CodeMeter Administrator Guide

Version 6.40 - November 2016

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Table of Contents

1   Version

CodeMeter User Help 6.40, 11/9/2016.
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LLVM compiler and toolchain technologies *AxProtector*
```
University of Illinois/NCSA
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Developed by:

    LLVM Team

    University of Illinois at Urbana-Champaign

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```
Program             Directory
-------             ---------
Autoconf            llvm/autoconf
                    llvm/projects/ModuleMaker/autoconf
                    llvm/projects/sample/autoconf
Google Test         llvm/utils/unittest/googletest
OpenBSD regex       llvm/lib/Support/{reg*, COPYRIGHT.regex}
pyyaml tests        llvm/test/YAMLParser/{*.data, LICENSE.TXT}
ARM contributions   llvm/lib/Target/ARM/LICENSE.TXT
md5 contributions   llvm/lib/Support/MD5.cpp llvm/include/llvm/Support/MD5.h
```

ASM Java program library *AxProtector Java*
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Apache *Commons AxProtector Java*

AxProtector Java uses Google Protocol Buffers according to the BSD 3-Clause License.

jQuery functions *CodeMeter WebAdmin*

```
http://jquery.com/

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```

`libusb` program library Version 1.0.8 Linux-operating systems *CodeMeter License Server*

The programming library serves to read and write USB devices. The code is licenses under the GNU Lesser General Public License (LGPL) Version 3.
The code of the programming library `libusb` can be downloaded at the project website http://www.libusb.org/. On request the source can also be electronically obtained free of charge contacting Wibu-Systems (support@wibu.com).

2   Manual

The following parts of this *CodeMeter* Developer Guide on installing and using many of the *CodeMeter* tools are also of interest for the administrator and thus part of a separate section.

2.1   First important Information

First connection of *CmDongle*

Connect your *CmDongle* with a free USB interface of your PC. The light diode of the *CmDongle* alternatively flashes red and green for 1-2 seconds. Your PC shows that a new USB device has been found. *CmDongles* with additional Flash memory, e.g. *CmStick/M*, are able to permanently hold any data on this drive. Alternatively to the mass storage device status, *CmDongles* can also display as HID (Human Interface Device) without a drive status (for more details see here[124]).

> ⚠️ *CmDongles* without Flash memory represent virtual drives, i.e. data you save on it will get lost once you disconnect the *CmDongle*!

By default, *CodeMeter*® Runtime Server is installed as service (Windows) or as daemon (Linux, Mac) and thus automatically starts on system startup. The behavior at system startup is optimized by using default values and prevents eventually occurring process access conflicts. In the case of problems, please contact Wibu-Systems Support.

If *CodeMeter*® Runtime Server should not be active, it can be manually started or stopped[20]. The following table shows you start options for different operating systems

Operating System	Menu Control	Name
Windows	[Start | All Programs | CodeMeter | CodeMeter Control Center]	`CodeMeter.exe`
	Press "Windows" key to open Start screen | Type "CodeMeter Control Center" | Press "Enter" key	
Mac OS	[Programs | CodeMeter | CodeMeter Control Center	`CodeMeterMacX`
Linux	[Applications | System | CodeMeter Control Center] or [Applications | Accessories | CodeMeter Control Center]	`CodeMeterLin`

> ℹ️ On Linux (graphic desktop environment KDE 4) eventually connected *CmCards* are not automatically detected.
> If removable devices are connected to Linux systems, they have to be mounted, i.e. making the filesystem on the device accessible. Some desktop environments do this automatically, some do not.
> Check the settings for general automatic mounting and also for the *CmCard* using the menu item "System Settings \| Hardware \| Removable Devices".
> Please note, that on mounting the CmCard must have already connected once to the system.

Activating *CmActLicense* licenses

CmActLicense the software- and activation-based *CodeMeter*® variant requires no hardware token. Rather *CmActLicense* licenses are bound to hardware properties of the PC on which they are accessed.

> ⚠️ Please make sure you activate a *CmActLicense* license <u>only</u> on the PC for which you want to use the license.

Before you are able to activate *CmActLicense* licenses for your PC you require a separate file you obtain from your software vendor. This licenses information file corresponds to an empty license container. It serves to collect hardware properties of your PC as a kind of 'finger print' for the subsequent activation. Please proceed as follows:

1. Drag & drop the `*.wbb` file, e.g. `MyCmActLicense.wbb`, you received from your software vendor onto *CodeMeter Control Center.*
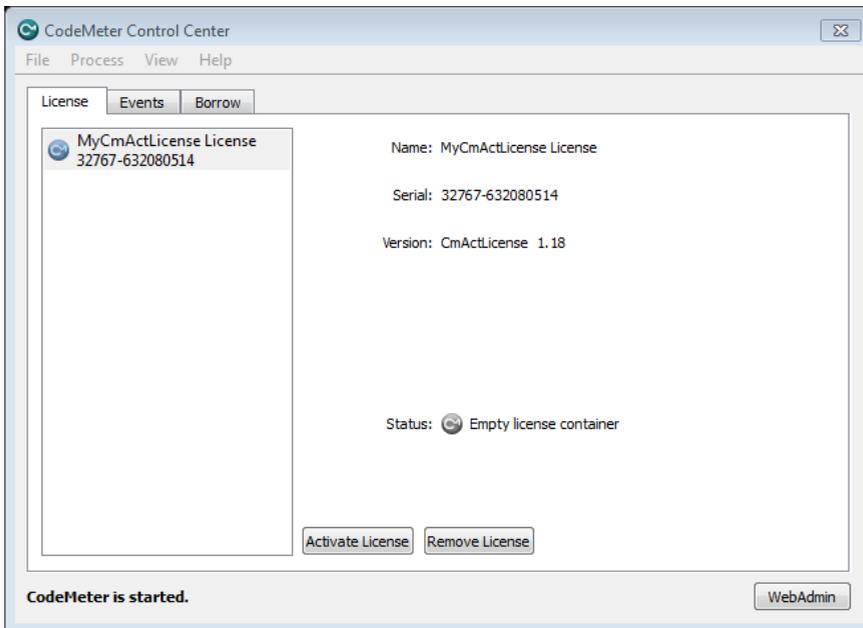
The **"Status"** field shows that is file is only an empty license container and not a license. At the same time, the *CodeMeter*® symbol changes to red.

2. Click the **"Activate License"** button to create a license request file (see <u>here</u> 📄 37) and to send it to your software vendor.
Subsequently, your software vendor will send you a license update file.

3. Drag&drop the `*.wbb` file, e.g. `MyCmActLicense.WibuCmLIF`, you received from your software vendor onto *CodeMeter Control Center.*
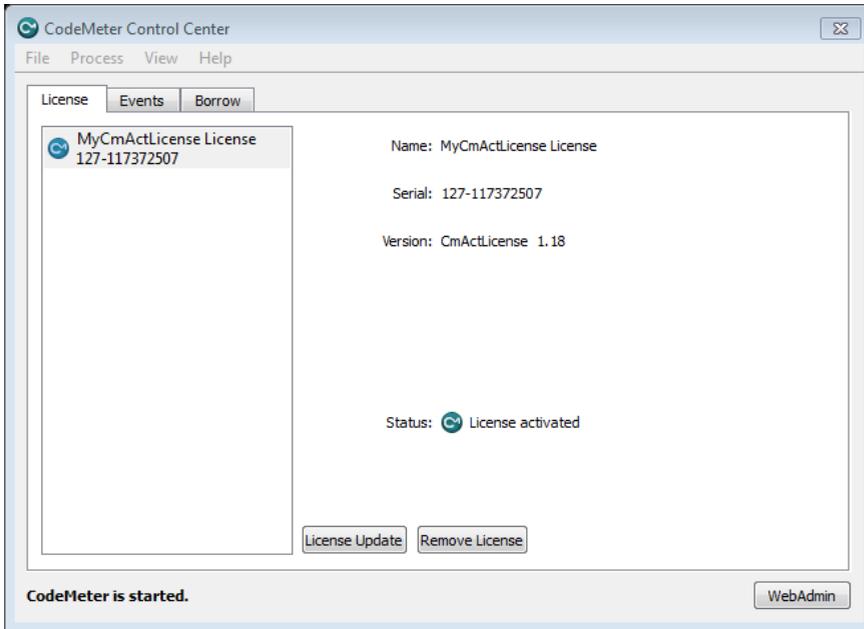
The **"Status"** field shows that the license has been activated. At the same time, the license has a serial number, and the *CodeMeter*® symbol has switched to activated status.

CodeMeter FAQ

A comprehensive FAQ area on *CodeMeter*® and on other additional products, you will find at our CodeMeter support page.
Please take a first look at the information on the *CodeMeter*® support page before you contact our support team. In most cases, you will find quick answers to your questions and problems.

Support

You have several options to contact us:

E-Mail	Writes us an e-Mail at support@wibu.com Please describe your problem in detail and add the file `CmDust-Result.log` created with *CmDust* 106.
Telephone	Contact our *CodeMeter*® Hotline at +49-721-93172-15. We are available in Germany (local Baden-Wuerttemberg non-holiday) workdays (Monday through Friday) from 8 a.m. to 5 p.m. Wibu Systems USA support is available Monday through Friday from 8 a.m. to 5 p.m. PST by phone at 800-6-GO-WIBU (425-775-6900) or by e-mail (support@wibu.us) In China contact our Shanghai office per phone +86 (0) 21-55661790 or by e-mail (info@wibu.com.cn).

2.2 Safety Instructions

The hardware of WIBU-SYSTEMS AG serves to protect and license digital products and has been developed, manufactured and inspected in accordance with state-of-the-art technology and recognized technical safety rules and regulations.

For further information on hardware certificates see the respective documents to be downloaded at the website of Wibu-Systems (http://www.wibu.com/en/certificates.html).

Before you use the hardware please observe the following safety instructions:

- If you follow the instructions regarding safety as described in this manual, the hardware will, in the normal case, neither cause personal injury nor damage to machinery and equipment. Connect the hardware only to matching intended interfaces. The use for other purposes, opening or own repair of the hardware may lead to damages of the product and its suroundings.Modifying the hardware affects the product safety. Caution: risk of injury!
- The hardware may warm up during operation - which is a normal operational parameter.
- Keep the hardware away from humidity and avoid strong vibration, dust, heat, and direct sunlight, in order to prevent operational interference
- Depending on the used operating system the detection of the hardware device may take some seconds. Before disconnecting the hardware the user should wait several seconds to avoid loss of data during data saving.
- This product is not a toy, keep away from children!.

Non-compliance with the safety instructions results in a loss of warranty.

2.3 Installation

The following section contains installing and uninstalling information of the *CodeMeter* for different operating systems.

While installing it is not required that a *CmDongle* is connected to the computer.

- Windows 32-bit/64-bit 13
- Mac OS X 15
- Linux 17

2.3.1 Installation on 32/64-bit Windows

For Windows 32- and 64-bit a *CodeMeter*® Runtime Kit installation program is available:

For installing the *CodeMeter*® Runtime Kit start the respective installation program and follow the installation wizard.

2.3.1.1 Installed files on 32/64-bit Windows

The files the *CodeMeter*® Runtime Installation Kit installs on your PC you find in the installation directory usually in `[%\`*Program Files*`\CodeMeter\Runtime\bin]`).

For 32-bit Windows the following directory structure is valid:

```
%ProgramFiles%
   `--CodeMeter
```

```
    |-- Backup (starting with Version 4.30 as Shortcut)
    |-- Logs (starting with Version 4.30 as Shortcut)
    `-- Runtime
        |-- bin
        |   |-- CodeMeter.exe
        |   |-- CodeMeter.l*
        |   |-- CodeMeterCC.exe
        |   |-- CodeMeterCC.l*
        |   |-- CodeMeterZZ.wbb - WebAdmin
        |   |-- CmRmtAct32.*
        |   |-- cmu32.exe
        |   |-- WibuCmId32.*
        |   `-- WibuCmTrigger32.*
        `-- help
            `-- CmUserHelp
%WINDIR%
  `-- System32
      |-- WibuCm32.lxx
      |-- WibuCm32.dll (CodeMeter Calling Driver)
      |-- WibuCmJni.dll
      `-- WibuXpm4J32.dll
%ProgramData%
  `-- CodeMeter
      |-- Backup
      `-- Logs
```

For 64-bit Windows the following directory structure is valid:

```
%ProgramFiles(x86)%
  `--CodeMeter
      |-- Backup (starting with Version 4.30 as Shortcut)
      |-- Logs (starting with Version 4.30 as Shortcut)
      `-- Runtime
          |-- bin
          |   |-- CodeMeter.exe
          |   |-- CodeMeter.l*
          |   |-- CodeMeterCC.exe
          |   |-- CodeMeterCC.l*
          |   |-- CodeMeterZZ.wbb - WebAdmin
          |   |-- CmRmtAct64.*
          |   |-- cmu32.exe
          |   |-- WibuCmId32.*
          |   `-- WibuCmTrigger32.*
          `-- help
              `-- CmUserHelp
%ProgramFiles%
  `--CodeMeter
      `-- Runtime
          `-- bin
              |-- WibuCmId64.dll
              `-- WibuCmTrigger64.*
%WINDIR%
  |-- SysWOW64
  |   |-- WibuCm32.lxx
  |   |-- WibuCm32.dll (CodeMeter Calling Driver)
  |   |-- WibuCmJni.dll
  |   `-- WibuXpm4J32.dll
```

```
  `-- System32
      |-- WibuCm64.lxx
      |-- WibuCm64.dll (CodeMeter Calling Driver)
      |-- WibuCmJni64.dll
      `-- WibuXpm4J64.dll
%ProgramData%
   `-- CodeMeter
      |-- Backup
      `-- Logs
```

The following table shows an excerpt of installed files:

File	Description
CodeMeter.exe	Process of *CodeMeter License Server*
CodeMeter.l**	Language files for CodeMeter.exe
CodeMeterCC.exe	Process of *CodeMeter Control Center*
CodeMeterCC**.qm	Language files for *CodeMeter Control Center*
cmu32(64).exe	Process of *cmu* commandline program
CmRmtAct32(64).dll	Dynamic Link Library (DLL) required by CodeMeter.exe for license update.
CmRmtAct32(64).l**	Language files for license update.
CodeMeterXX.wbb	*CodeMeter WebAdmin* in several languages.
WibuCm32(64).dll	Includes all *CodeMeter*® API functions. This DLL must be installed on all PCs using a *CodeMeter*® protected application; installation path: [\Windows\System32].
WibuCm32(64).lXX	Language files for WibuCm32(64).dll; installation path: [\Windows\System32].
WibuCmTrigger32(64).dll	Required by Microsoft Internet Explorer.
WibuCmTrigger32(64).lXX	Language files for WibuCmTrigger32(64).dll.
CmUserhelp*.*	*CodeMeter*® online help in several languages; installation path [%CodeMeter%\Runtime\help].

2.3.1.2 Uninstalling on 32/64-bit Windows

1. Select the "**Software**" option in the Windows System control start menu item.
2. Select the "**CodeMeter Runtime Kit**" item and the "**Remove**" option

All *CodeMeter*® files as part of an installations package and registry entries are deleted. Only the log and backup directories remain.

2.3.2 Installation on Mac OS

For Mac OS X a *CodeMeter*® Runtime Kit installation programm is available:

File	Description
CmRuntimeUser.dmg	installs all required *CodeMeter*® runtime components

1. Run the CmRuntimeUser.dmg file to install the *CodeMeter*® Runtime Kit.
2. Select the file CmInstall.mpkg in the new directory CmRuntime and follow the instructions of the installation wizard.

2.3.2.1 Installed files on Mac OS

For Mac OS the following directory structure is valid:

```
/
|-- Applications
|   |-- CodeMeter.app
|   |   |-- CmUserHelp
|   |   |   `-- ...
|   |   |-- CodeMeterCn.wbb
|   |   |-- CodeMeterDe.wbb
|   |   |--  ...
|   |   |-- CodeMeterMacX
|   |   |-- CodeMeterUs.wbb
|   |   |-- Contents
|   |   |   |-- Info.plist
|   |   |   |-- MacOS
|   |   |   |   |-- CodeMeterCC
|   |   |   |   |-- CodeMeterCC_de.qm
|   |   |   |   |--   ...
|   |   |   `-- Resources
|   |   |       |-- CodeMeterCC.icns
|   |   |       |-- com.wibu.CodeMeter.Server.ini
|   |   |       |-- English.lproj
|   |   |       |-- ...
|   |   |       `-- zh_TW.lproj
|   |   `-- PkgInfo
|-- Library
|   |-- Application Support
|   |   `-- CodeMeter
|   |       |-- Backup
|   |       `-- CmAct
|   |-- Frameworks
|   |   `-- WibuCmMacX
|   |-- Logs
|   |   `-- CodeMeter
|   |-- Preferences
|   |   `-- com.wibu.CodeMeter.Server.ini (permissions
|   |                                       -rw-rw-rw-)
|   `-- Java
|       `-- Extensions
|           `-- libwibuKJni.jnilib
|-- System
|   `-- Library
|       |-- Extensions
|       |   `-- CmUSBMassStorage.kext
|       |           `-- Resources
|       |               `-- CodeMeter.icns
|       `-- PreferencePanes
|           `-- CodeMeter.prefPane
`-- usr
    `-- bin
        `-- cmu
```

The following table shows an excerpt of installed files:

File	Description
CodeMeterMacX	[Applications/CodeMeter.app]; *CodeMeter License Server* process.
CodeMeterXX.wbb	[Applications/CodeMeter.app]; *CodeMeter WebAdmin* in several languages.
CodeMeterUserhelp	[Applications/CodeMeter.app/CmUserHelp]; *CodeMeter*® end user help
CodeMeterCC	[Applications/CodeMeter.app/Contents]; *CodeMeter Control Center*.
CodeMeterCC**.qm	[Applications/CodeMeter.app/Contents/resources]; Language files for *CodeMeter Control Center*.
Cmu	[usr/bin/cmu]; *cmu* commandline program.
WibuCmMacX	[Library/Frameworks/WibuCmMacX.framework]; includes all *CodeMeter*® API functions.
CodeMeterMacX	[Library/StartupItems]; *CodeMeter License Server* startup item.
libwibuKJini.jnilib	[Library/Java/extensions]; *CodeMeter*® Java extension.
com.wibu.CodeMeter.Server.ini	[Library/Preferences]; includes "Profille Basic Settings" for *CodeMeterMacX*.
CodeMeter.prefPane	[System/Library/PreferencePanes]; includes the system control for *CodeMeter*MacX."

Starting *WebAdmin*

You start *CodeMeter WebAdmin* in Mac/Linux:

- using the button **Web Admin** in **CodeMeterGUI** tool
- directly in your Internet browser specifying the URLs: http://localhost:22350 or http://127.0.0.1:22350.

2.3.2.2 Uninstalling on Mac OS

To uninstall the *CodeMeter*® Runtime Kit, proceed as follows:

1. Re-open the CmRuntimeUser.dmg disk image.
2. Start in the directory CmRunTime the program CmUninstall.mpkg and follow the instructions of the wizard (in the commandline enter the following command: $ sudo installer -pkg / Volumes/CmRuntimeUser/CmUninstall.mpkg -target. Please note that path specification may vary.).

2.3.3 Installation on Linux

For Linux operating systems different installation packages are available in common formats:

File	Description
CodeMeter-[CodeMeter-Version].[Package Number].i386.rpm	Basic 32-bit drivers in RPM format (Red Hat Package Manager Format) (e.g. Suse 9x,)
CodeMeter-[CodeMeter-Version].[Package Number]_i386.deb	Basic 32-bit drivers in DEB format gcc3 based (e.g. Debian 3.0, Ubuntu 6.06)

File	Description
CodeMeter64-[CodeMeter-Version].[Package Number].x86_d64.rpm	Driver extension 64-bit in RPM format (Red Hat Package Manager Format) (e.g. Suse, RHEL, FC)
CodeMeter64-[CodeMeter-Version].[Package Number].amd64.deb	Driver extension 64-bit in DEB format (e.g. Debian, Ubuntu)

To install *CodeMeter License Server*, proceed as follows:

1. Select the desired installation package, and
2. Install the package as usual, e.g. shell command or respective help programs.

rpm packages: [rpm -ivh CodeMeter-[CodeMeter-Version].[Package Number].i386.rpm]

deb packages: [dpkg -i CodeMeter-[CodeMeter-Version].[Package Number]_i386.deb]

For Linux the following directory structure is valid:

```
/
|-- etc
|    |-- hotplug
|    |    `-- usb
|    |         |-- codemeter.usermap    (obsolete)
|    |         `-- codemeter
|    |-- init.d
|    |    `-- codemeter
|    |-- udev
|    |    `-- rules.d
|    |         `-- 52-codemeter.rules
|    `-- wibu
|         `-- CodeMeter
|              |-- CmFirm.wbc    (permissions -rw-rw-rw-)
|              `-- Server.ini    (permissions -rw-rw-rw-)
|-- usr
|    |-- bin
|    |    |-- CodeMeterCC
|    |    |-- CodeMeterLin
|    |    |-- cmu
|    |    `-- codemeter-info    (permissions -rwsr-xr-x)
|    |-- lib (for 64-bit systems here the 64-bit libs locate with suffix 64;
otherwise the 32-bit libs)
|    |    |-- libWibuCmWebLin[64].so
|    |    |-- libwibucmJNI[64].so
|    |    |-- libwibucmlin[64]-4.so
|    |    `-- libwibucmlin[64].so -> libwibucmlin[64]-4.so
|    |-- lib32 (directory exists only in the 64-bit Installer)
|    |    |-- libWibuCmWebLin.so
|    |    |-- libwibucmJNI.so
|    |    |-- libwibucmlin-4.so
|    |    `-- libwibucmlin.so -> libwibucmlin-4.so
|    `-- share
|         |-- CodeMeter
|         |    |-- CodeMeterCC
|         |    |-- CodeMeterCn.wbb
|         |    |-- CodeMeterDe.wbb
|         |    |-- CodeMeterFr.wbb
|         |    |-- CodeMeterIt.wbb
```

