KEYnote 37

THE WIBU-MAGAZINE

CodeMeter Certificate Vault

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WIBU SYSTEMS

Content

Dear Clients and Partners!

The year 1989 marked the birth of Wibu-Systems. Today, we can look back with great satisfaction on three decades of business success. It makes us proud to see how our products have developed, how we have grown, and what we have achieved. What makes us even prouder is our loyal customers, who are accomplishing great things with our products and many of whom have been our trusted partners for a very long time.

The future holds much promise and many exciting challenges. Security is an indispensable precondition for commercial success and business profitability. The digital transformation is in full swing, and we expect this evolution to continue for the foreseeable future. We depend on you, our research partners, our clients, and our suppliers for guidance, and let's not forget our great staff, who understand your needs and expectations, who expand upon your ideas, and who have the knowledge and creativity to put them to work. As a sign of our commitment to all of you and as the foundation for the great things to come, we are investing further into our headquarters here in Germany and expanding our international ventures.

This KEYnote Magazine unveils our new CodeMeter Certificate Vault and tells you more about using TPM in CodeMeter Embedded. You can learn about interesting use cases of CodeMeter License Central, like reselling licenses, a reseller portal, and our hosting services with Wibu-Systems Operating Services, WOPS. There is also an exciting look behind the scenes at our Security Incident Response Team.

I hope you can take away many interesting new ideas for your business and am looking forward to seeing you at one of the upcoming spring expos.

Best regards from

Oliver Winzenried

CodeMeter Certificate Vault

Digital certificates using the x.509 format are becoming more and more common and increasingly important. The processes for managing certificates or storing keys securely, however, have not become any simpler or straightforward. The need for certain security procedures is set for a head-on collision with usability in the real world. CodeMeter Certificate Vault is here to save the day.

At the core of every CodeMeter dongle (CmDongle), there is a secure element, a tiny chip with secure key storage and readable memory. CodeMeter Certificate Vault builds on this basic system and goes beyond the established CodeMeter API to offer interfaces for integrating the solution with existing applications or the client's specific requirements. CodeMeter Certificate Vault works as a PKCS#11 compliant token provider, integrates with the Microsoft Cryptographic API Next Generation (CNG) as a Key Storage Provider (KSP), and works perfectly with the OpenSSL API to e.g. store and handle the keys for TLS certificates with uncompromising CodeMeter security.

The certificates and keys make their way onto the CmDongles via a specially protected route, going through a central system like CodeMeter License Central. There is no need for the end user to be concerned about the technical nitty-gritty of requests, updates, or signed certificates. All of this complex administration happens in the background for the user, including the CA (Certificate Authority) if need be.

According to the textbook process, the entity (a person or a machine) that needs a certificate would first create a key pair, ideally already within a hardware secure element. This is used to sign a request that is sent to the higher Certification Authority. The request is checked, a certificate created and signed, and the signed certificate sent back. The requesting entity then loads that certificate into the readable memory. Once the certificate has expired, the entire process starts over. This (simplified) description makes it easy to understand why so few emails are signed and encrypted, why the smart health insurance card is such a political hot potato in many countries, and why certificates are the wallflower of the IT world outside of the dedicated crypto scene.

CodeMeter Certificate Vault has arrived to change all this: On the user's side, the standard interfaces like PKCS#11, KSP, or OpenSSL remain in place. Every application can access certificates and keys in the CmDongle in a fully conformant manner, and the necessary cryptographic operations happen in the dongle. The entire

creation of certificates occurs within the central Certification Authority, which could be embodied by a company's IT department. Here, certificates, and key pairs are created and then distributed to the dongles in the field.

This approach seems to go against all the rules of correct certificate management, which stipulate that private keys must never leave the secure dongles of the users. However, if the keys and certificates are created in a central and similarly secure environment, the CodeMeter Certificate Vault Admin Tool or CodeMeter License Central can package them up in an encrypted update file (WibuCmRaU) that only the destination CmDongle can decrypt. The file is the secure vessel bringing the keys and certificates into the CmDongle, where they are available for use via the standard interfaces. Certificates can also be renewed or deleted in the same manner, and the users need not get involved at all. This makes the process the ideal choice for remote controlled devices in industrial facilities, IoT devices, or just for encrypted emails or VPN certificates in corporate networks.
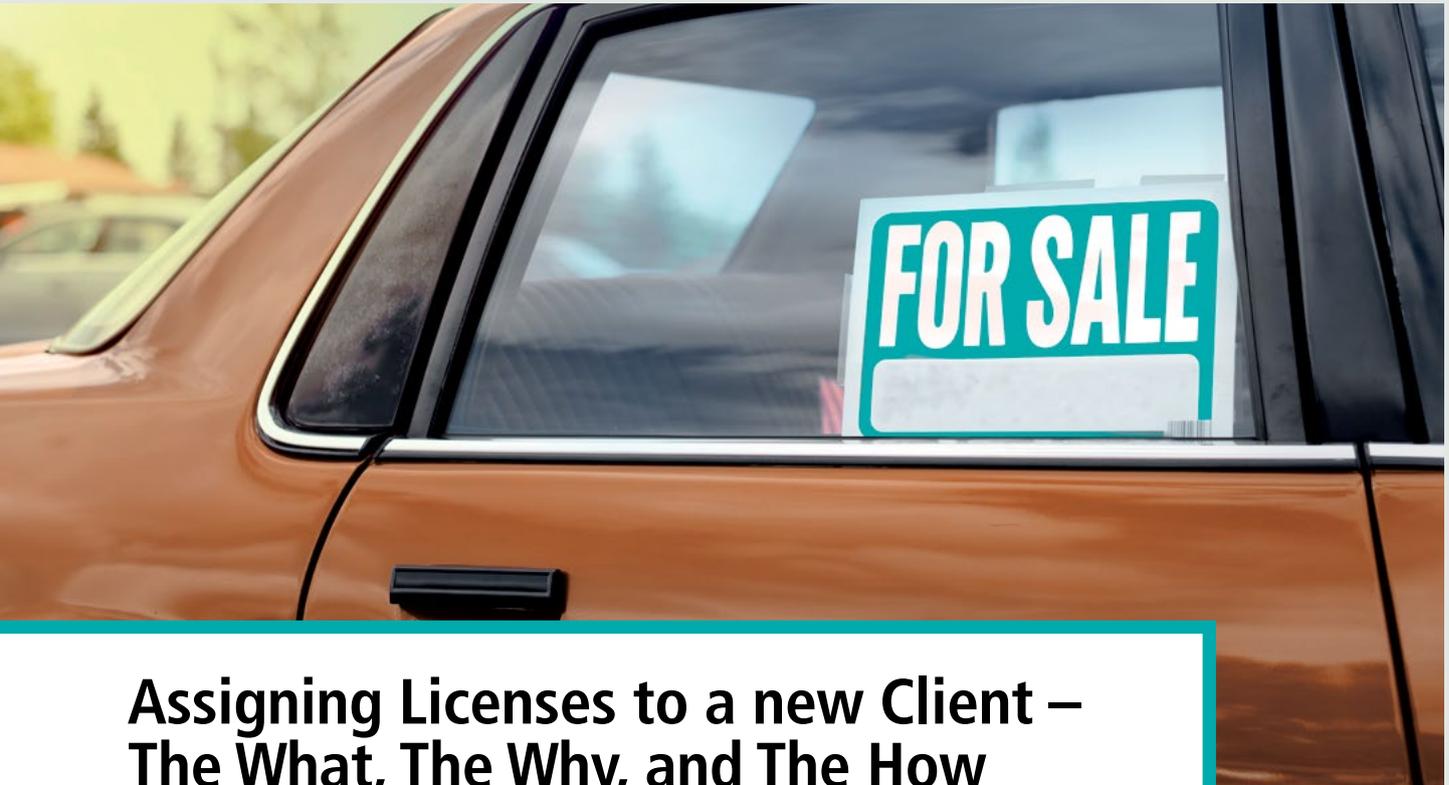
Assigning Licenses to a new Client – The What, The Why, and The How

