

CmReady

Facts and Use Cases



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To access the on-demand replay of this masterclass,
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[https://www.wibu.com/wibu-systems-
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About Swissbit

SWISSBIT AG

HEADQUARTER
Switzerland, Bronschhofen

EMPLOYEES
> 450 worldwide



Products and Solutions for securing a digitally connected world

Memory

Reliably Storing Data

NAND Flash Memory Module &
Components



Embedded IoT

Protecting Data & Devices

Hardware & Software-based
security solutions



Hyperstone

Storing & Protecting Data

NAND Controller for Industrial &
Security applications



Production “Made in Germany”

Production Site Berlin



Made in Germany



Production and office area: 10,000m²
Production capacity: 2-3 Mio units / month
IATF 16949 – ISO 9001 - ISO 14001 – ISO 27001 – ISO 50001

DP Product Features - Overview

- **Hardware & Security features**

- Industrial grade robust memory, longevity, fixed BOM
- AES 256-bit encryption, fast crypto-wipe option
- Implicit and replay-safe secure authentication
- Authenticity and integrity check
- User PIN and administrator login
- Hidden Storage / OTP (One Time Programmable) memory

- **Secure Memory**

- **CD-ROM function** protects read-only data such as boot media, software installers, or any data that must not be overwritten.
- **Private partitions** encrypt and protect any type of data. After secure PIN login, this type of partition is unlocked and available for unrestricted read-write access.
- **Hidden storage** serves to store **WORM data** (Write Once, Read Multiple) or random accessible special data that can be controlled in every detail.

- **Supported operating systems:** Linux, Windows

- **Supported platforms:** X86/X64 and ARM



Data Protection features – How can they be used?

Exemplary Use Case: Manufacturing

Boot partition is write protected.

- content fully controlled by card issuer

OS partition

- cannot be modified
- only visible after authentication of system
- content controlled by card issuer

User data or dynamic part of OS

- only accessible after authentication by system or user
- content controlled by the system

NVRAM partition

- hidden, cannot be formatted
- Audit trails, “flight data recorder”

