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THE WIBU-MAGAZINE

Licensing for ISVs and End Users: Simple – Flexible – Customizable

Highlights

- Switching to CodeMeter
- Named User Licenses
- Licensing Models for CodeMeter

WIBU SYSTEMS

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Dear Clients and Partners!

Education is a great challenge and a great opportunity for all societies around the world. It is essential for refugees trying to recover their lives and livelihoods in a new job market. And it is just as essential for apprentices, students, or experienced professionals alike. The processes and solutions in our business are getting more and more complex, and sufficient training and qualifications have become the be-all and end-all. Wibu-Systems respects the value of education and training. That is why we are supporting career guidance projects, training our own apprentices, and earmarking a substantial budget for the continuing education of our professionals. Product seminars and training for our staff in Germany and abroad and for our distributors and clients are just another dimension of this. Together, this ensures top-quality advice and support and the optimum use of our solutions for your applications.

The Internet of Things (IoT) is on everybody's lips. The analysts at Gartner expect that the world will have 25 billion connected devices by 2020, not counting smartphones, tablets, or regular PCs. Selling software-based functions that your customers want and need and getting paid for them are two elementary tasks for businesses in the IoT. Developers need to offer more value for their customers and establish sustainable business models. CodeMeter can help them with modular licensing, usage monitoring, and license delivery from the cloud.

Read more about what's new with CodeMeter in this issue of KEYnote. Named User Licenses, expanded WebDepot functions, a look at the projects of our professional services team, exciting success stories from our clients, and a round-up of all the latest news are waiting for you.

This fall will again bring countless expos, conferences, and trade fairs. Come and visit us and let's share our viewpoints. I look forward to seeing you, and wish you and your families a pleasant holiday period and a healthy end-of-year business.

Oliver Winzenried

CEO

Team Building and Training

Cooperation, professionalism, and organizational competencies are the key factors for success in our times. While solutions are getting more sophisticated every day, the common expectation is that they can be used intuitively. In order to achieve that balance, you need regular training and professional guidance when developing solutions.

Wibu-Systems places a premium on training and education. That is why we offer regular courses for our German and international staff and our distribution partners. There are also regular open and in-house seminars for our clients, conducted in Karlsruhe or on site at the client. Please contact us if you are interested!

Professional qualifications are one side of the coin. Enjoying work, identifying with one's business, and cooperating with others are the other side. Where better to demonstrate these qualities than on board a ship? In a team building exercise during our WIPS 2016 (Wibu-Systems International Partner Summit) in July, we became the crew of the Imperial Roman Navy's Lusoria Rhenana. At a length of 18 meters, width of 2.80 m, and a mast height of 9 m, the Germersheim-based ship is a faithful reproduction of the original "Navis lusoria". The five-ton vessel was part of the nimble river navy of the late Roman empire. The Lusoria Rhenana offers room for 24 oarsmen (and women). With twelve oars on each side, perfect coordination is necessary to navigate the waters of the Rhine.

The enriching experience displayed our team spirit and demonstrated how we literally all pull in the same direction to achieve a common goal.

Switching to CodeMeter

When you are a newcomer to software licensing, you have the great opportunity to design the perfect solution for your needs from the ground up. However, many developers have been using some form of software protection for many years already, be it our own legacy product WibuKey, a solution from a competitor, or even a custom technology made by themselves. When thinking about switching to CodeMeter, one question will be on their minds: "What about the old licenses?"

Knowing Your Requirements

One important criterion before making the switch is knowing your requirements.

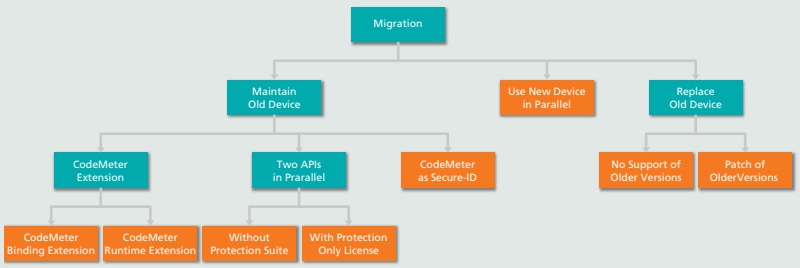
Security is a key pillar in this respect: How important is it for you to protect your software against reverse engineering? How important is copy protection?

Another key principle to consider is the integration of licensing in your established processes: Does it matter whether the processes are the same for all products? Do you have to be able to create new licenses for older versions of your products?

The third and equally important criterion is the budget you have available.