The What?

CodeMeter License Central has a fiendishly difficult task: To deliver the complexities of license generation and lifecycle management in as simple a form as possible. Other software products purport to do so similarly, but what sets CodeMeter License Central apart is its sheer flexibility.

One of the more recent additions to CodeMeter License Central's growing arsenal of capabilities is license rebooking, a feature introduced in v3.20. As asset costs continue to rise inexorably, license rebooking is becoming an increasingly important topic for ISVs and end users alike, since it provides a means of recouping some of their initial capital outlay in order to help reduce the costs of new projects.

The Why

An easy way to think of license rebooking is the everyday example of owning a car: Let's suppose you buy a brand-new E-Class Mercedes with all the trimmings. It costs you €75,000, and your plan is to run it for five years and then buy something new. Maybe you are happy with your current E-Class, so you plan to buy a newer model; maybe you like the idea of upgrading to an S-Class Mercedes; or maybe you fancy the idea of a Tesla Model X. The process is the same: You sell the old car and purchase a new one. It would be utter madness to simply throw the perfectly good E-Class away when you could get tens of thousands of Euros back for it.
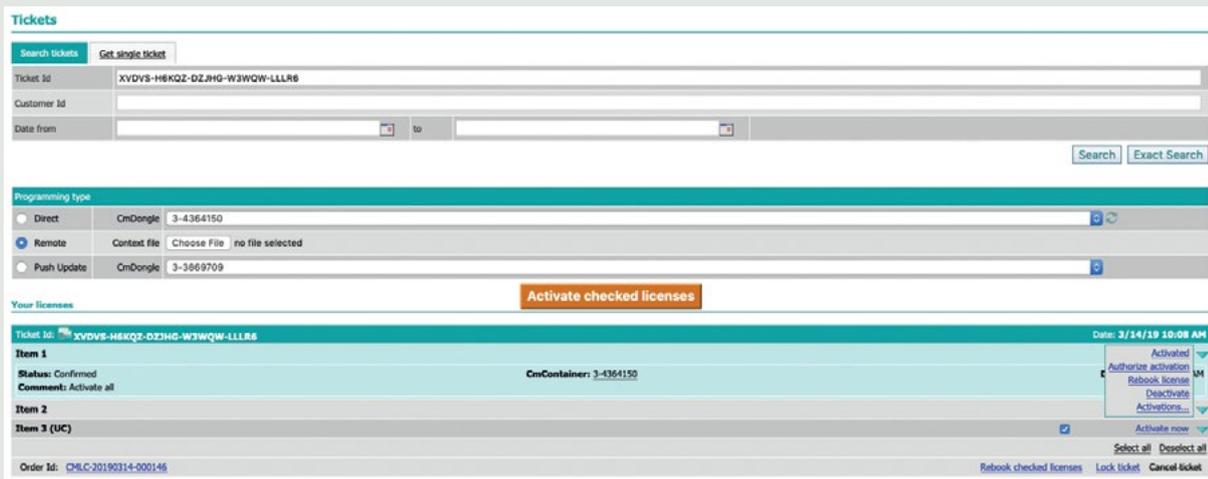
Clearly, car resale is not just some whimsical desire. It is a crucial part of car ownership. Now let's think about how this might apply to licenses, again with a hypothetical example.

Consider a company, Avocado Inc., that produces widgets and achieves this through means of a rather expansive machine, the Widget Maker Model A. This can churn out widgets at a rate of 1,000 a week. However, Avocado Inc. just cannot produce enough of them to meet demand. Everybody wants one. The problem is that the Widget Maker contains some rather complex software that is used to monitor the health of the machine

and apply design tweaks to the finished widget. Of course, the company that makes the Widget Maker – let's call them Berry Ltd. – also writes the software for it, but therein lies the problem: Nobody can leave Avocado Inc. with a Widget Maker Model A under their arm, because it is too big and heavy. However, stealing the underlying software is a very different proposition, since it is vastly more portable. Writing software is an incredibly expensive business. Quite rightly,

the Model A for a new project they have, and Avocado Inc. wants to buy their new hardware, all set to grow their business. When Cherry Pickers AG takes delivery of the Model A, they also take delivery of the underlying license. But herein lies the problem: The license is registered to Avocado Inc. and so too are all the support and service contracts with Berry Ltd.

Fortunately, Berry Ltd. was using Wibu-Systems' CodeMeter License Central for their Widget

to have this recorded for their own internal processes (audit, support contracts, etc.).

