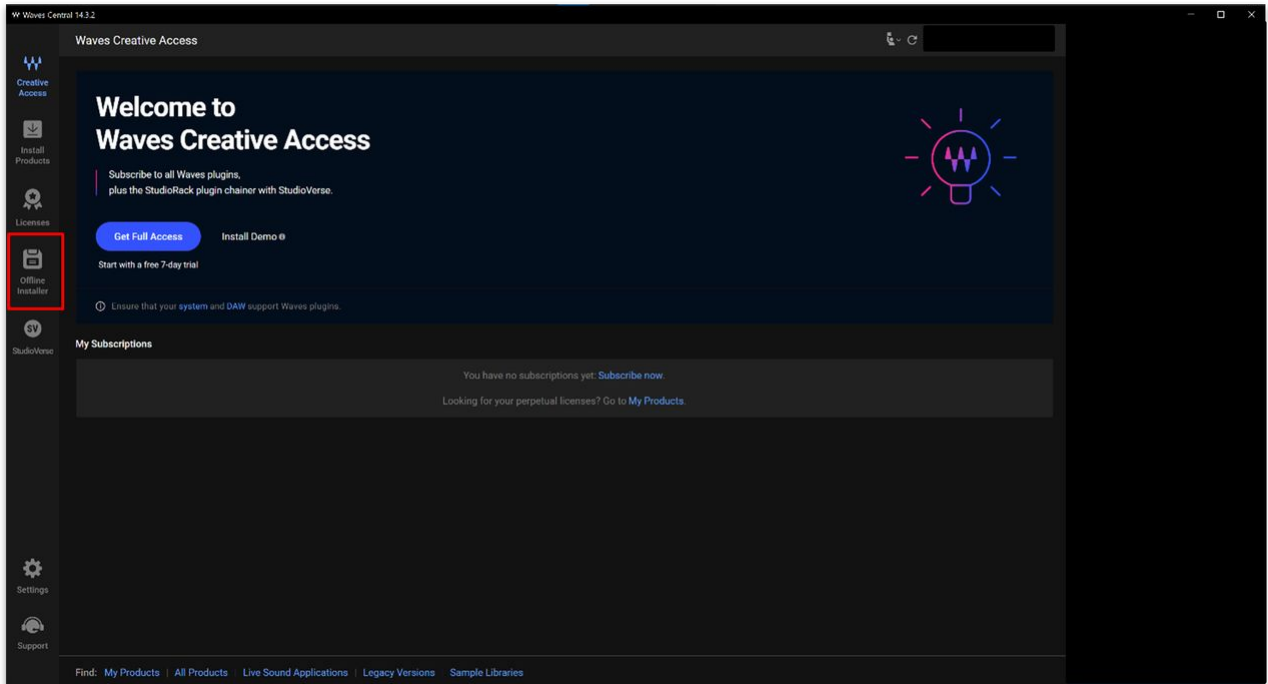
If you wish to connect to the Waves Axis Scope PC, using a Windows Remote Desktop connection, please follow the steps in [Waves for mc<sup>2</sup> - Prerequisites](#).