Picking the Right Migration Scenario

Once you know your requirements and priorities, you need to find the right migration scenario for your needs. A popular strategy for moving forward from this point is to allow a transition period in which parts of the old system continue to be used, while the installed CodeMeter base is slowly expanded until it is ready for a complete switch-over in the second phase. Another strategy is to migrate individual products to CodeMeter, while the bulk follows later.



We will take a look at typical scenarios:

CodeMeter Binding Extension

With CodeMeter Binding Extension, you can bind a software-based CmActLicense to an old dongle or other device. This puts the entire CodeMeter functionality at your disposal without having to replace dongles or retrofit older machines. Existing users can keep their old devices, but new clients receive a CmDongle or CmActLicense.

You can also start to use CodeMeter License Central immediately and optimize your license creation and management processes. You can use Protection Suite, but without the added benefit of being able – at least not without major limitations – to lock down licenses with traps in your code.

In this scenario, the strength of your copy protection depends on your old protection hardware's ability to provide a securely readable and unique ID. CodeMeter 6.30 introduced the option of linking a

CmActLicense with a specified device. Your user can have several CmActLicenses on his hardware at the same time. All CmActLicenses whose assigned devices are connected are activated and can be used immediately; any CmActLicenses on devices that are not connected at the time will be locked and not available.

The disadvantage of this scenario is that it puts considerable limitations on new license management features, such as the ability to migrate or return licenses.

CodeMeter Runtime Extension

Version 6.40 expanded the CodeMeter Binding Extension to become the CodeMeter Runtime Extension. In addition to binding licenses to a named device, license data can also now be stored on the device (if sufficient storage space is available). This gives even legacy devices a complete "CodeMeter make-over".

The CmActLicense automatically appears when the device is connected and disappears when the device is removed. Depending on the memory, licenses can now also be returned or transferred, and traps can be integrated.

Two Protection APIs

In the old system, you only used the API of the dongle in question. A common strategy is to continue to use the old integration in parallel with the CodeMeter API for a transition period of two to three years. In this period, you start distributing CodeMeter, but continue to use it in the same way as your old system, before making the complete switch after the time has elapsed.

The transition period keeps the number of dongles you need to replace to a minimum; customers who have bought your product in the last two or three years already have CodeMeter on board. Full-scale replacements are only required for older clients with active maintenance contracts.

This solution is cost-efficient and enables a smooth switch-over. Its disadvantage is that you can only start using the full capabilities of Protection Suite and CodeMeter License Central after you make the final transition. You will only benefit from the added security and uniform processes after that point.

Any protection against illegal copies can only be as strong as its weakest link, which often turns out to be the API of the legacy dongle.

Two Protection APIs and Protection Only License

A protection only license allows you to benefit from the stronger security of Protection Suite even while you are still using two separate protection APIs. Unfortunately, this does not yet include the use of traps, which are a key component of our Blurry Box technology.

A protection only license is a CmActLicense that is not bound to a specific device. You simply distribute it alongside your software and install it automatically with your installer. It gives you a type of basic license that is available on any computer and that you can use to encrypt your software with Protection Suite. This safeguards your software against reverse engineering.

CodeMeter as a Secure ID

This is a popular scenario for transitioning from an existing complex licensing system to CodeMeter. CodeMeter, usually in the form of a CmDongle, is integrated into the existing system and used as a secure binding property. The old system continues in use for a period of two or three years. After that point, your installed base of CodeMeter-equipped systems is so broad that you can begin a replacement of the remaining older devices. In this scenario, the user can use older versions as well after that point, because they had been fitted with CodeMeter in the transition period.

Parallel New Devices

A very simple, but drastic scenario would be a "cut-off". In this scenario, you distribute all new licenses with CodeMeter, and older software continues to be used with the older licenses only. The process is very simple, and Protection Suite and CodeMeter License Central can be used in full for the newer software.

Clients with existing maintenance contracts would now have a new and an old license and can use these separately on two computers at the same time. This means that a decision needs to be made as to whether the risk of having duplicate licenses at the time of the release outweighs the ease of the process.

This scenario is particularly common when the transition goes from a software-based license to a dongle or vice versa. In such cases, the decision is explicitly between the mobility of the dongle and the easier activation of a software license without additional hardware, which makes it harder to argue for both mechanisms at the same time.

Replacing Dongles

The strongest, but admittedly most costly solution is to replace all protection devices with CmDongles. They offer the strongest protection, because all capabilities of Protection Suite are immediately available for your use. It also includes all CodeMeter features, such as CodeMeter License Central or the ability to return, migrate, or borrow licenses.