```
|         |    |-- CodeMeterJp.wbb
|         |    |-- CodeMeterLin
|         |    |-- CodeMeterUs.wbb
|         |    |-- WibuCmSTrigger.jar
|         |    |-- codemeter.rc      (copy of /etc/init.d/codemeter)
|         |    |-- getpath.class
|         |    `-- libWibuCmWebLin.so -> ../../lib/libWibuCmWebLin.so
|         |-- applications
|         |    `-- codemeter.desktop
|         |-- doc
|         |    `-- CodeMeter
|         |         |-- AppletExample.class
|         |         |-- AppletExample.html
|         |         |-- COPYING
|         |         |-- CmUserHelp
|         |         |    `-- ...
|         |         |-- License.rtf
|         |         `-- README
|         |-- man
|         |    `-- man1
|         |         `-- codemeter-info.1.gz
|         `-- pixmaps
|              `-- codemeter.png
`-- var
    |-- lib
    |     `-- CodeMeter
    |            |-- Backup
    |            |    `-- CM-Backup2-506426-10Aug04-16-40-40.wbb   (Sample)
    |            `-- CmAct
    |                   |-- CmActFI-5010.wbb     (Sample)
    |                   `-- 5010_ABCD-4711.wbb   (Sample)
    `-- log
         `-- CodeMeter
              `-- CodeMeterLin2010-08-04-170622.log   (Sample)
```

2.3.3.1   Uninstalling on Linux

Execute the respective shell command for uninstalling of the *CodeMeter*® Runtime Kit:
* for RPM based distributions, such as, Suse/RedHat/Fedora [rpm -e CodeMeter]
* for DEB based distributions, such as, Debian/Ubuntu [dpkg -r CodeMeter]

2.4   CodeMeter Control Center

CodeMeter Control Center serves to locally configure *CodeMeter License Server*. Software-sided, *CodeMeter License Server* as the runtime environment is at the heart of *CodeMeter*®. It allows the access to *CmContainer*. In doing so, *CmContainer* can be locally connected or are available on a network. By default, *CodeMeter License Server* is installed as service or deamon (Linux, Mac) and automatically starts when the system starts.

When the service has been started, other programs are available to access licenses stored in *CmContainer* and use protected data areas in a *CmContainer*.

Operating System	Menu Control
Windows	[Start - All Programs - CodeMeter - CodeMeter Control Center]
	Press "Windows" key to open Start screen | Type "CodeMeter Control Center" | Press "Enter" key.
Mac OS	[Programs - CodeMeter - CodeMeter Control Center
Linux	[Applications - System - CodeMeter Control Center] or [Applications - Accessories - CodeMeter Control Center]

> *CodeMeter License Server* starts only one-time on each PC!

Start and Stop *CodeMeter*®-service or daemon

The following table shows you for different operating systems how start or stop the *CodeMeter*® service or daemon.

Operating system	Description
Windows	1. Navigate via **"Windows | Control Panel | Administrative Tools | Services"** to *CodeMeter* Runtime Server. 2. Right mouse-click and **'Start'** or **'Stop'** the service. Alternatively, use the **"Action📄 25 "** menu of *CodeMeter Control Center*.
Mac OS	1. Navigate via **"System preferences | Other"** to the *CodeMeter*® icon. 2. Click the *CodeMeter*® Icon. The CodeMeter dialog displays

Operating system	Description
	 3. Click the **"Stop Service"** or **"Start Service"** button to stop or start the service.

🐧 **Linux**	1. Call the following script with '`sudo`' root privileges to stop the service:
	`/etc/init.d/codemeter stop.`
	2. Call the following script with '`sudo`' root privileges to start the service:
	`/etc/init.d/codemeter start` or alternatively the command `service codemeter start.`

CodeMeter License Server uses TCP/IP network protocol for communication and the default port `22350`. Make sure your firewall does not block this port. Please make sure that the used IP-Port `22350` is available for *CodeMeter*® .

CodeMeter License Server on Linux operating systems uses the `libusb` program library to read and write USB devices. The code is licensed under the GNU Lesser General Public License (LGPL) Version 3. The code of the programming library `libusb` can be downloaded at the project website http://www.libusb.org/. On request, the source can also be electronically obtained free of charge contacting Wibu-Systems (support@wibu.com).

2.4.1 Structure and Navigation
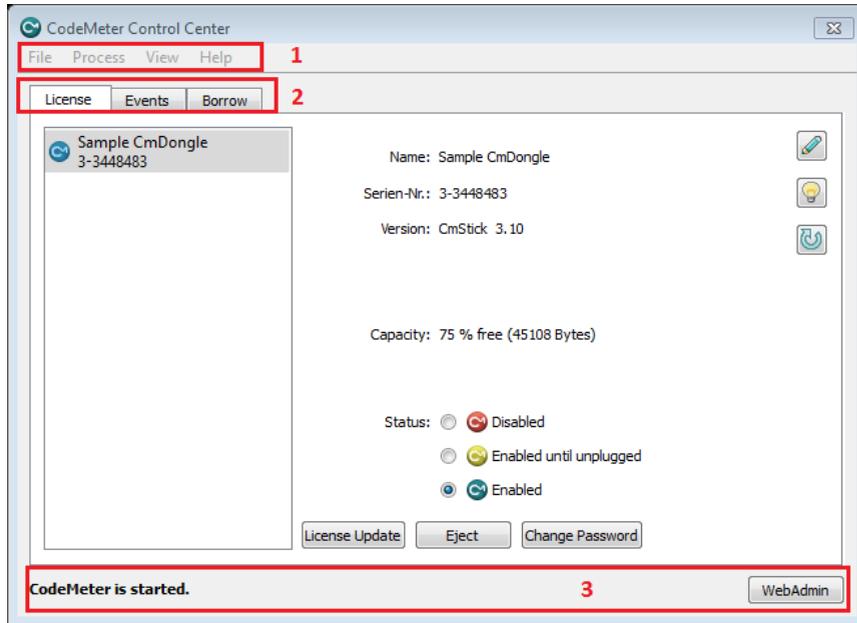

Figure 2: *CodeMeter Control Center* - Overview

The *CodeMeter Control Center* user interface is divided in three separate areas:

* [menu bar]◻ 23 (**1**)
* Tab areas (**2**)
* *Status and Open CodeMeter WebAdmin*◻ 34 (**3**).

Starting *CodeMeter Control Center*

You access and start *CodeMeter Control Center* in several ways:

Open
• Double-click on the *CodeMeter*® or symbols in the info area of the Windows task bar
• Right mouse-click on the *CodeMeter*® or symbol there, and subsequently select the **"Show"** menu item. The *CodeMeter Control Center* secondary menu (right mouse-click on the *CodeMeter* symbol) provides the additional menu items:

Item	Description
WebAdmin	Starts *CodeMeter WebAdmin* in the default Internet browser.
Eject all CmDongle(s)	Option to safely disconnect *CmDongles*.
Disable CmDongle	Prompt to insert the Cm*Dongle* Password.
Help	Opens the *CodeMeter*® help.
About	Shows general information on *CodeMeter*® components.
Quit	Exits but not shuts down the service *CodeMeter License Server*.

• Navigation by the **"Start	All Programs	CodeMeter Control Center"** start menu (Press "Windows" key to open Start screen | Type "CodeMeter Start Center" | Press "Enter" key).

In the info area of the Windows task bar, different colors of the *CodeMeter*® symbols represent different status conditions of connected *CmContainer.*

Color	Status
Grey	No *CmContainer* is connected, or *CodeMeter License Server* is not started.
Green	An activated *CmContainer* is connected.
Blue double	Several *CmContainer* are connected and activated until disconnected.
Yellow	A *CmDongle* is connected and activated until it is disconnected.
Red	A deactivated *CmContainer* is connected.

Figure 3: *CodeMeter*® Symbols Windows Task Bar

2.4.2 Menu Bar

File Menu

Element	Description
Import license	In order to import license contents using *CodeMeter Control Center*, proceed as follows: 1. Select the **"File	Import License…"** item. 2. Select in the following **"Import CodeMeter License Contents ..."** dialog the *CodeMeter*® files of the types `*.WibuCmRaU`; `*.wbb`; `*.wbc` and read in license data by clicking on the **"Import** button.

Element	Description
Figure 4: *CodeMeter Control Center* - Import Licenses
	Alternatively, you can also directly import the license file using the Windows Explorer. Simply drag & drop the file in the **License** tab area of *CodeMeter Control Center*.
WebAdmin	Opens *CodeMeter WebAdmin* in the default Internet browser. Alternatively, press the key combination `<CTRL>+W`.
Logging	Saves all *CodeMeter®* events to a log file. Alternatively, press the key combination `<CTRL>+L`. When you activate the logging, this also affects the logging display in *CodeMeter WebAdmin* on the "<u>Diagnosis</u> 70 " page. On Windows operating systems this log file is stored to the directory `%\Programm Files%\CodeMeter\Logs`. This log file is especially important for trouble shooting.
Preferences	Opens *CodeMeter WebAdmin* and is defaulted on the page where you are able to apply <u>network settings</u> 75.
Exit	Exits *CodeMeter Control Center*. Alternatively, press the key combination `<CTRL>+Q`. The service*CodeMeter License Server* however is not shut down.

Processes Menu

Element	Description
Eject all CmDongles	Ejects all connected *CmDongles* in one go. Alternatively, press the key combination `<CTRL>+ALT+Q`.
Defragment License Memories	Defragments the license memory of the selected *CmContainer*. Alternatively, press the key combination `<STRG>+ALT+D`.

Element	Description
Update Time Certificates	Updates the time certificates in the selected *CmContainer*. All time stamps are refreshed.
Start CodeMeter Service	Starts the service *CodeMeter License Server*.
	Use this menu item if *CodeMeter License Server* has been stopped before, for example, when you made changes on the network settings in *CodeMeter WebAdmin* which require the restart of the service.
	When you have administrator privileges under Windows you can also manage the *CodeMeter License Server* service by setting the desktop management (System Settings | Management | Services).
Repair Hardware Configuration	Repairs the hardware configuration of the *CmDongle* form factors SD Card and CF Cards. This tool is required if the *CmCard* hardware is not listed in the license list of *CodeMeter Control Center*.
Stop CodeMeter Service	Stops the service *CodeMeter License Server*.
Restart CodeMeter Service	Restarts the service *CodeMeter License Server*.

View Menu

Element	Description
Hide Window	Minimizes and hides the *CodeMeter Control Center* window back into the info area of the Windows task bar. Alternatively, press the key combination `<CTRL+M>`.
Refresh	Refreshes the display of all connected *CmContainer*. Alternatively, press the key `<F5>`.
Zoom in	Enlarges the display in the **Events** tab area. Alternatively, press the key combination `<CTRL>++`.
Zoom out	Scales down the display in the **Events** tab area. Alternatively, press the key combination `<CTRL>+-`.
Copy Event Content	Copies the event actions in the **Events** tab area to the clipboard. Alternatively, press the key combination `<CTRL>+C`.
Clear Event Content	Deletes the event actions in the **Events** tab area. Alternatively, press the key combination `<ALT>+C`.

Element	Description
Show all connected CmContainer	Shows all connected *CmContainer* including details in the **Events** tab area. Alternatively, press the key combination `<ALT>+S`.
List all open Handles	Shows all open handles in the **Events** tab area. Handles work as references for the developer for further programming.
Show all available License Entries	Shows all *CmContainer* license entries in the **Events** tab area. Alternatively, press the key combination `<ALT>+E`.
Borrow visible	Toggles between a visible and not visible **Borrowing** tab area. By default, starting with *CodeMeter* Version 6.00a this tab area is not visible.

Help Menu

Element	Description
Help	Opens the *CodeMeter*® online help. Here you access the help files on *CodeMeter License Server* and *CodeMeter Control Center*.
Register CmDongle	Opens the secure website https://my.codemeter.com to register *CmDongles*.
About	Informs on the started *CodeMeter Control Center* version.

2.4.3   License Tab

The **"License"** Tab shows you information on connected *CmContainer* and provides some options to configure connected *CmContainer*. Moreover, you are able to update licenses located in your *CmContainer* using the CmFAS Assistant 35 .
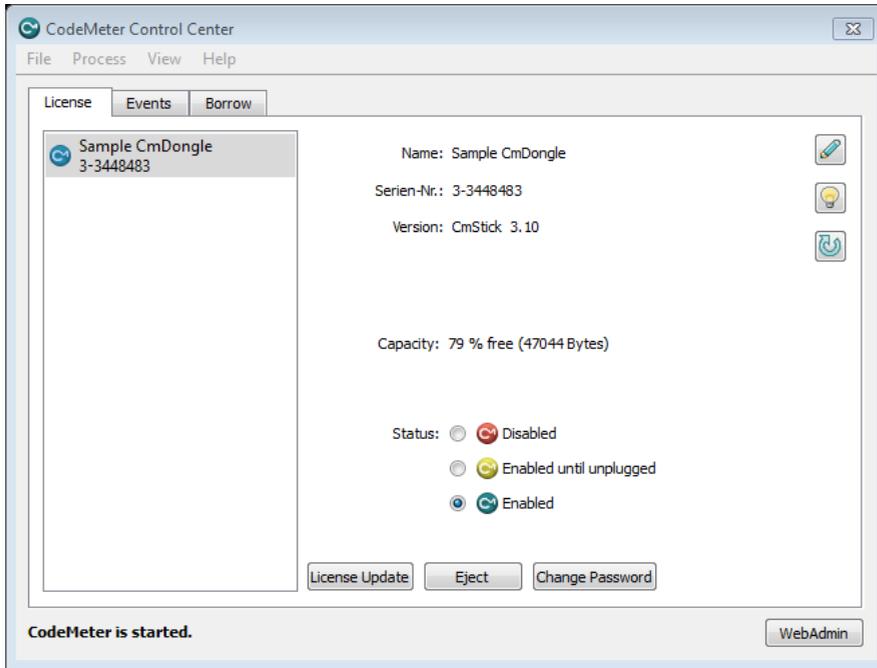
Figure 5: *CodeMeter Control Center* License Tab

Element	Description
Name	Changes and displays the name of the selected *CmContainer*. In the subsequent dialog you can edit the name. Figure 6: *CodeMeter Control Center* - Change Name of *CmContainer*
	Flashes the LEDs of the selected *CmStick*. This eases the identification of a *CmStick,* if several *CmSticks* are connected.
	Updates the firmware of the selected *CmDongles*. This guarantees the correct execution of essential functions, and solves eventually occurring problems. When you execute a firmware update, you require an Internet connection. Then *CodeMeter Control Center* automatically connects to the Firmware Update Server of Wibu-Systems. You are prompted to enter your *CmDongle* Password in order to confirm this action.
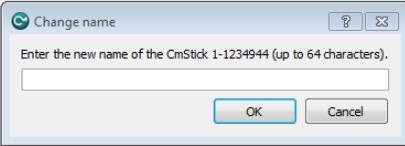
Element	Description
	The update may take a couple of minutes. You <u>must not</u> remove the *CmDongle* before this process is finished. Otherwise, irreparable damage of the *CodeMeter*® SmartCard Chip may occur.
Capacity	Informs on the capacity of the *CodeMeter*® SmartCard Chip of a selected *CmDongle*. The capacity is displayed in percent format, and by number of absolute bytes.
	Please note that this value tells nothings about the memory allocation of an eventual flash memory of a *CmDongle*.
Status	The status group informs on the activation status of the selected *CmDongle*.

Color	Status
	The connected *CmContainer* is disabled. No licensed application can use license information in the *CmContainer*. This is may be the case, if a *CmActLicense* license is 'broken'.

Then the **"Repair license"** button is available to eventually repair the license. If this is not successful, the following error message displays. In this case, only a reactivation is helpful. Please contact your software vendor.

Element	Description

	Color	**Status**
		For information on eventual reasons for a 'broken' license als a look at the log on the Events 31 tab may be helpful.
		The *CmDongle* is enabled as long as it is connected. If the *CmDongle* is removed from the PC, automatically the licensed access by applications is deactivated.
		The *CmContainer* is fully enabled. In the case of a *CmDongle,* the licensed access of applications is still featured even if the *CmDongle* is removed.

> Wibu-Systems recommends the activation status **"Enabled until plugged out"**.
> This ensures that even when a *CmDongle* is lost, unauthorized access to the licenses and personal data in the *CmDongle* is not possible.

Changing Activation Status

In order to change the activation status, please proceed as follows:
1. Select the radio button of the desired status option.
2. Enter the *CmDongle* Password in the following dialog.

> The default password for *CmDongle* is "`CodeMeter`".

Figure 7: *CodeMeter Control Center* - Enter Password

3. Click the **"OK"** button to confirm the status change.

Element	Description
License Update	Click this button to request new, or update existing licenses for selected *CmContainer*. The *CodeMeter Field Activation Service* (CmFAS) Assistant⌐34 opens. Figure 8: *CodeMeter Control Center - CmFAS Assistant*
Eject	Click this button to disconnect the selected *CmDongle*. The *CmDongle* logs off from the operating system, and can be safely removed from the PC.
Change Password	Click this button to change the password of the selected *CmDongle*. In the following **"Change Password"** dialog please complete the respective fields. Figure 9: *CodeMeter Control Center* - Change Password **1.** Enter in the **"Old Password"** field the currently used *CmDongle* password. The default password for *CmDongle* is "`CodeMeter`". **2.** Enter in the **"New Password"** field the new desired *CmDongle* password. **3.** Re-enter in the **"Retype Password"** field the new desired *CmDongle* password. If you forgot the *CmDongle* password, you have the option to set a new *CmDongle* password by using the *CmDongle* Master Password. **4.** Click the **"OK"** button to confirm your input.

Element	Description
	5. Activate the **"Input Master Password"** option and specify your *CmDongle* Master Password in the **"Old Password"** field.
	A Master Password you have received when you registered at the website my.codemeter.com. In order to register, use the **"Help	Register CmDongle"** menu item. A registration bears several advantages and serves to provide security when using *CodeMeter*®. Only when you are registered loosing the own password can be remedied by requesting a Master Password.

2.4.4 Events Tab

This tab displays information at start and at runtime of *CodeMeter License Server* and comprises the following items:

- number of connected *CmContainer*
- number of *CmContainer* entries
- number of found license container at the Firm Item level
- accesses to *CodeMeter License Server*

You configure the display of the event list using the **"View | ...** 25 **"** menu item.
You log the content for the event view using the **"File | Logfile** 24 **"** menu item.

2.4.5 Borrowing Tab

> By default, starting with *CodeMeter* Version 6.10 this tab displays only, if borrowing clients entries exist programmed with the 'old' borrowing using prepared *CmContainer*.

This tab informs on borrowable licenses as a feature of *CodeMeter*® license borrowing. Then licenses can also be used when the access to license information does not require to be connected to the license server.
You can toggle the view of this tab using the **"View | Borrow visible"** menu item.
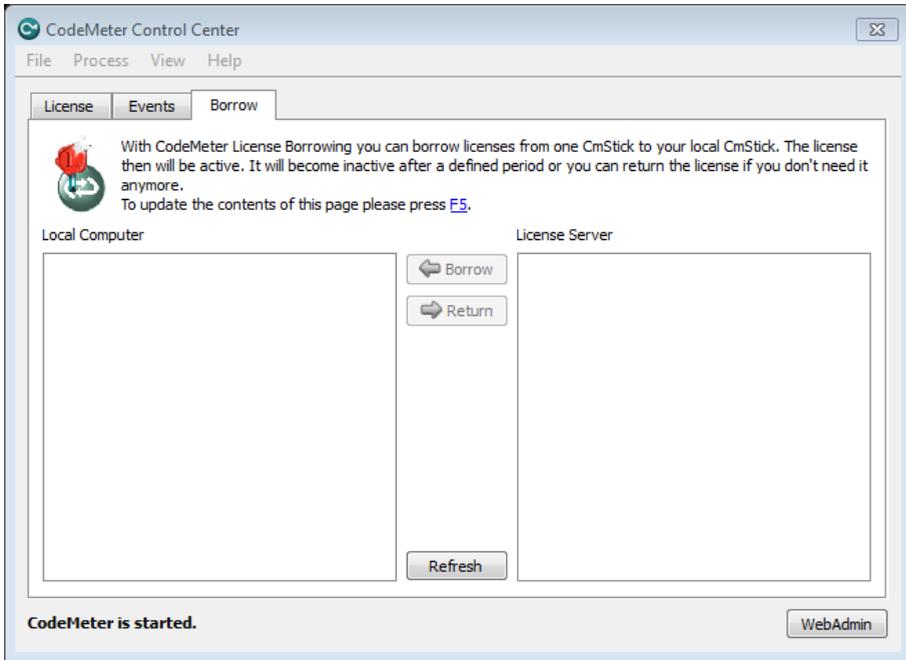
Figure 10: *CodeMeter Control Center* - Borrowing Tab

License Server

On the right, you see all licenses available for the 'License Borrowing' feature. The licenses are ordered by existing license server, Firm Items, and Product Items. The displayed licenses either are borrowable or inactive.

> You can borrow only active licenses. You recognize active licenses by the colored symbol and the activated **"Borrow"** button.
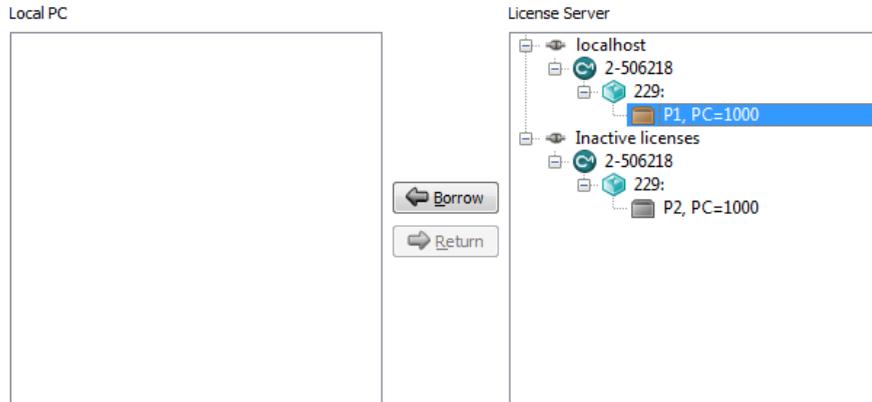
Figure 11: *CodeMeter Control Center* - Borrow Licenses

1. Click on the **"Borrow"** button to borrow licenses from the license server for the local PC.

Local PC

On the left, all licenses borrowed for the local use on a PC from a license server are displayed. These licenses are deactivated according to the defined borrowing period. However, you also have the option to return borrowed licenses before the borrowing period expires.

1. Click on the **"Return"** button to return borrowed licenses, and make them available again for the license server.
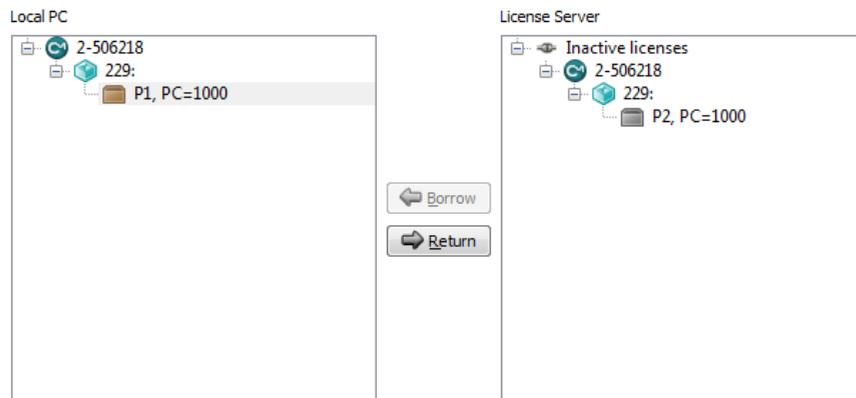
Figure 12: *CodeMeter Control Center* - Return Licenses

For refreshing the display of the tab press the key <F5> or the **"Refresh"** button.

2.4.6   Status and Starting CodeMeter WebAdmin

Status

This area displays information on the *CodeMeter License Server* status, i.e. if this service is started or not. If you want to change the status, use the **"Process | Stop CodeMeter Service"** or **"Process | Start CodeMeter Service"** menu items.

WebAdmin

Click this button to open *CodeMeter WebAdmin*. Alternatively, you can use the **"File | WebAdmin"** menu item.