### Step 3: Create a Waves offline package installer

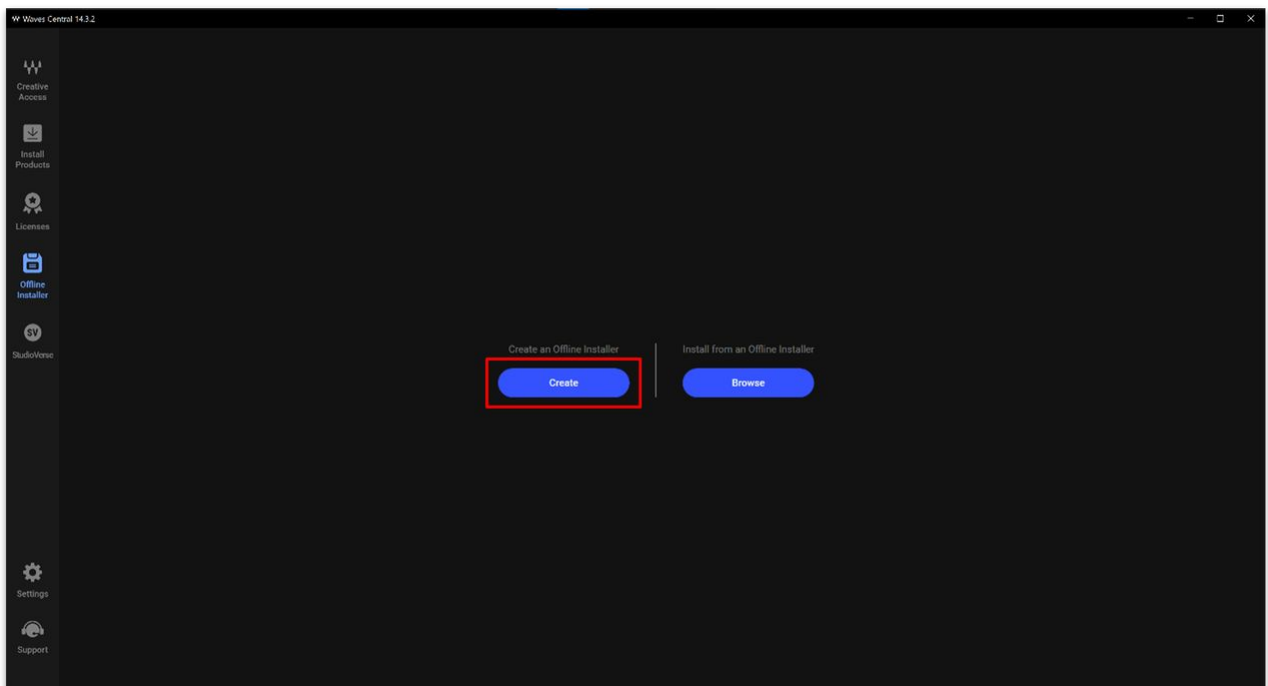
The next step is to create a Waves products installer package that can be used offline.

To do this you will need a computer with an internet connection.

- Start Waves Central.
- Log in to your Waves account (as described [here](#)).
- Register the Waves products (as described [here](#)).
- Transfer the licenses onto a USB Key. For help, please see Waves support at: <https://www.waves.com/support/install-activate-products-on-offline-computers>
- Go to "**Offline Installer**".

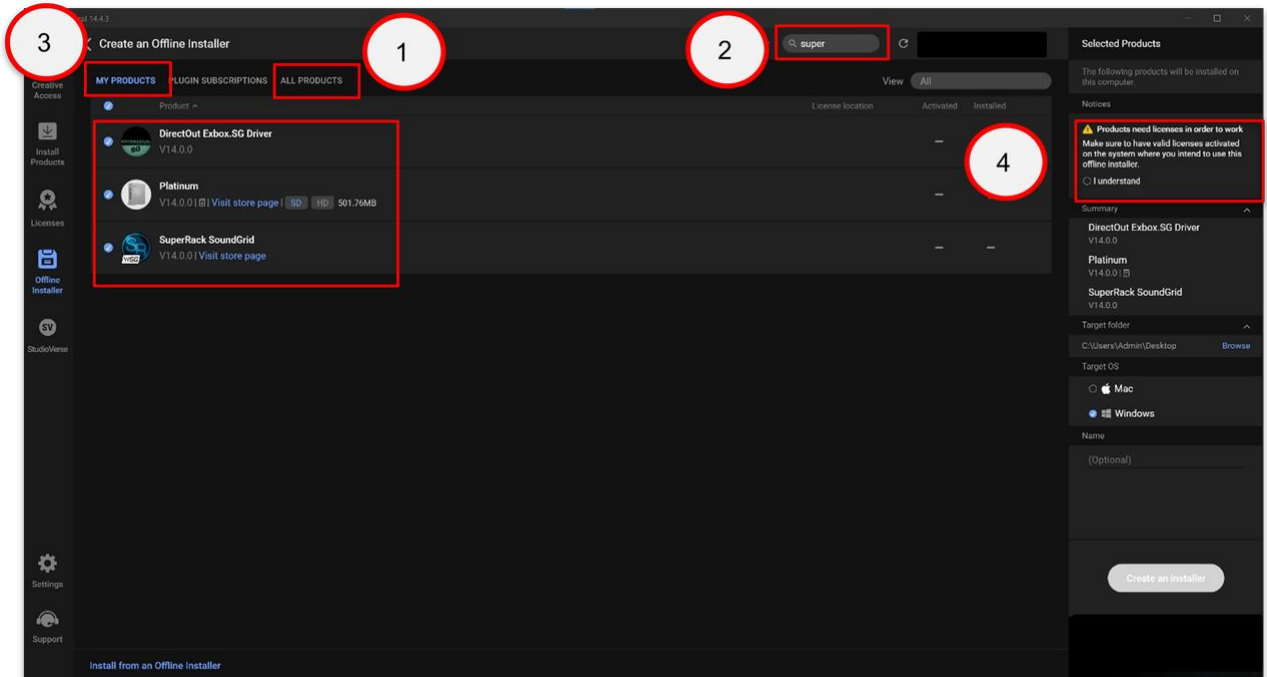


- Click on "**Create**".