By contrast to the previous scenario, in which the old license stayed with the user, the old dongle or activation is returned or voided in the field. This takes away the ability to duplicate licenses, but it also stops the user from using the old version of the licensed software. Whether this is possible depends on the terms and conditions for the software in question; traffic control software, for instance, needs to be able to run legacy versions as well for auditing reasons, which run-of-the-mill office applications usually do not need.

Patching Older Versions

A patch is required to prepare older versions for CodeMeter. This can be a simple or a complex process, depending on how the old protections are integrated. One popular route is to move all protection queries into a dedicated DLL. This is not an ideal solution in terms of security, but it offers the optimum scenario for patches. All that is needed is to modify the old DLL to return the right responses for new CodeMeter compatibility licenses.

This patch allows older versions to continue to be used, even if the older device does not exist anymore or has been voided by you. The user can continue to use his software, but needs a CmDongle that is licensed for the new version as well. In practice, this means that he cannot operate two versions of the software on two different computers at the same time.

Conclusion

There is no one-size-fits-all solution for switching to CodeMeter when a licensing system is already in place: depending on your specific needs, the transition process will differ from case to case. Our Professional Services team is available to help and advise you for preparing and making the transition to CodeMeter.

Individual Customizations

I like to compare CodeMeter to a steering wheel. Software developers choose suppliers and integrate their copy protection or licensing resources into their software, just like the car makers fit the steering wheel in the car. Thirteen years ago, steering wheels were quite a simple affair. Today, they have turned into intelligent on-board computers. CodeMeter has experienced a quite similar evolution in that period as well.

When CodeMeter was born in November 2003, it was simply a dongle, albeit a dongle with much more space for many more licenses than its predecessor, the trusted old WibuBox. It was a dongle equipped with the latest in cryptographic algorithms. Usually, software developers integrated the CodeMeter API or CmCrypt, a forerunner of AxProtector, in their products, automated the programming of the CmDongles with a batch file, and delivered their software with the required protections. Consultation and support services were rarely needed. Typical services at that time would simply include tougher protections against illicit copying or reverse engineering.

The Expectations Are Changing

Today, 13 years later, the picture has changed dramatically. Software protection continues to be an important concern, but most software developers now care more about licensing and ways to automate their licensing processes. With CodeMeter License Central, they have the perfect Swiss army knife for their needs, making things easier for them, simplifying processes, and integrating them into existing systems.

CmActLicense gives them a purely software-based licensing system. While CmDongles are usually equipped with the right licenses and delivered ready for use by the software developers, software licensing needs the fingerprint of the target computer as a reference point for binding the license. This type of software-based licensing cannot really be imagined anymore without activation servers.

Software protection has also changed in many ways. Java and .NET have developed into mature technologies, and reverse engineering has become so simple with them that much tougher safeguards are needed now – safeguards that also keep the performance-paranoia balance intact. At the same time, it has become more important to be able to protect software running on embedded systems. Thirteen years ago, embedded systems incorporated proprietary designs and by their very nature offered enough protection. Today, most work with standard hardware and standard operating systems.

Our Professional Services Team

In response to these changing requirements, Wibu-Systems has continued to expand its professional services team over the last eight years. This applies both to the integration of protections, the range of operating systems we support, and the extent of integration of CodeMeter into other licensing-related processes.

Our professional services team supports software developers from their first integration concepts to the go-live of the finished solution. We conduct workshops to understand your requirements and develop concepts for your projects. Training is available to empower you to help yourself and get off to a running start with the integration of CodeMeter. If you wish to concentrate your resources on your business' core competences, our team can take over parts or even the complete integration and implementation effort on your behalf. Even project management, especially for coordinating internal SAP developers and external SAP partners, is part of our professional services portfolio.

Training

Training always provides a great opportunity to become familiar with the core functions of CodeMeter. This training is offered as open-enrollment seminars in Karlsruhe or as dedicated in-house training for our clients on site or in Karlsruhe. We also offer trainings in our offices in Paris, Antwerp, Taunton and Hengelo, as well as open trainings in other locations (for the next dates, see the back page of this KEYnote). The open seminars bring together interested participants from different businesses, which is not only a cost-efficient option, but also a stimulating opportunity for sharing experiences with other professionals in the field.

In-house training can be offered for an unlimited number of participants, on request on your own premises. For three or more participants, these special courses can indeed be less expensive than taking part in open seminars. The in-house courses can also be modeled to your specific needs, with the option of adding a hands-on session with your software or another practical use case. The normal training would take place over three days:

Day 1: Core features of CodeMeter
Day 2: Integrating software protections in a .NET application
Day 3: Integrating license creation into your processes

In-house courses can replace the .NET training with Java or another native application; individual units of the three-day training can also be shortened or removed entirely if the seminar is reduced to a two-day condensed course.

