

A__UHD Core

Installation & Service Guide

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1. Introduction

About this Manual

This document describes the hardware, installation and service procedures of the A__UHD Core.

Look out for the following which indicate:

Notes - points of clarification.

Tips - useful tips and short cuts.

Attention - alert you when an action should *always* be observed.

Further Information

Mechanical drawings and data sheets (including weights and dimensions) are available from the **Downloads** area at www.lawo.com (after **Login**).

We also recommend that you carefully observe the release notes delivered with your system.

Lawo User Registration

For access to the **Downloads** area and to receive regular product updates, please register at:

www.lawo.com/registration.

2. Important Safety Instructions

Please observe all of the instructions provided in the "General Safety Information for Lawo Equipment" booklet delivered with your devices. Double-click [here](#) to open the same information (as a pdf).

Please also observe the "Safety Information" included in the product data sheets. These are available from the **Downloads** area at www.lawo.com (after **Login**).

3. The Hardware

This chapter describes the A__UHD Core hardware.

3.1 Overview



The **A__UHD Core** is an IP-based processing core.

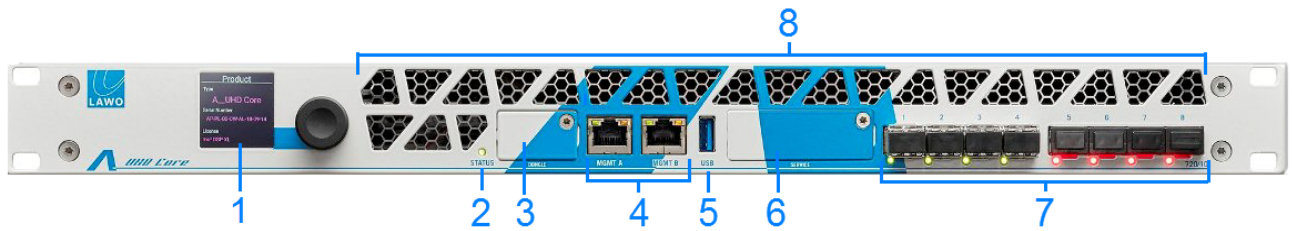
Each A__UHD Core supports up to 1024 processing channels. These can be dedicated to a single console or shared between up to four systems. The amount of resource available, and whether sharing is possible, is determined by the A__UHD Core license. A second device can be installed to provide DSP redundancy.

The A__UHD Core streaming connections are established using RAVENNA. The streams are fully compatible with the SMPTE ST2110-30/31, AES67 and RAVENNA standards. Redundant streaming can be configured via SMPTE ST2022-7 Seamless Protection Switching.

The A__UHD Core is designed for 1RU, 19" rack-mounting. The device is fitted with dual-redundant power supplies.

3.2 Controls, Connectors & Indicators

3.2.1 Front View



1 SYSTEM Display

The display shows the Management A IP address. In the current release, the rotary control has no function.

2 STATUS LED

This LED indicates the health of the device. If the LED is blinking at regular intervals, then the device is working properly.

3 DONGLE

Use this port to connect the USB memory stick containing your system's WIBU license. The port is protected by a cover plate to prevent accidental removal of the dongle. To remove the cover, you will need a T10 star tool.

4 MGMT A & B - Management Network

The two Management Network ports provide a connection to the device's control system (for administration and control).

5 USB

The USB port can be used for service procedures

6 SERVICE panel

This area is protected by a cover plate. To remove the cover, you will need a T10 star tool. Once removed, you will find the following ports/buttons:

- USB-A and Display Port - for a local KVM connection.
- USB-B - for debugging.
- RESET button - press to perform a warm start.

A warm start will reboot the device. Do *NOT* perform a warm start while live on air!

7 IO 1 to 8 (via SFP) - Media Network

The eight 10/1 GbE network IO ports stream audio to and from an IP network.

The streams are fully compatible with the SMPTE ST2110-30/31, AES67 and RAVENNA standards. To achieve redundant streaming compatible with [SMPTE ST2022-7](#), you must connect odd/even port pairs to discrete network paths. The Media Network *must* be properly managed and configured.

The LED beside each port indicates the status of the network connection: green, flashing = link up + network traffic; green, static = link up, no traffic; off = link down.

8 Ventilation Holes

Internally, the device is fitted with slow turning, low noise fans which are temperature controlled. Ventilation holes are provided at the front and rear of the unit.

Take care that no devices or cables obstruct the flow of air and, thereby, hinder cooling.

3.2.2 Rear View



9 10101 - Serial Port

The serial port can be used for debugging.

10 WCLK IN, THRU & OUT

The wordclock ports can be used for external synchronization.

11 MAINS 1 & 2

The **MAINS 1** & **MAINS 2** connectors supply AC mains power to the frame. The sticker below the connector states the AC mains requirements.

Only one PSU is required for the system to operate; the second provides redundancy.

The **DC OK** LEDs indicate the status of each PSU: green, static = the power supply is working properly; off (unlit) = there is no power or low DC voltage (to the main circuit board).

12 CASE

The CASE grounding screw should be used to ground the frame.

4. Installation

This chapter describes how to install the hardware.

4.1 Unpacking

A__UHD Core is delivered in its own box with all included accessories. If you have ordered SFP modules then these will be delivered separately.

Please check the contents of the shipping boxes, and in the event of any transport damage, contact your local Lawo representative or email support@lawo.com.

4.2 Packing List

Included

The following items are included with each A__UHD Core:

- **2 x 2m IEC power cables (country-specific)** - to connect mains power to the frame.
- **1 x USB license dongle** (250-5998-000).
- **1 x 75 terminating resistor** (designed as BNC connector) - to terminate the Wordclock THRU port.
- **Dust caps for the SFP cages** - these will be mounted in the frame.

Note that you will need to install your A__UHD Core license onto the USB dongle before connecting it to the device. The license code for your chosen feature set can be found on the delivery note.

Optional

The following items must be ordered separately.

- **SFP modules** - for the Media Network IO ports. You must order one SFP for each port you wish to use.

4.3 Mounting the Frame



*Recessed Rack
Adapters*



A__UHD Core is designed to be mounted in a 19-inch rack. Please install supporting slide bars to hold the weight of the unit, and use the locking devices provided. For recessed rack-mounting, use standard, third-party, 1RU recessed rack adapters such as the ones shown above. When fitting the rack adapters, you must make sure that there is sufficient airflow around the device for cooling.

Connectors are located at the front and rear of the unit. Therefore, when using 19-inch racks with doors please leave enough room for the cables.

4.4 Dimensions and Weight

Width	483 mm (19")
Height	44.0 mm (1 RU)
Depth (inc PSU)	379 mm
Weight	7.4 kg

4.5 Temperature and Cooling

A__UHD Core is equipped with temperature-controlled fans for minimum noise emission. Ventilation holes are provided at the front and rear. There must be sufficient airflow around the device for cooling.

DO NOT obstruct the ventilation holes as to do so will prevent efficient cooling.

The recommended tolerances can be found in the [data sheet](#) for the A__UHD core main frame.

4.6 Mechanical Drawings

Please double-click [here](#) to open the A__UHD Core dimension drawing (pdf).

4.7 Wiring from the A__UHD Core

Front View



Rear View



The front panel provides the following connections:

- **MGMT A & B** - Management Network ports.
- **USB** - service port. This is usually left unconnected.
- **USB-A, Display Port and USB-B** (behind the service panel) - for a local KVM connection.
- **IO 1 to 8** - Media Network ports (via SFP).

The rear panel provides the following connections:

- **10101** - serial port. This is usually left unconnected.
- **WCLK IN, THRU & OUT** - external Wordclock.
- **MAINS 1 & MAINS 2** - AC mains power. Only one connection is essential for operation; the second provides redundancy.
- **CASE** - frame grounding.