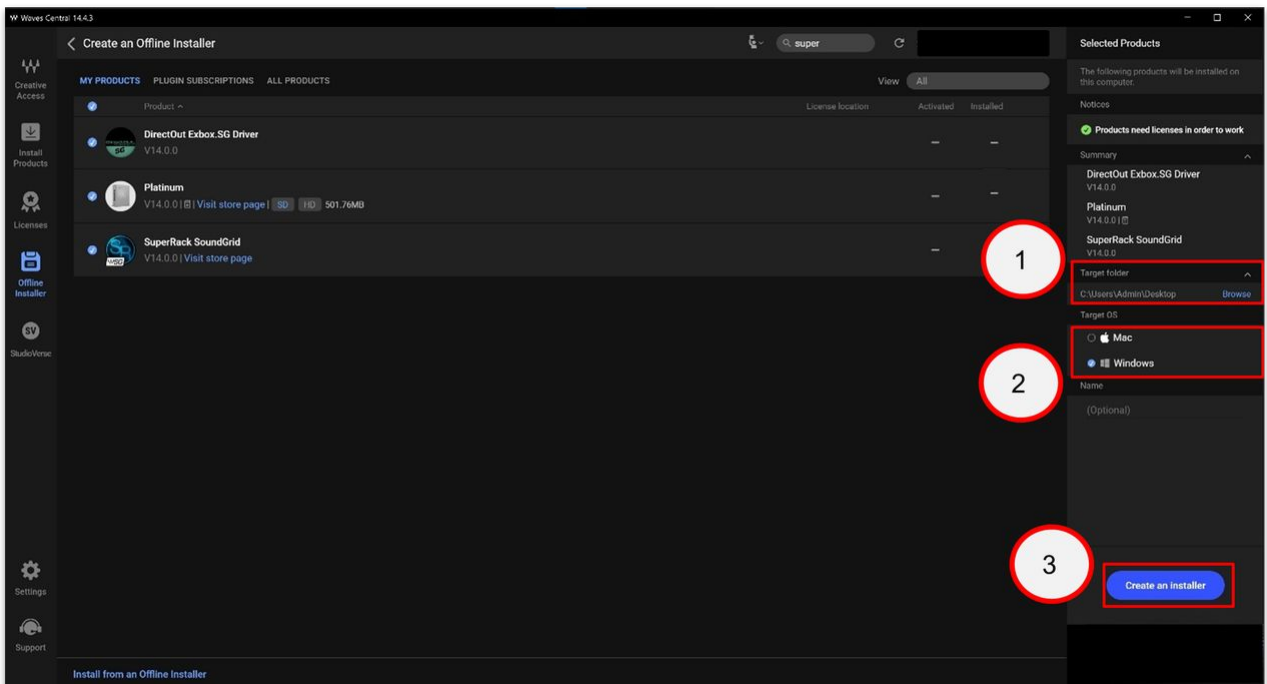


- You are redirected to "**Install Products**" page.
  - Select "**ALL PRODUCTS**".