Security Study

"How effective are my software protections?" If you need to ask yourself this question, a security study can be the perfect answer. For the study, we would approach your software with the mindset of a hacker and analyze its weaknesses for possible improvements. The study can be conducted either as a black box or a white box procedure.

In a black box approach, we would start the simulated attack with the same know-how that any hacker would have: We know the application and we have a license for it. For the white box approach, we would team up with you to learn more details about your copy protections and how they are integrated into your software. The black box process might be more realistic, but a white box analysis is the more effective and direct way of finding possible gaps and chinks in your armor.

Customized WebDepot

Most recent professional services projects have involved at least one web portal in their scope. This was usually WebDepot, the standard portal of CodeMeter License Central for use by your customers. Typically, our professional services team can add the following customizations:

1. Integration of your corporate design
2. Addition of user management capabilities
3. Integration with existing user portals
4. Adjustment of the functionality

Our professional services team has access to a wealth of ready-for-use modules to make the customization process lean and cost-efficient. A great part of the functions of WebDepot can be adjusted by changing the built-in configurations. Beyond that, certain functions can be removed, e.g. for limiting WebDepot to offline use, or new functions can be added, such as customer registration data that is transmitted, extracted, and stored alongside the license query itself.

Internal Portals and Tools

CodeMeter License Central is a powerful tool. For routine tasks, it can help to establish a special portal or dedicated tool, reducing the functionality to the specific purpose and allowing your staff to work with the terms and terminology they are accustomed to. The architecture of CodeMeter License Central with the integrated web services makes sure that the internal portal and tools will work correctly after each update of CodeMeter License Central.

A typical use case would be the ability to authorize another license activation when a user has taken a computer out of service without deactivating the license first. Many factors would have to be considered in such a case. CodeMeter License Central knows the history of the license, e.g. how often it has been "lost" before. Your CRM system knows the user and any relevant exceptional conditions. The portal could combine both pieces of information, and the appropriate response would be available at the click of a button. Our professional services team offers several options for the implementation:

- Implementation of a portal
- Implementation of a tool
- Implementation of a library (e.g. DLL) for integration in an existing portal or tool