The topics which follow describe the connections in more detail.

4.8 Power



The A__UHD Core is powered by dual-redundant power supplies fitted to the two "PSU slots" at the rear of the frame. To operate the device, only one of the supplies is required. When both supplies are operational, the load is shared.

The PSUs can be hot-plugged and include their own cooling fan.

4.8.1 PSU Replacement

To replace a PSU: loosen the two screws (marked by the driver icon), and then pull the unit out of the frame (using the handle provided); insert the replacement and then tighten the screws to close the frame.

4.8.2 Electrical Specification

Please refer to the A__UHD core [data sheet](#) for power consumption figures. The AC mains requirements are summarized below each **MAINS** connector.

4.8.3 Mains Connections

The two **MAINS** connectors supply AC mains power to each supply.

There is no on/off switch, and so the A__UHD Core will boot as soon as mains power is supplied.

For redundancy, it is recommended to connect both PSUs, each to a separate phase of the AC mains circuit.

The mains connectors include a locking mechanism for security. Please unlock before removing a connector. Be sure to turn the mains power off *BEFORE* connecting or disconnecting a cable.

The device *MUST* be connected to the mains using the IEC power cables supplied with the system. When running with two mains supplies, make sure that both circuits lie on the same ground potential. Otherwise, an internal bridge of two grounding wires can lead to a ground loop!

4.9 Grounding

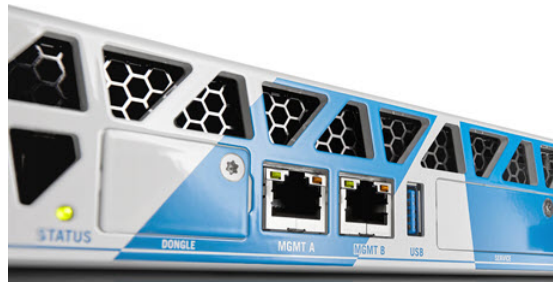
Although operator protection is guaranteed, it is best to establish an additional ground for EMC reasons. A grounding screw is provided beside the PSU 2 MAINS connector on the rear of the frame.

1. Use the M4x8 **CASE** screw to fasten the grounding cable to the housing.

The A__UHD Core must be on the same potential as all other system devices. For Scandinavian countries, ALWAYS use a grounded mains connection, to prevent the device from being grounded through Ethernet or other signal connections.

4.10 Control

Front View



The **MGMT A** and **MGMT B** ports provide a connection to the device's control system (for administration and control). Only one connection is essential for operation. A second connection can be installed to support redundancy.

Connections are made via TCP/IP Ethernet.

A single computer or device can connect directly. However, it is more common to install a network switch to create a dedicated Management Network.

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

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

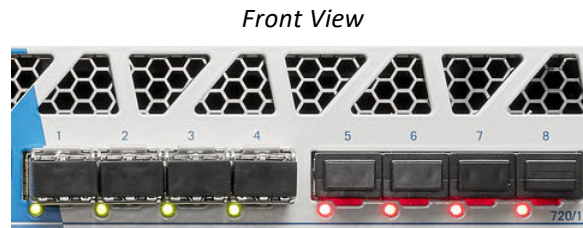
Cable Specification

Choose an Ethernet cable that meets the following specification.

- **Cable:** CAT 5 or better (CAT 5e/6/7); straight (1:1) or crossed cable*.
- **Connector:** RJ45.
- **Network Speed:** 1000, 100 or 10 Base-TX LAN. 1000 Base-TX (Gigabit Ethernet) is recommended.
- **Length:** up to 100m.

*For a direct connection, you will need a crossed network cable. When connecting to a network switch, use a straight (1:1) cable.

4.11 Media Network IO



The eight IO ports are used to stream multi-channel audio to and from the Media Network.

In an mc² installation with Nova73 (A__UHD Core Phase 1), audio is transferred between the A__UHD Core and Nova73 using RAVENNA. The streams are set up automatically according to the AdminHD configuration.

In an A__UHD Core Phase 2 installation, streams are managed dynamically, on demand by the user or the operator, using the integrated "IP Easy" facilities.

The streams are fully compatible with the SMPTE ST2110-30/31, AES67 and RAVENNA standards. To achieve redundant streaming compatible with [SMPTE ST2022-7](#), you must connect the odd/even port pairs to discrete network paths.

All connections *must* be made via the Media Network (i.e. to and from a RAVENNA-compatible network switch). This ensures that the network's PTP clock signal is available to all streaming ports.

4.11.1 Audio-over-IP Specification

Each IO port provides:

- RAVENNA: multi-channel digital audio-over-IP.
- Up to 512 bi-directional channels at 48kHz.
- Up to 128 TX and 128 RX streams.
- Redundant streaming compatible with SMPTE ST2022-7 Class C.

RAVENNA provides full SMPTE ST2110-30 and AES67 compatibility, since these protocols are a subset of the RAVENNA specification.

The Media Network *must* be properly configured and managed. i.e. it must use a suitable network architecture; all components must support multicast (as opposed to unicast); a proper Quality of Service (QoS) must be configured; and so on.

Please *DO NOT* attempt to connect the streaming ports using an unqualifying IP network, as correct operation cannot be guaranteed.

You can find more details about the data network requirements and suitable components in the [Lawo IP Networking Guide](#).

4.11.2 SFP Modules

To use an IO port, you must fit a Lawo-certified SFP module. The SFP determines the cable type, connector and maximum distance.

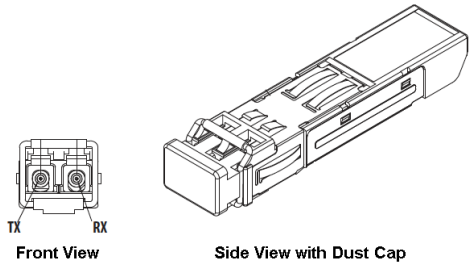
All SFPs must be Lawo-certified (as listed below). SFPs are not included and must be ordered separately. You will need one SFP for each port.

➤ **RAVENNA Interface SFP Modules**

SFP Module Description	Part Number
1000 Base-SX: 850nm, -7dBm, multi-mode fiber, 550m	981/60-10
1000 Base-LX: 1310nm, -3dBm, single-mode fiber, 10km	981/60-20
1000 Base-ZX: 1550nm, 0dBm, single-mode fiber, 80km	981/60-30
1000 Base-T: RJ45, copper, 100m	981/60-60

Installing the SFPs

The SFP modules are hot-pluggable, and so they can be fitted or exchanged while the device is powered.



1. Remove the dust caps from both the port and SFP module.

Store these carefully so that they can be replaced if a module is removed.

2. Push the SFP module into the rectangular slot.
3. Press gently and firmly until the module locks into position.

Attention: Before removal, please unlock SFP modules to avoid mechanical damage to the slots. If a module is removed, please refit the port's dust cap to protect the internal components. You *must* use the correct fiber type for your remote device. Using the wrong fiber type or exceeding the maximum optical input power can result in malfunction of, or damage to, the optical device.

4.12 External Synchronization (WCLK)

Rear View



WCLK IN can be used to connect an external wordclock sync reference.

WCLK THRU provides a "looped-through" output of the sync signal connected to WCLK IN, regardless of the system clock selection. If no further components are connected to the THRU port, then it is essential to terminate the port using a 75 Ω resistor. A terminating resistor, designed as a BNC connector, are included in the delivery.

WCLK OUT always provides an output of the current system reference: PTP, Wordclock, MADI or Internal.