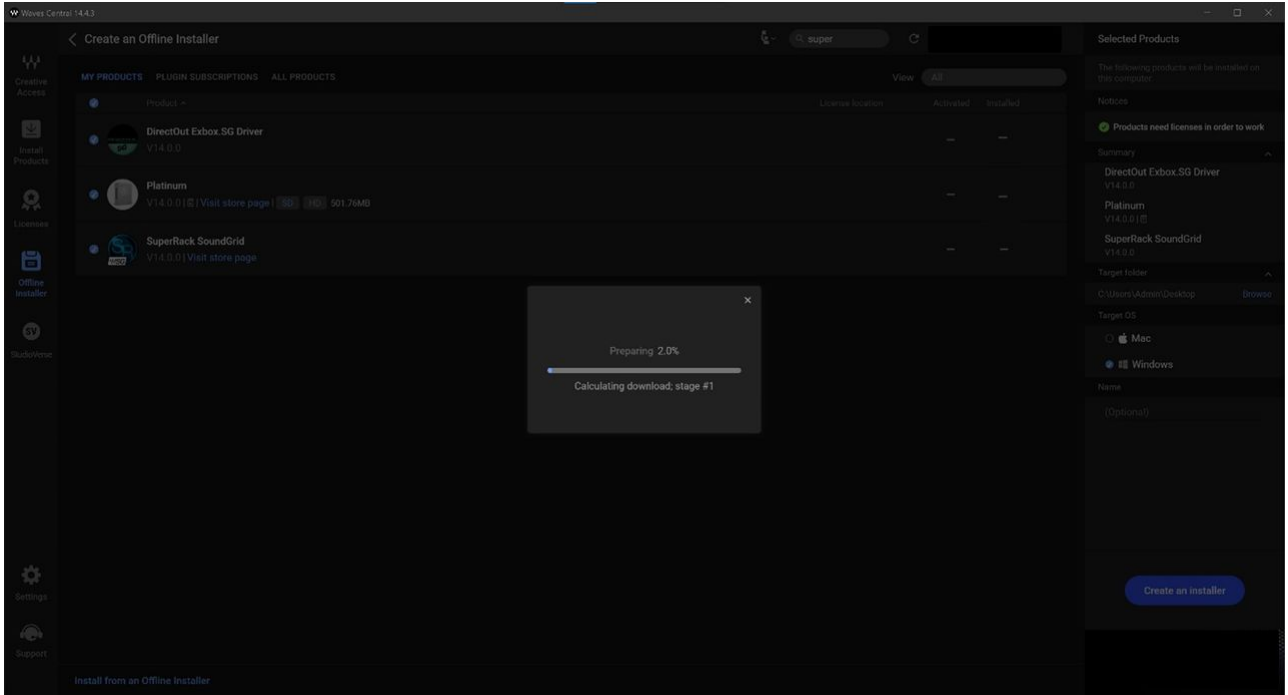
- Type in the search bar: **DirectOut EXBOX.SG driver** and select it.
- Select **"MY PRODUCTS"**
- Click on **"I understand"**.



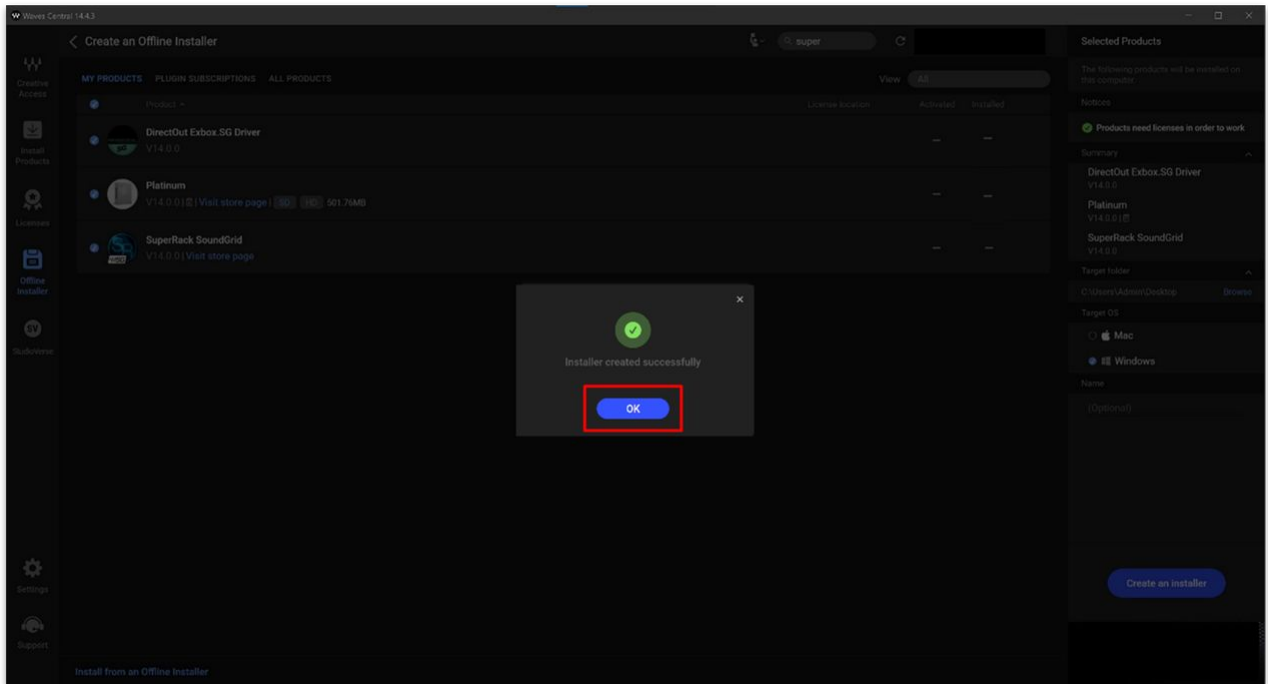
- Select as target OS Windows.
- Select the target folder. (The default folder location is the desktop).
- Click on **"Create an installer"**.