Boot partition
Read only

OS partition
Read only
Pin protected

Private Data
read/write
Pin protected

NVRAM
configurable access
Hidden memory

Physical storage

Visible storage



Swissbit (micro)SD Memory Cards

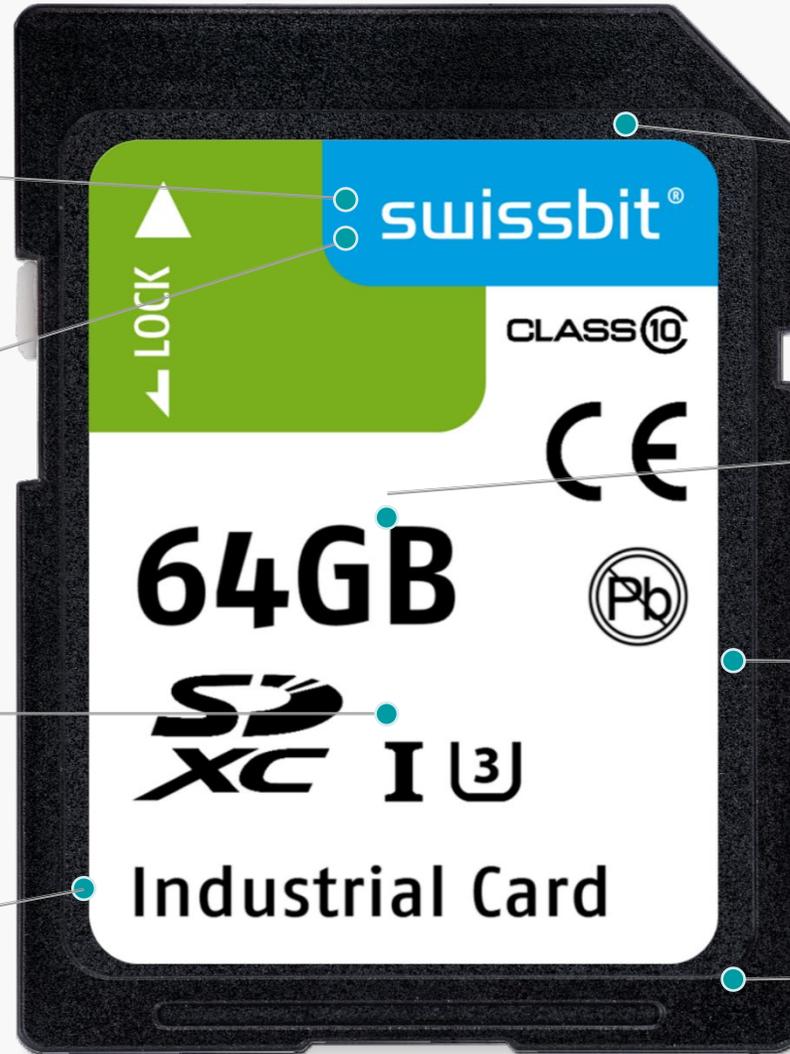
What makes them different

Dedicated industrial grade controller

Firmware optimized for industrial requirements

NAND flash pretested for industrial temperature

Manufactured in IATF 16949 certified Swissbit fab



Best-in class power interrupt stability (verified >10'000 cycles)

Top grade NAND quality

Support for Life Time Monitoring

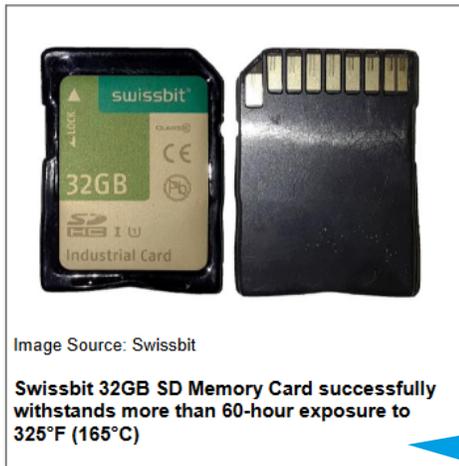
Longevity components and locked BOM

Swissbit (micro)SD Memory Cards

What makes them different than commercial cards – exemplary snippets

PRESS RELEASE

Swissbit S-450 SD memory card survives high-temperature bake



Although tested temperature range 165°C was well outside of the card's specification (-40°C to 85°C), all of the original data remained fully intact.

Stress test PASS – 11'400 power interrupts

Raspberry Pi

MicroSD card Approval Certificate

The below microSD cards have been approved as up to standard for use on Raspberry Pi computers.

Manufacturer / Brand:	Swissbit
Supplier Part Number:	60233780 PS-66u 60233781 PS-66u
Size of Card:	16GB / 64GB



Test set-up:
Raspberry Pi4 Model B/4GB test rig
Each card under test is loaded with a custom image containing up to date Buster image, automated stress test scripts and a local web site to be accessed using Google Puppeteer automation.

Test date: 14th July 2023 Test engineer: R Jones

Results:	Specification limits	
	A1 standard	Raspberry Pi
Sequential write speed	>10MB/S	>12MB/S
Sequential IOPS - write	>500 IOPS	>500 IOPS
3) Sequential IOPS - read	>1500 IOPS	>2000 IOPS

Size	Power interrupts	Total time on (sec)	End Run Speeds		
			Seq Write KB/S	Random Write IOPS	Random Read IOPS
16GB	11,447	2,058,954	40,300	1,059	2,402
64GB	11,409	2,052,539	40,814	1,346	2,368

Approved:  Stamp: 

Date: 15th July 2023
Valid to: 15th July 2024

Note: card approval is valid only on cards of same specification as the parts provided for approval. Any changes in card bill of materials require the card to be re-approved by Raspberry Pi

Swissbit CmReady Product portfolio



Available form factors	SD Memory card (PS-66 DP) microSD Memory card (PS-66u DP)
Data transfer	Speed class 10, UHS-I Class 3, A1, V30
Temperature range	-40°C to 85°C
FLASH technology	pSLC
Density	16 - 64 GB (& 4-8 GB ext. OP variants)