Fortunately, using CodeMeter License Central makes the whole process quite painless, even though the process involved is extremely flexible. In our particular example, Berry Ltd. would simply locate the original ticket used to deploy the Model A license to Avocado Inc. This can be done by using the ticket search feature of CodeMeter License Central.
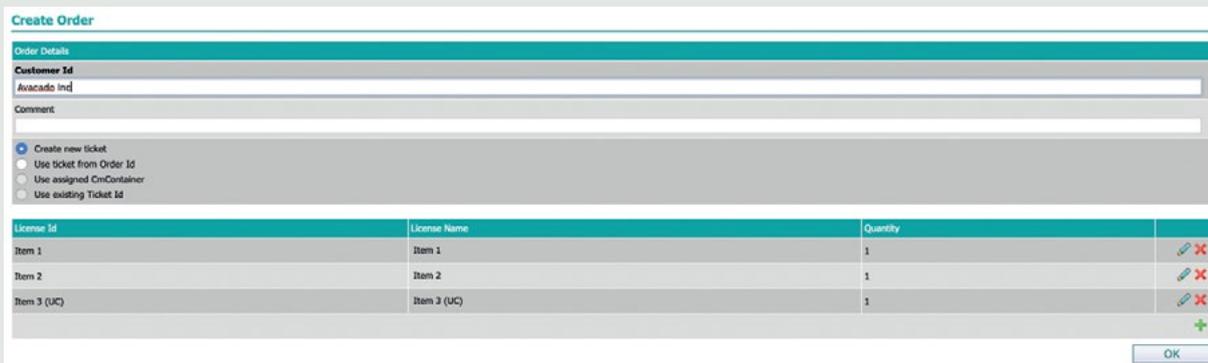
Berry Ltd. wants to protect their software using Wibu-Systems technology and then license that technology to Avocado Inc.

Everything runs happily. Avocado Inc. can continue to make and sell their widgets, and Berry Ltd. can sit back, safe in the knowledge that nobody can steal their IP. [Obviously, Avocado Inc. also uses Wibu-Systems' technology to license the software on their Widgets, but let's not go there].

Then the inevitable happens: Avocado Inc. decides that the time has come to grow – they figure they can sell (and therefore need to make) 5,000 widgets every week. Fortunately, Berry Ltd. has created their Widget Maker Model B, which can handle this workload so Avocado Inc. decides to sell their Model A and buy a Model B. Cherry Pickers AG buys

Maker's software security requirements. It only took a software engineer a few minutes at his desk to transfer the license. All three companies were able to get on with their business, safe in the knowledge that all IP had been protected.

The How?
One of the many strengths of CodeMeter License Central is the sheer flexibility it provides the end user with performing a task. Of course, this is also the case when rebooking licenses.

The beauty of the situation is that the software driving the Widget Maker Model A will still run happily even if the machine itself has been relocated to its new home. But transferring ownership of the Model A from Avocado Inc. to Cerry Pickers AG implicitly transfers ownership of the software license, and Berry Ltd. needs

The search feature provides a myriad of ways of finding the ticket. In this particular case, a simple search on the customer identity and order date is enough to locate the relevant ticket (your mileage may vary). Viewing this ticket will show exactly which licenses have been activated, where, and when.

They can then select the required license and rebook it to a new ticket which can then be associated with Cherry Pickers AG.

Some things just work…
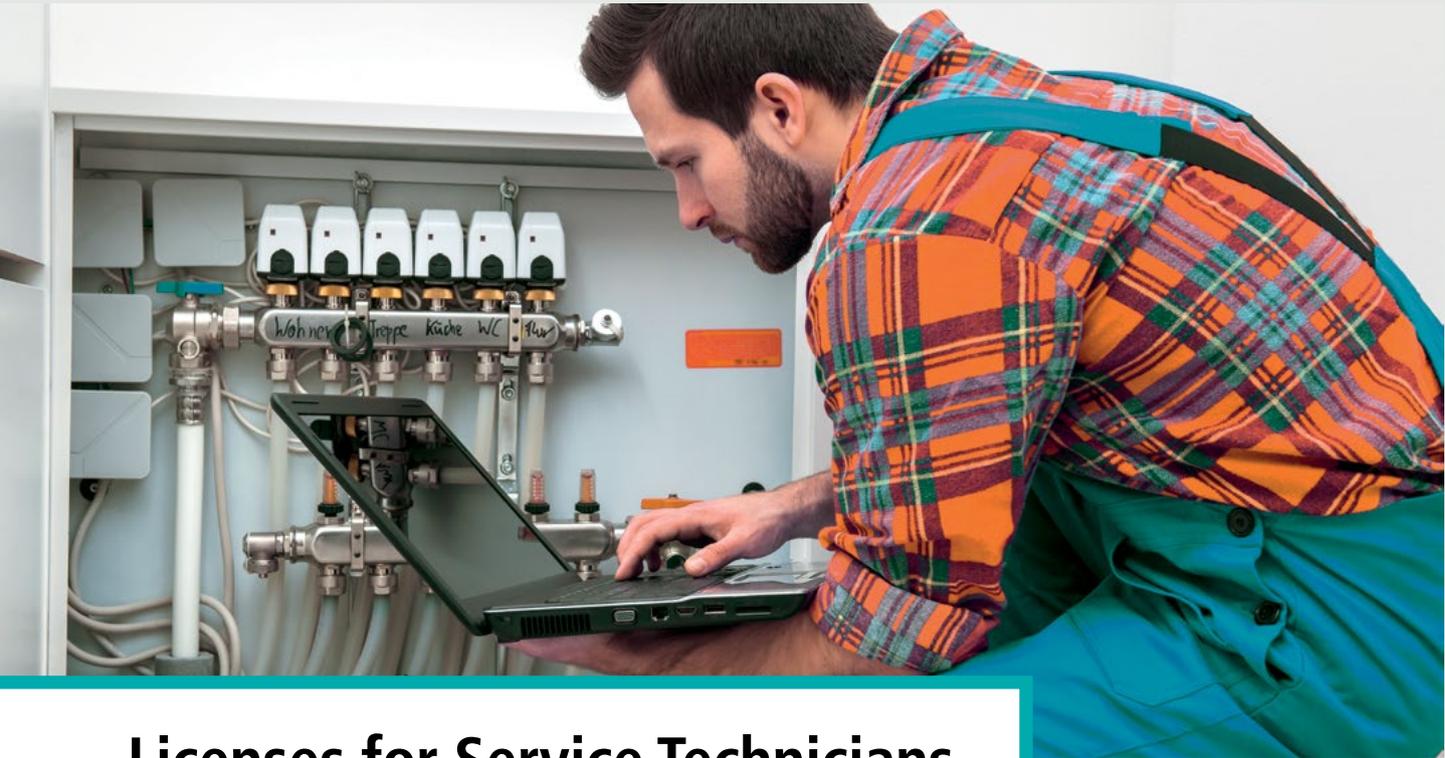
Licenses for Service Technicians

There are many cases in which service technicians need to use software for maintenance or repair jobs out in the field. Forklifts, operating room (OR) equipment, or automatic teller machines (ATMs) are just three of the countless examples. But service software comes jam-packed with invaluable know-how that needs to be shielded from those who have no legal claim to it. This can be the software itself or text and multimedia documents. CodeMeter is the perfect choice for all of these use cases.