4.13 Installing a Redundant Unit

A second A__UHD Core can be installed to provide redundancy. In this instance, the first device runs as master while the second device works as a slave. The system monitors the quality of the control connection to the two devices, and triggers an automatic takeover if certain factors, such as connection loss, occur.

To implement this option, you must activate and install a redundancy license on the second (slave) unit. The master should be installed with whatever license(s) are required in the normal manner.

If the master fails and you wish to reboot the system, then you must move the master's license dongle to the slave. Or, activate and install two sets of licenses on both devices.

5. Licensing

This chapter describes the licensing system.

5.1 Introduction

The A__UHD Core requires an active license. This must be installed onto the USB dongle supplied with the system, and connected to the front panel DONGLE port.

5.2 Licensing Options

There are four types of license available: fixed, temporary, redundancy and pooling. For purchasing and pricing, please contact your local Lawo representative.

MIX 256 License 256 DSP channels	+256 TMIXx License Temp. adding of DSP for x weeks	RED DSP License Enables a 2 nd unit as redundancy	POOL DSP License DSP split across multiple consoles
MIX 512 License 512 DSP channels	+512 TMIXx License Temp. adding of DSP for x weeks		
MIX 768 License 768 DSP channels	+768 TMIXx License Temp. adding of DSP for x weeks		
MIX 1024 License 1,024 DSP channels			

➤ Fixed Licenses

There are four "MIX" licenses which form the basis for the system. These resources are permanent (providing the active license is detected).

- MIX 256 License - 256 DSP channels.
- MIX 512 License - 512 DSP channels.
- MIX 768 License - 768 DSP channels.
- MIX 1024 License - 1,024 DSP channels.

➤ Temporary Licenses

The following "TMIXx" licenses can be added to upgrade the DSP resources for a fixed time period. This provides a more cost-effective way to meet the needs of a specific production.

- +256 TMIXx License - temporary adding of 256 DSP channels for x weeks.
- +512 TMIXx License - temporary adding of 512 DSP channels for x weeks.
- +768 TMIXx License - temporary adding of 768 DSP channels for x weeks.

Various time periods can be purchased. Once activated, the license expiration is calculated in hours. The options include 2 weeks (336 hours); 4 weeks (672 hours); 8 weeks (1334 hours) and 16 weeks (2688 hours).

➤ Redundancy License

The redundancy license should be installed on a second A__UHD Core if you wish to install a redundant unit.

➤ Pooling License

The DSP pooling license splits the Core's 1024 DSP channels between up to 4 consoles. The split works in a fixed manner, allocating 256 DSP channels to each console.

5.3 Conditions

Before purchasing a license, please read the following conditions:

- For DSP upgrades, only 1 additional full "MIX" license is permitted.
- For the temporary licenses, the number of channels are accumulative. For example, if a user activates a +256 TMIX license for x hours and then later activates a +256 TMIX license for y hours, the number of DSP channels available will be 512 for the overlapping period.
- The active license(s) are checked on an hourly basis. If a license has expired, then the user will see an alarm (on the Central GUI). The system will continue to operate normally until the next restart.

The status of the current license(s), including the time remaining, can be viewed from the WIBU system's [WebAdmin](#) page (described later).

5.4 License Activation

Lawo licenses are activated and managed by the CodeMeter Runtime licensing system from [WIBU systems](#).

5.4.1 Preparation

To activate a license, you will need:

- A PC with an internet connection (and USB port if using a dongle). If your PC does not have an internet connection, then the offline activation method can be used.
- The WIBU systems USB memory stick (if using a dongle).
- The license code. This can be found on the delivery note shipped with the system. It takes the form of a 25-digit ticket number such as the one shown below.

License Code Example

Ticket:
7MAMJ-8HZ95-N9VW5-3MKX6-LWUYM

Once activated, it is strongly recommended that you backup your licenses (using the **CodeMeter WebAdmin** portal). This will allow you to restore a license if the original is lost or damaged.

5.4.2 About the Dongles

All dongles are specially-configured USB memory sticks which can be purchased from either [Lawo](#) or [WIBU systems](#). The dongles supplied for hardware and software products ship with different file systems, so it is important not to mix up the dongle types. If you have purchased a dongle for a Lawo software product, then this will have a metal "LAWO logo" tag attached as shown below. Multiple software products can be licensed from a single dongle. The dongles supplied for A__UHD Core are stand-alone (with no metal tag).

USB Dongle (for Lawo software)



5.4.3 Installing CodeMeter Runtime

To activate a license, your PC must be installed with **CodeMeter Runtime** (from WIBU systems). The latest version can be downloaded from <https://www.wibu.com/support/user/downloads-user-software.html>

Run the installer and then check the installation by looking in the Windows taskbar where you should see the following icon.

CodeMeter Runtime Cm container



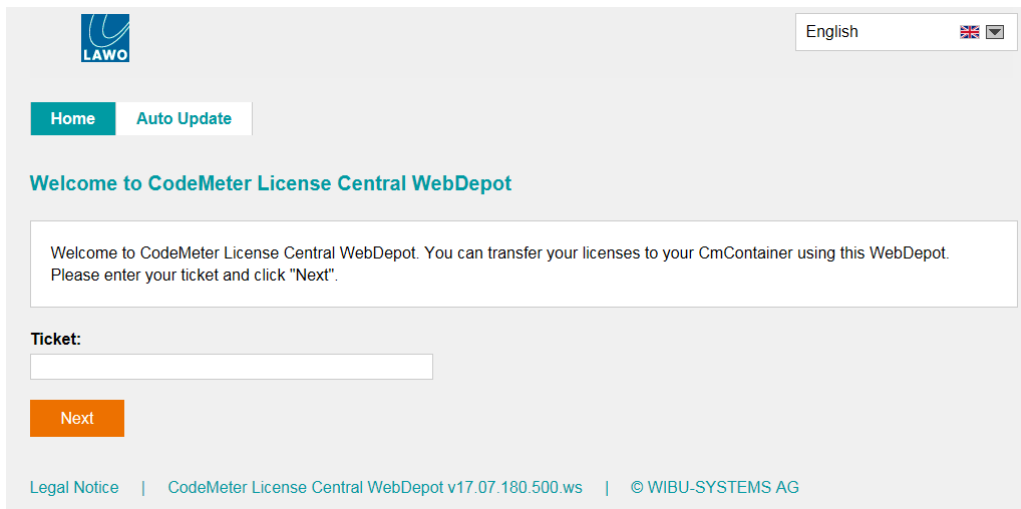
This shows that a Cm container (for local license storage) has been installed.

5.4.4 Activating a License Online

The license must be installed onto the USB dongle supplied with the system.

To use this method, your PC must have an internet connection. If installing onto a dongle, then this should be connected to the PC's USB port.