- Waves Central now creates the installer package.



- Once the package is created, you will see this message. Click on "OK".



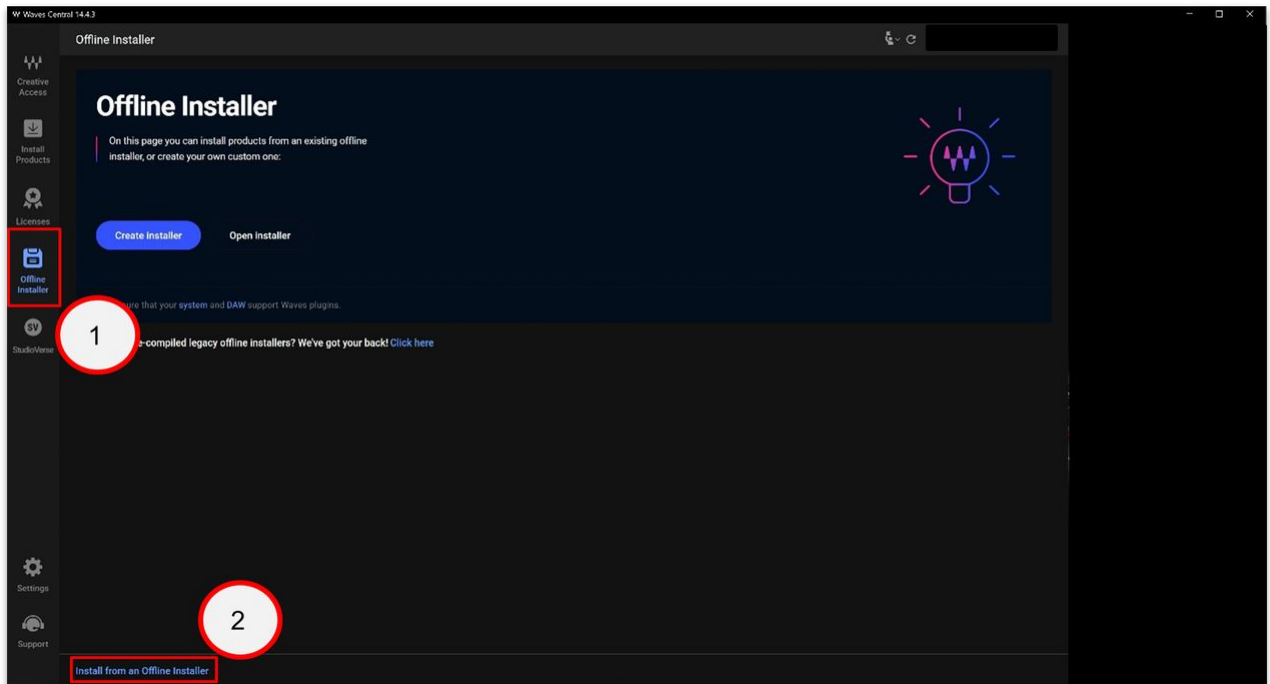
The installer package is created in a folder called "Waves" in the target folder location..



## Step 4: Install the Waves products

The final step is to install the Waves products (on the Axis Scope PC).