Competitors

One of the top reasons for choosing CodeMeter for service technicians is the ability to shield vital know-how from the prying eyes of competitors. They would be prevented from digging into the inner workings of software or accessing documents that can save them costly development time. With company secrets closely guarded in this way, competitors have no way of exploiting possible weaknesses when trying to poach clients.

By encrypting software with CodeMeter Protection Suite and protecting documents with SmartShelter PDF, CodeMeter stops all unauthorized access and illicit analysis.

Proof of Qualification for Service Professionals

Many companies restrict services to only properly qualified and certified professionals. Their certification can be limited to a certain period of time before it needs to be renewed.

One feature that CodeMeter can deliver is control over who gets to access the software needed for service jobs. CodeMeter can be used to apply different types of access rights for different licenses. Service technicians could then be assigned a license for the works they are qualified for, which could even be limited to a specific time. This guarantees that only properly trained professionals can conduct such works while their certification remains valid.

External Service Technicians

The makers of devices or machines would often prefer to keep all technical services limited to their own specialists. This can be an essential part of their business models. However, lawmakers are often calling for a liberalization of the market to include service partners or even direct competitors.

CodeMeter gives you effective controls over the access they can have. You know who works on your devices or machines, and you decide whether to restrict this to qualified and certified professionals or require them to buy your service software.

Disgruntled Staff

Industrial espionage by disgruntled former or current employees is a factor too often underestimated. Client data, software, templates, draft contracts, or blueprints are just some of the typical targets for theft or tampering.

As with its protections against unscrupulous competitors, CodeMeter again offers an opportunity to encrypt data and software. They could then only be used if the right license is present; decryption is only possible for a defined period of time. After that open period has passed, the data becomes worthless for whoever has access to it. By binding the license to a named employee's workstation, it becomes even harder to pass on the license without authority.

Unauthorized Modifications by the Client

There can be use cases in which an incorrectly configured machine can have fatal consequences. OR room equipment or a dialysis machine are just two obvious examples, but even in less life-threatening cases, tampering with the settings can lead to waste or in-creased wear and tear. This could be a poorly calibrated dental milling machine or the incorrect maximum RPM of a wind turbine. To forestall any debates about warranties, CodeMeter allows the settings and calibration of equipment to be restricted to certified service technicians.

Logging

CodeMeter is also the solution of choice for cases in which the user or service technician must be able to configure the settings themselves. A CmDongle can be used to identify who changed any of the settings. A tamper-proof log is kept to record the changes and the person who authorized them.

A CmDongle with flash memory can also be used to record the logs in an area that only specially authorized software can read. This shields the logs against accidental or deliberate deletion by the user or a virus.

2-Factor Authentication

Highly sensitive use cases, such as ATMs, can demand two-factor authentication: possession and knowledge. The service technician would need to be in possession of a CmDongle and know the password for the CmDongle. Both are needed to start the software and provide the required services.

Encryption

One of the two factors making CodeMeter an effective choice for service software and service documents is the option to encrypt data with a key bound to the license. Only a service technician who has the right key can access the software and documents, decrypt them, and use them for his work. CodeMeter offers a granular selection of different rights and entitlement levels. CmDongles or CmActLicenses bound to a specified device provide solid and protected key storage for this purpose.

Automatic License Renewals

The second critical factor is the issuing of automatically renewals. These are created via CodeMeter License Central and collected by the service technician. As the issuer, you limit them to a specific period to reduce the risk of licenses falling into the wrong hands.

Your software regularly checks back with CodeMeter License Central to renew the license automatically in the background. This would mean that a service technician who stays online will always have a fully usable license. If a license is lost in the field, it is locked in CodeMeter License Central and expires automatically.

Changes like new rights for new documents or features can also be rolled out in the background in this manner – or withdrawn if need be.

Reseller Integration

Resellers are a good way to expand your business with minimal investments. Resellers have the boots on the ground: They are on site, they know the local customs and preferences, and many of them already bring an established customer base to the table. By going through resellers, you avoid having to buy premises and recruit staff. However, you do need to find a way to integrate the resellers into your usual software distribution processes.

CodeMeter License Central gives you a flexible framework and the ability to tailor it to your specific needs. There can never be one "right" reseller setup, as every business will have its own specifications, established or planned processes, and a unique system landscape. Read on to find several stories of resellers successfully integrated through CodeMeter License Central.

Provider of dental products
A maker of dental treatment equipment and instruments started by selling a new type of camera, with its software licensed with CodeMeter. Most of these cameras are being sold through resellers, specialized wholesalers for dental surgeries. In most cases, the original maker does not even know the actual dentist using the hardware. With the decision to introduce licenses for the camera software and registering the dentist users, this situation is set to change in favor of a more direct relationship between the camera maker and the camera user.

As the selling process was always very hardware-centric, CodeMeter was deliberately integrated with hardware as the backbone. The resellers could simply keep their established processes. A production order is created in SAP for the required license, and the items transferred into CodeMeter License Central. A ticket is sent back to SAP to confirm the order, which is engraved on a special check card voucher. The camera maker sells these vouchers to the resellers, who can then sell the cameras to the dentists with the license tickets on the cards.

Dentists can register in the maker's user portal to activate the software. Their data is transferred back by CodeMeter License Central into the SAP system, starting a workflow that checks it against the existing user data.

Resellers are integrated exactly how they would expect it: They are given the voucher cards to deliver to their customers. This fits

in perfectly with their traditional routines. A more modern route – the Internet – is used for the other side of the equation, capturing and recording the users' data.

Trusted by Wibu-Systems
Another user of the reseller capabilities of CodeMeter License Central is Wibu-Systems. A software developer or vendor needs licenses to use CodeMeter, which are either billed by unit or by annual fees. Our own sales offices and sales partners around the world operate as our resellers. They need to know that the licenses are always ready for delivery, even if it is long past midnight at our home in Karlsruhe, Germany.