Customer & Distribution Network



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More than 4000 customers worldwide, covering wide range of embedded applications

Global Distribution Network

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RUTRONIK
next generation e-commerce

WIBU-SYSTEMS AG in Short

- Founded in 1989, staff >150 people
- Headquarter Karlsruhe, Germany
- Global subsidiaries:
 - USA, China, Japan & Europa
- Financially Independent
- Global market leader
 - Comprehensive Solution
 - Technology Leadership
- Our Vision: Digital Sovereignty via security and strong collaboration



**SECURITY
LICENSING**

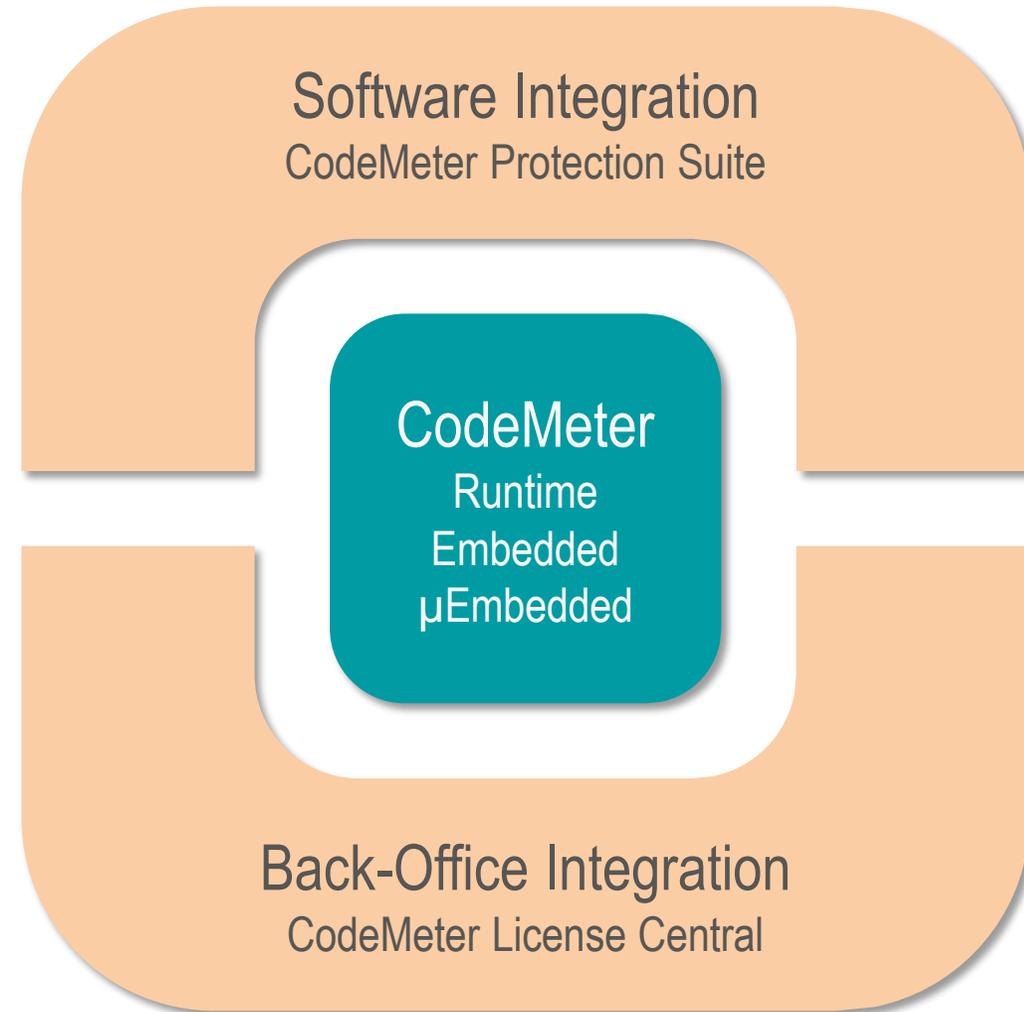
PERFECTION IN PROTECTION

Customers and Partners



The Overall Picture of Protection and Licensing

- CodeMeter
 - License Models
 - CodeMeter Container Variants:
 - CmActLicense (file based)
 - CmDongle (secure hardware)
 - CmCloud (storage and exec in the cloud)
- Software Integration
 - Automatic Encryption
 - API Calls
- Back Office Integration
 - ERP / e-commerce / MES / CRM
 - Software Activation