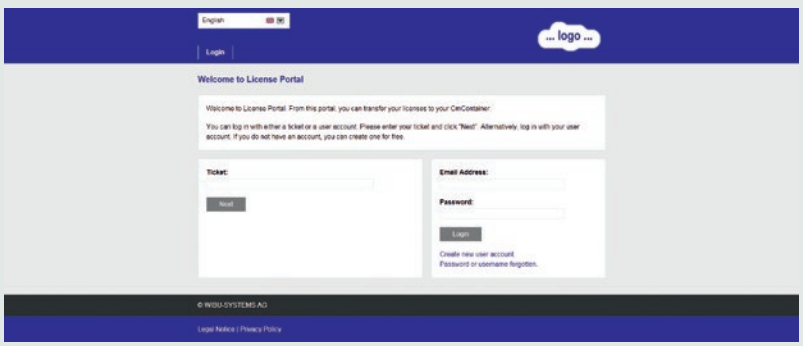
SAP Integration

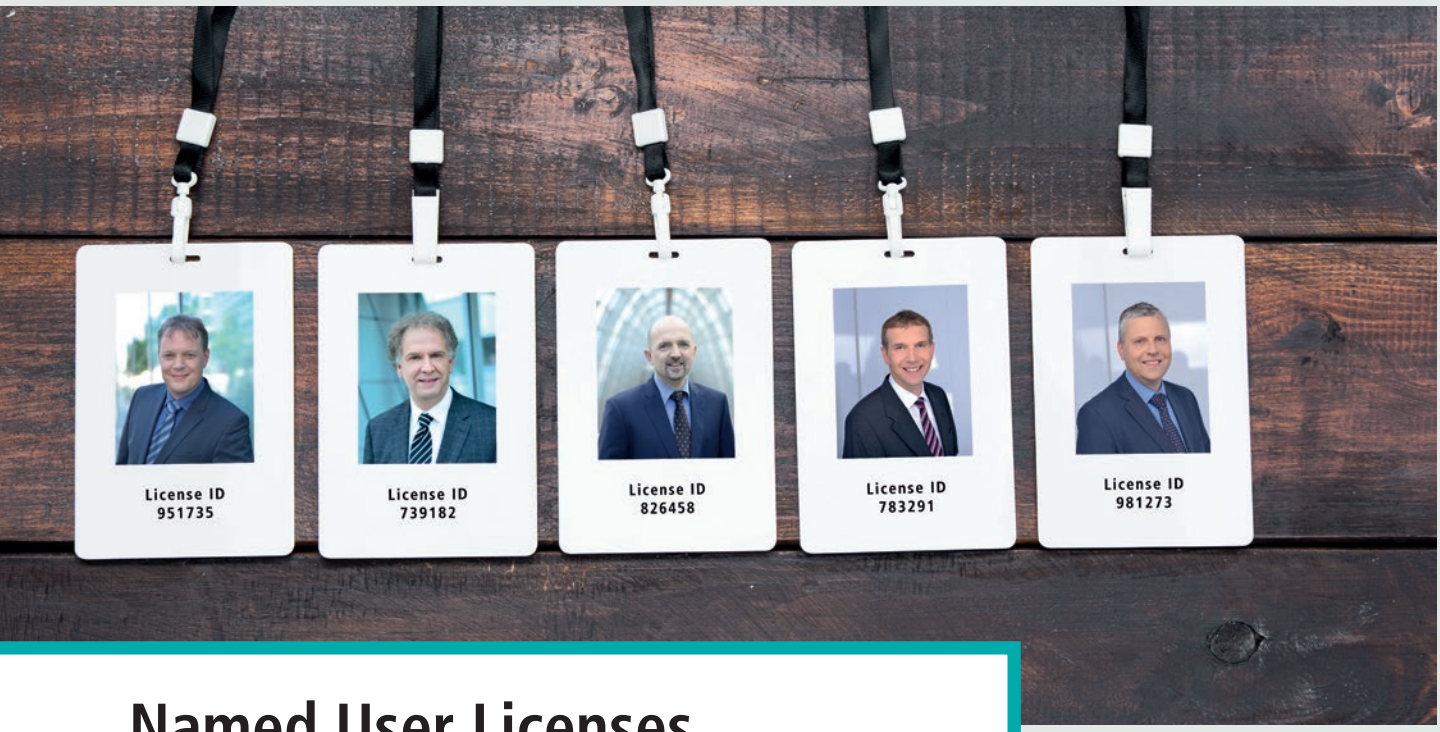
Whenever the name SAP is mentioned, people automatically think of large-scale, slow-moving projects. But with the support of our professional services team and certified external SAP partner, Informatics, the integration of CodeMeter License Central will take days, not weeks or months, without any effort on your part.

We generally distinguish between two types of SAP integration. The simple approach includes the sending of queries from SAP to CodeMeter License Central and returning of the relevant ticket to SAP. This is usually stored on specific equipment or a specific technical location. In the expanded variant, the data sent back by CodeMeter License Central to SAP can include a simple activation or deactivation as well as more complex registration data from a customized WebDepot.

More Integration

In addition to SAP, we can integrate CRM systems like Salesforce or e-commerce solutions like asknet, Avangate, Cleverbridge, Digital River, Element 5, or Magento with CodeMeter License Central. Integration with other ERP systems like Navision or Axapta is also part of the support offered by our professional services team.





Named User Licenses

Named User Licenses are a new type of license that is bound to a specific user. This might sound simple at first, but virtually every person has very different expectations of what this means in practice. The good news first: CodeMeter can cover all of them.

In essence, the different expectations of Named User Licenses would fall into two categories. On one side, there is the viewpoint of software developers who expect to increase their revenues with this new licensing model. On the other side, there are end users who want to allocate or reserve the licenses they have bought for specific persons or groups of people.

Named User as a Licensing Model

From the software developer's point of view, a Named User licensing model is a good alternative to the Concurrent User model, which typically keeps licenses on a license server in the network. This license can be used by several different users, even if only one user can use it at any given time. If a client has three licenses, three people can use the licensed software at a time, irrespective of who they might be. One popular feature is the ability to borrow such licenses, which would mean transferring the license for a defined time from the license server to a local computer or connected dongle. After the defined period has expired, the license automatically reverts back to the server, where other users can access it.

In the case of Named User licenses, the software developer would bind the license to one specific user. The license can and must only be used by that person. Typically, Concurrent User licenses are worth more, because they can be used by several users. The client needs to own fewer of them to serve his users. Their values can be different by a factor of between 1.5 and 3.0; in the case of office applications that are used more frequently and for longer periods of time, the factor would lie nearer the lower end of 1.5, whereas with analytical tools or compilers that are used rarely and only for brief periods, the factor can often reach 3.0. By using the Linger Time option, even short-use software like compilers can be licensed effectively via networks. The license then "lingers", that is, it remains reserved for the last user for a defined time after its last use, and can only be released to other users after the linger time. Products that are normally used on a permanent basis typically avoid using Named User licenses.