Again, CodeMeter License Central is integrated into the ERP system used by Wibu-Systems. By contrast to the dental example, this is not done by production order, but by a customer order (in the SAP world, this is named sales order and uses the Sales and Distribution (SD)
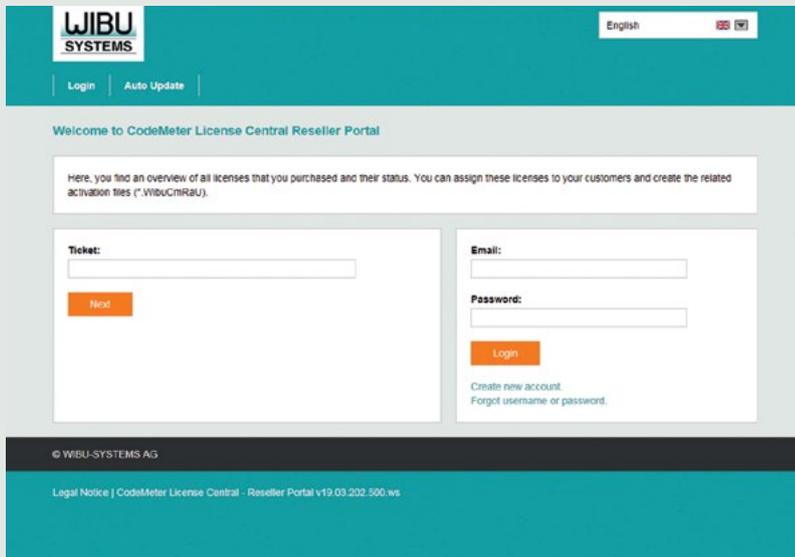
module.): Upon receiving an order from one of our resellers, a ticket is created in CodeMeter License Central and sent back to the ERP system, where it is printed on the delivery note. The end user then uses this ticket in the WebDepot of Wibu-Systems.

Licenses sold by unit are not tied to a named user. This allows resellers to store licenses in the form of tickets, ready for delivery. A ticket could, for instance, hold 1000 licenses. A custom portal created for the resellers can be used to withdraw the required number of licenses from the ticket and repackage them on a new ticket for the end user. This enables our resellers to supply their users at top speed, while keeping us in control over the entire process, as the number of licenses available for the resellers can be limited on their tickets. The same transparency is guaranteed for the reseller, as the portal shows them exactly which tickets have already been activated by their users.

One particular highlight of this type of integration is its territorial protection: Resellers get the exclusive right to sell licenses in a defined region. To do so, a special flag is set in the licenses when they are first created, which is then checked when they are activated. No other reseller is then able to sell licenses to this customer.

By being integrated in this way, our resellers can deliver Wibu-Systems licenses virtually instantaneously. They can create new tickets and load any number of licenses from their contingent onto them, allowing them to create individual licenses on demand.

Teachers and professors as resellers

Another Wibu-System client from the educational market is using the special EduPortal in a similar manner: Here, teachers and professors become the resellers. They have a certain contingent of licenses, which they can manage through their portal. They know in real time which licenses have been activated and which have not.

Their students are the users in this scenario. They are given a ticket to activate via Web-Depot or in the software itself. The software's original maker can define whether the end user has to register and whether any special criteria need to be fulfilled, such as student of a school or university or employee of a company. These can be checked e.g. by looking for approved email domains.

As with Wibu-Systems' own resellers, the original maker keeps full control over the number of created and activated licenses. At the same time, the teachers / professors can distribute their contingents as they wish, without having to check back with the maker – as long as they stick to the rules set by the maker in the first place.

Flexible license creation by resellers

CodeMeter License Central is intrinsically able to create licenses flexibly for resellers, which would go far beyond assigning them a certain contingent to distribute to their customers. In practice, this is usually done via SAP or another e-commerce solution: The resellers order their licenses in

the e-commerce system, which checks the order and creates the tickets for the resellers in CodeMeter License Central.

A customized license portal gives the resellers an overview over all of their tickets, while the end users can see their tickets in WebDepot.

Value Added Reseller (VAR)

There are resellers that specialize in selling products in a bundle with their own software, called Value Added Resellers (VARs). CodeMeter License Central can accommodate them just as effectively, with the following options:

- Creating an OEM software version

- Coupling two CodeMeter License Centrals

- Using the original makers' feature flags.

For the OEM version, the resellers operate their own CodeMeter License Central: They get a special version of the original software that works with their Firm Code. They can sell it through their CodeMeter License Central, with the sale booked and invoiced through the CodeMeter License Central reporting function.

By coupling two CodeMeter License Centrals, the original maker and the reseller both operate their specific ends of the system. WebDepot creates the bridge between them and activates the licenses for the end user in both CodeMeter License Centrals: Two separate systems that keep just "one face to the customer" for the end user.

For the last option, the original maker allows the reseller to order additional flags for use with their licenses. The reseller orders these flagged licenses directly from there. What is great about this solution is that the reseller needs no separate licensing infrastructure at all.

There are many other flexible integration options for VARs: the Professional Services Team of Wibu-Systems is always available for a custom solution.

Wibu Operating Services

Since launching Wibu Operating Services (WOPS), more than 150 clients have already entrusted us to host their CodeMeter License Central. There are many reasons for the success of fully managed application hosting at WIBU-SYSTEMS AG. Here are just a few of them:

Software as a Service

CodeMeter License Central is designed to be user-friendly, but it can require a certain level of expertise that not every company can cover with its own system administrators. Building up the required competencies and systems internally often make little commercial or technical sense; the competition for talent in the labor market has been heating up in recent years. In such case, it is a wise choice to entrust these operations to the experienced people of Wibu-Systems.

In essence, CodeMeter License Central can be operated very effectively in an outsourced, 'capsule' form. Handing over the operation to Wibu-Systems can positively impact a company's competitiveness. They remain the proprietors of their processes and licensing systems, which are connected through their ERP and CRM systems via a secure interface to CodeMeter License Central. Wibu-Systems provides a choice of standard interfaces or web services that can be used to implement custom interfaces. You can call on the support of our Professional Services team to help you design and implement the system that is right for you.

Optimization as the Principle

Since we launched Wibu Operating Services, we have not only won the trust of more and more clients every month, but are always adding the latest technology in the field and recruiting new personnel to maintain a top level of security, availability, and customer service. High availability is not just standard for our network components and services; CodeMeter License Central can now be delivered in a High Availability Package. We check our processes regularly and keep developing them further, in compliance with ISO 9001:2015 and 27001 standards. This includes the automated functions that would spring into action once an incident is noticed and return the service to normal operations by following a special algorithm we developed in-house. The newest element of this optimization is represented by our security checks, and we are already planning to build in more redundancy in our data center to offer our clients a geo-clustering solution in the near future.

Security as the Minimum Standard

Operating an application through the web is naturally a more complex task for everyone involved. The flood of hacking incidents keeps growing around the world – and not just in simple numbers, but also in the severity of the problem. This puts more pressure on administrative and technical systems. Constant monitoring and super-fast reactions to any incidents 24/7 are the absolute minimum norm nowadays.

Wibu-Systems operates cutting-edge technology for monitoring and managing the hosted systems. Any disruptions and load peaks are recognized instantaneously, and countermeasures are introduced to cushion their impact. This includes an immediate notification for our clients to allow them to take the right measures as well, e.g. letting their service hotlines know that a service might be disrupted.

Even if this is a very rare occurrence indeed, Wibu-Systems ensures that our processes and technology keeps working perfectly when such incidents happen.