The License needs a Secure Anchor



CodeMeter Universe

- CodeMeter License Container

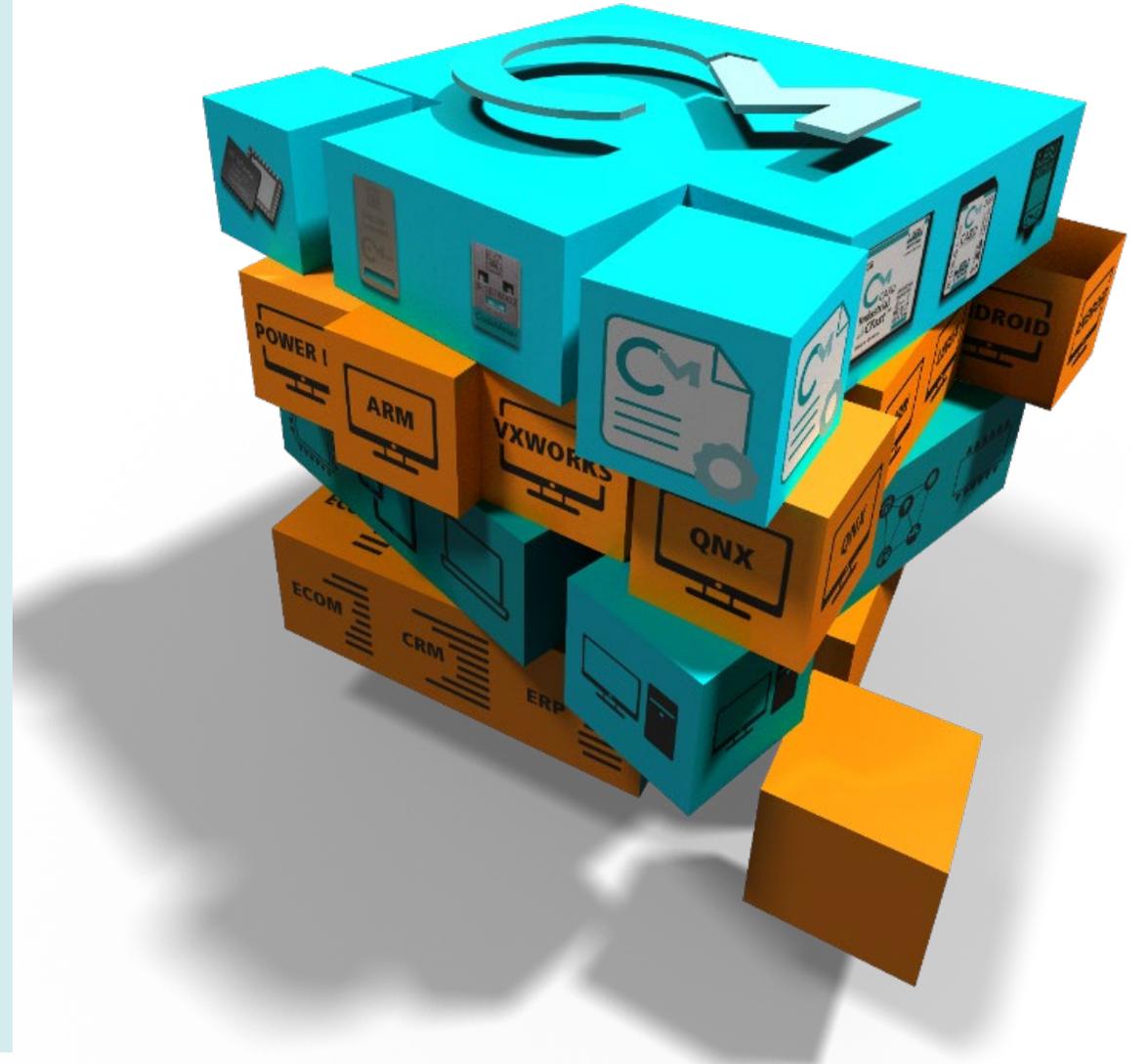


- Software Integration with Protection Suite
 - Native Code, Managed Code, Script Languages, Compile Time Protection
- Back Office Integration with CodeMeter License Central



CodeMeter Solution – Interoperability

- Operating Systems:
 - Windows, Linux, macOS, RTOS, VxWorks, QNX
- Architectures:
 - x86, x64, ARM, PPC, MIPS
- Environment support
 - MicroEmbedded for micro controllers (C source)
 - Embedded (C source and tested libraries)
 - Standard (all features incl. license server)
 - Certificate Vault (PKCS#11)
- Target groups
 - ISVs – Independent Software Vendors
 - IDMs – Intelligent Device Manufacturers



CmReady

Brief Introduction

CmReady Concept in a Nutshell



Industrial SD card
+
CmActLicense
=
CmReady License
Container

CmReady Technology in a Nutshell



- **Looks like** a new container type in addition to
 - CmDongle
 - CmActLicense
 - CmCloudContainer

However,

- **It is:** a CmActLicense with a ready-to-use binding to CmReady-certified SD cards