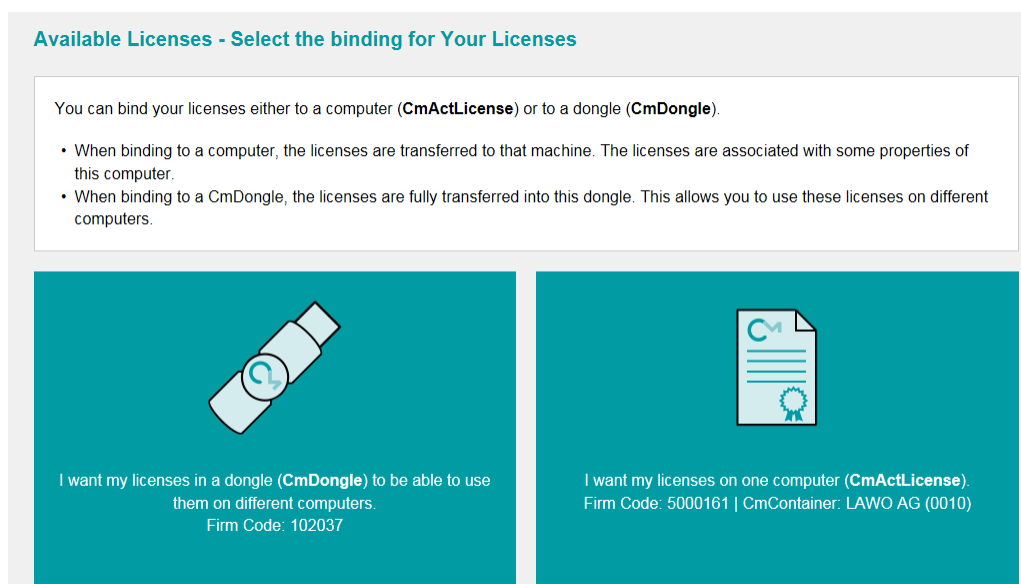
1. Open the Lawo licensing web page by copying the following URL into your web browser: <https://licenseportal.lawo.com>



If necessary you can choose a different language using the drop-down menu at the top right of the page.

2. Copy your license ticket number - this is the 25-digit number code - into the **Ticket** field and select **Next**.
3. The WebDepot searches for and displays your licenses - select **Activate Licenses** to continue.
4. At the next page, select the storage method for your license - note that this cannot be altered later.

Choose either **CmDongle** (to create a USB dongle) or **CmActLicense** (to bind the license to the local computer).



5. At the next page, select the licenses you wish to activate and the **CmContainer** to be used for the license storage.

Available Licenses

To activate your licenses:

1. Select the licenses you want to activate.
2. Select the locally connected CmContainer to which you want to transfer the licenses.
3. Click "Activate Selected Licenses Now".

<input checked="" type="checkbox"/> Name	Activated On	CmContainer	Status
<input checked="" type="checkbox"/> *Product Name* <small>(License Quantity: 1)</small>			Available

Select CmContainer

128-2311304 (LAWO AG)

Offline license transfer

[Select binding](#)

[My Licenses](#)

You can store multiple licenses in the same container. If no Cm containers are available, then you will see an option to **"Get CmContainer automatically"**.

6. Click on **Activate Selected Licenses Now** and wait for a few seconds - a confirmation pop-up appears once the activation is successful:

Online License Transfer

! **Please wait!** The selected licenses are transferred. **This process may take several minutes to complete.** Please do not remove the CmContainer during this process and do not reload this page.

Starting license transfer.
Creating license request.

Online License Transfer

Starting license transfer.
Creating license request.
Downloading license update.
Importing license update to CmContainer.
Creating receipt.
Uploading receipt.

License transfer completed successfully!

7. After selecting **OK**, a summary appears:

Home
My Licenses
Auto Update

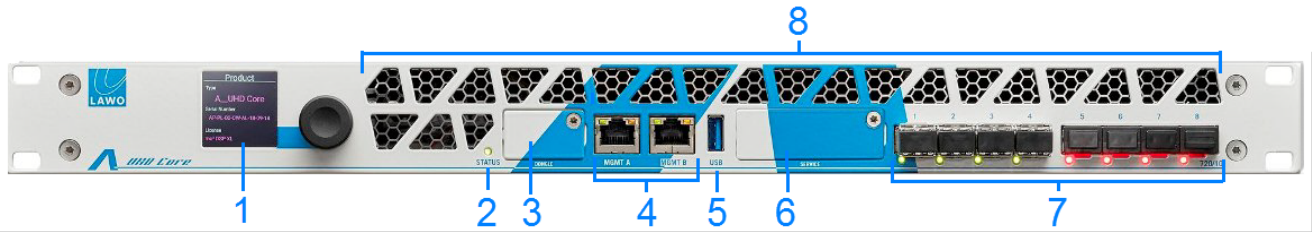
My Licenses

Name	Activated On	CmContainer	Status
Product Name <small>(License Quantity: 1)</small>	2018-07-05 18:33:51	128-2311304	Available: 0 (1)

8. You can now close the browser and return to your Lawo software application or install the USB dongle. For information on re-hosting a license, offline activation, backup/restore and using a license server, please see the [Advanced Licensing Features](#) appendix.

5.5 Installing the License Dongle

Once your license has been activated, connect the USB memory stick to the DONGLE port (3) on the A__UHD Core front panel:



The port is protected by a cover plate to prevent accidental removal of the dongle. To remove the cover, you will need a T10 star tool.

After inserting the license dongle, the device will automatically reboot and load the appropriate settings.

6. Configuration

This chapter describes how to configure the A__UHD Core.

6.1 Configuring the Network Settings on A__UHD Core

The network settings stored locally on the device can be edited by opening the A__UHD Core Web UI.

For the initial setup, you should connect your computer *directly* to the device's MGMT A port. At this stage do NOT connect the device via the network, as first you must assign the relevant ports a unique IP address.

1. Power on the device.
2. Connect your computer's LAN port directly to the MGMT A port on the front of the A__UHD Core.

Take care to connect to MGMT A (and not MGMT B or one of the Media Network IO ports).

3. Configure the network settings for your computer's LAN port. The exact steps vary depending on your OS version.

The IP address must be unique, and set within the same range as that of the port you are connecting to. The subnet masks should be identical.

The default settings for the MGMT A port are listed below.

Default Network Settings	MGMT A Interface
Connection type	Static
IP address	192.168.110.253
Netmask	255.255.255.0
Gateway	192.168.110.1

4. Test the connection by opening a web browser application and typing in the IP address for MGMT A (by default, 192.168.110.253).
5. Press ENTER - if the connection is successful, then the "Device Initial Setup" page appears.

If the initial setup has already been completed, then the "Home" page appears.

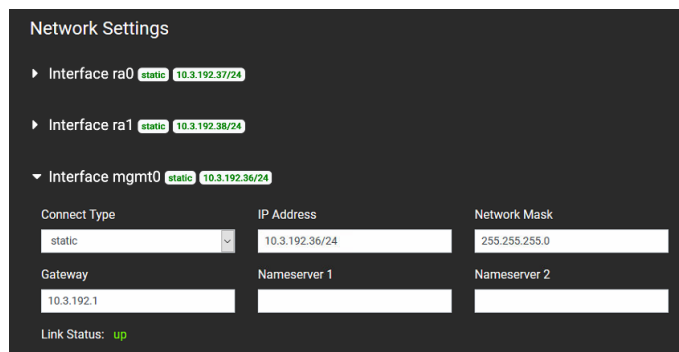
6. Click on **Network Settings** to reveal the network interfaces.

The eight "ra" interfaces define the Media Network ports: ra0 = IO 1, ra1 = IO 2, and so on.

The two "mgmt" interfaces define the management ports: mgmt0 = MGMT A and mgmt1 = MGMT B.

The current IP address is shown beside each interface - the text color shows whether the link is up (green) or down (red).

7. Click on **Interface mgmt0** to open its settings:



8. Set the connection type to **static** (in order to edit the other fields). Then enter the **IP Address** and other settings as required.

The Interface mgmt0 must match the "Management IP A" settings defined in AdminHD.

The other interfaces can be left untouched, as these ports will be configured automatically by the mcx control system according to the Device IDs.

9. Once all required fields have been edited, select **Apply** to confirm the changes (or **Cancel** to exit).
10. If you have changed the settings of the mgmt0 interface, you will lose your browser connection, so enter the new IP address to re-establish and check the connection.

7. Appendices

This chapter includes further information which you may find useful.