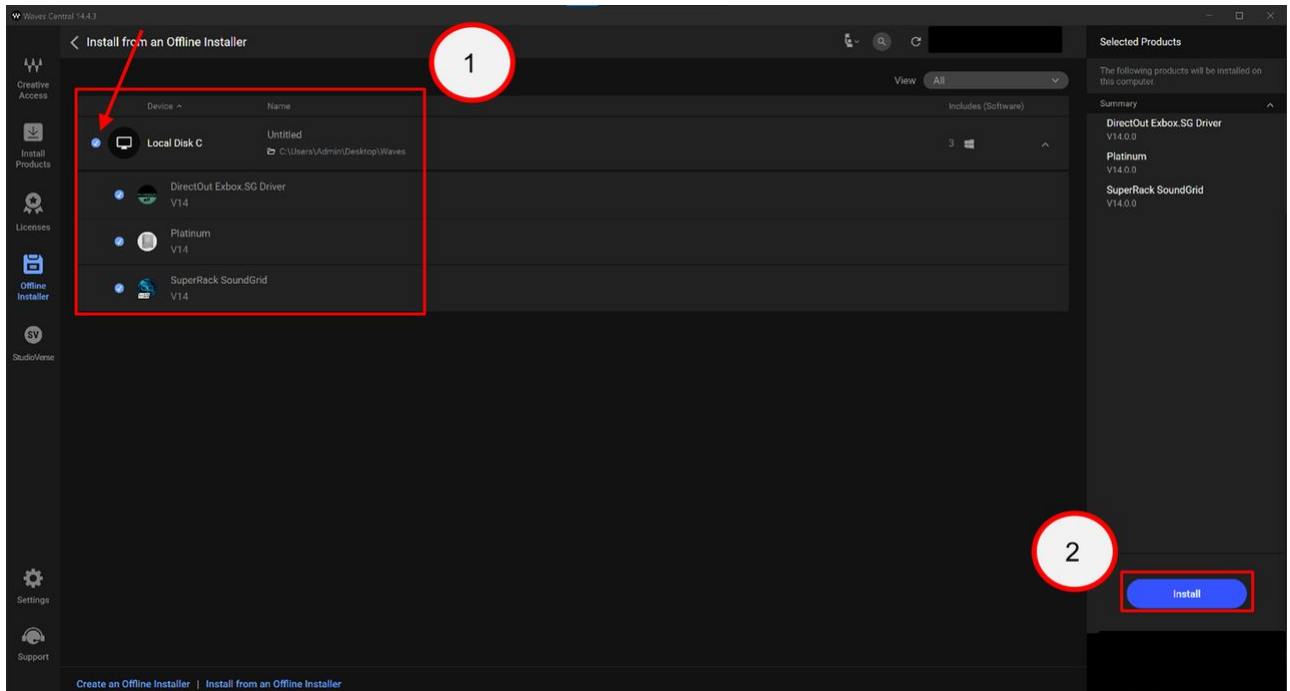
- Copy the "Waves" folder from your computer to a USB key.
- Insert the USB key into the Waves Axis Scope PC and copy the "Waves" folder to the desktop.
- Start Waves Central (on the Waves Axis Scope PC).
  - Click on "**Offline installer**".
  - Click on "**Install from an Offline Installer**".



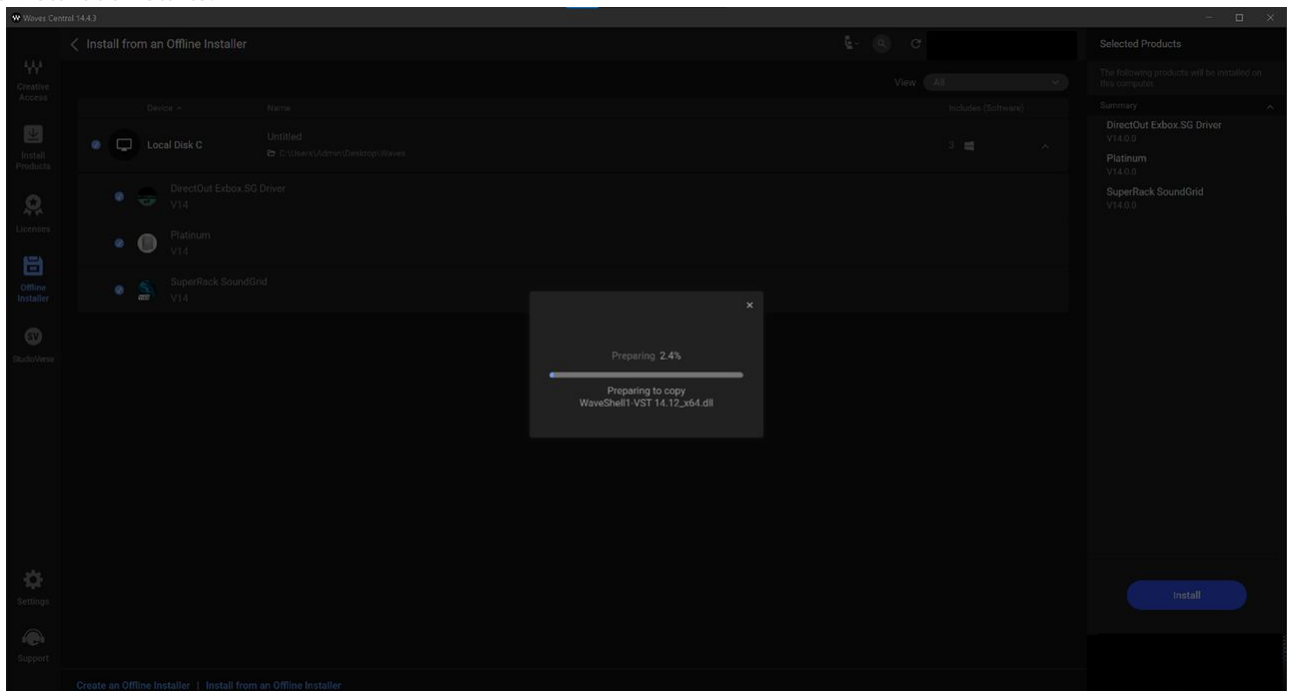
- A box dialog opens. Select the "Waves" folder (copied to the desktop) and click on "**Select Folder**".