- **Works with:** CmRuntime > v8.00 and CmEmbedded > v3.00

Comparing CmReady with CmDongles and CmActLicenses



	CmActLicense	CmReady Card	CmDongle
Time / Feature / Usage-based Licensing	✓ / ✓ / ✓	✓ / ✓ / ✓	✓ / ✓ / ✓
IP Protection	✓	✓	✓
Virtual Clock	✓	✓	✓
Mass Storage		✓	✓
Mobile Usage		✓	✓
Easy Offline Replacement of a Broken Device/Computer		✓	✓
Hardware Clock			✓
Strong Authentication			✓
Key and Counter Storage in the Smart Card Chip			✓
Form Factors		Memory card	USB stick, memory card or ASIC

CmReady

Different Points of View

CmReady – The Software Vendor’s Perspective



- CmActLicense bound to individual Swissbit Data Protection (DP) cards
- Ready-to-use plugin for binding
- Boot medium, data storage, and licensing system on one card
- License programming independent of the device
- Works with CodeMeter Runtime and CodeMeter Embedded



CmReady – Your Customer’s Perspective



- The handling of a dongle with the flexibility of different SD card configurations
- Customers can use CmReady device for their own licensing purposes
- License programming independent of the device
- Works with CodeMeter Runtime and CodeMeter Embedded