7.1 Part Numbers

System Component		Part Number
A__UHD Core	A__UHD Core frame	720/10
	SFPs, see SFP Modules	981/60-xx

7.1.1 Data Sheets

Further technical information can be found in the product data sheets available from the **Downloads** area at www.lawo.com (after **Login**).

To help locate the correct data sheet, please use the part numbers listed above.

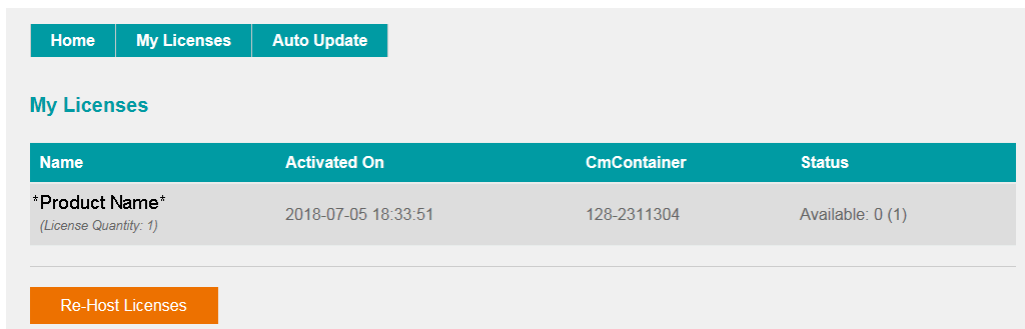
7.2 Advanced Licensing Features

This section describes the more advanced features of the CodeMeter Runtime licensing system.

7.2.1 Re-Hosting a License

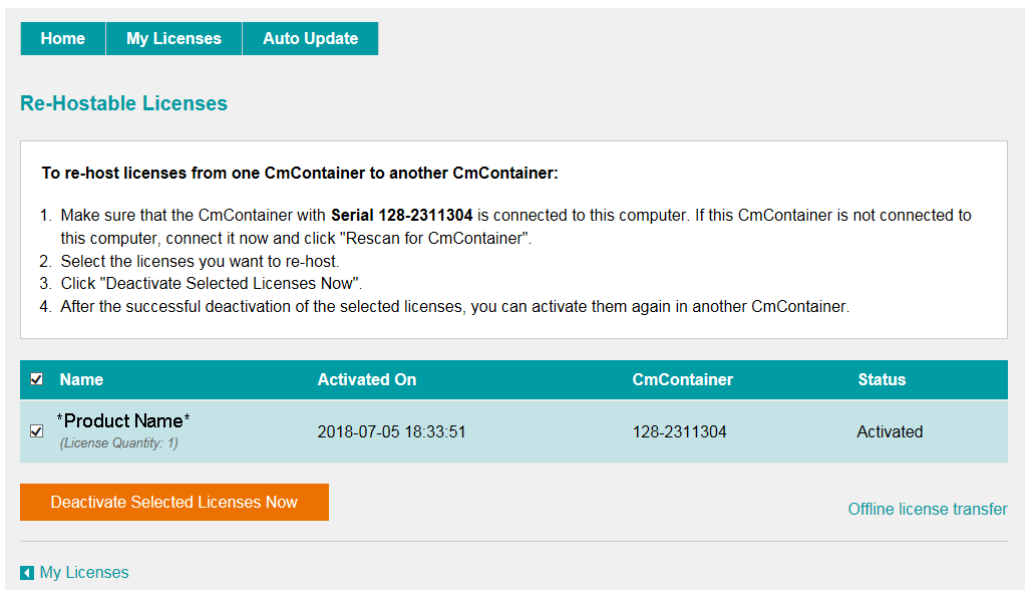
To move a license from one Cm container to another, you will need to re-host the license as follows. This requires you to first de-activate the license from its existing Cm container, and then choose the new storage container.

1. Follow the first two steps from the online activation method:
 - Open the 'Lawo License' web browser page at <https://licenseportal.lawo.com>.
 - Copy your license ticket number - this is the 25 number code - into the **Ticket** field and select **Next**.
2. At the "My Licenses" summary window, select **Re-Host Licenses**:



Name	Activated On	CmContainer	Status
Product Name <small>(License Quantity: 1)</small>	2018-07-05 18:33:51	128-2311304	Available: 0 (1)

3. Make sure that the Cm container is connected to the computer, select the licenses you wish to re-host and select **Deactivate Selected Licenses Now**.



To re-host licenses from one CmContainer to another CmContainer:

1. Make sure that the CmContainer with **Serial 128-2311304** is connected to this computer. If this CmContainer is not connected to this computer, connect it now and click "Rescan for CmContainer".
2. Select the licenses you want to re-host.
3. Click "Deactivate Selected Licenses Now".
4. After the successful deactivation of the selected licenses, you can activate them again in another CmContainer.

<input checked="" type="checkbox"/>	Name	Activated On	CmContainer	Status
<input checked="" type="checkbox"/>	*Product Name* <small>(License Quantity: 1)</small>	2018-07-05 18:33:51	128-2311304	Activated

Wait for a few seconds - a confirmation pop-up appears once the de-activation is successful.

You can follow steps 3 to 7 from the online activation method, or perform an [offline](#) license transfer, to activate the license using a new storage container.

7.2.2 Activating a License Offline

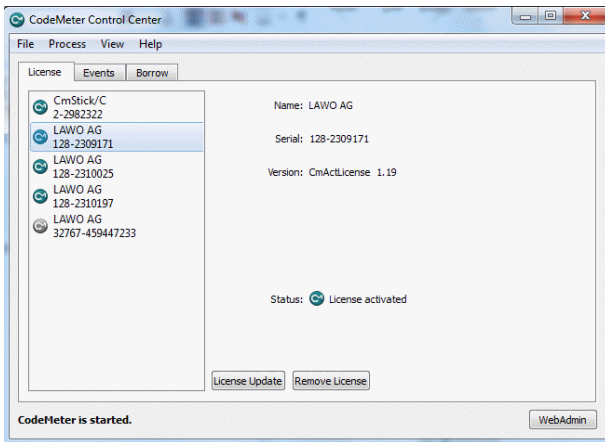
If your PC has no internet access, then you can activate a software license offline. This method involves three stages:

- **Create a license request file** - for the Cm storage container. Then copy the file onto a computer with internet access.
- **Activate the license** - using the 'Lawo License' web portal, copy the license update file back to the original computer.
- **Import the license update file** - to the Cm storage container.

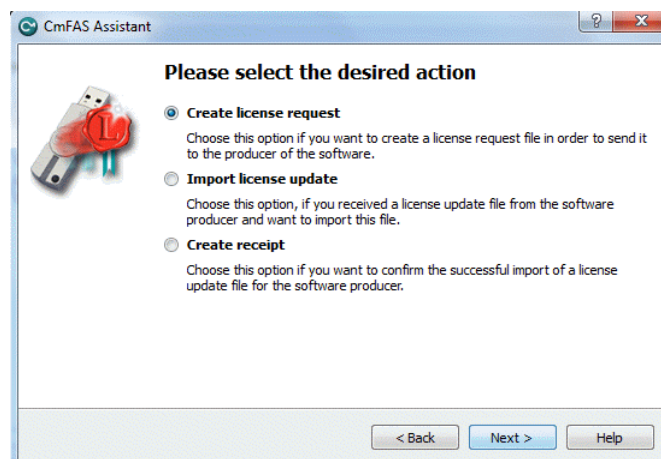
Creating the License Request File

On the computer you wish to license:

1. Open the '[CodeMeter Control Center](#)' (by clicking on the Cm taskbar icon), and select the container you wish to use for the license storage.
2. If the container is empty, select **Activate License**. Or, if the container already holds an active license, select **License Update**. This starts the 'CodeMeter Field Activation Service (CmFAS) assistant':