2.5   Importing and Updating Licenses

The *CmFAS Assistant* [⮡ 35] supports you in importing and updating license files for your *CmContainer*. Using various dialogs you manually create license requests, import license updates, and, optionally, create receipts for these operations the end-user then sends to the software vendor. Using license files also allows the activation of licenses on a PC which has no direct Internet access. The figure below illustrates this process.

> Please note that importing license updates files (`*.WibuCmRaU`) is currently not supported for a *CmContainer* in operation.
> Before a license update, please save your work and close all other running *CodeMeter*© protected applications which access licenses on the target *CmContainer*.
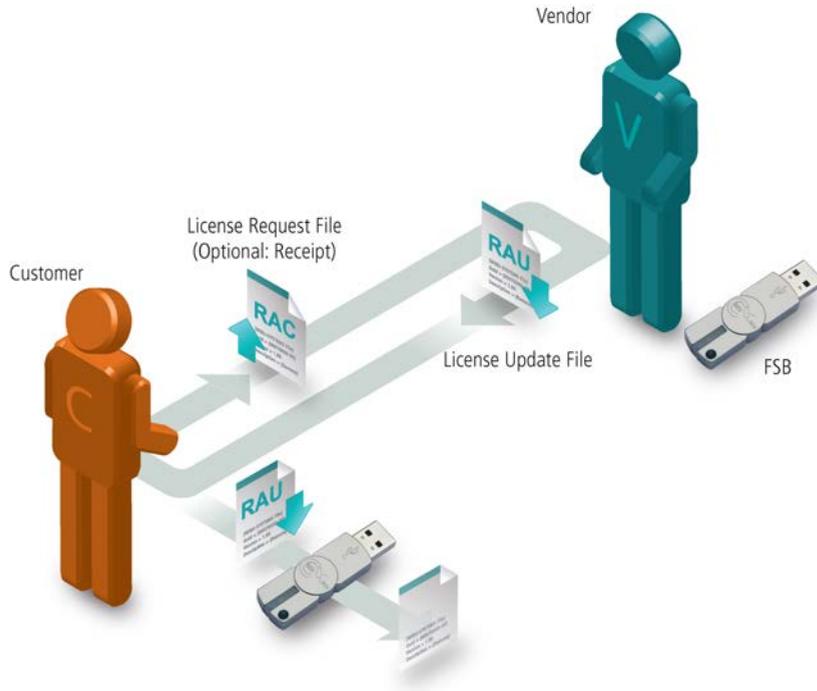
Figure 13: *CmFAS* - File-based Remote Update

2.5.1   The CmFAS Assistant in CodeMeter Control Center

> Please note that importing license updates files (`*.WibuCmRaU`) is currently <u>not</u> supported for a *CmContainer* in operation.
> <u>Before</u> a license update, please save your work and close all other running *CodeMeter*© protected applications which access licenses on the target *CmContainer*.

1. Open *CodeMeter Control Center*. If several *CmContainer* are connected to the computer, select the desired *CmContainer*.
2. Click on the **"Update License"** button.
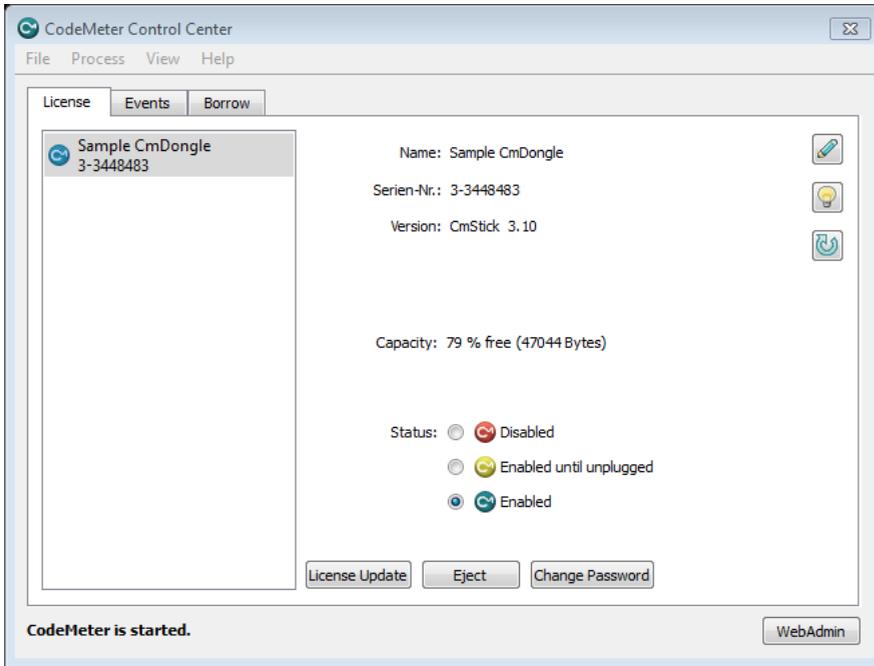
Figure 14: License Update - *CodeMeter Control Center*

The *CodeMeter Field Activation* (CmFAS) Assistant opens with a welcome dialog.

Figure 15: *CmFAS Assistant*

3. Click the **"Next"** button.

2.5.1.1 Create License Request File

The starting dialog prompts you to proceed. There you select from creating a license request, import a license update you received from the software vendor, or, optionally, create a receipt after an update to send it to the software vendor. After your selection click the **"Next"** button.
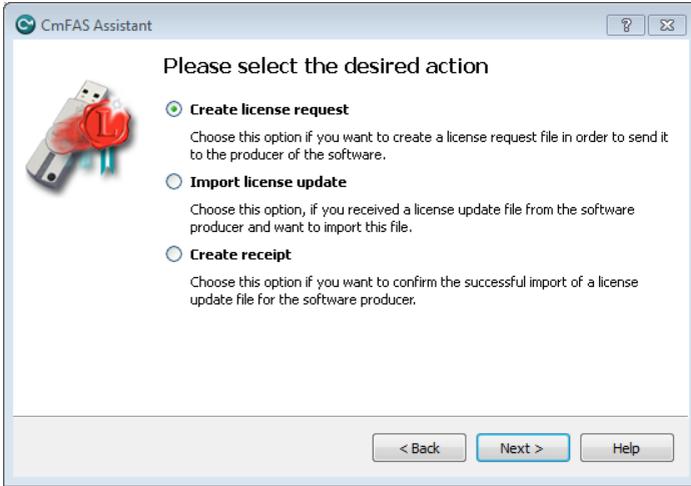
Figure 16: *CmFAS* - Create License Request

2.5.1.11 Extend Existing License

On creating a license request, you select whether you want to extend an existing license, or add a license of a new vendor. After your selection click the **"Next"** button.
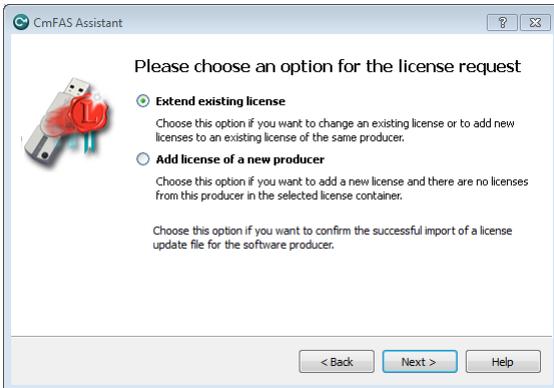
Figure 17: *CmFAS* – Extend existing License

When you extend an existing license, select the software vendor for which you want to create a license request. After your selection click the **"Next"** button.

Figure 18: *CmFAS* - License Extension - Select Vendor

The next dialog allows you to save the license request file to a desired location. Then click the **"Commit"** button to create the file. This file you then can send by e-mail to the software vendor.
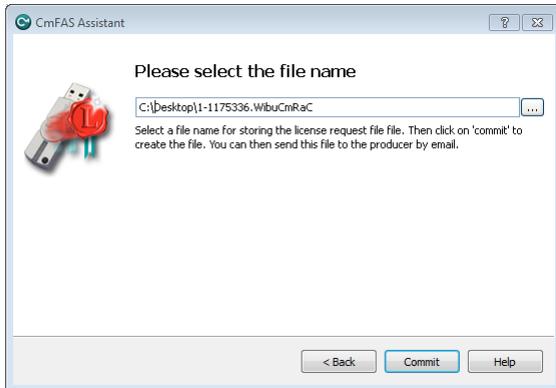
Figure 19: *CmFAS* – License Extension – Save File

Finally, a dialog displays which confirms the successful creation of the license request file. Click the **"Finish"** button to close the dialog.

2.5.1.12 Add a License of a new Producer

On creating a license request you can decide to extend an existing license, or to add a license of a new vendor. Select **"Add license of a new vendor"** and click the **"Next"** button.
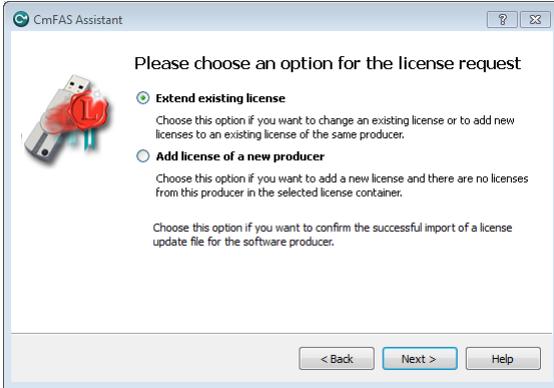
Figure 20: *CmFAS* – New License

In the next dialog, specify the Firm Code you received by the software vendor, and click the **"Next"** button.

Figure 21: *CmFAS* – Firm Code

The next dialog allows you to save the license request file to a desired location. Then click the **"Commit"** button to create the file. This file you then can send by e-mail to the software vendor.
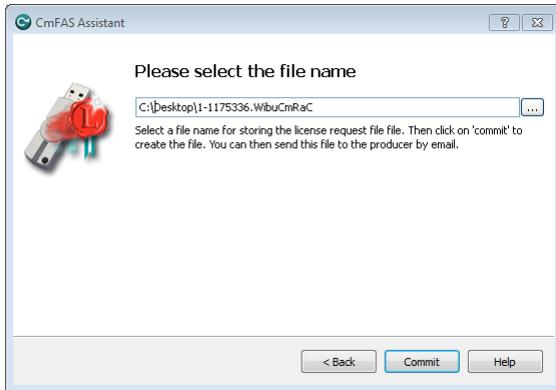
Figure 22: *CmFAS* - Save File

In both case, either when extending or adding a license you receive a confirmation the license request file has been successfully created. Click on the **"Finish"** button to complete this process.

Figure 23: *CmFAS* - Receipt

2.5.1.2 Import License Update

Please note that importing license updates files (`*.WibuCmRaU`) is currently <u>not</u> supported for a *CmContainer* in operation.
<u>Before</u> a license update, please save your work and close all other running *CodeMeter*© protected applications which access licenses on the target *CmContainer*.

In order to import a license update, in the start dialog select the respective option, then click the **"Next"** button.
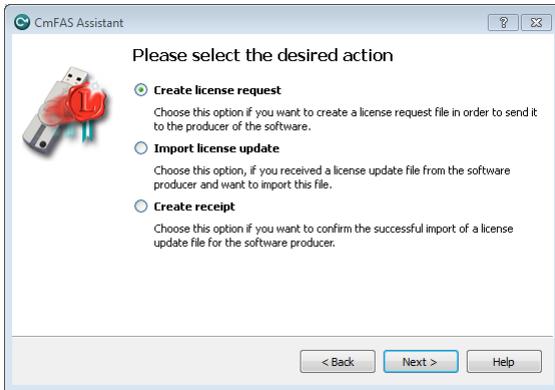
Figure 24: *CmFAS* - Import License Update

In the next dialog, select the file name you used when saving the license update file you received. Then click the **"Commit"** button to import the license update file.
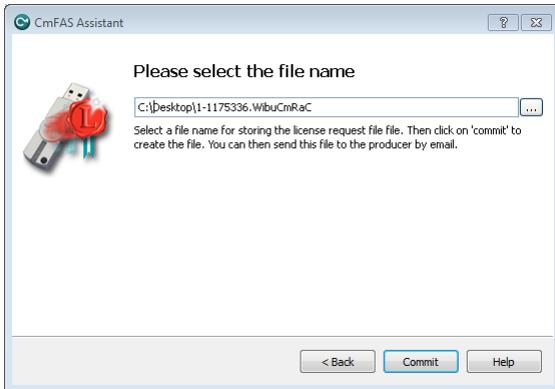
Figure 25: *CmFAS* - License Update - Save File

The following dialog confirms the successful import. Optionally, you can send a receipt to the software vendor. This option you also have in the start menu. Click the **"Finish"** button.
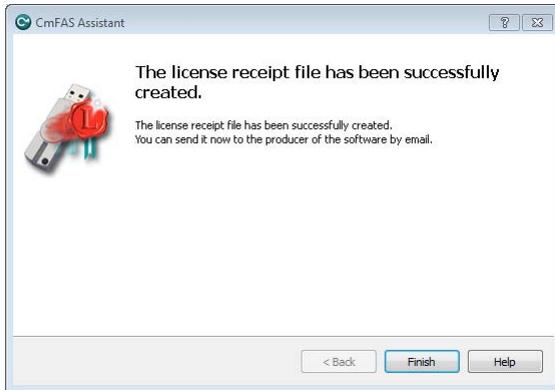
Figure 26: *CmFAS* - License Update - Receipt

2.5.1.3   Create Receipt

In the start menu, select the option **"Create Receipt"**, then click the **"Next"** button.
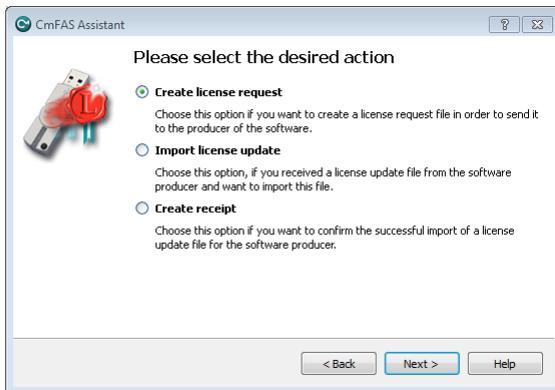
Figure 27: *CmFAS* - Create Receipt

In the next dialog, select the software vendor you want to send the receipt to, then click the **"Next"** button.

Figure 28: *CmFAS* - Create Receipt - Producer

Save the receipt file using the **"Commit"** button and send it to the software vendor.
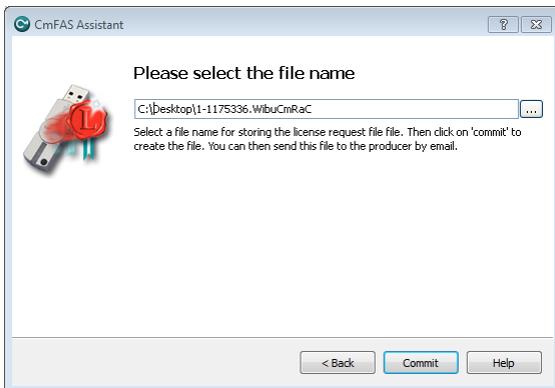
Figure 29: *CmFAS* - Create Receipt - Save File

The successful creation of the receipt file is confirmed in the next dialog. Click on the **"Finish"** button to complete this process.
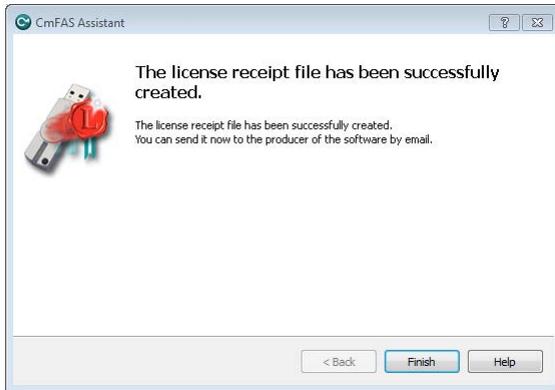
Figure 30: *CmFAS* - Create Receipt - Receipt

2.6 CodeMeter WebAdmin

With *CodeMeter WebAdmin* you obtain information on connected *CmContainer* and available licenses stored in them. In addition, you configure the service *CodeMeter License Server*. In detail, *CodeMeter WebAdmin* provides many configuration and analysis options in the following areas:

- **status information**: host [50] , *CmContainer* [52]
- **configuration** [71]: use as network server, proxy settings, access protection, remote access, time server, backup
- **display** [61]: display of all existing licenses locally and on the network, view of license conditions, session information
- **management** [64] : management of network licenses by manual allocation of licenses
- **diagnosis** [70] : logging
- **backup** [75].

The following list briefly describes terms which recur on single pages in *CodeMeter WebAdmin*.

| Term	Description
Access Mode	see: Status
Activation Time	Informs on the activation time of a license, i.e. the start time of a valid license.
Borrow Licenses	Informs on existing borrowed licenses, the borrowing period, and a unique security identifier (SID) when used on a network.
Currently Borrows Licenses	Number of the currently borrowed licenses.
Expiration Time	Informs on the expiration date of a license, i.e. when the license expires.
Extended Protected Data	Additional entry field for binary data for the licensor.
Feature Map	Informs on licenses which the licensor delivers with different functionalities and modules, or in different versions. These are mapped by Feature Maps describing a special functional scope. The value specified here informs on the valid functionality or the activated module/version.

Term	Description
Firm Code	Number which identifies the separate license container of a licensor.
Hidden Data	Additional entry field for binary data for the licensor.
Implicit Firm Item (IFI)	The license container holding licenses the user is able to use only with his/her *CmDongle* Password. This license container is identified by the number of "0".
License Quantity	Informs on the total number of licenses available for a license.
Linger Time	Informs on the time how long the license lingers after the license is re-allocated after the protected application is closed.
Maintenance Period	Informs on the period in which a protected version of the software has to be released to represent a licensed version. The start and the end of the period displays.
n/a	Informs that no related entry exists for this license (not available).
Product Code	Number which identifies the license entry, i.e. a product, of a licensor.
Protected Data	Additional entry field for binary data for the licensor.
Secret Data	Additional entry field for binary data for the licensor.
Status	Informs on how the number of started instances of a protected software relates to the allocation of licenses. User Limit: here each started instance allocates a license. Shared: here several started instances of the same application on the same PC allocate only a single license. Exclusive: here a protected application runs only once on a PC. No User Limit: here any number of started instances of the protected application can be started on the network without allocating additional licenses.
Unit Counter	Informs on licenses which are billed by use (pay-per-use, pay-per-print, etc.). This is implemented by counters which are decremented on use of a product. The value specified here informs on remaining units for the use of a license.
Usage Period	Informs on the usage period of a license. The value specified here informs on the use of a licenses in days. The value can also be bound to a starting time for the validity of a license.
User Data	Additional entry field for binary data for the licensee.

Table 2: *CodeMeter WebAdmin* - Terms in License Display

1. Check if the used Internet browser is not set to "offline mode".
2. Check the JavaScript support of your Internet browser.

> JavaScript must be activated for effective using *CodeMeter WebAdmin*.

3. Type in the URLs: `http://localhost:22350` or `http://127.0.0.1:22350` directly in the address field of your Internet browser.

2.6.1 Basics

TCP/IP based

Communication between *CodeMeter WebAdmin* and connected *CmContainer* is browser-based and uses network components. Thus the installation of the network protocol TCP/IP is required, and access must be granted to the `localhost(127.0.0.1)`.

However, an actual connection to the Internet is not established.

Firewall Settings

Please also note that the settings of your firewall do not block communication.

CodeMeter License Server uses a specific IP port (defaulted on 22350) to communicate with your PC and the network. This network port is registered at IANA (Internet Assigned Numbers Authority) and uniquely assigned for *CodeMeter*® communication.

Make sure that your firewall is not blocking this port. Enable the used IP port 22350 and make sure it is accessible by *CodeMeter*, i.e. share the communication for this IP port.

Communication Mode

By editing registry or server entries you are also able to define which communication mode *CodeMeter License Server* uses.
The following table shows you where for which operating system you find the profiling to set the communication mode.

Operating system	Registry / Server Entry
Windows	`HKLM/SOFTWARE/WIBU-SYSTEMS/CodeMeter/Server/CurrentVersion`
Mac OS	`/Library/Preferences/com.wibu.CodeMeter.Server.ini`
Linux	`/etc/wibu/CodeMeter/Server.ini`

The parameter **ApiCommunicationMode**. is available for setting the mode. The following properties are available:

CodeMeter®**-Version**	Properties
smaller than 4.40	'1' TCP/IP (Default) '2' Shared Memory
starting with 4.40	'1' Platform-specific (Default) Platform-specific defaults: • Windows: IPv6, IPv4; Shared Memory • Linux/Mac:IPv6, IPv4 • WinCE: IPv4, Shared Memory '2' Shared Memory '4' IPv4 '8' IPv6 Single modi may be combined.

Wibu-Systems recommends to use the relevant default settings, if no justified reasons suggest otherwise.

2.6.2 Starting CodeMeter WebAdmin

CodeMeter WebAdmin is a web-based tool to be displayed with any standard internet browser. The following table shows existing start options.

Operating System	Start
![Windows icon] Windows	• via *CodeMeter* symbol in the task bar (right mouse-click) and selection of 'WebAdmin' item. • via the 'WebAdmin' option in *CodeMeter Control Center* • directly in your Internet browser when typing in the URLs: **http://localhost:22350** or **http://127.0.0.1:22350**.
![Mac/Linux icon] Mac OS / Linux	• via *CodeMeter* in the task bar (right mouse-click) and selection of 'WebAdmin' item. • via the 'WebAdmin' option in *CodeMeter Control Center* • directly in your Internet browser when typing in the URLs: **http://localhost:22350** or **http://127.0.0.1:22350**.

If *CodeMeter WebAdmin* should not start, try the following:

1. Check if the used Internet browser is not set to "offline mode".
2. Check the JavaScript support of your Internet browser.

> ![info icon] JavaScript must be activated for effective using *CodeMeter WebAdmin*.

3. Type in the URLs: http://localhost:22350 or http://127.0.0.1:22350 directly in the address field of your Internet browser.

On all pages you are able to select from a list of available server.
Right to the display **"Current Server"** follows the name of the actual PC on which the service *CodeMeter License Server* is started. A search request using the port 22350 is sent to the network. For changing the server, please proceed as follows:

1. Click the ![icon] icon.
   A dialog displaying a list of all available server displays.


Figure 31: *CodeMeter WebAdmin* – Available Server

2. Select another PC on which *CodeMeter* is also started and the service *CodeMeter License Server* runs.

The entry changes color to orange and the **"Apply"** button becomes operable.
3. Click the **"Apply"** button.
4. Check the **"Use IP Address"** check box, if you want to use the IP address.

2.6.3   Operating

CodeMeter WebAdmin uses the following elements covering the navigation through the pages, the display of information, and actions.

Navigation element	Description
License Monitoring ˅ All Licenses Sessions License Tracking	Classical tab menu including dropdown controls.
Server Configuration › Server Access	Breadcrumb trail navigation area.
˅ ˅ ^ ^ or › ‹	Expand or collapse additional detailed information.

Display element	Description
	Image to show that the *CmContainer* is a *CmDongle*.
	Image to show that the *CmContainer* is a *CmActLicense*.
	Information icon changing its color from orange to red informs on important information to read and respond, e.g. restarting of *CodeMeter License Server*.
	Icon displaying license transfer options. Hover over control changes color to orange and displays information. A click advances to the Product Item detail page.
	Icon displaying license transfer history. Hover over control changes color to orange and displays information. A click advances to the Product Item detail page.

Action element	Description
	Opens a dialog to select available server.
	Defragmenting of the *CmDongle* chip memory.
	Updating the Certified Time of the *CmContainers* using a *CodeMeter Time Server*.

Action element	Description
➕	Adds a new entry to a list.
🗑	Deletes a list entry.
⬆	Moves up a list entry a level higher.
⬇	Moves down a list entry a level lower.

2.6.4 Dashboard

The dashboard displays basic server information on the *CodeMeter* runtime.

Figure 32: *CodeMeter WebAdmin* – Dashboard

Element	Description
Current Server	Name of the machine on which the service *CodeMeter License Server* has been started.
IP Address	Shows information on the network address in use.
Operating System	Shows information on the operating system in use.
Server Startup	Shows information on the start time of the server.

Element	Description
Server Version	Shows information on the *CodeMeter* version on the server.
Runtime Version	Shows information on the *CodeMeter* runtime in use.

2.6.5   Container

Using the **Container** navigation item finds information on connected *CmContainer*. This covers:

- licenses⌐ 52 including detailed information on Firm Items⌐ 53 and Product Items⌐ 54 .
- CmContainer Info⌐ 56
- User data⌐ 58 including detailed information on Product Items⌐ 59
- Backup and Restore⌐ 59

> If you open a selected *CmContainer* using *CodeMeter Control Center*, only this single *CmContainer* displays. At the same time, the tab **Licenses** opens. This also is the case, if you select a single Container from the list of **All Containers**.
>
> Click **All Containers** to open a clear overview of all connected *CmContainer*.

2.6.5.1 Licenses

The expanding area **"Licenses"** displays all licenses the selected *CmContainer* holds.

Figure 33: *CodeMeter WebAdmin* – CmContainer Details - Licenses

The display of licenses is ordered by different vendors. A vendor is uniquely identified by number value, the Firm Code, and a name. For example, in the figure above this is the Firm Code "600010" of "Vendor 1".
All related products, i.e. the licenses, are listed below the single licensor holding the respective Product Code, defined by a unique number value.

- If a license is expired or an Unit Counter has reached a value of `0`, the license entry is in red writing.

- If you see the pictograms, then a license transfer 91 is involved with the respective Firm Codes or Product Codes.

    inform on License Transfer Options

    informs on the License Transfer History

    On hovering the pictograms a separate popup informs, if clicking the pictogram, the **Firm Item Detail** 53- or **Product Item Detail** 54 page opens.

- Arrow symbols ↵ attached to sub-Product Code items indicate that Module Items⤢ [106] exist.

In the figure above, this is, for example, the product "Spreadsheet Application" with the Product Code of 13 or the product "Chart Application" with a Product Code of 14. In addition, you obtain further information⤢ [45] on existing **Unit Counter**, **Valid Until** (Usage Period, Expiration Time, Activation Time), **License Quantity** and **Feature Map**.
Click on the highlighted Firm Code⤢ [53] entry for the display of more detailed information on the license conditions of products by a specific vendor.