CmReady – The SD Card Manufacturer’s Perspective



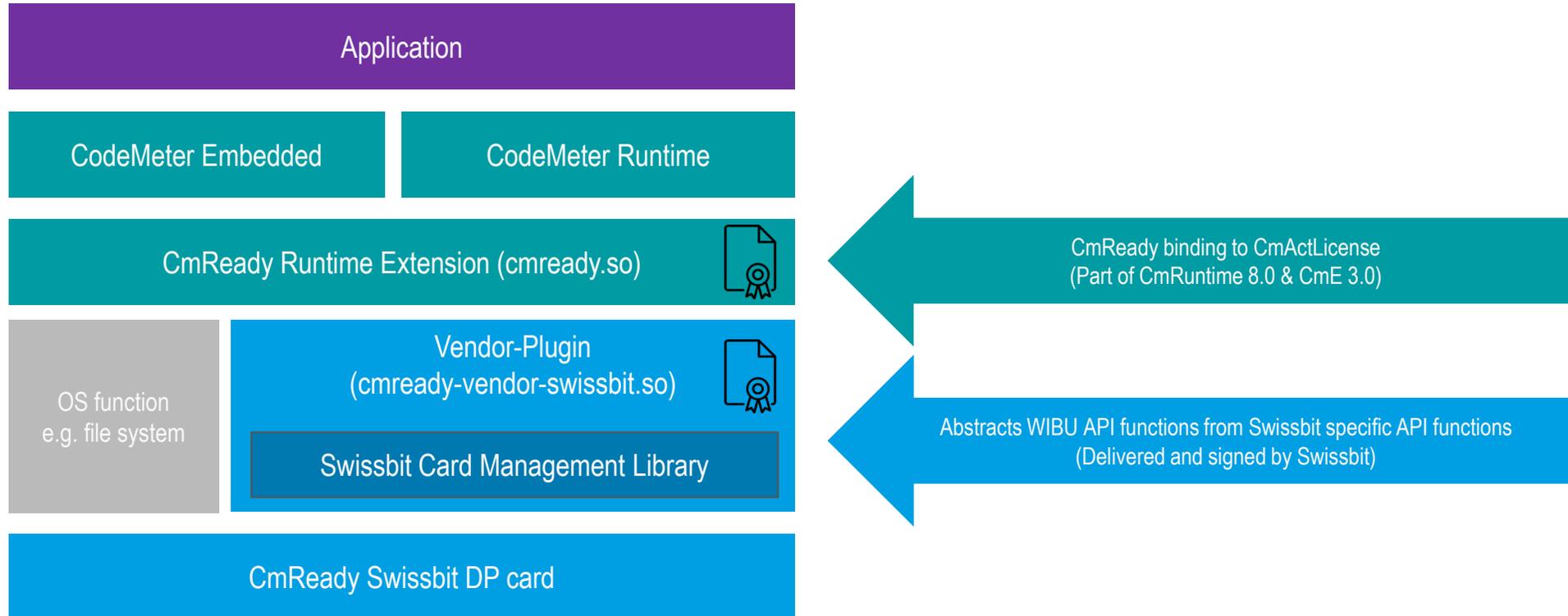
- CmReady certification for industrial SD cards
- Product portfolio extended
- The power of synergies
- Leveraging SD cards security features to access CodeMeter’s world



CmReady

All the technological aspects

CmReady Architecture



Security and Safety



- Binding
 - The binding is anchored inside the CmReady card firmware
- Reliability
 - The libraries are signed by Wibu-Systems and Swissbit
- Counters against replay of images
 - Monotone counters inside the CmReady card firmware
- Operational Safety
 - Automatic backup of the license container in the non-volatile RAM of the CmReady card
 - Automatic backup restore when a CmReady card is detected and the license container file is missing

Technical Data and Prerequisites



- Operating Systems: Linux, Windows
- Processor platform: x86, x64, ARM 32, ARM 64

- At least, one read-write partition for CodeMeter process.
- Compatible with boot mediums or partition encryption.
- Can hold up to 4 license containers.

CmReady

First Steps

ISV's First Steps with CmReady



- Preparation
 - Obtain an FSB with your unique Firm Code
 - Install CodeMeter SDK and Runtime (provided by Wibu-Systems)
 - Install the vendor's specific library (provided by Swissbit)
 - Use CmReady device plug&play just like you would with CmDongle or CmActLicense
- Usage and Delivery
 - Protect your software with CodeMeter Protection Suite and the assigned Firm Code
 - Distribute software, including the card vendor's specific library

Customers' First Steps with CmReady



- Preparation
 - Install the protected software package
 - Usually this comes with the CodeMeter installer or integrated CmEmbedded
 - Get the license from the portal, if not already installed on the delivered CmReady card
- Usage
 - Plug the CmReady SD card into device
 - Run the software



Type your questions in the chatbox



Let's meet at Embedded World

Wibu-Systems

Hall 4

Booth 168

Swissbit

Hall 1

Booth 534

Thank You!

Let's keep in touch

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