Who Controls the User's Name?

Controlling the user name is the essential challenge when using Named User licenses. Software developers are naturally interested in keeping full control to prevent misuse of their licenses. At the same time, they need to account for use cases in which the user name has to change, e.g. when an employee who had been using the license leaves his job, sometimes years after the original definition of the license. Many solutions have been put forward for achieving this balance between control and complexity.

Simple Contractual Controls

The simplest solution is to control the named user just by contractual limitations, without any technical precautions or with a simple watermark in the license that does not limit the software's functionality.

CodeMeter can integrate the watermark in the protected data or customer owned license information, and read it by API during runtime.

Binding to a Database Account

Developers of client-server applications like bug trackers are in the optimal position of having a distinct account for each user of their applications. Using group accounts (like Team, Team1, Team2 etc.) normally has major disadvantages for the client. When the client

uses up all of his accounts, he can delete obsolete accounts to recover space for new users or buy more licenses.

In such cases, the maximum number of registered users is entered as the license quantity. The application on the server reads this information and compares it regularly, and whenever new accounts are created, with the current number of accounts. If a license has been breached, no new accounts can be added. Alternatively, accounts above the paid limit can be deactivated, or all users receive an error message.

Single User License via a Portal

A common and simple form of implementation is a single user license bound to a specific machine. This is often used in combination with a user portal. Every user of the client is given his or her own account, and the license administrator of the client allocates a license to each user. The user can now activate the license on his or her computer. If he or she needs to move the license, e.g. to use it on a second workstation, the user can deactivate the license and reactivate it on the other system.

This can be done with CodeMeter License Central and a simple change to the WebDepot license portal. A single user license is the standard licensing model of CodeMeter and is immediately available.

Software as a Service

Named User licenses are a popular option when offering Software as a Service, with the software developer providing cloud access to the application in question. Since the system is operated by the developer, he can effectively control how the licenses are being used. Nonsense names and group accounts can be identified and the problem remedied with a "quiet word" with the client.

Similar to when the license is bound to a specific user name, CodeMeter can again set the maximum number of accounts in the license and monitor them in the software. The special advantage of CodeMeter in this case is that it can combine Software as a Service with on-premise software or act as a token for the reliable identification of a user.

Hard Binding to a User Name

Excellent controls are possible by binding the license to the log-in name of the user. This option has been completely remodeled for CodeMeter 6.30 and is now available as a ready-for-use licensing model. In this case, the developer chooses whether the license is tied to a user name, a user name and domain, or a user name chosen by the developer himself.

When licenses are bound to a user name with or without specified domain, CodeMeter handles almost the entire process automatically. The developer simply needs to add the right user names and, optionally, domain. When the license is used, CodeMeter Runtime checks the user name and domain automatically on the client PC. If a fitting Named User license is available, it would be used first. Otherwise, a Concurrent User license is chosen. If neither a Named User nor Concurrent User license, an error message is displayed.

A user name from an existing database can be used for binding the license to a user name. The CodeMeter API informs the software in the CodeMeter Runtime of the user name in question.

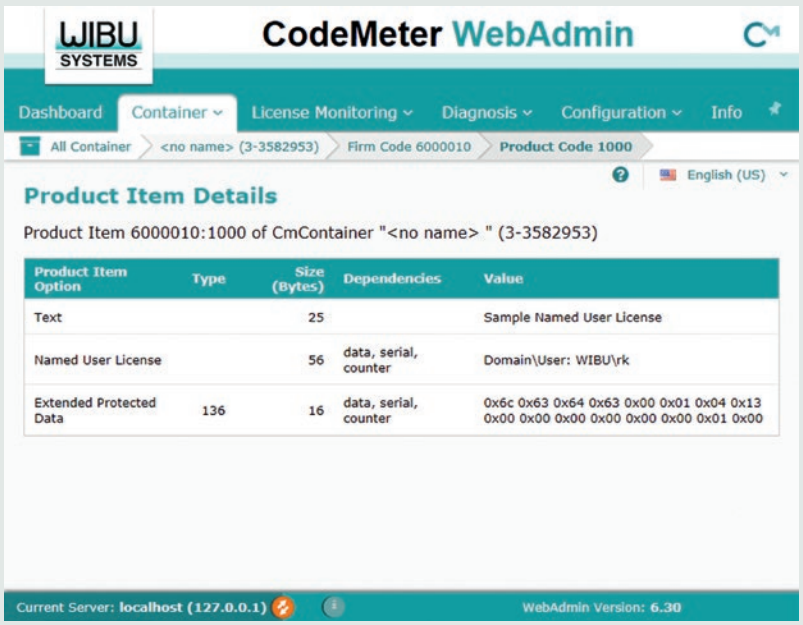
But what happens to the process when user names change? This can be defined with entries in CodeMeter License Central that are completed when the license is activated. An adjustment to the WebDepot license portal or the software activation assistant and gateway allows the name to be overwritten upon each activation. To change the user name, the license is deactivated and reactivated with a new user name. The developer can decide how often this can be done, simply count the instances, or enforce a hard limit. CodeMeter License Central gives you the option of accessing the last value and the date when the value was changed. This makes it easy to implement models like "Change every 30 days".