Our security checks were revised and optimized completely and carefully last year. We employed the newest technology to scan our client systems for more than 100,000 potential vulnerabilities and removed any problems we identified immediately. The Wibu Operating Services team is trained in IT security and regularly updates and expands its expertise.

These efforts have helped us maintain availability in the last twelve months far above the contractually agreed levels – 99.97 percent over the course of 2018. And, should we ever fail to provide the monthly availability we guaranteed, our clients receive credit in compensation for the time their systems were not up and running.

Your Expectations as the Benchmark

Our clients love Wibu-Systems' flexibility to accommodate all requirements. This can mean the provision of services outside of regular office hours to keep the effects on normal operations to a minimum. To avoid problems due to demand peaks, additional lines of CodeMeter License Central can be activated as needed. Our clients can switch between our different editions at any time without worrying about their data. They can choose different options for a secure connection to the systems or even combine them as required (https client certificates, IP filtering, basic authentication). When migrating a regular CodeMeter License Central to WOPS, our WOPS team will join the client's project team to offer functional and organizational support and guarantee that the switch works as smoothly as possible.

As our client, you can choose the right flavor for you from our many editions:

Datacenter Edition

Several clients can share the resources on a shared server. Their installations will, naturally, be kept separate and their data stored in separate databases. This is the best edition for clients who need a maximum of 1,500 license activations or deactivations per month and do not require any web services to connect their systems. Availability is guaranteed at 99.5% per month.

Dedicated Server Edition

This edition gives you direct access to the web services to connect your own systems via a secure connection. As the name implies, a dedicated server is set up to operate your CodeMeter License Central, configured to match your needs and requirements perfectly. This guarantees that performance is not affected by other clients' installations. 99.5% availability is guaranteed per month.

This is the best edition for all clients who need to activate or deactivate a maximum of 3,000 licenses and access the web services up to 250,000 times per month.

High Performance Edition

Using a Firm Security Box (FSB) is a time and computing-intensive operation and can be a limiting factor for programming licenses. By comparison to the Datacenter and Dedicated Server Editions, the High Performance Edition gives the client not only a dedicated server, but also a dedicated FSB. Availability is again guaranteed at 99.5% per month.

This makes this edition the right choice for scenarios with a maximum of 25,000 license activations or deactivations per month. Access to the web service is limited to a full 250,000 cases per month.

High Availability Package

The High Availability Package includes a set of two or more lines of the High Performance Edition. A special load balancer spreads the load across the lines according to the rules chosen by the client. The data is handled by a MySQL database cluster with several nodes. The nodes of the load balancer and database cluster are automatically switched if any problems occur. Wibu-Systems guarantees availability of 99.9% for this edition, implying downtime of less than 45 minutes per month (excluding scheduled maintenance).

This allows the client a maximum number of 25,000 license activations and deactivations per line, i.e. at least 50,000 activations and 500,000 web service accesses for two lines. The sky is the limit, as more lines can be added as required.

Support Means Partnership

All WOPS clients are given their own service level agreement for their support requests. They can, of course, also use the self-service support portal, which includes a special incident reporting form for Wibu Operating Service incidents. An emergency function is available for more urgent cases. The self-service portal also includes up-to-date information about any disruptions to service, with an immediate notification if full service has been resumed. This makes the management of their tickets and the status of the hosting service transparent for all clients of Wibu Operating Services at the touch of a button.

The WOPS team is always at your service!

Datacenter Edition	
Activations per month	1,500
License queries per month	50,000
Load balancing service	-
No. of lines	1
Availability	99.5%
Access to all web services	-

Dedicated Server Edition	
Activations per month	3,000
License queries per month	250,000
Load balancing service	-
No. of lines	1
Availability	99.5%
Access to all web services	yes

High Performance Edition	
Activations per month	25,000
License queries per month	250,000
Load balancing service	-
No. of lines	1
Availability	99.5%
Access to all web services	yes

High Availability Package	
Activations per month	50,000
License queries per month	500,000
Load balancing service	yes
No. of lines	2
Availability	99.9%
Access to all web services	yes
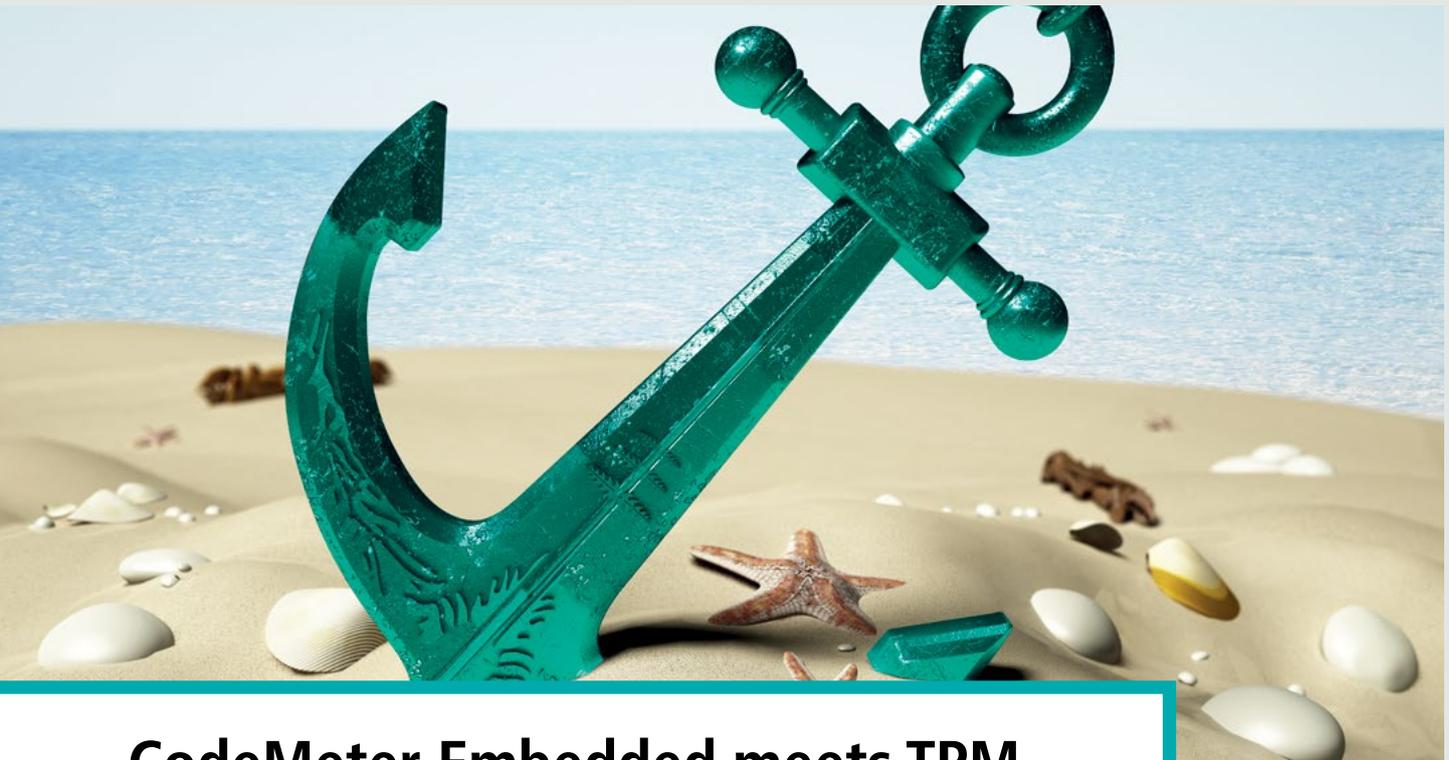
CodeMeter Embedded meets TPM