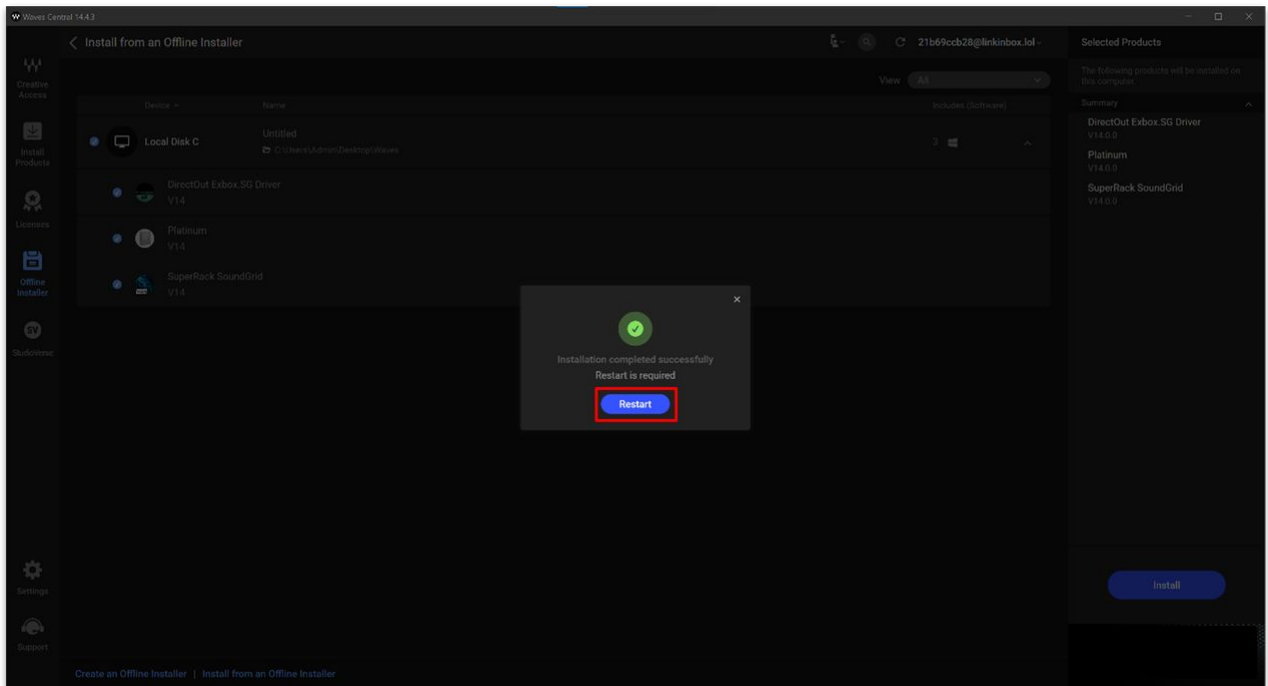
- Select all of the package and click on "**Install**".