Named User Licenses from the Client's Point of View

There can be instances when a client wants to use a Concurrent license like a Named User license. For instance, two teams might want to share ten licenses. The two team leaders want to have a personal license reserved for themselves, while the other eight licenses should be at the disposal of their team members.

The client's administrator can do so by configuring the settings in CodeMeter WebAdmin. The administrator would allocate one license each to the two team leaders, which would behave like Named User licenses. The administrator can also define the rules for using the remaining licenses, for instance reserving three licenses exclusively for each team and leaving the final two up for grabs.

This type of setup is popular particularly for accounting reasons. One team might have paid for four licenses, the other for six. All ten licenses are stored on a shared server, but each team might want exclusive access to the licenses it bought. To do so, both teams need separate Active Directory groups, with one team getting four and the other team receiving six licenses.



Release Cycles

Many software developers use CodeMeter Runtime and encrypt their applications with AxProtector. They want to know when new innovations or changes to their encryption software or the licensing technology for their products will be available.

In Development

At Wibu-Systems, all software development is coordinated with a planned release date in mind. New features are introduced at the earliest possible point in the process. This leaves more time for testing the new features. Time is also needed to update technical documentation with all of the new innovations in user manuals and help documents.

Apart from adding new features, a great part of software development is given to maintaining the existing product. This is a continuous process: Signatures need to be updated and the requirements of new operating systems need to be implemented. Patented technologies, like SmartBind for binding activation processes to specific machines, need to be tested for their compatibility with new OS versions. The mechanisms must function correctly and smoothly, and developers need to check whether the new operating systems have introduced features that could improve the binding process.

Better Safe than Sorry

Product quality comes from the development phase, not later testing. However, testing is essential in order to be sure that the new features or bug fixes did not introduce new flaws in some other area in the product. With this in mind, Wibu-Systems conducts automated testing for all versions coming out of the build system. Every nightly build goes through hours of automated test scripts on several systems to check whether the software behaves as expected. And software features are not the only thing to be tested so scrupulously: different CmDongle types are tested in conjunction with this process as well.

Handcrafted

For software development, the start of the final tests represents the end of the development phase proper. For the testing team, it is the signal to get busy. Before the final tests commence, the best combination of differently scaled test formats for different operating systems is defined in a special matrix. This keeps the testing efforts to a manageable size, while ensuring coverage for the various OS versions (32-bit vs. 64-bit, real vs. virtual machines). All tests are processed manually and in line with the defined testing schedule. At the same time, specially qualified testers conduct compatibility tests with older versions of the software.

The Gamma Phase

The work pays off: Display errors are common as the new design of a web interface might look 'off' in some language versions, or a new term has not been localized at all. Developers are ready to remedy these problems immediately. After the software has gone through the first extensive test and is stable and looking good, the gamma phase gets under way. In this phase, interested clients have the opportunity to install a pre-release version to test how well the new version works with their own software. Their feedback is included in any late changes to the product.

On the Launch Pad

The first release candidate is developed after these extended tests have been completed. From this stage onwards, only minor changes requiring tiny interventions in the code are allowed, and even then only after intensive scrutiny. The shipping tests start at the same time as manual, focused tests that check and verify the results of the previous, more expansive tests. Once these are passed, product management clears the release, and the new version is ready for our clients approximately four to six weeks after the commencement of the final tests.