Click on the highlighted Product Code⤢ [54] ,entry for the display of more detailed information on the license conditions of products by a specific vendor.

2.6.5.2   Firm Item Details

This page displays detailed information on:
- Firm Item options of the selected *CmContainer*

Element	Description
CmContainer	Name of the *CmContainer* including mask and serial number.
Firm Access Counter	Displays the Firm Access Counter reading. The Firm Access Counter (FAC) locates at the Firm Item level of a *CmContainer*. This counter allows to control whether a Firm Item can be used for encryption purposes. By default, the FAC is deactivated and has a value of `65535 (0xFFFF)`. It can be programmed by the software vendor to any other value.
Firm Update Counter	Displays the Firm Update Counter (FUC) reading. This counter is automatically incremented on programming.
Firm Precise Time	Displays the time of the Firm Item-programming.

- the licensing of products of a specific software vendor.
  In the following figure, for example, you see all licenses of "Vendor 1" (Firm Code 600010). Additional information⤢ [45] covers **Product Code**, **CmContainer** serial number, **Name**, **Unit Counter**, **Valid Until** (Usage Period and/or. Expiration Time), **License Quantity** and **Feature Map**.

Figure 34: *CodeMeter WebAdmin* – Firm Item Details

2.6.5.3   Product Item Details

This page displays detailed licensing information of products of a specific vendor.
The following figure shows all available information[45] on the product "Word Processing Application" with a Product Code "10" of the software vendor at the Firm Item level with a Firm Code of "10".

Figure 35:*CodeMeter WebAdmin* – Product Item Details

Element	Description
Product Item Options	In the first column you see the Product Item Options.These are license properties set by the licensor. For illustrative reason the figure lists all options. When listed in other cases, not all of these options[45] are always displayed. In the figure above you see that the license has been borrowed for the local use.
Type	If the license properties represent data fields, the column informs in which area of the *CmContainer* these fields are located.
Size (Bytes)	The column the number of bytes a listed license property allocates.
Dependencies	The column informs whether a licensor has set dependencies for the programming sequence of the *CmContainer*.
Values	The final column displays the stored value of the single license property.

The license properties as displayed in the figure above are not always set. The display of your license may differ.

2.6.5.4 CmContainer Info

The expanding area **"CmContainer Info"** displays information on the selected *CmContainer*.

Figure 36: *CodeMeter WebAdmin – CmContainer* Info

The following information and elements are available.

Element	Description
Name	Shows the **Name** of the selected *CmContainer*. If you want to change the name of your *CmContainer,* use *CodeMeter Control Center*.
Serial Number	Shows the **Serial Number** of the selected *CmContainer*.
CmContainer Type	Shows the **Type** of the selected *CmContainer*.
First Device	Shows the drive information of the selected *CmDongle* if configured as Mass Storage Device. Alternatively to the Mass Storage Device status, the *CmDongle* can display as HID without a drive status. Each status can be configured[124]. ℹ️ The drive size is only displayed in the case of *CmDongles* with Flash memory.
Status	Shows the current activation status of the selected *CmContainer*. The following status settings are displayed: • **Disabled:** 🔴 The connected *CmContainer* is deactivated and not usable by any application.

Element	Description
	• **Enabled until Unplugged**: The *CmDongle* is activated as long as it is connected and supplied by electrical energy. After removed from the PC the *CmDongle* is automatically deactivated. • **Enabled**: The *CmContainer* is fully activated. If a *CmDongles* is removed, the license access is still possible after plug out. • **Empty**: The *CmContainer* is empty and must yet be activated (*CmActLicense* - LIF). You change the activation status of a *CmContainer* using CodeMeter Control Center⌂ 23 . Wibu-Systems <u>recommends</u> the activation status "**Enabled until Unplugged**" when using *CmDongles*. This ensures that even when a *CmDongles* is lost, unauthorized access to the licenses and personal data in the *CmDongle* is lost, unauthorized access to the licenses and personal data is not possible.
System Time (PC)	Shows the **System Time** (local time on the PC) when the service *CodeMeter License Server* has started.
System Time (CmContainer)	Shows the saved **System Time** (internal time) of the *CmContainer*. These two system times may differ due to the pending synchronization process.
Certified Time (CmContainer)	Shows the Certified Time saved in the *CmContainer*. In order to update the Certified Time of your *CmContainer* using a *CodeMeter*® Time Server, click the [⟳] button. This action is confirmed by a dialog. Figure 37: *CodeMeter WebAdmin* - Update Certified Time
Free Memory	Shows the **Free Memory** of the SmartCard chips of a *CmDongle*, i.e. how much space is available for the programming of additional license entries.
Defragment	Click the [≡] button to defragment the memory of the *CmDongle c*hip.

2.6.5.5 User data

The expanding area **"User Data"** displays detailed <u>information</u>[45] on products (licenses) the user is able to use only explicitly with the personal *CmDongle* Password. The Firm Code in this case has a value of "0".

Figure 38:*CodeMeter WebAdmin* – User Data

2.6.5.6 User Data Details

The **"User Data Details"** page displays detailed Product Item information[45] on products (licenses) the user is able to use only explicitly with the personal *CmDongle* Password.

Figure 39: *CodeMeter WebAdmin* – User Data Details

2.6.5.7 Backup and Restore

The expanding area **"Backup and Restore"** allows you to save personal data located in your *CmDongle*, and restore them in the *CmDongle*.

	This area does not display for the Container type *CmActLicense*.

	Note, that the backup and restore mechanism only comprise the user data in the *CmDongle* but no license information of other licensors. Backup and restore exclusively relates to the license container with the Firm Code "0". In order to restore licenses which do not locate in the personal area (Firm Item levels unequal to Firm Code "0"), please contact Wibu Support.
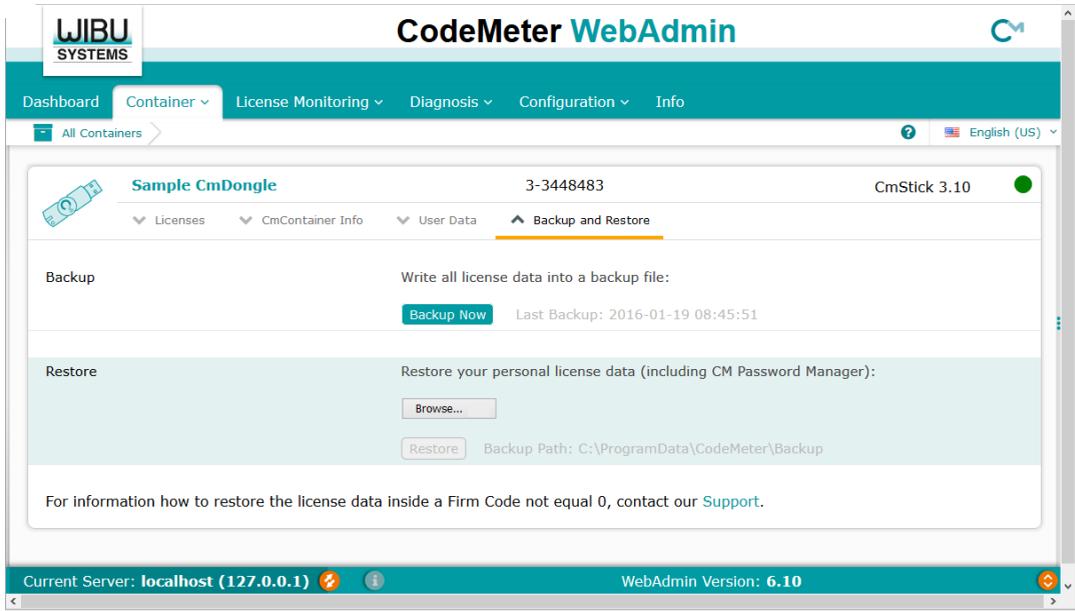
Figure 40: *CodeMeter WebAdmin* - "Backup and Restore"

Area	Description
Backup	1. Click the **"Backup now"** button to apply an instant backup of your personal *CmDongle* data (user data). In addition, the time of the **Last Backup** is displayed. 2. Confirm the following dialog to create the backup file.
Restore	1. Click the **"Browse"** button to select the backup copy which is to be restored. The location of the backup file displays. 2. Click the **"Restore"** button to start the restoring process. 3. Confirm the following dialog and click the **"OK"** button.

	ℹ️ If you import a backup into the *CmDongle*, all changes after the backup was created are lost.
	4. Enter the Password of the *CmDongle* in which the backup file is to be imported.
	ℹ️ You are also able to import the saved data into another *CmDongle*. Please note, however, that the second *CmDongle* must have the same password !

2.6.6 License Monitoring

The **"License Monitoring"** page displays all existing licenses and their allocation ordered by licensors and related licenses.
Next to describing information on **Product Code**, **Name**, and **Feature Map**, the column **License Quantity** shows the respective total number of **available** licenses..

Shared and Available Licenses

In addition, an expandable area structures the licenses according to access modes (**User Limit (Borrowed)**, **No User Limit**, **Exclusive**, **Shared**) and shows **available** licenses.

Figure 41: *CodeMeter WebAdmin* – "License Monitoring | Available"

Element	Description
User Limit	Here each started instance allocates a single license. It does not make a difference if the *CmContainer* was found locally, or on a network. In brackets the number of borrowed licenses display, if existent.
Station Share	Here multiple instances can be started on a single PC but allocate only a single license. You use this setting, for example, when you want to provide the end-user with the option of starting the application several times. On a terminal server each session allocates a license. In virtual machines each machine allocates a license.
Exclusive	Here a protected application can be started only once on a PC.
No User Limit	Here any number of instances of the protected application can be started locally or in a network, and no additional licenses are allocated. Allocated licenses in this mode can be re-used.

2.6.6.1 License Monitoring Details

The **"License Monitoring Details"** page displays detailed information on the license allocation.

Figure 42: *CodeMeter WebAdmin* – "License Monitoring | License Monitoring Details"

For example, in the figure above you see:

- the licenses for the application derive from the licensor with the Firm Code 600010 and describe the product with the Product Code 14.
- the licenses are stored in the *CmContainer* with the mask and serial number `3-3448482`.
- in total 1 client, identified by **ID**, **Client** (`::1(WIBU \ fs`) and **Client Process ID** columns, 4 times accessed the application "Chart Processing" using Station Share. Here multiple instances can be started on a single PC but allocate only a single license. An access from another PC would be possible as the upper table (Total 2, Available 1) shows.
- There is no expiration date.
- Client `::1(WIBU \ fs` for the first time accessed the application (**First** and **Last Access** columns are of same date).

- Using the pictogram of the **Action** column allows you to deallocate single accessed licenses..

> You cannot deallocate and reallocate borrowed licenses before they have been returned.

For example, this is necessary when all licenses are allocated but an additional instance of the application needs to be started.

> After deleting of an access the license is deallocated and available again. The client of the application receives a respective error message.

2.6.6.2   Sessions

The **"License Monitoring | Sessions"** page displays all existing licenses ordered by users actually logged on (**Clients**).

Figure 43: *CodeMeter WebAdmin* – "License Monitoring | Sessions"

Here you obtain all describing information[45] on the **CmContainer**, licensor (**Firm Item**), license (**Product Item**), and **Access Mode**.

2.6.6.3   License Tracking

The **"License Monitor | License Tracking"** page allows you to track who, when, from where, how often uses server licenses of *CodeMeter*-protected applications.

> For Windows operating systems you find the profiling entries stored in the registry, for other operating systems entries are set in the file `server.ini`. The following table shows you the respective locations.

Operating system	Registry / Server.ini Entry
Windows	`HKLM/SOFTWARE/WIBU-SYSTEMS/CodeMeter/Server/CurrentVersion`
Mac OS	`/Library/Preferences/com.wibu.CodeMeter.Server.ini`
Linux	`/etc/wibu/CodeMeter/Server.ini`

There exist two relevant profiling entries for *License Tracking*.

Entry	Property	Value
`LogLicenseTracking`	`[DWord]`	`[0;1]`
		Default value is is `0` and Logging for License Tracking is disabled.
`LogLicenseTrackingPath`	`[SZ]`	`<path>`
		◦ Default path on Windows operating systems is `%ProgramData%\CodeMeter\LicenseTracking`. For other operating systems the default path has the same value of the general profiling entry `LogPath`.

> ℹ️ Please note that changed settings will take effect only after restarting *CodeMeter License Server*.

On the basis of selectable Firm Codes, log files and licenses, accesses are displayed graphically and in detail. The created report may serve to use information on license requests and denials for saving license costs and create forecasts or prognoses.

Using a separate navigation the number and origin of allocated, rejected or released licenses can be tracked according to specified view modes (month, day, hour). Clicking on the displayed bars shows more details on the use of licenses.

For using license tracking, please proceed as follows:

1. Select the desired Firm Code using the field "**Select Firm Code**".

Select Firm Code

10: CodeMeter Test Firm Code   Reload

Click the "**Reload**" button to update the displayed Firm Codes.

2. Select the log file using the field "**Select logging period**".

Select logging period

2015-12-11T13:16 - 2015-12-11T13:32   Reload

Click the "**Reload**" button to update the logging period entries.

3. Select the license to be tracked using the field "**Select license**".

Select logging period

2015-12-11T13:16 - 2015-12-11T13:32   Reload

4. Click the button "**Create report**".

The separate area **Navigation**:
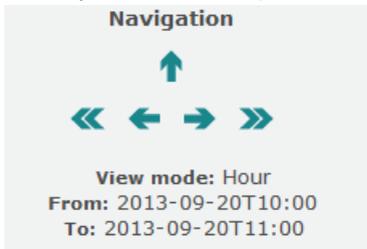
- informs on the view mode (Month, Day, Hour),
- shows the tracked period (From - To),
- allows to browse back and forward in time periods and switch back to the previous view mode.

Below the selection area a **bar chart** displays showing the maximum number of allocated licenses and rejected requests over time.

The default is set to the view mode month.

5. Move over a colored bar to open an over-layered dialog for information display.

6. Click left to change to view mode **Day**.

For switching back to the view mode **Month** you may use the arrow symbol in the **Navigation** area.

7. Move over a bar again tom switch to the view mode **Hour**.

> **From:** 2013-10-10T15:00
> **To:** 2013-10-10T15:59
> **Allocated Licenses:** 3
> <click left for hour>

8. Move over a bar again and left click to open the separate **Details** area.

> **From:** 2013-10-10T15:07:00
> **To:** 2013-10-10T15:07:59
> **Allocated Licenses:** 3
> <click left for details>

Detailed information and separate tables for single bars list details on **Active Users**, **Rejected Requests** and **All Events**.

Details

Period: **2013-10-10T15:09:00 - 2013-10-10T15:09:59**
Maximum number of allocated licenses: **3**
Maximum number of rejected requests from different users: **1**

Active Users (ID, Client, User)

Active Users

ID	Client	User
57	10.49.12.17	wv
58	10.49.12.17	wv
59	10.49.12.17	wv
60	10.49.12.17	wv
61	10.49.12.17	wv
62	10.49.12.17	wv
63	10.49.12.17	wv
64	10.49.12.17	wv
65	10.49.12.17	wv
66	10.49.12.17	wv
67	10.49.12.17	wv
68	10.49.12.17	wv

Rejected Requests (Second, Event Type, Client, User)

Rejected Requests

Second	Event Type	Client	User
26	Denial	10.49.12.17	wv
28	Denial	10.49.12.17	wv
30	Denial	10.49.12.17	wv
34	Denial	10.49.12.17	wv
36	Denial	10.49.12.17	wv

All Events (Second, Event Type, ID, Client, User)

All Events

Second	Event Type	ID	Client	User
3	Denial		10.49.12.17	wv
5	Access	60	10.49.12.17	wv
5	Release	58		
5	Release	59		
7	Access	61	10.49.12.17	wv
7	Access	62	10.49.12.17	wv
11	Release	60		
13	Access	63	10.49.12.17	wv
13	Denial		10.49.12.17	wv
13	Release	62		
16	Access	64	10.49.12.17	wv
16	Access	65	10.49.12.17	wv
20	Release	63		
22	Access	66	10.49.12.17	wv
22	Release	64		
22	Release	65		
24	Access	67	10.49.12.17	wv
24	Access	68	10.49.12.17	wv
24	EOF			

The detail view uses the following elements:

Element	Description
ID	uniquely discerns requesting / accessing processes.
Client	identifies the IP address of the requesting / accessing machine.
User	identifies the user requesting / accessing the license.
Second	informs on the second time value.
Event Type	**Denial** describes that a user requested a license but did not get one because no more licenses could be allocated. It will not show license requests of licenses that do not exist on this server.
	Access describes that a license on a server is allocated to a user.

Element	Description
	Release describes that a user has released a formerly accessed license on a server.

2.6.7   Diagnosis

The **"Diagnosis"** page allows you to log all events related to the *CodeMeter License Server* service.

2.6.7.1   Events

The **"Diagnosis | Events"** page provides information which supports you in detecting eventually occurring errors by viewing events.

> *CodeMeter WebAdmin* displays a protocol only if you previously activated[⧉ 24] this function in *CodeMeter Control Center*.
> There you find further information on how to save the log file.

Figure 44: *CodeMeter WebAdmin* – Diagnosis | Events

2.6.8   Configuration

Using the **Configuration** navigation item allows you to configure some Basic⬚71, Server⬚75, and Advanced⬚88 settings.

2.6.8.1   Server Search List

The **"Configuration | Basic | Server Search List"** page allows to define access to and order of installed⬚75 *CodeMeter* network LAN and WAN (Wide Area Network) server.
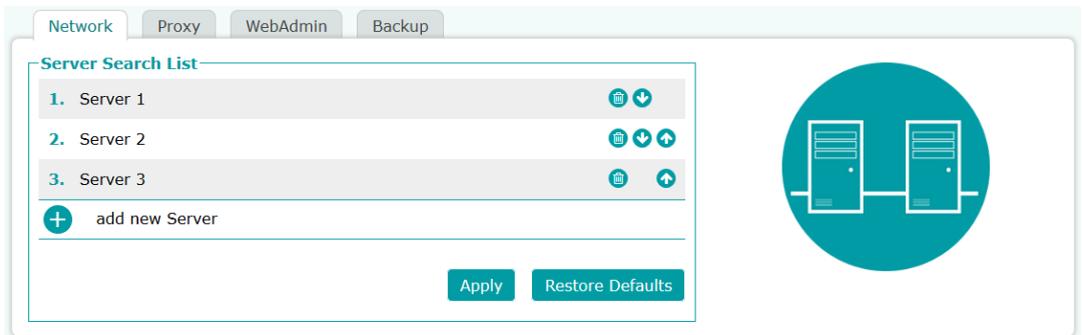
Figure 45: *CodeMeter WebAdmin* – "Configuration | Network"

Element	Description
Server Search List	Use a **Server Search List** to define access to and order of *CodeMeter*® network LAN and WAN (Wide Area Network) servers.
	You edit the server search list by using the respective ⊕ **add new Server**, 🗑 **remove"** buttons. You can also change the order by using the ⬆ **up** and ⬇ **down** buttons. You save the changes you made by using the **"Apply"** button.
	ℹ You set back the settings of the server search list using the **"Restore Defaults"** button.
	Alternatively, you are also able to set the Server Search List using the configuration files `CodeMeter.ini` or `Server.ini`. The table below shows you where to find the respective files.
		Operating System	Configuration File	
		Windows	`%Program Files%\CodeMeter\Runtime\bin\CodeMeter.ini`	
		Mac OS	`\Library\Preferences\com.wibu.CodeMeter.Server.ini`	
		Linux	`\etc\wibu\CodeMeter/Server.ini`	
	In the separate section `[ServerSearchList]` define the server as the exampe below shows:
	`[ServerSearchList]`