Why not let CodeMeter Embedded work with a TPM (Trusted Platform Module)? Some embedded or IoT devices already come with a TPM or similar secure element on board. Why not use it like a CodeMeter ASIC for secure key storage? The components are often mass-produced and inexpensive, and point-of-sale hardware often have them built right in.

Simple answer: Yes, CodeMeter Embedded does that. But no TPM will ever rival the sheer power of a CodeMeter ASIC. The CodeMeter hardware built into our dongles and ASICs is not only highly powerful, its storage structure and firmware have also been optimized to work perfectly with CodeMeter. TPMs and other secure elements were designed with a completely different purpose in mind: To offer one or more cost effective and convenient secure anchors for e.g. secure boot or other low-level system processes. Any CodeMeter chip will beat them hands-down with the size of the secure memory alone – not to mention the many other capabilities like the Code Moving feature.

There is one challenge: The embedded landscape is as diverse and heterogeneous as they come. There are untold numbers of systems, each unique in its performance, application, and, not least, operating costs. The highly secure memory of a CodeMeter ASIC is overkill for some applications. This is where CmActLicense comes into play. It stores the data in a structure that is compatible with the dongle model, but it does so in a special license file. To make this almost as secure as a physical dongle, it needs to be bound to certain properties of the system it is on. Without a firm anchoring to the system, the file could be copied and would work on other systems as well, circumventing the entire licensing system. CmActLicense achieves this with custom binding: The license is bound to a custom selection of the embedded system's properties, like its CPU ID, MAC, GPU ID, IMEI or similar unique identifier. The more specific attributes are used, the more tightly the license is bound to the system. One needs to know the properties of the target hardware in its most minute details, so the binding system needs to be fine-tuned by each developer using it. This is where integrating a TPM can come in handy: In the best and simplest case, the TPM's endorsement key will already suffice as a unique trait for binding the CmActLicense. It is the best of both worlds: The CmActLicense provides the secure storage structure, and the TPM (or similar secure element) provides the secure anchor by guaranteeing a unique, cryptographically proven identity.

A TPM can also be used to put in place a binding setup that works on more than one system without having to be adjusted for each specific hardware in the mix. To do so, the process would not simply verify the identity of the system, but initiate a specialized cryptographic process, called platform attestation. This checks the authenticity of the key and makes sure that the CodeMeter Embedded process in the secure software indeed communicates directly with the TPM and has not exposed itself to a man-in-the-middle attack. This binding setup can also replace other platform-specific binding to the hardware in question, as the same cryptographic process serves to verify the identity of the hardware system.

This combination has CmActLicense working as a secure place to store keys and certificates. The resulting 'soft safe' is locked with a key that is kept in the TPM – i.e. secure hardware. CmActLicenses working with TPMs are a good and versatile option if no dongle or ASIC can be used, but hardware-based key storage needs to be guaranteed.

Security Incident Response Protocol

At Wibu-Systems, security is our first and foremost priority. We are acutely aware of the need to integrate the most stringent quality and security standards into our products. While we strive for perfection, we also recognize that even the slightest of irregularities, bugs, or misconfigurations can have serious consequences. It is for these rare occurrences that we have created a Security Incident Response Team and a critical response protocol to address issues as swiftly and transparently as possible.

Following is a general overview of our Security Incident Response Protocol:

Report

If a client or user of Wibu-Systems believes that they have identified a critical bug, they are encouraged to contact our support team directly by email to support@wibu.com or by logging into our Incident Management System at https://support.wibu.com (a separate category is included for 'Security Incidents'). If this category is selected, a response time of two hours is applied in the system, irrespective of the service level for the reporting client. This approach ensures that the ticket is reviewed by a qualified member of our support staff as quickly as possible, who then checks whether the input data is complete and actionable.

Scoring by CVSS

The ticket is then passed on to our dedicated Security Incident Response Team, which includes three security experts working in our Corporate Technology unit. They have a standardized process for assessing the reported incident and preparing an initial scoring, using the industry standard CVSS (Common Vulnerability Scoring System). This means that a score between 0.0 and 10.0 is calculated to designate whether the incident implies minor or high vulnerability. Additional information is also recorded to help other security specialists understand immediately what is at stake and which corrective action needs to be taken for the system(s) affected.

The scoring is reported back to and, if need be, coordinated with the original user. As in all scoring processes, feedback from all participants is considered.

Action

If the check confirms that the reported incident is a critical problem, special tags are set in our software development tracking system. Depending on the severity of the vulnerability, the problem is typically resolved with an ad-hoc bug-fix release or with the scheduled next release of the software as part of the regular development process. The Security Incident Response Team along with the relevant product and development managers and key executives as needed are all involved in the decision-making process.

This protocol guarantees that we are able to respond as quickly as possible and deliver the appropriate solutions for all of our clients and users. We truly believe that an honest and transparent response to security incidents like this is always the right choice.

News in Brief

CmStick/D and /DMC

The USB interface continues to evolve – as we do. CmStick/D and CmStick/DMC 16 GB are our new CmDongles with USB Type C plugs (samples available on stock).

SmartBind® for Linux ARM

CodeMeter Runtime 6.80 Linux ARM now supports our SmartBind® technology to bind CmActLicenses securely and flexibly to the digital fingerprint of a Raspberry Pi.

Protection Only License

CodeMeter Protection Suite can now protect applications against reverse engineering that do not require a license or CodeMeter Runtime to run.