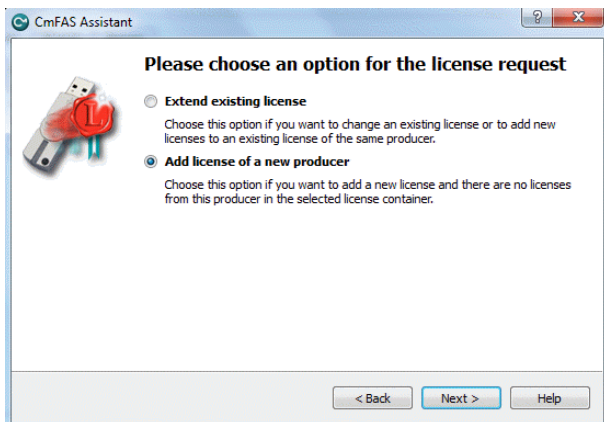


3. Select **Next:** and then **Create license request:**



At this stage, there are two additional steps (to add the correct firmcode) if you have selected a **CmStick** container. Enter the following Lawo FirmCode to create the license request file:

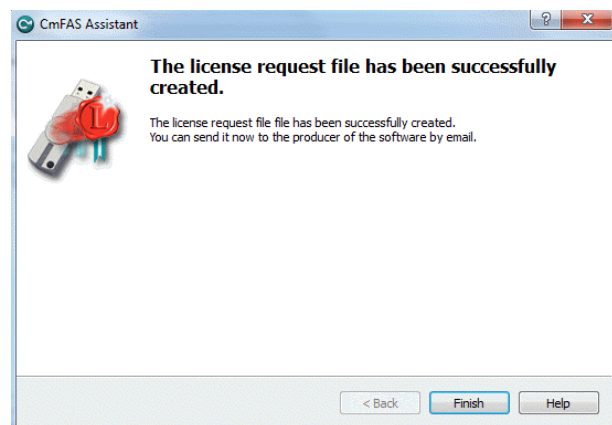
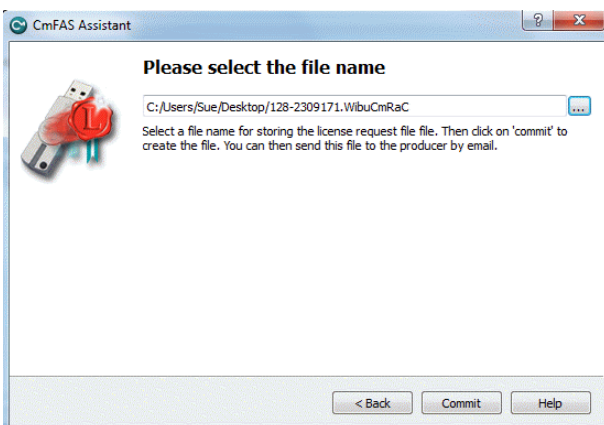
Select Add license of a new producer



Enter the Lawo FirmCode = 102037



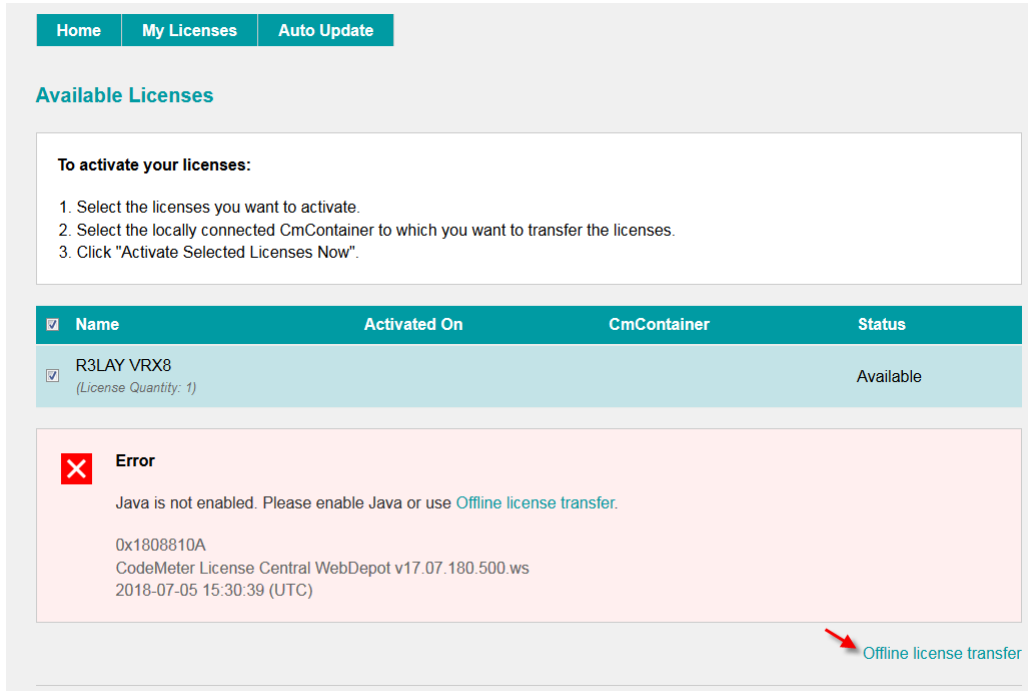
4. Select **Next**, and using Windows Explorer, enter a file path for the license request file. Choose somewhere easy to find, such as the Desktop. Then select **Commit** to create the request file:



5. Select **Finish** and copy the request file onto a computer with internet access. You will need both the license request file and the 25-digit ticket number (received with your license purchase).

Activating the License

- On a computer with internet access, follow the first four steps from the online activation method:
 - Open the 'Lawo License' web browser page at <https://licenseportal.lawo.com>.
 - Copy your license ticket number - this is the 25 number code - into the **Ticket** field and select **Next**.
 - When your license is displayed, select **Activate Licenses** to continue.
 - Select the storage method for your license - either USB dongle or single computer.
- At the **Available Licenses** page, select **Offline license transfer** to continue:



Home My Licenses Auto Update

Available Licenses

To activate your licenses:

- Select the licenses you want to activate.
- Select the locally connected CmContainer to which you want to transfer the licenses.
- Click "Activate Selected Licenses Now".

<input checked="" type="checkbox"/>	Name	Activated On	CmContainer	Status
<input checked="" type="checkbox"/>	R3LAY VRX8 <small>(License Quantity: 1)</small>			Available