```
[ServerSearchList\Server1]
Address=184.45.89.5

[ServerSearchList\Server2]
Address=185.55.78.6
```

When you define network settings, in some cases, this requires the restart of the *CodeMeter*® service. However, you do not have to eject or deactivate the *CmContainer*. After you specified the settings you are able to stop and then restart the *CodeMeter*® service in *CodeMeter Control Center* 25. For non-Windows operating systems see here 20 .

In order to check for a successful connection, on the **"Home"** page click the **"Host Name"** button and look for the successful appending of the PC as server. The check works also by opening *CodeMeter Control Center* on the clients and the server and looking for the communication status in the respective "Events" tabs.

> If a connection is still not established specify on the client PCs the server IP address.

Using in a local area network (LAN):

By specifying the PC names or IP addresses you define that the client requests exactly address the defined *CodeMeter*® network server. This increases the performance on the network.

> If the *CodeMeter*® network server is located in another subnet, you should always specify the IP address in the server search list in order to preclude UDP broadcast problems.
> By default, *CodeMeter License Server* binds to the first network adapter found.

Using in a wide area network (WAN):

> Please note, that a WAN connection has to be provided by the Software Vendor.

Specify the IP address(es) for client requests to the defined *CodeMeter License Server* in the WAN.

> When specifying the IP address(es) please note that you are required to prefix a "`https:\\`"needed for the secured communication with a reverse proxy in the WAN.

2.6.8.2 Proxy

On the **"Configuration | Basic | Proxy"** page you define settings when using a proxy server. You require a proxy server, for example, coupled with:
- Firmware update
- update of the certified time using a Wibu-Systems time server
- access via CmWAN on a remote *CodeMeter* server.
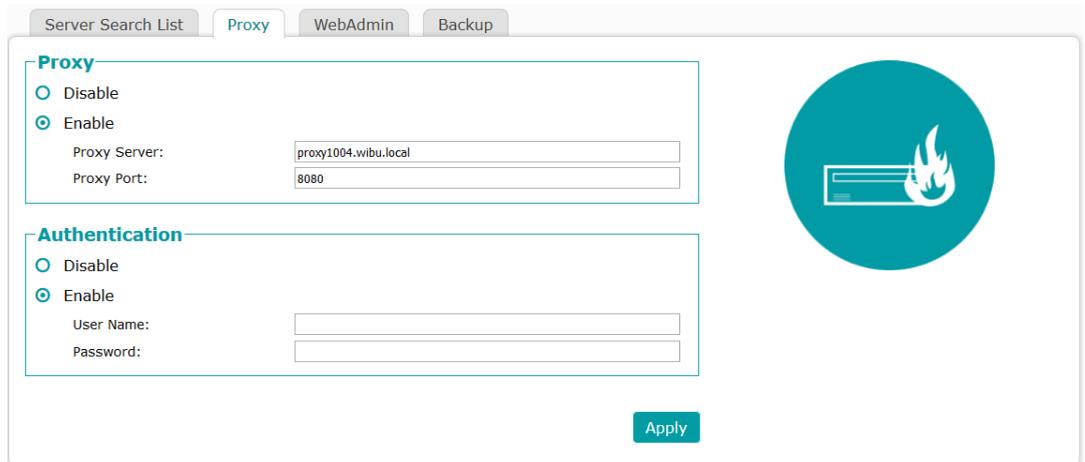
Figure 46: *CodeMeter WebAdmin* - "Configuration | Proxy"

For activating the **Proxy**, please proceed as follows:
1. Click the **"Enable"** radio button to configure the proxy.
2. Specify the **Proxy Server** as IP address or DNS name.
3. Specify the **Proxy Port**.

For activating the **Authentication** of the proxy server, please proceed as follows:
1. Click the **"Aktivieren"** radio button.
2. Specify the **User Name**.
3. Specify the **Password**.

Click the **"Apply"** button to save the changes.

2.6.8.3 WebAmin

On the **"Configuration | WebAdmin"** page you define settings to manage the remote access to *CodeMeter WebAdmin*.

Figure 47: *CodeMeter WebAdmin* - "Configuration | WebAdmin"

Element	Description
Allow Only Local Access (unrestricted)	Activate this option to allow unrestricted local access to *CodeMeter WebAdmin*.
Require Authentication	Activate this option to enable remote write-access to *CodeMeter WebAdmin*. This allows a client to access the server via HTTP. This requires an authentication. Please complete the necessary authentication data in the fields **User**, **Password** and **Verify Password**.
Allow Remote Read *	Activate this option to allow remote read access.

Click the "**Apply**" button to save the changes you have made. By a previous click on the "**Restore Defaults**" button you save the default settings. Remote read access is featured

Setting the remote access requires the restart of the *CodeMeter* service. However, you do not have to eject or deactivate the *CmContainer*. After you specified the settings you are able to stop and then restart the *CodeMeter* service in *CodeMeter Control Center*[25] . For non-Windows operating systems see here[20] .

2.6.8.4 Backup

On the **"Configuration | Basic | Backup"** page you define settings for the location and intervals of *CmDongle* data backups.

Figure 48: *CodeMeter WebAdmin* - "Configuration | Backup"

Element	Description
Backup Path	Specify in the Backup Path field the location where the backup file of the *CmDongle* is to be saved. The default location for backup files depends on the operating system in use.
Backup Interval	Specify in the Backup Interval field the recurring time period for automatic backups. By default, automatically a data backup is executed every 24 hours. However, you are also able to create a backup for the *CmDongle* at any time.
Certified Time	Activate this option when a Certified Time update has to take place before a backup is executed.

Click the "**Apply**" button to save the changes you have made.
By a previous click on the "**Restore Defaults**" button you save the default settings.

2.6.8.5 Server Access

On the **"Configuration | Server | Server Access"** page you set up *CodeMeter*® in a network and/or a wide area network (WAN).

Please note that changes you make here will apply only after a restart[20] of *CodeMeter License Server*.

Figure 49: *CodeMeter WebAdmin* – "Configuration | Server | Server Access"

For activating the **Network Server** option, please proceed as follows:
1. Click the **"Enable"** radio button to use the PC as *CodeMeter* network server.
   Then this PC provides its *CodeMeter* licenses on the network using the service *CodeMeter License Server*.
2. Specify a **Network Port**. By default, the port 22350 is used for the *CodeMeter* communication.
   This network port is registered at IANA (Internet Assigned Numbers Authority) and uniquely assigned for the *CodeMeter* communication.

   > You are able to customize this port value. However, make sure that all *CodeMeter License Server* use this port when a *CodeMeter* protected application is to be used on the network.

3. Click the **"Apply"** button to save the changes or **"Restore Defaults"** restoring the default settings.

For activating the **CmWAN Server** option, please proceed as follows:
1. Click the **"Enable"**radio button to use the PC in a wide area network (WAN) and allow license accesses.

   > Please note, that a WAN connection has to be provided by the Software Vendor.

2. Specify a **CmWAN Port**. By default, the port 22351 is used for the *CodeMeter* communication via WAN.

> You are able to customize this value. In this case, make sure that:
> * all *CodeMeter License Servers* use this port, if *CodeMeter* protected applications access licenses via WAN.
> * the configured reverse proxy has the same port setting.

3. Click the **"Apply"** button to save the changes or **"Restore Defaults"** restoring the default settings.

2.6.8.6 License Access Permissions

On the **"Configuration | Server | License Access Permissions"** page you define settings managing the client access to *CodeMeter License Server* on a network.
On access configuration you can select among a basic and an advanced mode.
The basic⌐77 mode allows adding client computer and IP addresses for accessing *CodeMeter License Server* on a network.
The advanced⌐80 mode allows, for example, specifying global and specific access rules for accessing licenses and reserving license access for single staff member or complete Active Directory groups.
Please select the desired License Access Permissions mode.
Basic Mode

Figure 50: *CodeMeter WebAdmin* - "Configuration | Access Control"

Element	Description
Clients	Shows a list of all client PCs which have the privilege to use *CodeMeter License Server*, i.e. to allocate a license. ⓘ When this list is empty, each *CodeMeter*® client on the network is able to use *CodeMeter License Server*. This is the default setting. To add a new client to the client list, please proceed as follows: **1.** Click the **"Add"** button. A prompt dialog displays. **2.** Specify the PC name or the IP address of the client in the dialog. **3.** Click the **"OK"** button. The PC is now added to the client list. To remove a client from the list, please proceed as follows: **1.** Click the **"Remove"** button. The PC is now removed from the client list
Enable FSB Access	If you own a *CodeMeter*® Firm Security Box (FSB), this option activates the sharing of the FSB on the network. Then the FSB is able to be used by several users, for example, to program *CmContainer* or automatically protect applications.

Element	Description
	This option makes sense only for *CodeMeter*® licensee with an individual *CodeMeter*® Firm Code.
	Click the **"Apply"** button to save the changes you have made. By a previous click on the **"Default"** button you save the default settings. Then the client list is empty, and the FSB is not available on the network.
	When you define access settings, in some cases, this requires the restart of the *CodeMeter*® service. However, you do not have to eject or deactivate the *CmContainer*. After you specified the settings you are able to stop and then restart the *CodeMeter*® service in *CodeMeter Control Center* ⤷ 25 . For non-Windows operating systems see here ⤷ 20 .

Additional access control of client list via whitelist and Blacklist

Alternatively, you also have the option to create a white or blacklist for the access of clients. This so-called profiling you conduct for different operating systems at the following locations:

Operating System	Profile Creation
Windows	Registry entry in `HKLM/SOFTWARE/WIBU-SYSTEMS/CodeMeter/Server/CurrentVersion`
Mac OS	`/Library/Preferences/com.wibu.CodeMeter.Server.ini`
Linux	`/etc/wibu/CodeMeter/Server.ini.`

The generation of the profile for *CodeMeter License Server* comprises the following versions (`CodeMeter.exe`, `CodeMeterMacX`, `CodeMeterLin`, `CodeMeterSun`),

When you edit the `*.ini` files in the case of Mac OS and Linux, you <u>must</u> stop the service *CodeMeter License Server* before. Otherwise, changes you have been made do not apply.

Parameter	Description
Client<index>=<Subnetz>[,<serial>[,FC[,PC]]]] (Whitelist)	**Whitelist**: These parameters hold the IP addresses of client PCs on the network which have the privilege to access the local *CodeMeter License Server*. When the IP address of a client is not on this list, the access is denied. If no whitelist exists, no other restrictions apply. The specification of subnets is possible. The syntax is as follows: `Client<index>=<Subnetz>[,<serial>[,FC[,PC]]]` The serial number has to follow the pattern `MaskByte-Serial Number` (e.g. `1-1179681`). <u>Example</u>: Client1=192.168.0.0/24,1-123456,10,13 this addresses all computer ranging from 192.168.0.0 to192.168.0.255 (Class C). Usually are also /8 (Class A) and /16 (Class B). The serial number, FC, and PC are optional. This whitelist corresponds to the client list in *CodeMeter WebAdmin*.

Parameter	Description
Client<index>=<Subnetz>[,<serial>[,FC[,PC]]]] [SZ, optional]	**Blacklist**: These parameters hold the IP addresses of client PCs on the network which have no privilege to access the local *CodeMeter License Server*. When an IP address of a client is on this list, the access is denied. If no blacklist exists, no other restrictions apply. The syntax is as follows: `Client<index>=<Subnetz>[,<serial>[,FC[,PC]]]` The serial number has to follow the pattern `MaskByte-Serial Number` (e.g. `1-1179681`). Example: Client1=192.168.0.0/24,1-123456,10,13 this addresses all computer ranging from 192.168.0.0 to192.168.0.255 (Class C). Usually are also /8 (Class A) and /16 (Class B). The serial number, FC, and PC are optional.

Advanced Mode

Figure 51:: *CodeMeter WebAdmin* - "Configuration | Access Control" - Advanced Access Control Mode

The advanced access control mode allows the controlling of license access using access rules. The license access by single staff members but also of complete Active Directory groups can be organized. The detection of single staff members (user name) and groups happens automatically without any integration efforts.

Two types of access rules exist:

- global access rules [81]

- specific access rules⤷ 82

The global access rules control the license access to **all** *CmContainer*. If specific access rules have been defined, then these are exempted from the global access rules.
The specific access rules control license access to separately specified license entries (Firm Code, Product Code). Then the specific access rules are valid and for matching license entries the global access rules are ignored.
The following conditions hold true for access rules:

- access rules are created, edited and deleted in a separate area or dialogs.
- access rules may cover several rules. Rules are processed top-down, which means that the order of the rules is decisive for the result.
- access rules conclude with an area defining the default license access status applied after the final rule of a set is performed.
- If specific access rules are defined, the most specified available access rules apply. If no rules are configured for the Product Code, the rules for the Firm Code apply. If no Firm Code rules exist, the global rules apply.

> Please note that reading complete Active Directory groups depending on the complexity of their structures may take some time.

Creating the global access rules

In order to create the global access rules to control license access globally for all *CmContainer*, please proceed as follows:

1. Select the **"Global access rules"** item in the left tree view.
2. Click the **"Add new rule"** button.
   A dialog for defining a new rule displays.

3. Click the **"Allow"** or **"Deny"** radio button in the area **Action** to decide, whether the following license access by client is to be allowed or denied.
   A client access can be defined by one of the following parameter: **Computer** name, **IPv4 Subnet** address **User** or **Group** name.
4. Specify the desired parameter in the respective field. If an active directory is integrated, the list of fields **User** and **Group** is auto-completed.

5. Click the **"Add"** button to add the new rule.
A click on the **"Cancel"** button cancels the process.
The new rule displays in the right rule view.

If you defined several rules, you may change the rule sequence by using the arrow symbols ⬆ ⬇ . Rules are processed top-down, which means that the order of the rules is decisive for the result.
Using the **"Edit"** or **"Delete"** link allows you to modify a completely delete a rule.

6. Define which default license access status applies after the final rule of a set is performed.
You have the option to set the **Default action** to allow or deny license access.

7. Click the **"Allow"** or **"Deny"** button.

8. Click the **"Apply"** button in the lower part to save the changes made to the global access rules.
Using the **"Undo Changes"** button reverts the global access rules prior to the modification, and the **"Restore Defaults"** button applies the default settings.
If you apply the changes made, please restart[20] *CodeMeter License Server*.
The figure below shows an example of global access rules. It allows the global license access by a guest user and the complete support department. All other licenses accesses are also allowed, if no specific access rules specify otherwise.

Figure 52:: *CodeMeter WebAdmin* - "Configuration | Access Control" - advanced Mode- global access rules

Creating specific access rules

In addition to defining the global access rules, you have also the option to control the license access to specific separate license entries. Here you define specific access rules for separate defined Firm Codes and/or Product Codes.

Firm Code-specific access rules

In order to create specific access rules to control license access to separate Firm Codes, please proceed as follows:

1. Select the **"Specific access rules"** item in the left tree-view.

2. Click the **"Add Firm Code"** button.
The dialog for selecting a Firm Codes displays.

3. Select the Firm Code and click the **"Add new access rule"** button.
    New specific access rules valid for this Firm Code display in the right rule view.

4. Click the **"Add rule"** button.
    A dialog for defining a new rule displays.

5. Click the **"Allow"** or **"Deny"** radio button in the area **Action** to decide whether the following license access by client is to be allowed or denied.
    A client access can be defined by one of the following parameter: **Computer** name, **IPv4 Subnet** address **User** or **Group** name.
6. Specify the desired parameter in the respective field. If an active directory is integrated, the list of fields **User** and **Group** is auto-completed.
7. Click the **"Add"** button to add the new rule.
    A click on the **"Cancel"** button cancels the process.
    The new rule displays in the right rule view.

    If you defined several rules, you may change the rule sequence by using the arrow symbols ⬆ ⬇ . Rules are processed top-down, which means that the order of the rules is decisive for the result.

Using the **"Edit"** or **"Delete"** link allows you to modify a completely delete a rule.
If you delete Firm Code-specific access rules using the **"Delete rule list"** button, then also all Product Code-specific access rules - if existing - are deleted.
8. Define which default license access status applies after the final rule of a set is performed.
You have the option to set the **Default action** to allow or deny license access.
9. Click the **"Allow"** or **"Deny"** button.
10. Click the **"Apply"** button in the lower part to save the changes made to the global access rules.
Using the **"Undo Changes"** button reverts the global access rules prior to the modification, and the **"Restore Default"** button applies the default settings.
If you apply the changes made, please restart [20] *CodeMeter License Server*.
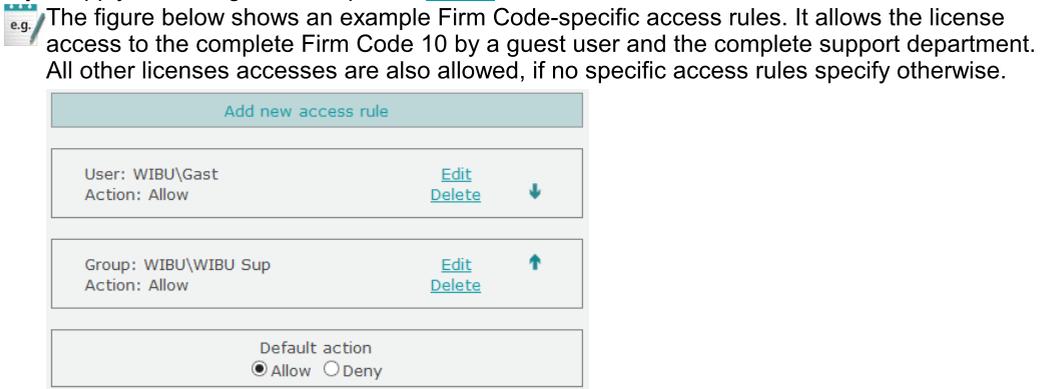
> **e.g.** The figure below shows an example Firm Code-specific access rules. It allows the license access to the complete Firm Code 10 by a guest user and the complete support department. All other licenses accesses are also allowed, if no specific access rules specify otherwise.

Figure 53:: *CodeMeter WebAdmin* - "Configuration | Access Control" - Advanced Mode - Specific access rules - Firm Code

Product Code-specific access rules

Specific access rules which refer to Product Codes also offer the option to reserve license accesses to defined clients. This, for example, allows to organize license access for separate departments while at the same time reserving exclusive license access for the heads of departments.
In order to create specific access rules to control license access to separate Product Codes, please proceed as follows:

> Creating a Product Code-specific access rules requires a previously created Firm Code-specific access rules.

1. Select the **"Specific access rules"** item in the left tree-view.
2. Click the **"Add Product Code"** button.
The dialog for selecting a Product Code displays.

Add Product Code

201000 - SampleNotePad - Basic Module - Floating User

Add Cancel

3. Select the Product Codes and click the **"Add"** button.
    A new specific access rules valid for this Product Code displays in the right rule view.
    At the same time, the entry displays information on the **License Quantity**, i.e. the number of concurrent licenses on a network.
    This number is not to be exceeded, if later defining limits to the number of accesses.

    Product Code: 10:201000 (SampleNotePad - Basic Module - Floating User)

    License Quantity: 4

    Add new access rule

    Default action
    ● Allow ○ Deny

    Delete rule list

4. Click the **"Add new access rule"** button.
    A dialog for defining a new rule displays.

    Add Rule

    Action
    ● Allow ○ Deny

    ● Host
    ○ IPv4 Subnet
    ○ User
    ○ Group

    Reserved: 0 Limit: 0

    Add Cancel

5. Click the **"Allow"** or **"Deny"** radio button in the area **Action** to decide whether the following license access by client is to be allowed or denied.
    A client access can be defined by one of the following parameter: **Computer** name, **IPv4 Subnet** address **User** or **Group** name.

6. Specify the desired parameter in the respective field. If an active directory is integrated, the list of fields **User** and **Group** is auto-completed.

7. Specify the number of license accesses which can be optionally reserved for a defined client in the field **Reserved**. The field **Limit** states the allowed maximum of allocated license accesses by this client. The setting for a reserved license access always available for the client is: Reserved: 1; Limit: 1.

> ℹ Please note that in the case of further specific access rules reservations and limits are added. The value of the License Quantity must <u>not</u> be exceeded.

> ℹ If a rule applies but according to the limit set no licenses can be allocated by this rule, then it is assumed that the rule does not apply and the next rule is applied.

8. Click the **"Add"** button to add the new rule.
   A click on the **"Cancel"** button cancels the process.
   The new rule displays in the right rule view.

   If you defined several rules, you may change the rule sequence by using the arrow symbols ⬆ ⬇ . Rules are processed top-down, which means that the order of the rules is decisive for the result.
   Using the **"Edit"** or **"Delete"** link allows you to modify a completely delete a rule.
   In order to delete a complete Product Code-specific access rules use the **"Delete rule list"** button.
9. Define which default license access status applies after the final access is performed.
   You have the option to set the **Default action** to allow or deny license access.
10. Click the **"Allow"** or **"Deny"** button.
11. Click the **"Apply"** button in the lower part to save the changes made to the global access rules.
    Using the **"Undo Changes"** button reverts the global access rules prior to the modification, and the **"Restore Defaults"** button applies the default settings.
    If you apply the changes made, please restart[20] *CodeMeter License Server*.

    🔲 The figure below shows an example of a specific access rules with exclusive access rights (Reserved: 1; Limit: 1) to the Product Code 201000 of Firm Code 10 for a guest user, the complete support department and a Supervisor. A single access of a total of 4 license accesses (license quantity) remains available and the default license access is defined as allowed.

Figure 54:: *CodeMeter WebAdmin* - "Configuration | Access Control" - Advanced Mode - Specific access rules - Product Code

2.6.8.7 Time Server

On the **"Configuration | Advanced | Time Server"** page you define settings for the *CodeMeter* Time Server.
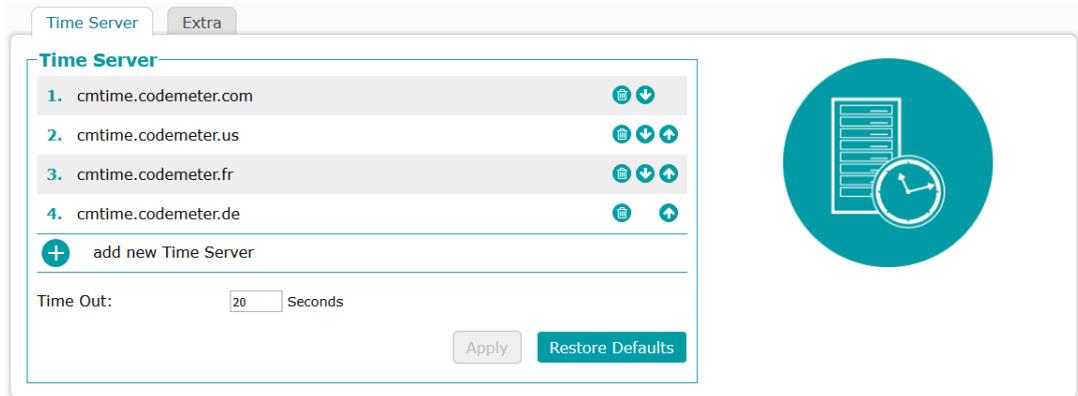
Figure 55: *CodeMeter WebAdmin* - "Configuration | Time Server"

Element	Description
Time Server	Shows a list of Wibu-Systems *CodeMeter* Time Server allowing for an update of the Certified Time. Time Server are specified either as Internet address or IP address. You edit the Time Server list by using the ⊕ **"add"** or 🗑 **"remove"** buttons. You change the order of the list by using the ⬆ **"up"** and ⬇ **"down"** buttons.
Time Out	Defines the maximum response period for the *CodeMeter* Time Server. The default value is 20 seconds. Click the **"Apply"** button to save the changes you have made. By a previous click on the **"Restore Defaults"** button you save the default settings.

2.6.8.8   Extra

On the **"Configuration | Advanced | Extra"** page you configure some additional advanced settings.
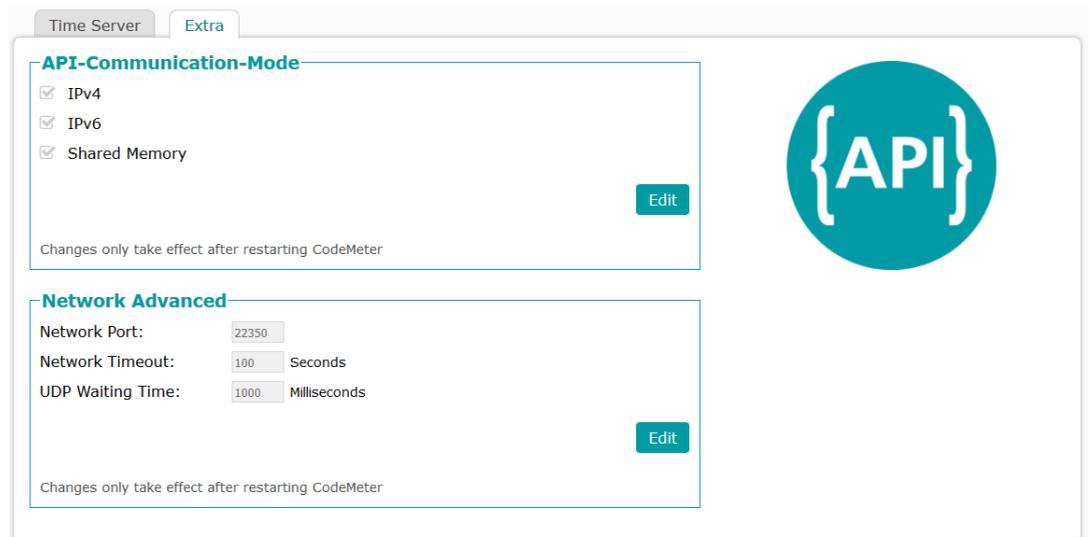
Figure 56: *CodeMeter WebAdmin* – "Configuration | Advanced | Extra"

API Communication Mode