AxProtector / IxProtector	AxProtector / IxProtector Protection Only	
AxProtector	AxProtector Protection Only	Integrity Protection (Tamper Protection)
		Automatic Protection (IP Protection)
		Anti-Debug Methods
		Automatic License Checks
IxProtector	IxProtector Protection Only	Encryption of Individual Functions
		Individual License Checks
CodeMeter Runtime		CodeMeter Variant Used

Windows UWF, EWF, & FBWF

To increase the stability of its file systems, Windows offers several write filters, a feature which is particularly important in the embedded and industrial fields. CodeMeter Runtime now supports all filter variants with CmActLicenses.

CodeMeter Certificate Vault

The PKCS#11 compliant token provider is designed to work with the Microsoft Cryptographic Next Generation API (CNG) or the OpenSSL API. CodeMeter Certificate Vault stores certificates in CmDongles. With certificates created and distributed with CodeMeter License Central, ease-of-use is guaranteed.

CodeMeter Certificate Vault

PKCS#11	Microsoft KSP	OpenSSL
Import via WibuCmRaU	Use of Certificates (Read Only)	Standard Certificate Functions
RSA 1024, 2048	RSA 3072, 4096	ECC 224, 256
CodeMeter Runtime		CodeMeter Embedded
CmDongle	CmActLicense	CmCloudContainer

iF Design Award 2019

CmStick/B is one of the proud winners of the coveted iF design award. The 67 members of the international jury were impressed by its innovative, functional, and aesthetic qualities.

CmCloud Press Event

At 1 pm on April 1st, we will unveil the new CmCloud solution in the Frankfurt hall of the Hannover Messe Congress Center, Germany. CmCloud is the highly scalable hosting solution for license containers, removing the need for CmActLicenses or CmDongles at the user level and taking the hassle out of license management for tradi-tional PC software or IoT and Edge devices.

Triple Mode Redundancy (TMR) Server

Users that depend on top availability of their licenses have an optimum solution in the form of the CodeMeter TMR server, combining availability with strong protections against illicit multiple use.

Milestones of Electronics

Wibu-Systems has won the ELEKTRONIKPRAXIS award in the Security category. Two criteria convinced the jury: The exceptional innovations and developments for software protection and licensing and the special relevance in the market.

1989 – 2019:
Wibu-Systems at 30

1989

2019

Over the last three decades, a simple and user-friendly copy protection product for PC software launched in 1989 has evolved into a multiple award-winning portfolio of patented solutions for copy and know-how protection, licensing, and security for micro-controllers, embedded and PLC systems, traditional PCs, and the cloud.

Marcellus Buchheit and Oliver Winzenried met at the University of Karlsruhe, where they studied computer science and electrical engineering. In 1987, the idea was born to develop a copy-protection dongle for PC software that made uncompromising use of cryptographic capabilities and offered greater security than the products of German and American competitors. The first chip was developed in 1989, Wibu-Box was launched as the first product, and the company Wibu-Systems founded. After garnering massive attention at CeBIT in 1990 and COMDEX/Fall in the United States in 1993, the company started on its trajectory of prolific growth. In 1995, Wibu-Systems became a public company, and our first own premises were completed in 1999.

The year 2003 saw the introduction of Code-Meter and the ability to store licenses and keys in software-only CmActLicense files, in CmDongles, or in the Cloud. CodeMeter License Central offers license creation, management, and distribution in a database-driven application on premise or from the cloud and guarantees a lean integration in existing business processes, like SAP or e-commerce platforms.

Numerous awards and prizes, an unbeaten track record in global hacking contests, and our patents and partnerships with research institutions like the KIT and the KASTEL com-petence center for security, the IT research center FZI, the Fraunhofer Institute, and the Tongji University of Shanghai mark major milestones in our company's story. We have continued to expand our sales capacities and founded sales offices in Europe and subsidiaries in the United States, China, and Japan to offer optimum local support. We are actively involved in industry associations like VDMA, BITKOM, or the USB Implementers Forum, the Trusted Computing Group, the OPC Foundation, the Industrial Internet Consortium, the Chinese Alliance Industrial Internet, and the Japanese Robot Revolution Initiative to form novel collaborations and stay abreast of developments in our field.

Where does the story go from here?
Wibu-Systems is proud to play an active role in enabling the strength and securing the future of the global economy. Our work represents an important contribution to the protection of intellectual property, the creation of novel business models, and security everywhere. We strive to inspire trust with transparency and user-friendly solutions. We address the challenges of the digital transformation and connected infrastructures – going beyond the legislative requirements and the commercial interests of our own business – with our commitment to digital sovereignty in our society.

Ongoing training, education, and the recruitment of new talent are the foundations for our success. We believe in getting students excited about occupationsin the field of science, technology, engineering, and mathematics and engaging young people everywhere.

Wibu-Systems is demonstrating our commitment to our future by investing in two separate constructions projects: our new headquarters and a dedicated House of IT Security. Our purpose is to create stimulating new jobs and a physical beacon to attract all proponents of IT security, including enterprises, startups, associations, and researchers.

Wibu-Systems has set its sights on market leadership for digital product protections with added value for makers, operators, and users. Our technology is used everywhere from industrial automation and CAD/CAM software to the automotive and financial industry, medical technology, and all of the many walks of life that are touched by the digital transformation. We are powering it as a dependable and technically competent partner. For 30 years, our independent family business has remained and will continue to remain committed to our values of fairness, honesty, and loyalty.

Wibu-Systems informs

Wibu-Systems Workshops

Wibu-Systems offers you the opportunity to participate in one of the special seminars about:

- Software monetization, back-office integration
- Licensing of software with hardware or software-based keys (SmartBind)
- Code protection against illegal use & reverse engineering
- Solutions for embedded software in systems or cloud applications

Access the latest training schedule by scanning the QR Code or visit **www.wibu.com/tr.**

Training location	Date	Time
Eindhoven (NL)	6 June 2019	10 am – 3 pm
London (UK)	13 June 2019	10 am – 3 pm
Paris (FR)	20 June 2019	10 am – 3 pm
Madrid (ES)	26 June 2019	10 am – 3 pm
Zaventem (BE)	27 June 2019	10 am – 3 pm

Interested? Please send an e-mail to marketing@wibu.co.uk

Contact your local sales representative for details about the workshops and/or upgrading your test kit or current solution to Universal Firm Code with secure offline license transfer and borrowing.

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France	+33 (0)186266129	sales@wibu.fr

Join Wibu-Systems and its subsidiaries atthe following events:

Hannover Messe
1 – 5 April 2019
Hanover, Germany

NIWeek
20 – 23 May 2019
Austin, TX, USA

T4M
7 – 9 May 2019
Stuttgart, Germany

SPS IPC Drives
28 – 30 May 2019
Parma, Italy

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SECURITY
LICENSING
PERFECTION IN PROTECTION

WIBU SYSTEMS