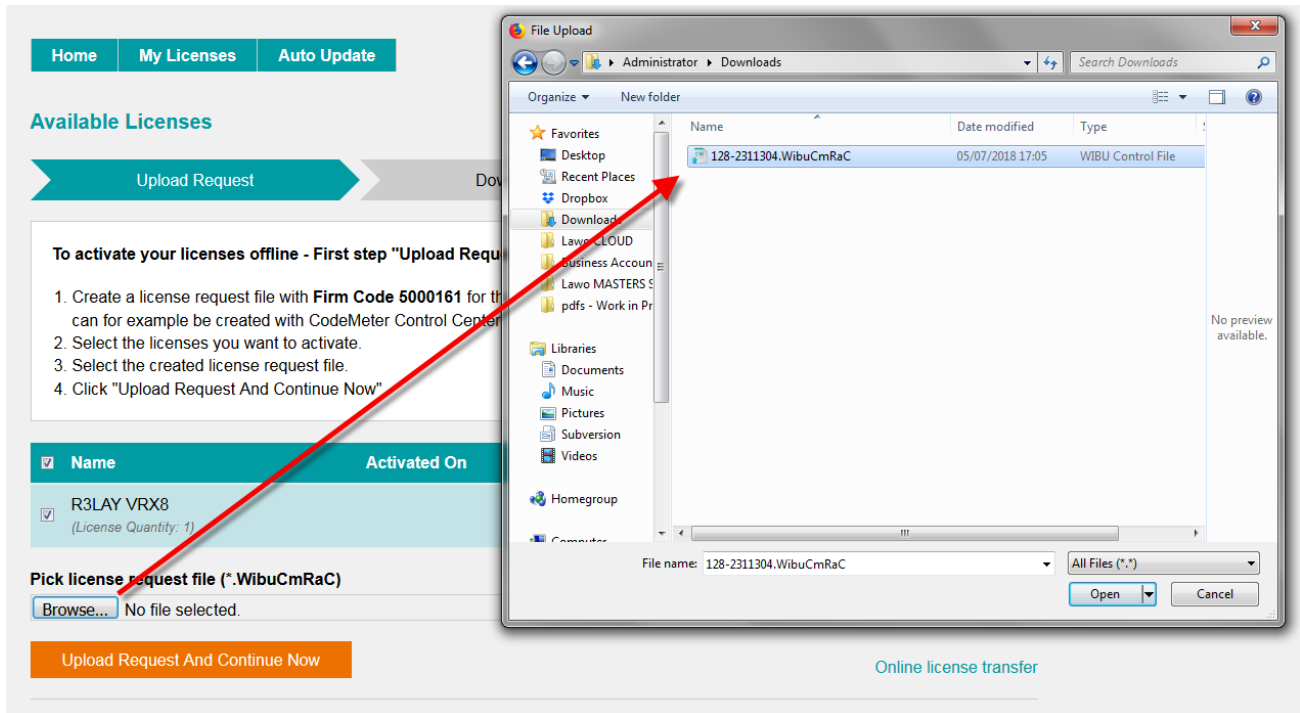
Error

Java is not enabled. Please enable Java or use [Offline license transfer](#).

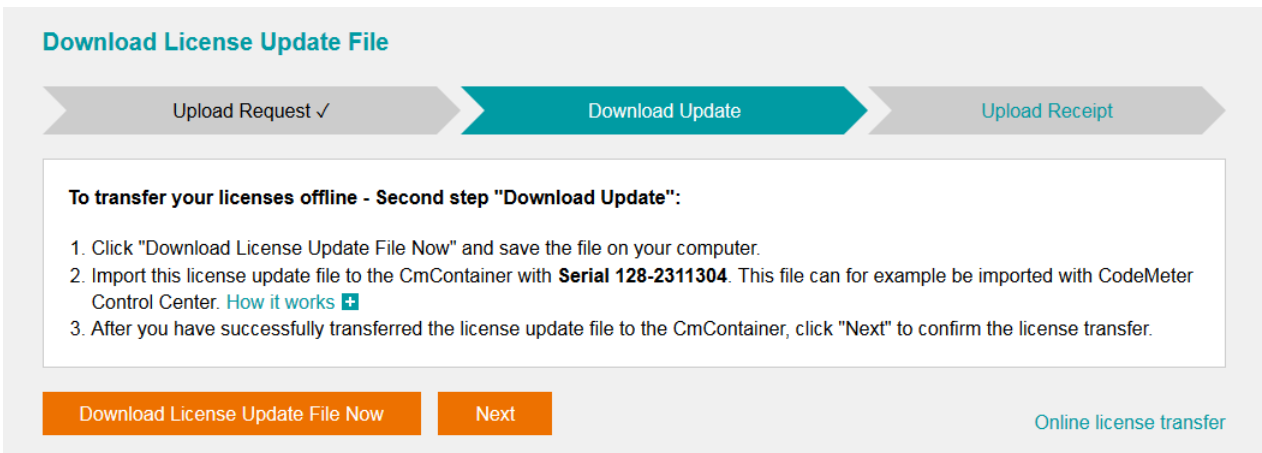
0x1808810A
CodeMeter License Central WebDepot v17.07.180.500.ws
2018-07-05 15:30:39 (UTC)

[Offline license transfer](#)

3. On the next page, select the license(s) you wish to activate, select **Browse...** and, using Windows Explorer, choose the request file (created earlier):



4. Then select **Upload Request And Continue Now** - the license request is processed and, if successful, you will have the option to Download the update:

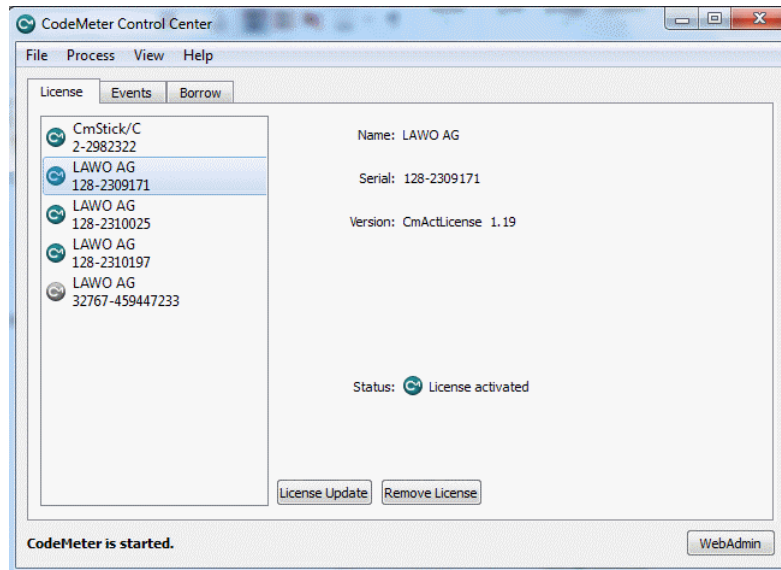


5. Select **Download License Update File Now** and, when prompted, choose the **Save** file option - the file is downloaded.

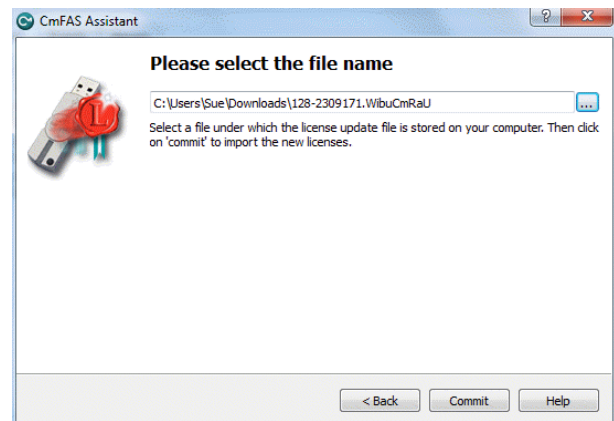
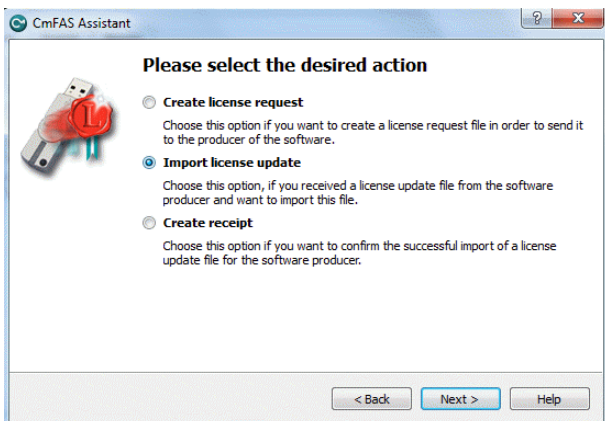
6. Copy the License Update file back to the original PC.

Importing the License Update

1. On the original computer re-open the 'CodeMeter Control Center' and select the Cm container for the license update. Note that this must be the same container as the one selected earlier (during the License Request).