Here you define which communication mode *CodeMeter License Server* uses. Please proceed as follows:

1. Click the **Edit** button.
2. Check the box to select the mode.
    The following parameter are available:

CodeMeter®-**Version**	**Properties**
smaller than 4.40	'1' TCP/IP (Default) '2' Shared Memory
starting with 4.40	'1' Platform-specific (Default) Platform-specific defaults: • Windows: IPv6, IPv4; Shared Memory • Linux/Mac:IPv6, IPv4 • WinCE: IPv4, Shared Memory '2' Shared Memory '4' IPv4 '8' IPv6 Single modi may be combined.

Wibu-Systems <u>recommends</u> to use the relevant default settings, if no justified reasons suggest otherwise.

Alternatively, by editing registry or server entries you are also able to define which communication mode *CodeMeter License Server* uses. The following table shows you where for which operating system you find the profiling to set the communication mode. The parameter **ApiCommunicationMode**. is available for setting the mode.

Operating system	Registry / Server Entry
Windows	`HKLM/SOFTWARE/WIBU-SYSTEMS/CodeMeter/Server/CurrentVersion`
Mac OS	`/Library/Preferences/com.wibu.CodeMeter.Server.ini`
Linux	`/etc/wibu/CodeMeter/Server.ini`

Make sure you restart CodeMeter after changing the settings.

Network Advanced

Here you define some advanced network settings. Please proceed as follows:
1. Click the **Edit** button.
2. Enter the desired values in the respective fields.
   The following parameter are available:

Please make sure you activated *CodeMeter License Server* for <u>running as network server</u> 🗋 75 .

Element	Description
Network Port	Define a network port other than the default port, if desired.
Network Timeout	Defines the maximum response period for the *CodeMeter* License Server if running on a network. By default, this value is 100 seconds.
UDP Waiting Time	Specify the **UDP Waiting Time** in order to define the period in which a UDP request for existing *CodeMeter License Server* on the network has to reply. By default, this value is 1000 milliseconds. Changing this time allows to customize the performance of the service. However, when no urgent need exists, you should keep that default.

Make sure you restart CodeMeter after changing the settings.

2.6.9 Info

The **"Info"** page displays an overview of products and important Wibu-Systems addresses.

Figure 57: *CodeMeter WebAdmin* – Info

2.6.10 License Transfer

> ⚠ The License Transfer is supported for only, if using Universal Firm Codes with a number range bigger than 6.000.000.
> For *CodeMeter* Version 6.10 the following is valid:
>
> - License Transfer is supported only for the CmContainer Type *CmActLicense*.
>
> - Of the Transfer Types only the types Licenses (moving 'n' from 'm' licenses) and Borrow local license.

CodeMeter WebAdmin on various pages displays License Transfer Options and a History. Following tables list potentials items.

For a brief example of a license transfer of type "Licenses" ('n' from 'm' licenses) see here[94] and for the type "Borrow local license" here[100] .

License Transfer Options

In the case of a license transfer activity, this table displays the actual values of the license transfer option.

Option	Description		
License received from	Serial number of the *CmContainers* from which a license has been received.		
Pulling allowed	**Value**	**Description**	
	yes	A license can be actively requested by a receiving *CmContainer* from a sending *CmContainer*. Is valid only for all not time-limited license transfer types (move complete, move units, move licenses).	
	no	A license <u>cannot</u> be actively requested by a receiving *CmContainer* from a sending *CmContainer*.	
Returning allowed	**Value**	**Description**	
	yes	A previously transferred license <u>can</u> be returned from the receiving *CmContainer* to the sending *CmContainer*.	
	no	A previously transferred license <u>cannot</u> be returned from the receiving *CmContainer* to the sending *CmContainer*.	
Firm Item at target required	**Value**	**Description**	
	yes	On the target *CmContainer* a Firm Item <u>must</u> exist before the transfer takes place (*CmActLicense*).	
	no	On the target *CmContainer* a Firm Item <u>must not</u> exist before the transfer takes place (*CmActLicense*).	
Transfer Type	Display of Transfer Type		
	Value	**Description**	
	Complete	An existing Product Item is completely moved from a sending *CmContainer* to a receiving *CmContainer*.	
	Units	An existing Product Item with a Unit Counter is duplicated in two Product Items while the Unit Counter is split over the two *CmContainer*.	
	Licenses	An existing Product Item with License Quantity is duplicated in two Product Items while the License Quantity is split over the two *CmContainer*.	
	Borrow Complete	A complete Product Item is borrowed for a definable period from one *CmContainer* to another. After the period has expired, the licenses automatically fall back to the originator. A completely borrowed license can not be further transferred.	
	Borrow Local License	A license is borrowed for local use only (without connection to a license server) for a definable period from one *CmContainer* to another. After the period has expired, the licenses automatically reallocates to the server's license pool. A locally borrowed license can not be further transferred	
Transfer Depth	This option specifies the number of license transfer levels involved		
Borrow Expiration Time	Date at which the borrowing expires.		
Borrow Source	Serial number of the Source-*CmContainers* from which a license has been borrowed.		

Option	Description
Licensor Transfer Key	Key to create the required certificates.

License Transfer History

In the case of a license transfer activity, this table displays the license transfer history.

Item	Description
#	Sequential number of the license transfer history item.
Status	Status of the transfer --- created, in transit of the transfer mode (push, return, pull), completed after obtaining receipt
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>0</td></tr><tr><td>Transferred</td><td>The transfer has been performed.</td></tr><tr><td>In Transit (return)</td><td>The return transfer is currently in transit.</td></tr><tr><td>In Transit (pull)</td><td>The pull transfer is currently in transit.</td></tr><tr><td>Transferred & Receipted</td><td>The transfer has been completed after receipt was obtained.</td></tr></table>
Type	Display of Transfer Type
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>Complete</td><td>An existing Product Item is completely moved from a sending *CmContainer* to a receiving *CmContainer*.</td></tr><tr><td>Units</td><td>An existing Product Item with a Unit Counter is duplicated in two Product Items while the Unit Counter is split over the two *CmContainer*.</td></tr><tr><td>Licenses</td><td>An existing Product Item with License Quantity is duplicated in two Product Items while the License Quantity is split over the two *CmContainer*.</td></tr><tr><td>Borrow Complete</td><td>A complete Product Item is borrowed for a definable period from one *CmContainer* to another. After the period has expired, the licenses automatically fall back to the originator. A completely borrowed license can not be further transferred.</td></tr><tr><td>Borrow Local License</td><td>A license is borrowed for local use only (without connection to a license server) for a definable period from one *CmContainer* to another. After the period has expired, the licenses automatically reallocates to the server's license pool. A locally borrowed license can not be further transferred</td></tr></table>
Time	Date stamp on creating the license history item.
Unit Counter	Depending on transfer type:
	<table><tr><th>Value</th><th>Description</th></tr><tr><td>0</td><td>transfer types complete, licenses, borrow complete, borrow local license</td></tr><tr><td></td><td></td></tr></table>

Item	Description		
	Value	**Description**	
	Number	transfer type units: number of units to be transferred.	
License Quantity	Depending on transfer type:		
	Value	**Description**	
	0	transfer types complete, units, borrow complete, borrow local license	
	Number	transfer type licenses: number of network license quantities to be transferred.	
Borrow Expiration Time	Depending on transfer type:		
	Value	**Description**	
	0	transfer types complete, licenses, units	
	date	transfer types borrow complete, borrow local license: The BorrowExirationTime displays.	
Transfer ID	Display of a unique Transfer ID		
CmContainer	Serial number of the *CmContainer*		
Update Counter	Infomation on the Update Counter metering at the sender when the license transfer has started.		

2.6.10.1 Licenses

A brief example for performing a license transfer of type "Licenses" ('n' from 'm' licenses) covers moving⌐ 94 and returning⌐ 97 of licenses.
For a sender and a receiver the various *CodeMeter WebAdmin* views will display (*CmContainer*, Firm Item, Product Item Details, License Monitoring).
30 Licenses are moved and returned.

2.6.10.11 Move 'n' from 'n' licenses

CmContainer Details
Sender

Receiver

Firm Item Details
Sender

Receiver

Product Item Details
Sender

Product Item Details

Product Item 6000010:2001 of CmContainer "Sender Licenses" (130-3356136053)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		8		Transfer
License Quantity		4		70

License Transfer Options

Option	Value
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Licenses
Transfer Depth	2

License Transfer History

#	Status	Type	Time	License Quantity	Transfer ID	CmContainer	Update Counter
1	Transferred & Receipted	Licenses	2016-01-20 16:24:59	30	efe325c6ef38814495c5	130-2995221873	0

Receiver

Product Item Details

Product Item 6000010:2001 of CmContainer "Receiver Licenses" (130-2995221873)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		8		Transfer
License Quantity		4		30

License Transfer Options

Option	Value
License received from	130-3356136053
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Licenses
Transfer Depth	1

License Monitoring

⌃ 6000010	Vendor 1				User Limit (Borrowed)	No User Limit	Exclusive	Shared	Available
Product Code	Name		Feature Map	License Quantity					
2001	Transfer		-	70	0 (-)	0	0	0	70
2001	Transfer		-	30	0 (-)	0	0	0	30

2.6.10.12 Return 'n' from 'm' licenses

CmContainer Details
Sender

C	Sender Licenses	130-3356136053	CmActLicense 3.00	●
	⌃ Licenses ⌄ CmContainer Info ⌄ User Data			

⌃ 6000010	Sender Licenses				CodeMeter Evaluation License - not for commercial use! ⓞ
Product Code	Name	Unit Counter	Valid Until	License Quantity	Feature Map
2001	Transfer	ⓞ Ⓗ	n/a n/a	100	n/a

Receiver

C	Receiver Licenses	130-2995221873	CmActLicense 3.00	●
	⌃ Licenses ⌄ CmContainer Info ⌄ User Data			

⌃ 6000010	Receiver Licenses				CodeMeter Evaluation License - not for commercial use! ⓞ
Product Code	Name	Unit Counter	Valid Until	License Quantity	Feature Map
No Product Items available					
Expired and/or returned Product Items					
2001	Transfer	ⓞ	n/a n/a	0	n/a

Firm Item Details
Sender

Firm Item Details

Firm Item 6000010 of CmContainer "Sender Licenses" (130-3356136053)

CmContainer	Firm Access Counter	Firm Update Counter	Firm Precise Time
Sender Licenses (130-3356136053)	65535	2	2000-01-01 01:00:00

Product Items

Product Code	CmContainer	Name	Unit Counter	Valid Until	License Quantity	Feature Map
2001	Sender Licenses (130-3356136053)	Transfer	n/a	n/a	100	n/a

License Transfer Options

Type	Value
Pulling allowed	1
Licensor Transfer Key	<32 Bytes>

Receiver

Firm Item Details

Firm Item 6000010 of CmContainer "Receiver Licenses" (130-2995221873)

CmContainer	Firm Access Counter	Firm Update Counter	Firm Precise Time
Receiver Licenses (130-2995221873)	65535	2	2000-01-01 01:00:00

Product Items

Product Code	CmContainer	Name	Unit Counter	Valid Until	License Quantity	Feature Map
No Product Items available						
Expired and/or returned Product Items						
2001	Receiver Licenses (130-2995221873)	Transfer	n/a	n/a	0	n/a

Invalid

License Transfer Options

Type	Value
Pulling allowed	1
Licensor Transfer Key	<32 Bytes>

Product Item Details

Sender

Product Item Details

Product Item 6000010:2001 of CmContainer "Sender Licenses" (130-3356136053)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		8		Transfer
License Quantity		4		100

License Transfer Options

Option	Value
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Licenses
Transfer Depth	2

License Transfer History

#	Status	Type	Time	License Quantity	Transfer ID	CmContainer	Update Counter
1	0	Licenses	2016-01-20 16:24:59	30	efe325c6ef38814495c5	130-2995221873	0

Receiver

Product Item Details

Product Item 6000010:2001 of CmContainer "Receiver Licenses" (130-2995221873)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		8		Transfer
License Quantity		4		0, <no network>

License Transfer Options

Option	Value
License received from	130-3356136053
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Licenses
Transfer Depth	1

License Monitoring

Product Code	Name	Feature Map	License Quantity	User Limit (Borrowed)	No User Limit	Exclusive	Shared	Available
^ 6000010	Vendor 1							
2001	Transfer	-	100	0 (-)	0	0	0	100
2001	Transfer	-	0	- (-)	-	-	-	0

2.6.10.2 License Borrowing

A brief example for performing a license transfer of type "Borrow Local License" covers borrowing ¹⁰⁰ and returning ¹⁰³ of licenses.

For a sender and a receiver the various *CodeMeter WebAdmin* views will display (*CmContainer*, Firm Item, Product Item Details, License Monitoring).

1 License is borrowed and returned.

2.6.10.21 Borrow

CmContainer Details

Sender

Sender Borrowing			130-3834989529		CmActLicense 3.00	●
^ Licenses	∨ CmContainer Info	∨ User Data				

Product Code	Name			Unit Counter	Valid Until		License Quantity	Feature Map
^ 6000010	Vendor 1				CodeMeter Evaluation License - not for commercial use!			O
2001	Licenses to borrow	O	H	n/a	n/a		200	n/a

Receiver

Receiver Borrowing			130-3571548377		CmActLicense 3.00	●
^ Licenses	∨ CmContainer Info	∨ User Data				

Product Code	Name		Unit Counter	Valid Until		License Quantity	Feature Map
^ 6000010	Vendor 1			CodeMeter Evaluation License - not for commercial use!			O
2001	Licenses to borrow	O	n/a	n/a		1 (local)	n/a

Firm Item Details

Sender

Firm Item Details

Firm Item 6000010 of CmContainer "Sender Borrowing" (130-3834989529)

CmContainer	Firm Access Counter	Firm Update Counter	Firm Precise Time
Sender Borrowing (130-3834989529)	23	43	2000-01-01 01:00:00

Product Items

Product Code	CmContainer	Name	Unit Counter	Valid Until	License Quantity	Feature Map
2001	Sender Borrowing (130-3834989529)	Licenses to borrow	n/a	n/a	200	n/a

License Transfer Options

Type	Value
Pulling allowed	1
Licensor Transfer Key	<32 Bytes>

Receiver

Firm Item Details

Firm Item 6000010 of CmContainer "Receiver Borrowing" (130-3571548377)

CmContainer	Firm Access Counter	Firm Update Counter	Firm Precise Time
Receiver Borrowing (130-3571548377)	23	43	2000-01-01 01:00:00

Product Items

Product Code	CmContainer	Name	Unit Counter	Valid Until	License Quantity	Feature Map
2001	Receiver Borrowing (130-3571548377)	Licenses to borrow	n/a	n/a	1 (local)	n/a

License Transfer Options

Type	Value
Pulling allowed	1
Licensor Transfer Key	<32 Bytes>

Product Item Details

Sender

Product Item Details

Product Item 6000010:2001 of CmContainer "Sender Borrowing" (130-3834989529)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		19		Licenses to borrow
License Quantity		4		200

License Transfer Options

Option	Value
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Borrow Local License
Transfer Depth	1

License Transfer History

#	Status	Type	Time	Borrow Expiration Time	Transfer ID	CmContainer	Update Counter
1	Transferred	Borrow Local License	2016-01-21 11:49:21	2016-02-03 13:08:02	b75ae7e7f827e41313cd	130-3571548377	0

Receiver

Product Item Details

Product Item 6000010:2001 of CmContainer "Receiver Borrowing" (130-3571548377)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		19		Licenses to borrow
License Quantity		4		1 (local) (LocalOnly)

License Transfer Options

Option	Value
License received from	130-3834989529
Borrow Expiration Time	2016-02-03 13:08:02
Borrow Source	130-3834989529
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Borrow Local License
Transfer Depth	0

License Monitoring

	6000010	Vendor 1			User Limit (Borrowed)	No User Limit	Exclusive	Shared	Available
Product Code	Name		Feature Map	License Quantity					
2001	Licenses to borrow		-	200	1 (1)	0	0	0	199
2001	Licenses to borrow		-	1 (local)	0 (-)	0	0	0	1

2.6.10.22 Return

CmContainer Details

Sender

	Sender Borrowing		130-3834989529			CmActLicense 3.00	●
	Licenses	CmContainer Info	User Data				

	6000010	Vendor 1				CodeMeter Evaluation License - not for commercial use!	○
Product Code	Name			Unit Counter	Valid Until	License Quantity	Feature Map
2001	Licenses to borrow		○ Ⓗ	n/a	n/a	200	n/a

Receiver

	Receiver Licenses		130-2995221873			CmActLicense 3.00	●
	Licenses	CmContainer Info	User Data				

	6000010	Receiver Licenses				CodeMeter Evaluation License - not for commercial use!	○
Product Code	Name			Unit Counter	Valid Until	License Quantity	Feature Map
No Product Items available							
Expired and/or returned Product Items							
2001	Transfer		○	n/a	n/a	0	n/a

Firm Item Details

Sender

Firm Item Details

Firm Item 6000010 of CmContainer "Sender Borrowing" (130-3834989529)

CmContainer	Firm Access Counter	Firm Update Counter	Firm Precise Time
Sender Borrowing (130-3834989529)	23	43	2000-01-01 01:00:00

Product Items

Product Code	CmContainer	Name	Unit Counter	Valid Until	License Quantity	Feature Map
2001	Sender Borrowing (130-3834989529)	Licenses to borrow	n/a	n/a	200	n/a

License Transfer Options

Type	Value
Pulling allowed	1
Licensor Transfer Key	<32 Bytes>

Receiver
Firm Item Details

Firm Item 6000010 of CmContainer "Receiver Licenses" (130-2995221873)

CmContainer	Firm Access Counter	Firm Update Counter	Firm Precise Time
Receiver Licenses (130-2995221873)	65535	2	2000-01-01 01:00:00

Product Items

Product Code	CmContainer	Name	Unit Counter	Valid Until	License Quantity	Feature Map
No Product Items available						
Expired and/or returned Product Items						
2001	Receiver Licenses (130-2995221873)	Transfer	n/a	n/a	0	n/a

Invalid

License Transfer Options

Type	Value
Pulling allowed	1
Licensor Transfer Key	<32 Bytes>

Product Item Details
Sender

Product Item Details

Product Item 6000010:2001 of CmContainer "Sender Borrowing" (130-3834989529)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		19		Licenses to borrow
License Quantity		4		200

License Transfer Options

Option	Value
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Borrow Local License
Transfer Depth	1

License Transfer History

#	Status	Type	Time	Borrow Expiration Time	Transfer ID	CmContainer	Update Counter
1	0	Borrow Local License	2016-01-21 15:22:58	2016-02-03 13:08:02	535bbf992153b3a7b26d	130-2034689140	0

Receiver

Product Item Details

Product Item 6000010:2001 of CmContainer "Receiver Borrowing" (130-3571548377)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		19		Licenses to borrow
License Quantity		4		1 (local) (LocalOnly)

License Transfer Options

Option	Value
License received from	130-3834989529
Borrow Expiration Time	2016-02-03 13:08:02
Borrow Source	130-3834989529
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	No
Transfer Type	Borrow Local License
Transfer Depth	0

License Monitoring

Product Code	Name	Feature Map	License Quantity	User Limit (Borrowed)	No User Limit	Exclusive	Shared	Available
2001	Licenses to borrow	-	200	0 (-)	0	0	0	200
2001	Licenses to borrow	-	0	0 (-)	0	0	0	0

2.6.11 Module Items

> ⚠ Module Items are supported for only, if using Universal Firm Codes with a number range bigger than 6.000.000.
> For *CodeMeter* Version 6.10 the following is valid:
> * Module Items are supported only for the CmContainer Type *CmActLicense*.

Module Items allow the organizational grouping of different license entries required for a product. This is especially helpful when using the license transfer.

In the area "**Licenses**" of the **Container** navigation item existing Module Items display as arrow symbols (↩).

Figure 58: *CodeMeter WebAdmin – Container | Lizenzen* - Module Items

On clicking the Product Code, which holds the Module Items, the **Product Item Details** page opens and in the lower part existing Module Items displays.

Product Item Details

Product Item 6000010:2001 of CmContainer "ModuleIT" (130-535939122)

Product Item Options	Type	Size (Bytes)	Dependencies	Value
Text		9		CAD Inc.
Feature Map		4		0000 0000 0000 0011 0010 0001 0110 1000 (0x32168)
Unit Counter		4	data, serial	1000
Aktivierungsdatum		4	data, serial, counter	2015-04-01 00:00:00
Activation Time				. . .
Secret Data	124	48	data, serial, counter	<secret>

Module Items

Product Code	Name
20330101	CAD Inc. - Setup
20330307	CAD Inc. - Setup
20330909	CAD Inc. - Setup
20331103	CAD Inc. - Setup
20430105	CAD Inc. - Setup
21000008	CAD Inc. - Components
21000101	CAD Inc. - Components
21000504	CAD Inc. - Components
21000806	CAD Inc. - Components
21008810	CAD Inc. - Components

License Transfer Options

Option	Value
Pulling allowed	Yes
Returning allowed	Yes
Firm Item at target required	Yes
Transfer Type	Units
Transfer Depth	2

Figure 59:*CodeMeter WebAdmin* – Product Item Details - Module Items

On clicking a Module Item the usual **Product Item Detail** 54 page opens.

2.7 CmDust

At times, it may necessary to receive help by our support when using *CodeMeter*®. In order to ease identification of troubles, the program *CmDust* (**C**ode**M**eter En**du**ser **S**upport **T**ool) for the commandline has been developed.

> No secret information is transferred to Wibu-Systems. You are able to check the information saved in plain text.

CmDust on Windows

Open *CmDust* using the **"Start | All Programs | CodeMeter | Tools"** menu item.

Press "Windows" key to open Start screen | Type "CmDust" | Press "Enter" key.

The result of the program execution is written to the text file `CmDust-Result.log` and saved to the user directory which automatically opens when starting *CmDust*.

Alternatively, you are able to use the commandline application <u>cmu</u> 112 to create a log file.
For analyses this file can be sent to Wibu-Systems.

CmDust on Mac OS

For Mac OS you create the *CmDust* file using the <u>cmu</u> 110 commandline program. Calling *cmu* is stored in the search path.
To create a *CmDust* log, please proceed as follows:
1. Open *cmu* commandline
2. Type in the following command
   `cmu --cmdust`
   Using the option `--file` allows to add a name and a saving location.
   By default, the file is written to the directory from which you accessed *cmu*.
3. Send this file for analyzing to Wibu-Systems.

CmDust on Linux

For the operating systems Linux you create the *CmDust* file using the <u>cmu</u> 110 commandline program. Calling *cmu* is stored in the search path.
1. Open *cmu* commandline
2. Type in the following command
   `cmu --cmdust`
   Using the option `--file` allows to add a name and a saving location.
   By default, the file is written to the directory from which you accessed *cmu*.
3. Send this file for analyzing to Wibu-Systems.

CmDust output

CmDust reads out the following settings:

- Information on the operating system: version, installed service packs, language settings.

- CodeMeter relevant registry entries: installation path, settings of *CodeMeter License Server* and *CodeMeter WebAdmin*, backup and HTTP settings.

- AddOns: information on all *CodeMeter*® AddOns.

- Information on CodeMeter® and CmContainer: software and hardware version and all entries of connected *CmContainer*.