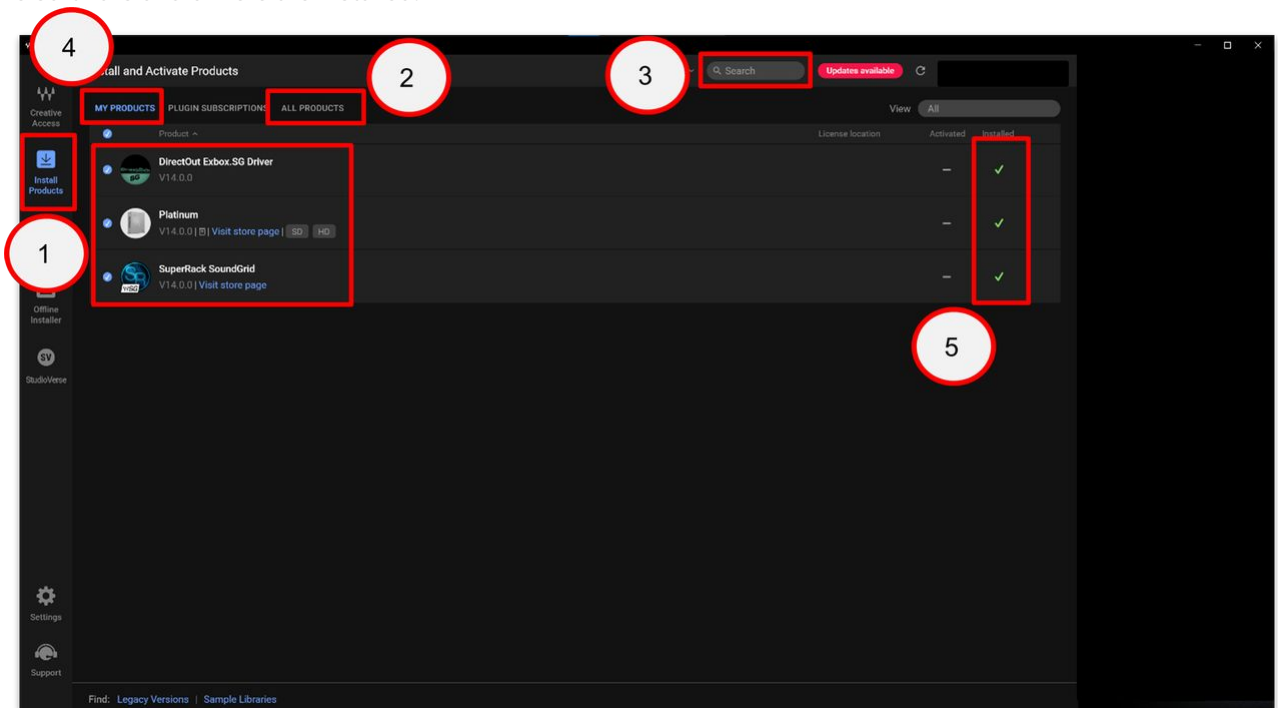
- The installation starts.



- Following a successful installation, you will see this message. Click on "**Restart**" to restart the PC.



- After the restart, open Waves Central.
  - Click on "Install Products".
  - Click on "ALL PRODUCTS".
  - Type in search bar: **DirectOut EXBOX.SG driver** and select it.
  - Click on "MY PRODUCTS".
  - The software and drivers are installed.



- To activate the software, insert the USB key with the licenses that you transferred earlier.

The Waves products are now active, and you can continue with the setup by installing GlobCon (as described [here](#)).





## 6 Waves for mc<sup>2</sup> - Useful Links

For more information about the third-party devices and software, please follow the links below.

- **Waves Axis Scope quick start guide**

Link: <https://assets.wavescdn.com/pdf/hardware/axis-scope-and-proton-quick-start.pdf>

- **Waves Axis Scope support notes**

Link: <https://www.waves.com/support/waves-computers-support-notes>

- **Waves SoundGrid servers quick start guide**

Link: <https://assets.wavescdn.com/pdf/soundgrid/soundgrid-servers-quick-start.pdf>

- **Waves SuperRack guide**

Link: <https://assets.wavescdn.com/pdf/live/superrack-v3.pdf>

- **Waves support topics**

Link: <https://www.waves.com/support>

- **Waves transfer licence ownership to another account**

Link: <https://www.waves.com/support/transfer-of-ownership>

- **Waves Central errors and troubleshooting**

Link: <https://www.waves.com/support/waves-central-errors-and-troubleshooting>

- **DirectOut EXBOX.SG user manual**

Link: <https://www.directout.eu/download/operating-instructions7/?wpdmdl=7348&refresh=6506cd071a4b01694944519>

- **EoptoLink EOLS-1303-2M user manual**

Link: <https://www.eoptolink.com/pdf/EOLS-1303-2M.pdf>