2. Select **License Update** and follow the instructions given by the 'CmFAS Assistant' - when prompted, select Import License update and choose the update file (downloaded from the License portal):

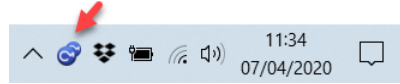


3. Select **Commit** to action the update - the license is activated and you can close the 'CodeMeter Control Center'.
4. You can now return to your Lawo application or install your USB license dongle - all licensed features should be available.

7.2.3 The CodeMeter Control Center

The 'CodeMeter Control Center' is used to manage the license containers and perform a backup or restore.

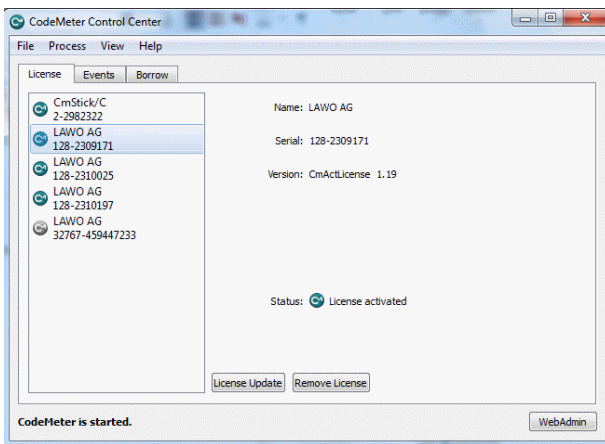
1. Click on the Windows taskbar Cm icon to open the 'CodeMeter Control Center' - the icon may be hidden from view or vary in color (depending on your taskbar configuration).



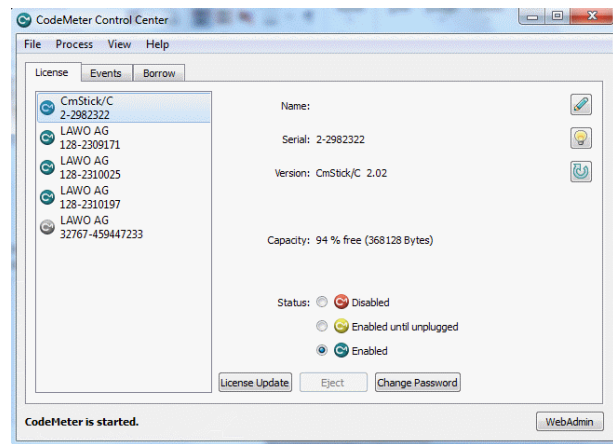
The 'CodeMeter Control Center' shows all the Cm containers which can be used for license storage.

A new local computer container is created each time you run the **CodeMeter Runtime** install wizard. Therefore, if you have installed multiple Lawo products or software versions, you will see several **LAWO AG** containers. If a USB dongle is connected, you will see a container labelled **CmStick**.

Local Computer Container (LAWO AG)



USB Dongle Container (CmStick)

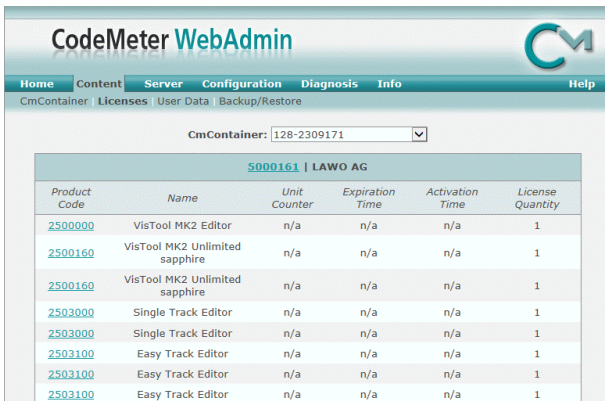


The **Serial** numbers identify each container. The icon colours indicate: green = license activated; grey = container is empty; red = license deactivated.

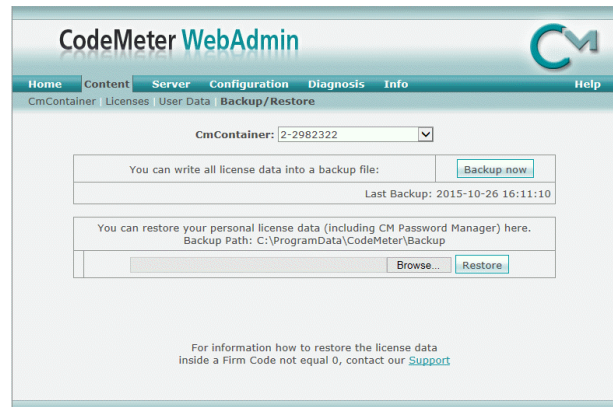
A single Cm container can contain multiple licenses - simply select the same container during the activation process.

2. Select **WebAdmin** (bottom right) to open the WebAdmin portal in your default browser. The portal has many functions including license interrogation, and backup/restore functions for licenses stored on a **CmStick** (USB Dongle):

WebAdmin Content Cm Container



WebAdmin Backup/Restore



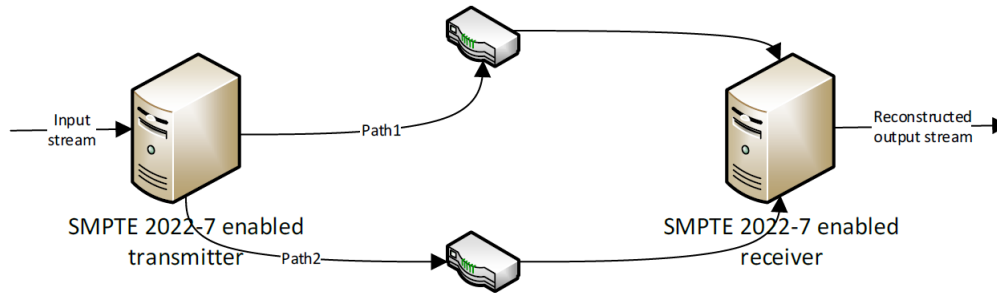
For further information, please refer to the **CodeMeter Runtime** documentation at wibu.com.

7.3 SMPTE ST2022-7 (SPS)

SMPTE ST2022-7 is a method of recovering lost data packets when streaming data over an IP network. The technology is also known as Seamless Protection Switching (SPS). Within a RAVENNA installation, it can be used to provide main and redundant paths for audio/video streams and PTP synchronization.

Concept

The diagram below illustrates the concept in a standard data network:



A SMPTE ST2022-7-enabled transmitter duplicates the input stream and sends it via two different network paths to the destination receiver. The receiver (also SMPTE ST2022-7-enabled) combines the data from both paths and reconstructs the original stream. If a packet from path 1 is missing, then the packet is taken from path 2. If path 1 is lost completely, then the entire stream is taken from path 2. And vice versa. The result is that the receiver can switch from one path to the other without impacting upon the stream content.

The network class determines how much delay between the two paths can be tolerated. Class C devices have an extended buffer size, and so can handle longer delays than Class A. Thus, Class C compatible devices can cope with a larger network infrastructure.

Configuration

To configure SMPTE ST2022-7, you will need to create two separate paths in the Media Network. This means doubling the network's infrastructure and then connecting each sending and receiving device to both paths. Within Lawo systems, the two paths are usually known as the primary (red) and secondary (blue) networks.

For partnering connections between the Core and a remote IO device, the streams are created automatically by the AdminHD configuration. For RAVENNA Tie-lines, the streams must be configured manually using the device's Web UI.

In all cases, you *must* use an odd/even pair of ports to configure SPS. i.e. ports 1+2 or 3+4, but not 2+3!