```
================================================================================
===
*************************** General Information
******************************
================================================================================
===
CmDust Version 4.40 Build 660 of 2011-11-10
Copyright (C) 2005-2011 by WIBU-SYSTEMS AG. All rights reserved.

CmDustLog created at 2011-11-17 15:24:40 (UTC)
CmDust was started from: C:\Program Files\CodeMeter\Runtime\bin
Current User has administrator rights
================================================================================
===
*************************** System Information
******************************
================================================================================
===
OS: Microsoft Windows 7 Business Edition, 32-bit Service Pack 1 (build 7601)
Computer Name:    FS2.wibu.local
Found IP address: 10.49.12.16 | 192.168.243.1 | 192.168.204.1 | 127.0.0.1
Not running inside Virtual Environment.

Language Settings:
  Machine:       English
  Current User: English

DataExecutionProtection state:
  OPTIN (Only Windows system components and services have DEP applied.)
Current User has administrator rights

Overview of available drives:
  C:\ = Fix Drive  (304336 MB)
  D:\ = CDROM
  E:\ = Removable Drive Bus=Usb;WIBU -  CodeMeter-StickM (7832 MB), contains
codemtr.io
  ==============================================================================
=====
*********************** Relevant registry entries
****************************
================================================================================
===
[HKEY_LOCAL_MACHINE\SOFTWARE\WIBU-SYSTEMS\CodeMeter] <All>
RuntimeVersion <All> = "4.40.660.500"
```

2.8   CMU - CodeMeter Universal Support Tool

You have also the option to alternatively execute some *CodeMeter Control Center* functions by the commandline based *CodeMeter Universal Support Tool* (*cmu*).

cmu supports you in:

- listing of *CmContainer* contents
- creating a simple test environment for *CmContainer*

- executing a certified time update, and creating and import of license request and update files (Remote Context and Update files, `*.WibuRaC`; `*.WibuRaU`)

Call *cmu* in the directory `%\Program Files%\CodeMeter\Runtime\bin` using the command `cmu[32].exe`.

Alternatively, on Windows call *cmu* by the start menu item **"Start | All Programs | CodeMeter | Tools | CodeMeter Command Prompt"**.
Press "Windows" key to open Start screen | Type "CodeMeter Command Prompt" | Press "Enter" key.

For the operating systems Mac OS and Linux this command is provided by the usual search path parameter.

> *cmu* on Linux operating systems uses the `libusb` program library to read and write USB devices. The code is licensed under the GNU Lesser General Public License (LGPL) Version 3. The code of the programming library `libusb` can be downloaded at the project website http://www.libusb.org/. On request, the source can also be electronically obtained free of charge contacting Wibu-Systems (support@wibu.com).

The following list shows all existing *cmu* commands.

Command	Description
`/h` or `--help`	shows this help in the commandline window.
`/v` or `--version`	shows the versions of all available *CodeMeter*® components.
`/l` or `--list`	lists all connected *CmContainer* by way of their serial numbers.
`/x` or `--list-content`	lists the contents of all connected *CmContainer*.
`/k` or `--list-server`	lists all available network license server.
`/n` or `--list-network`	list the complete network license information.

`--add-server`	adds a server to the end of your server search list. As an argument pass the server's name, IP or CmWAN URL.
	Examples:
	`server.domain.local`
	`192.168.0.72`
	`fe80::ea06:88ff:fecf:df6f`
	`https://user:secretpassword@server.domain.local/cmwan`

`/c <FI>` or `--context <FI>`	creates a license request for an *license update via CmFAS* 37 creates a license request for an license update via Firm Item <FI>. Using option `--file` specifies the output file. If no option is set the standard output is used (stdout).
`/i` or `--import`	imports a *license update file received via CmFAS* 41 for the available *CodeMeter*® license. Using option `--file` specifies the file name. The update can cover a *CmDongle* or a *CmActLicense* license file.
`/d` or `--firmware-update`	starts the firmware update of a *CmContainer*.
`/u` or `--time-update`	starts the update of the Certified Time in each connected *CmContainer*.
`/e <s>` or `--enable <s>`	allows the activation or deactivation of the selected *CmContainer*. Specifying the *CodeMeter*® password is required.

Command	Description
	The required new Enabling status is specified by the parameter **<s>**. Parameter values cover 1 (disable), 2 (temporary enable), 3 (enable).
`/t <no>` or `--test<no>`	starts some simple tests for each connected *CmContainer*. The number of tests is specified by parameter <no>. It is required that the *CmContainer* must be (temporarily) enabled.
`/vv` or `--cmdust`	creates a *CmDust* report. This report is useful and required when requesting support. Wibu-Systems recommends to create a *CmDust* report before contacting the support. Using the option `--file` writes the result into a text file.
`--borrow`	allows the borrowing of licenses from a license server to the local PC. You have to specify the Firm Code and the Product Code of the license using the options `--firmcode` and `--productcode`. As an additional option you may specify the Feature Map using the option `--featuremap`. Moreover, you have to specify the serial number of the client *CmContainer* and the server name using the options `--serial` and `--server`.
`--return`	returns the borrowed license to the license server. You have to specify the Firm Code and the Product Code of the license using the options `--firmcode` and `--productcode` and the serial number of the client *CmContainer* and the server name using the options `--serial` and `--server`.
`--borrowlist`	lists the borrowed licenses for the client and the server.
`--transferlist`	creates a listing of the license transfer relevant data.
`--enabling`	lists the enabling stati of all connected *CmContainer*. Combined with the command **–x** you can also display additional enabling information of the *CmContainer* content.
`--create-io`	is used in combination with the option `--file` and makes sense only when using the hardware form factors *CmCard/SD* or *CmCard/CF*. A new `codemtr.io` file is created. Please call this command only if the `codemtr.io` file is deleted.
`--detect-proxy`	detects the proxy settings of the system. When options are omitted the standard output is used (stdout). The option `--write` saves the settings using the *CodeMeter*® profiling.
`--delete-cmact-license`	deletes a *CmActLicense* license you specify using the command `--serial`. ⓘ Once you delete a *CmActLicense* license it cannot be restored.
`--set-access-data`	sets WebAdmin user authentication. Use with options `--user` and `--password` to define username and password.
`--reset-access-data`	resets WebAdmin user authentication. "Local Access only" will be set.
`--device-id`	sets this parameter on import of WibuCmLiF files (`--import`) with binding scheme "Binding Extension". The input of the `device-id` is as 128 hex digits preceeded by "0x".

License transfer options

All calls existing in CodeMeter Core API for the licenses transfer feature can also be called using *cmu*. Here the respective files are used (`WibuCmLIF`/`WibuCmRaC`/`WibuCmRaU`). The following *cmu* calls exist:

Command	Description
`--create-lt-context <parameters>`	Enables to create a license transfer context. Used with either `--lt-push` or `--lt-pull` or `--lt-initpull` parameters to specify the nature of the transfer - license update with FSB if omitted. Additional parameters:
	`--lt-request-file <file>` is a mandatory parameter. It is used to specify the file `<file>` where the result of the license context creation should be written.
	`--lt-context-file <file>` is a mandatory parameter in the case of the `--lt-pull` transfer. It is used to specify the file `<file>` containing the license context to be created.
	`--serial <serial>` or `-s <serial>` selects the *CmContainer* with the specified Serial Number.
	`--firmcode <fc>` sets the Firm Code of the transferred license.
	`--productcode <pc>` sets the Product Code of the transferred license.
`--create-lt-update <parameters>`	Enables to transfer a license transfer context. Used with one of following parameters to specify the nature of the transfer:
	`--lt-move-complete` the entire license will be transferred.
	`--lt-move-units <units>` the specified number of units will be transferred.
	`--lt-move-licenses <licenses>` the specified number of licenses wil be transferred.
	`--lt-borrow-local-license <expiration time>` expiration time as `<YYYY>-<MM>-<DD>[T<hh>:<mm>:<ss>]` (one license will be transferred for the specified time limit).
	`--lt-borrow-complete <expiration time>` expiration time as `<YYYY>-<MM>-<DD>[T<hh>:<mm>:<ss>]` (all licenses will be transferred for the specified time limit).
	`--lt-renewborrow <expiration time>` time validity of an already borrowed license will be extended.
	Additional mandatory parameters:
	`--lt-request-file <file>` is a mandatory parameter. It is used to specify the file `<file>` containing the license context to be transferred.
	`--lt-update-file <file>` is a mandatory parameter. It is used to specify the file `<file>` where the result of the license transfer should be written.
	`--serial <serial>` or `-s <serial>` selects the *CmContainer* with the specified Serial Number.
	`--firmcode <fc>` sets the Firm Code of the transferred license.
	`--productcode <pc>` sets the Product Code of the transferred license.
	Additional optional parameters:

Command	Description	
	`--lt-feature-code <number>`	It is used to specify the Feature Code `<number>`. The default input for the `<number>` is in decimal unless it begins with `0x` or `0X`.
	`--lt-product-ref <number>`	It is used to specify the Product Item Reference `<number>`. The default input for the `<number>` is in decimal unless it begins with `0x` or `0X`.
`--import-lt-update <parameters>`	Updates license transfer data on the target side. Used with either `--lt-push`, `--lt-pull`, `--lt-fsb` or `--lt-return` parameters to specify the nature of the transfer. Additional parameters:	
	`--lt-update-file <file>`	is a mandatory parameter. It is used to specify the file `<file>` where the result of the license update should be written.
	`--serial <serial> or -s <serial>`	optionally selects the *CmContainer* with the specified Serial Number.
	`--firmcode <fc>`	optionally sets the Firm Code of the transferred license.
	`--productcode <pc>`	sets the Product Code of the transferred license (optional, only with `--firmcode`).
`--create-lt-receipt <parameters>`	Creates a signature with a defined private key and gives it back as a receipt to specify the nature the transfer. Additional parameters:	
	`--lt-receipt-file <file>`	is a mandatory parameter. It is used to specify the file `<file>` where the receipt will be transferred to.
	`--serial <serial> or -s <serial>`	selects the *CmContainer* with the specified Serial Number.
	`--firmcode <fc>`	sets the Firm Code of the transferred license.
	`--productcode <pc>`	sets the Product Code of the transferred license.
`--import-lt-receipt <parameters>`	Checks the receipt with a defined public key confirming the validity of a transaction. Used with one of following parameters to specify the nature of the transfer. Additional parameters:	
	`--lt-receipt-file <file>`	is a mandatory parameter. It is used to specify the file `<file>` where the data will be transferred from.
	`--serial <serial> or -s <serial>`	selects the *CmContainer* with the specified Serial Number.
	`--firmcode <fc>`	sets the Firm Code of the transferred license.
	`--productcode <pc>`	sets the Product Code of the transferred license.
`--lt-cleanup <parameters>`	Possible cleanup action	
	`--deleted`	clean deleted licenses
	`--disabled`	clean disabled (dangerous)
	`--hiddenhistory`	clean history of given product item
	`--container`	removes whole license container (dangerous)
	Additional parameter	

Command	Description	
	`--serial <serial> or -s <serial>`	selects the CmContainer with the specified Serial Number.
	`--firmcode <fc>`	selects the Firm Code of the transferred license.
	`--productcode <pc>`	selects the Product Code of the transferred license.
	`--lt-product-ref <number>`	It is used to specify the Product Item Reference <number>. The default input for the <number> is in decimal unless it begins with 0x or 0X.

Named User licenses

The values of the username and the domain are automatically set.

Options	Description
`--nmu-userdefined <text>`	Specifies via `<text>` a case-sensitive UTF-8 string for the user-defined text. The string is truncated after 127 bytes.

Additional *cmu* options

The following list shows additional *cmu* options:

Options	Description
`/f <file>` or `--file <file>`	Additional option which writes the command result into a file **<file>**. This option is used in combination with the commands **--context**, **--import**, **--cmdust**.
`/s <serial>` or `--serial <serial>`	Additional option which defines that a command is valid only for a *CmContainer* specified by its serial number <serial>, e.g. "1-10234242".
`/p <pwd>` or `--password <pwd>`	Additional option in combination with the commands **--enable** and **--firmware-update**. This option defines the required *CodeMeter* Password for this command.
`--firmcode <fc>`	Additional option in combination with the commands **--borrow** or **--return** specifying the Firm Code of the borrowed license.
`--productcode <pc>`	Additional option in combination with the commands **--borrow** or **--return** specifying the Product Code of the borrowed license.
`--featuremap <fm>`	Additional option in combination with the commands **--borrow** or **--return** specifying the Feature Map of the borrowed license.
`--server <servername>`	Additional option to borrow a license from another server. Is used in combination with command **--borrow**.
`--write`	Additional option used in combination with the command **--detect-proxy** which saves the setting using the *CodeMeter*® profiling. These settings are written only if no proxy has been previously set in the profiling. For overwriting the settings use the option **--force**.
`--force`	Additional option used in combination with the command **--detect-proxy** which overwrites already existing proxy settings in the *CodeMeter*®profiling.
`--show-config-disk`	Shows the current settings of removable/fixed drives or of the type of the defined Master Boot Record (MBR). This option concerns the behavior of virtual flash memory partitions. Use only for *CmStick* and *CmStick/M*.

Options	Description
`--set-config-disk <parameter>`	Allows to define a special behavior of virtual flash memory partitions, e.g. drive settings, boot code or activations (*CmDongle* only).

	ⓘ Please note that replugging of the *CmDongle* is required.

Description	Parameter
Drive settings	`RemovableDisk,LocalDisk`
Boot Code	`Int18Boot ,ZeroBoot,LoopBoot,SwapBoot,VbrBoot`
Activation	`ActivePartition,InactivePartition`
FAT	`Fat16,Fat32`
USB-Communication Device Class	`HidCommunication`; `MsdCommunication`

Options	Description
`--check-cm-integrity`	Allows to check the *CodeMeter*® signature.
`--licensing-terms`	Print licensing terms of GNU Lesser General Public License (LGPL) 3.0.

Application examples

Action	Parameter
Displaying *cmu* options	`Cmu[32].exe -h`
Creating a *CodeMeter*® Remote Activation Context file (here:`1-1040870.WibuCmRaC`) for the Firm Code 10 (Firm Item level)	`Cmu[32].exe -c10 -f1-140870.WibuCmRaC`
Importing a *CodeMeter*® Remote Activation Update file (here:`1-1040870.WibuCmRaU`) --> reprograms the connected *CmContainer*	`Cmu[32].exe -i -f1-1040870.WibuCmRaU`
Showing the versions of current *CodeMeter*® components.	`cmu32 --version`
Listing all available *CodeMeter* network license server and if existing all related licenses.	`cmu32 --list-server --list-content`
Starting 100 simple tests. The tests are executed only for the *CmContainer* specified by the serial number of `1-233232`.	`cmu32 --test 100 --serial 1-233232`
Changing the enabling status to "temporarily enabled" for the *CmContainer* `1-2345` by using the *CodeMeter*® password "SECRET".	`cmu32 --enable2 --serial 1-2345 --password SECRET`

2.9   CodeMeter License Tracking

Starting with Version 4.50 *CodeMeter*® introduces license tracking allowing for the evaluation of licensing data based on structured logfiles. With it the actual use of licenses is recorded.
However, Wibu-Systems does not offer a separate application for license tracking but suggests that software vendors who want to evaluate how their licenses are used refer to tools by third parties able to aggregate information from real-time requests or logfiles.

Secure Licence Tracking

Starting with Version 5.20 *CodeMeter*® supports Secure License Tracking. This ensures that license access log data is written manipulation-safe. Manipulation is prevented by authenticated check of data integrity using signatures.
For analyzing license access data not a single log file is created but separate logfiles for each Firm Code. Integrity and authenticity of the log files preventing tampering is ensured by signatures and a subsequent signature check.

Validation

In order to validate either the contents of a given signed *CodeMeter* log file or a sequence of log files located in a given directory use the option   in *CmBoxPgm* the developer tool for local programming of *CmContainer* using a commandline (console).

Command	`/vslf` - Validation Of Signed Log Files
	Validates either the contents of a given signed *CodeMeter* log file or a sequence of log files located in a given directory. Expects the path to the file that contains the public keys to use for validation and the path to the log file respectively log directory as arguments.

Syntax	`/vslf:<public key file>,<log file>|<log directory>`
	The `<public key file>` musst be created as comma separated file (CSV).
	For this file the following notation is valid:
	`<major version>,<minor version>, <firm code>, Ox<public key>`
	You can specify several different values and public keys for separate runtime versions.
	You obtain the required values from one of the created *CodeMeter* log files.

e.g.	From the *CodeMeter* log file:
	`2014-06-24T06:06:19 SignedLogfile FirmCode:10,`
	`PublicKey:a809304778d517c44a22d65e1fcedd51a4e2a956fa89e93bb1a24e2100000000a`
	`2ad17e685306d6e15eb6b7ebc8cc72ebc97c0f52721b584836696de00000000, Runtime-`
	`Version:5.20.1432.500, LogfileId:1`
	the following `<public key file>` is derived:
	`5,20,10,0xa809304778d517c44a22d65e1fcedd51a4e2a956fa89e93bb1a24e2100000000a`
	`2ad17e685306d6e15eb6b7ebc8cc72ebc97c0f52721b584836696de00000000`

Currently, the logfile content is saved locally but for future version its is planned that contents may also be retrieved using HTTP access and calls (real-time history).

> If the logfiles need to be read from other systems, you must share the folder where the logfiles are stored as read-only in your local area network.

The following sections briefly:
- show how to configure License Tracking [117]
- introduce definitons and value ranges used in the logfile [119]
- describe single logfile entry types [120]

2.9.1   Requirements and Configuration

Using the *CodeMeter*® feature License Tracking requires at least *CodeMeter License Server* Version 4.50.
Using the feature Secure License Tracking requires at least *CodeMeter License Server* Version 5.20.

Configuration

The logging of licensing data must be activated together with CodeMeter License Server. This you do by direct activation in the *CodeMeter*® Profiling environment.

Profiling

For Windows operating systems you find the profiling entries stored in the registry, for other operating systems entries are set in the file `server.ini`. The following table shows you the respective locations.

Operating system	Registry / Server.ini Entry
Windows	`HKLM/SOFTWARE/WIBU-SYSTEMS/CodeMeter/Server/CurrentVersion`
Mac OS	`/Library/Preferences/com.wibu.CodeMeter.Server.ini`
Linux	`/etc/wibu/CodeMeter/Server.ini`

There exist two relevant profiling entries for *License Tracking*.

Entry	Property	Value
`LogLicenseTracking`	`[DWord]`	`[0;1]` Default value is is `0` and Logging for License Tracking is disabled.
`LogLicenseTrackingPath/[Firm Code]/`	`[SZ]`	`<path>` Default path on Windows operating systems is `%ProgramData%\CodeMeter\LicenseTracking`. For each Firm Code a separate directory is created. For example, the log file for Firm Code `10` is saved to the directory `<LogLicenseTrackingPath>/FC10/..` For other operating systems the default path has the same value of the general profiling entry `LogPath`.

> Please note that changed settings will take effect only after restarting *CodeMeter License Server*.

Logfile Rotation
Currently, there is no logfile rotation implemented.

> ⚠️ Currently, each time *CodeMeter License Server* is started, a new logfile with a timestamp is created and completed by respective licensing data.

2.9.2   Logfile Format

The following logic applies to the format of the logfile.
1.   Each line in the logfile can be handled separately. There exist separate lines for different entry types[120] .
2.   Each line that does not match to the described formats has to be ignored.
       This will allow us to enhance the output in future versions without causing trouble in working solutions.

> ℹ️ It is also recommended to do a parsing of the different arguments of a line and simply to ignore arguments that are not known.
> This allows us to enhance the output in future versions without causing trouble in working solutions.

2.9.2.1   Definitions and Value Ranges

For the logfile and single entry types the following definitions and value ranges are used:

Definition	Value Range
`access id`	`string`
	ℹ️ The `<access id>` is given by the server and extends the `<license id>` by an index describing the slot, i.e. `<license id>-<slot id>`.
`application id`	`[0..4294967295]`
`application text`	`string`
`borrow id`	`string`
	ℹ️ The `<borrow id>` is derived as `<mask>-<serial number>-<firm code>-<enabling block index>`. All values refer to the borrowing client.
`enabling block index`	`[0..31]`
`expiration time`	`["never"|UTC Timestamp]`
`feature map`	`[0..4294967295]`
`firm code`	`[0..4294967295]`
`license id`	`string`
	ℹ️ The `<license id>` is automatically derived as `<mask>-<serial number>-<firm code>-<product item reference>`, e.g. "2-1500002-100532-18". The `<license id>` is a unique identifier for a license entry.

`license quantity`	`[0..4294967295]`
`logfileID`	`[0..4294967295]` ID value of the log file. In order to prevent that a single or several log files can be deleted each log file must have a separate ID.
`mask`	`[0..65535]`
`product code`	`[0..4294967295]`
`product item reference`	`[0..4294967295]`
`product item text`	`string`
`serial`	`[0..4294967295]`
`server`	`string`
`slot id`	`[0..4294967295]`
`timestamp`	`UTC Timestamp` **UTC Timestamp sample:** "`2012-12-24T08:32:59`".

> Since the strings may contain quotation marks (") but may also be bracketed expressions, any quotation marks that are part of the string are quoted by a backslash (\). For example, the application text *The best of "John Doe."* will be issued as
>
> `...AppText: "The best of \"John Doe.\""`

2.9.3 Entry Types

The *CodeMeter*[®] license tracking logfile knows the following listed entry types.

List of Licenses[120]
License[121]
Access[121]
Release[121]
Borrow Access[122]
Borrow Return[122]
Denial[122]
Administrative[122]
SignedLogfile[123]
Signature[123]

2.9.3.1 List of Licenses Entry

Entry type	List of Licenses entry
Description	A list of License entries is preceded by a List of Licenses entry. This indicates that in the following lines all existing licenses of this server are listed. A previously retrieved list of License entries becomes invalid.
Writing time	The List of Licenses entry is written immediately before the list of License entries is written.
Syntax	`<timestamp> ListOfLicenses`

2.9.3.2   License Entry

Entry type	License entry
Description	The License entry describes an existing license.
Writing time	All License entries are written to the logfile: • on startup of *CodeMeter License Server* • each time when an entry is changed, e.g. by plugin / plugout or remote programming.
	In the cases mentioned above, all License entries of the current server are written preceded by a List of Licenses [120] entry.
Syntax	`<timestamp> License Server:"<server>", LicenseId:<license id>, SN:<mask>-<serial>, FC:<firm code>, PC:<product code>, FM:<feature map>, ET:<expiration time>, LQ:<license quantity>, PT:"<product item text>"`

Before all License entries are re-written on changing entries all allocated licenses are released by a Release entry. Immediately after issuing the License entries the previously released licenses are again allocated by an Access entry.

This is necessary because `license id`s can change on re-programming or on plugout and the subsequent rebooking. Moreover, the `access id` may change by automatic rebooking after plugout.

> Licenses with a License Quantity value of `0` (license for local use use) are not listed.
>
> The Expiration Time contains the minimum of the Product Item Option Expiration Time and the value of an activated Product Item Option Usage Period. If neither an Expiration Time is set nor a Usage Period exists or is activated the value is "`never`".

2.9.3.3   Access Entry

Entry type	Access entry
Description	An Access entry describes that a license on a server is allocated to a user.
Writing time	The Access entry is written at the moment a license is accessed.
Syntax	`<timestamp> Access Server:"<server>", LicenseId:<license id>, AccessId:<access id>, Client:"<computer name>", User:"<user name>", AppId:<application id>, AppText:"<application text>"`

> The application id and application text are derived from `CMCREDENTIAL` structure using `mulUserDefinedId` and `mszUserDefinedText`.

2.9.3.4   Release Entry

Entry type	Release entry
Description	A Release entry describes that a user has released a formerly accessed license on a server.
Writing time	The Release entry is written at the moment a license is released.
Syntax	`<timestamp> Release Server:"<server>", AccessId:<access id>`

2.9.3.5   Borrow Access Entry

Entry type	Borrow Access entry
Description	A Borrow Access entry describes that a user has borrowed a license from a server.
Writing time	The Borrow Access entry is written at the moment a license is borrowed. In addition, the Borrow Access entry is written when *CodeMeter License Server* is started and there already exist borrowed licenses.
Syntax	`<timestamp> Borrow Server:"<server>", LicenseId:<license id>, BorrowId:<borrow id>, Client:"<computer name>", User:"<user name>", Expires:<expiration time>, BorrowSn:< mask>-<serial>`

2.9.3.6   Borrow Return Entry

Entry type	Borrow Return entry
Description	A Borrow Return entry describes that either a user has returned a borrowed license on a server or the borrow duration has expired and the license was returned automatically.
Writing time	The Borrow Return entry is written at the moment a license is returned.
Syntax	`<timestamp> Return Server:"<server>", BorrowId:<borrow id>`

2.9.3.7   Denial Entry

Entry type	Denial entry
Description	A Denial entry describes that a user requested a license but did not get one because no more licenses could be allocated. It will not show license requests of licenses that do not exist on this server.
Writing time	The Denial entry is written at the moment a license access has failed.
Syntax	`<timestamp> Denial Server:"<server>", LicenseId:<license id>, Client:"<computer name>", User:"<user name>", AppId:<application id>, AppText:"<application text>"`

A Denial entry is only logged if error 212 (`CMERROR_NO_MORE_LICENSES`) occurs.

2.9.3.8   Administrative Entry

Entry type	Administrative entry
Description	An Administrative entry describes some event on the *CodeMeter License Server*.
Writing time	The Administrative entry is written at the moment the described event occurred.
Syntax	`<timestamp> Admin Server:"<server>" CodeMeter_started`
	`<timestamp> Admin Server:"<server>" CodeMeter_stopped`

If *CodeMeter License Server* is stopped, all Access entries are automatically canceled. Only Borrow Access entries remain valid and will be restored on next start of *CodeMeter License Server*. Usually, the Release entries are automatically added to the log, but in some circumstances this is not possible, e.g. killing *CodeMeter License Server*.

2.9.3.9   SignedLogfile Entry

Entry type	SignedLogfile entry
Description	The SignedLogfile entry corresponds to the header and holds the Public Key.
Writing time	The SignedLogfile entry is written at the moment the logfile is created.
Syntax	`<timestamp> SignedLogfile FirmCode: <FirmCode>, PublicKey: <PublicKey>, Runtime-Version: <Version>, LogfileId: <LogfileId>`

`<timestamp>` UTC time stamp: `<YYYY>-<MM>-<DD>-<hh><mm><ss>`.

`<FirmCode>` Firm Code of the content of this logfile.

`<PublicKey>` Public Key belonging to the Private Key used to sign the logfile.

`<Version>` *CodeMeter License Server* Version which generated the logfile. The version specification follows the short format: (`<Major>.<Minor two-numbered>.<Build>.<Count>`)

`<LogfileId>` ID value of the logfile.
In order to prevent that one or several logfiles are deleted, each logfile must have an ID. Each logfile created during a single running instance of *CodeMeter License Server* has the same `LogfileID`.
The latest `LogfileId` is written from the profiling value "`SignedLogfileId`" and is incremented on the next start of *CodeMeter License Server*. If no profiling entry "`SignedLogfileId`" is found an initial value of 1 is assumed.

`e.g.` `2014-02-07T10:34:33 SignedLogfile FirmCode:10, PublicKey:b4342ec15183992be75ee5e702ea7d118ebb489046df1b15393cdf8d000000007b3a92afafe35f6505222841d65610e75749bf9d572a0eea83d1d6be00000000, Runtime-Version:5.11.1343.201, LogfileId:13`

2.9.3.10   Signature Entry

Entry type	Signature entry
Description	The Signature entry hold the signature of the section last written.
Writing time	The Signature entry is written at the moment the section is signed.
Syntax	`<timestamp> Signature Signature: <Signature>`

`<timestamp>` UTC time stamp: `<YYYY>-<MM>-<DD>-<hh><mm><ss>`.

`<Signature>` Calculated signature value of the logfile using the secret signature key (Private Key). This value allows anybody to check the integrity of the logfile using the public verification key (Public Key ⮐ 123).

`e.g.` `2014-02-07T10:34:43 Signature Signature:75998652881c0c56ce7b391c3638c1a5540e12cab282e2c3c82a0a0a000000008cf46fd7a025939b7d86dfff8b4bdc01073da2eed7326bc351a335cb00000000`

2.10 HID Support

Starting with Version 5.0 *CodeMeter*® supports devices that conform to the USB's Human Interface Device (HID) class specification.

The installation of a special USB host driver is <u>not</u> required since the communication via the USB HID class is standardized and the operating systems provide respective classes. Currently, the operating systems Windows, Mac OS, and Linux are supported.

Alternatively to the Mass Storage Device status, thus *CmDongles* can display as HID without a drive status.

> The communication class HID is available for many *CmDongle*. Please consult the respective data sheet for support details.

Requirements

- Minimum *CodeMeter*® Firmware 2.02
- Minimum *CodeMeter*® Runtime 5.0

The USB communication standard can be switched any time from Mass Storage Device (MSD) to Human Interface Device (HID) or vice versa.

2.10.1 Set from Mass Storage to HID

To switch the USB communication standard from Mass Storage Device (MSD) to Human Interface Device (HID), please proceed as follows:

1. View the status in *CodeMeter WebAdmin* on page "**Content | CmContainer**".
   A drive is assigned and no flash memory is available.

2. Call *cmu* [110] .
   For Windows OS call *cmu* call *cmu* by the start menu item **"Start | All Programs | CodeMeter | Tools | CodeMeter Command Prompt"** (Press "Windows" key to open Start screen | Type "CodeMeter Command Prompt" | Press "Enter" key). For the operating systems Mac OS and Linux this command is provided by the usual search path parameter.

3. Enter the following commandline:
   ```
   cmu32 /s [Box mask-Serial number] --set-config-disk HidCommunication
   ```

The current status displays in the following commandline output:

```
cmu32 - CodeMeter Universal Support Tool.
Version 5.00 of 2013-Jan-30 (Build 1039) for Win32
Copyright (C) 2007-2013 by WIBU-SYSTEMS AG. All rights reserved.

- CmStick/C with Serial Number 2-2251132 and version 2.01
  Version:             2.01
  Flash Size:          no real flash available
  Virtual Drive:       E:
  Configuration:       LocalDisk with ActivePartition
  File System:         FAT32
  Communication:       Mass Storage Device
  Boot-Code:           Int18 Boot Code
  Mdfa:                0x539

  Please replug your CmDongle to apply the changes.
```

4. Unplug and replug the *CmDongle*.

5. View logging in *CodeMeter Control Center* tab "**Events**".
   The information for the switch to HID displays.
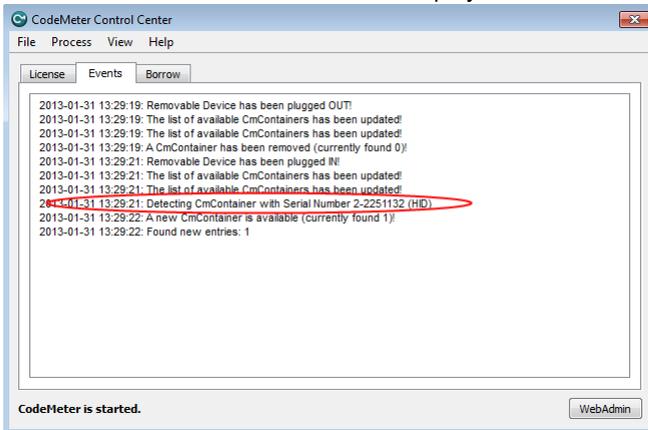
5. Check in *CodeMeter WebAdmin* page "**Content | CmContainer**".
   No drive is assigned.

2.10.2 Set from HID to Mass Storage

To switch the USB communication standard from Human Interface Device (HID) to Mass Storage Device (MSD), please proceed as follows:

1. View the status in *CodeMeter WebAdmin* on page "**Content | CmContainer**".
    A drive is not assigned.

2. Call _cmu_[□] 110
   For Windows OS call *cmu* call *cmu* by the start menu item **"Start | All Programs | CodeMeter | Tools | CodeMeter Command Prompt"** (⊞ Press "Windows" key to open Start screen | Type "CodeMeter Start Center" | Press "Enter" key). For the operating systems Mac OS and Linux this command is provided by the usual search path parameter.

3. Enter the following commandline:
   ```
   C:\Users\fs>cmu32 /s [Box mask-Serial number] --set-config-disk MsdCommunicat
   ```
   The current status displays in the following commandline output:
   ```
   cmu32 - CodeMeter Universal Support Tool.
   Version 5.00 of 2013-Jan-30 (Build 1039) for Win32
   Copyright (C) 2007-2013 by WIBU-SYSTEMS AG. All rights reserved.

   - CmStick/C with Serial Number 2-2251132 and version 2.01
     Version:              2.01
     Flash Size:           no real flash available
     Virtual Drive:        No drive assigned (HID)
     Communication:        Human Interface Device (HID)

     Please replug your CmDongle to apply the changes.
   ```

4. Unplug and replug the *CmDongle*.

5. View logging in *CodeMeter Control Center* tab "**Events**".
   The information for the switch to MSD displays.
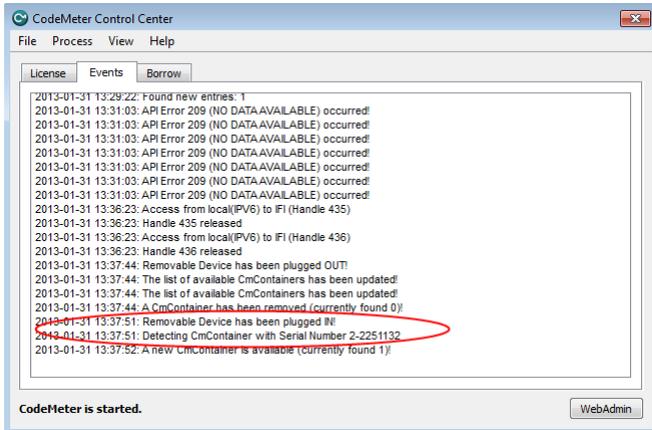
127

5. Check in *CodeMeter WebAdmin* page "**Content | CmContainer**".
A drive is assigned and no flash memory available.

2.10.3 Linux Kernel Settings

CodeMeter requires a working USB hotplugging infrastructure for the detection of a *CmDongle*. Thus make sure that the hotplug is working properly.

If hotplugging seems not to work on a new Linux distribution, please check if the new "udev" mechanism is used. If "udev" is used, the problem can be fixed by copying the file `/usr/share/CodeMeter/52-codemeter.rules` into the directory `/etc/udev/rules.d/`.

For the communication between *CodeMeterLin* and the *CmDongle*, *CodeMeterLin* requires a Linux kernel (Kernel 2.4.x or Kernel 2.6.x) with support for USB mass storage, human interface (HID) and scsi-generic devices. If you use a self compiled Linux Kernel, please check if you have activated usb-storage and sg-device support (as modules).

General Kernel configuration display settings including USB mass storage or HID (Human Interface Device):

CmDongle via USB as MSD (CmStick, CmStick/M, CmCard):

```
CONFIG_SYSFS
CONFIG_USB_SUPPORT
CONFIG_USB_*_HCD*
CONFIG_USB_STORAGE
CONFIG_BLK_DEV_SD
CONFIG_BLK_DEV_SG
CONFIG_*_FS
```
      (respective Host Controller)

      (for passthrough communication)

      (for file I/O, the respective file system)

CmStick via USB as HID:
```
CONFIG_SYSFS
CONFIG_USB_SUPPORT
CONFIG_USB_*_HCD*        (respective Host Controller)
CONFIG_HID
CONFIG_HIDRAW
CONFIG_USB_HID
```

CmCard via internal card reader (e.g. SDHCI):
```
CONFIG_SYSFS
CONFIG_MMC
CONFIG_MMC_BLOCK
CONFIG_MMC_*            (for the respective card reader)
CONFIG_BLK_DEV_SG      (for passthrough communication)
CONFIG_*_FS            (for file I/O, the respective file system)
```

CmCard via ATA:
```
CONFIG_SYSFS
CONFIG_BLK_DEV_SD
CONFIG_ATA             +  respective ATA Host adapter/controller
CONFIG_BLK_DEV_SG      (for passthrough communication)
CONFIG_*_FS            (for file I/O, the respective file system)
```

If your Linux Kernel is configured properly, use the command:
```
codemeter-info -L
```
to get a list of all *CmDongles* connected to your system. If this is not the case, you have probably a general problem with your Linux Kernel or a Kernel module could not be loaded correctly.

3 Glossary

Term	Description
AxProtector	Automatic protection of applications using *AxProtector* as secure basic protection without changing the source code including runtime checks, effective anti-debug mechanisms, modification of resources, and locking of *CmContainer* if crack attempts are detected. Available for different project types and as a commandline version.
CmActLicense	Completely software-based variant of the protection and licensing technology *CodeMeter®*. Licenses are bound to an individual computer.
CmBoxPgm	Commandline tool to create, edit, and delete licenses and their components (Firm Item, Product Item, and Product Item Options) in *CmContainer*. You can also apply scripts and batch files for mass production and test automation. Programming is simultaneously applied in one passe to several *CmContainer*.
CmContainer	Summarizing notion for describing the license carriers of both *CodeMeter®* variants. *CmDongle* in the case of the hardware-based licensing system and *CmActLicense* n the case of the software-based licensing system.
CmDongle	Hardware-based variant of the protection and licensing technology *CodeMeter®*. Available in many form factors for a variety of interfaces.
CmDust	The *CodeMeter®* Enduser Support Tool logs important system and *CodeMeter®* settings and helps Wibu-Systems Support to find remedies for eventually occurring errors.
CmFAS	*see CodeMeter Field Activation Service*
cmu	Commandline alternative to perform many *CodeMeter Control Center* functions (*CodeMeter Universal Support Tool*).
CodeMeter API Guide	Graphical tool to generate source code fragments. You create and test API functions with all related parameters and necessary structures for the programming language of your choice. Currently, the programming languages C, C++, C#, CB6, VB.NET, Delphi, and Java are supported.
CodeMeter Field Activation Service	see *File-based Remote Programming*
CodeMeter Control Center	*CodeMeter Control Center* provides the protected software to access the *CodeMeter®* runtime environment. It displays information on connected *CmContainer*, and presents options to configure connected *CmContainer*. Moreover, an assistant creates license request files and imports license update files (*CmFAS Assistant*).
CodeMeter License Central	Ticket-based system for creating, managing, and delivering licenses for software and digital content. Available in a *Desktop* and an *Internet* Edition.
CodeMeter License Editor	Graphical tool allowing you to create, edit or delete licenses and their components (Firm Item, Product Item, and Product Item Options) in *CmDongles*. Next to programming of locally connected *CmCongles* also file-based remote programming (*CodeMeter Field Activation Service*, CmFAS) is supported. Suitable for testing license strategies.
CodeMeter License Server	Runtime environment (`CodeMeter.exe`) for the protection and licensing technology *CodeMeter®*.
CodeMeter Start Center	Start screen tool to access and open most of the *CodeMeter®* applications and tools.
CodeMeter WebAdmin	Graphical *CodeMeter®* tool displaying information on connected *CmContainer* and related license entries in a browser. In addition, configuration and analyzing options for the *CodeMeter®* runtime environment (*CodeMeter License Server*) are provided.

Term	Description
CodeMeter®	Wibu-Systems' technology for protecting and licensing of software and digital content.
File-based Remote Programming	Remote updating a *CmContainer* requires some information on the *CmContainer* to be reprogrammed. This information is safely stored and transferred in a context file, i.e. `*.WibuRaC` file (license request file). Based on this license request file use the *CodeMeter*® programming tools to create an update file (`*.WibuRaU`) (license update). Subsequently, this file is safely transferred into the *CmContainer*. In addition, on creating the *.WibuRaU file automatically also a `*.WibuRaM` file is created which maps the *CmContainer* content at the time the licenses have been updated. An CmFAS *Assistant* in *CodeMeter Control Center* supports the licensee when updating licenses.
Enabling	Procedure to directly activate or deactivate the complete but also single Firm Item levels and license entries of the *CmContainer* by using an access code.
Firm Code	The Firm Code presents a unique number each licensor receives from Wibu-Systems. It ensures that each licensor is individually identified when protecting and licensing software or digital content.
Firm Item	Logical and hierarchical item level in the *CmContainer*. The Firm Item level holds entries which are unique for each licensor and includes the individual Firm Code.
Firm Key	Secret key which influences almost all encryption and decryption processes of licenses, their authentication, and the creation, editing and deleting of license entries at the level of Product Items. The Firm Key is initially shipped with the Firm Security Box.
Firm Security Box	Master *CmDongle* which allows to program other *CmContainer*. The FSB is unique for each licensor.
FSB	see Firm Security Box
HIP	*High Level Programming API* see *Programming API*
IFI	see Implicit Firm Item
Implicit Firm Item	The Implicit Firm Item level in the *CmContainer* features the same characteristic as usual Firm Items). It simply has some distinct features. While all other level are characterized by the existence of an exclusive Firm Code which is unique for each licensor, the Implicit Firm Item level has the Firm Code of 0. This implies that each owner of the *CmContainer* has licensor privileges for the Implicit Firm Item level including write access.
IxProtector	Individual advanced protection technology applied for software and digital content. 'Real' source code fragments are encrypted and decrypted by interfaces (*Software Protection API*, WUPI) and security mechanisms. Suited to implement modular software protection.
Core API	Powerful interface to communicate with *CmContainer* at runtime of *CodeMeter License Server*. All other APIs and protection mechanisms (*AxProtector*, *IxProtector*, *Software Protection API* WUPI) base on *Core API* functions. Thus using this interface complements existing protection options (encryption and decryption of data, personalization, reading additional data).
License Activation	see File-based Remote Programming
License Information File (`*.WibuCmLIF`)	This file corresponds for *CmActLicense* to an empty license container however holds specifications on binding schemes and additional activation options to be used for unique binding of a license to the computer or the device.
License Update File (`*.WibuCmRaU`)	The update file for a *CmContainer* valid only for a single unique *CmContainer* can be imported only once.

Term	Description
License Request File (`*.WibuCmRaC`)	The context file of a *CmContainer* mirroring the as-is status of license entries serves as basis for license updating in the process of file-based (remote) programming.
SmartBind	Binding scheme used in *CmActLicense* licensing system optimizes assuring the validity of *CmActLicense* licenses, if hardware properties of the PC change to which the licenses are bound.
PIO	see Product Item Options
Product Code	The Product Code represents a number free to choose and identifies the products to be protected and licensed.
Product Item Options (PIO)	License entries at the Product Item level. They hold the Product Code also further options defining the actual characteristics of a license, such as, how many licenses may be simultaneously used in a network, how long a license is valid, which functions are accessible and billed, etc. Moreover, several other data fields are available holding additional binary information and differ in their access privileges. These optional characteristics are combinable in a variety of ways, and constitute the basis for the mapping of any imaginable license strategy.
Product Item	Logical hierarchical entry level in a *CmContainer* below the Firm Item level. At the Product Item level you find the single license entries, i.e. the Product Codes and further Product Item Options.
Programming API	This class-oriented interface allows you to access any object or process required to program or organize license entries in a *CmContainer*, and features extended customizing for the integration of *CodeMeter* into own applications. The *Programming API* is available for many programming languages
Software Protection API	Interface which decrypts segments protected by *IxProtector* at runtime available as WUPI (WIBU *Universal Protection Interface*). It is lean, comprises only a few but essential functions, and is standardized and applicable for a variety of programming languages.
Wibu Universal Protection Interface	see *Software Protection API*
WUPI	see *Wibu Universal Protection Interface*

Index