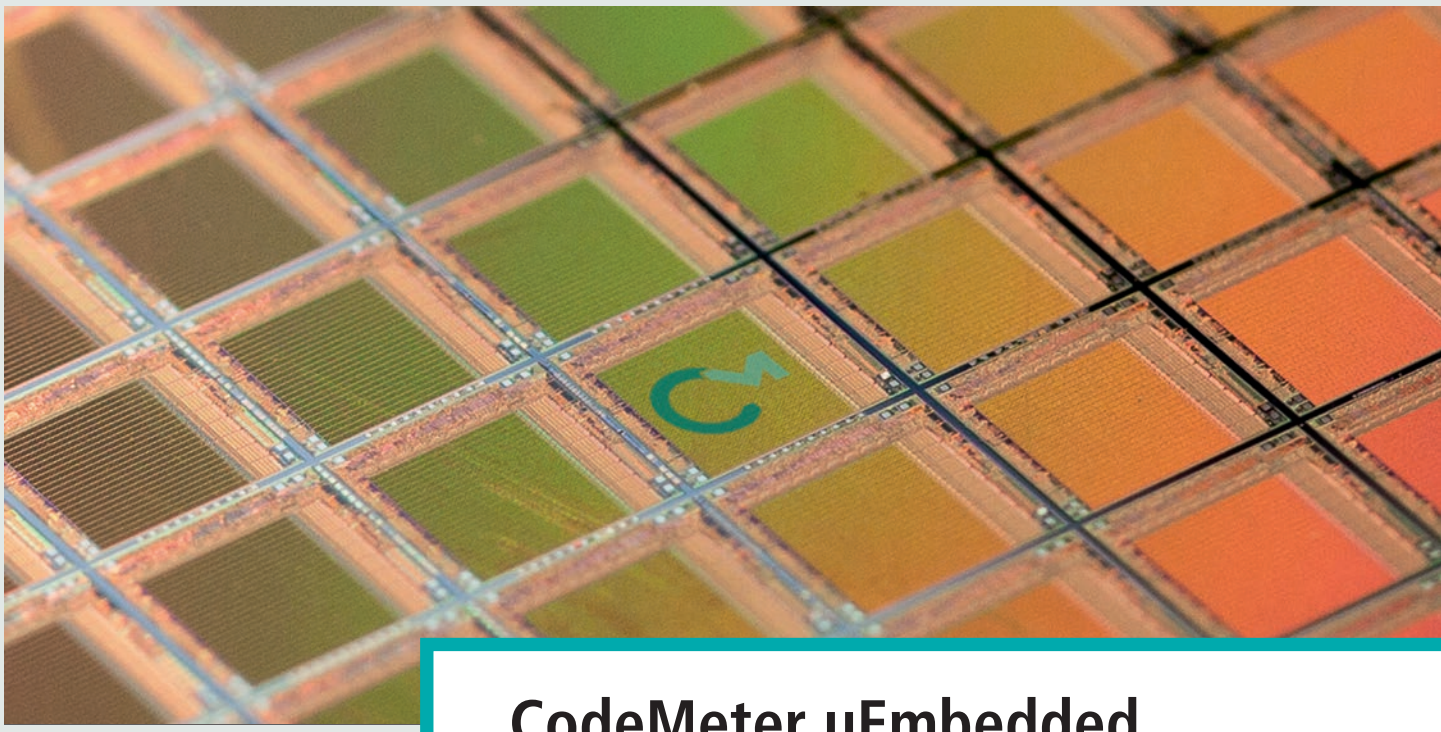
Waiting for the Next Release

Wibu-Systems publishes its two flagship products CodeMeter and AxProtector simultaneously, which reflects how closely related and interconnected the two products are. There are two regular release dates every year, at the end of March and the end of October.

Immediately after the release of CodeMeter, the final tests for CodeMeter License Central get under way, so that the back office solution for the distribution of licenses to end users can release the new license features as soon as possible. Testing and release takes approximately four weeks.

Quick Bug Fixes

In the unlikely case that a bug manages to slip past the testers and only gets discovered in the field, an immediate response is essential. A remedy is found, and a new release is built and sent through an accelerated final testing process. This process checks the specific bug fixes before moving on to the shipping tests. A service release of this type can be made public within one week or less.



CodeMeter µEmbedded

Microcontrollers are used in more and more critical applications like pump controls, servo inverters, sensors with field bus connections, and smart meters. This makes protecting their firmware – during production and in all later updates – an essential factor for the safety of users and the commercial success of the businesses involved. Several security rules need to be followed:

Code integrity: Controllers must only load firmware from a trusted source, with a reliable guarantee that it has not been tampered with.

Secrecy: Firmware must not be readable on their way into the controller to prevent reverse engineering and copying.

Authorization: Code can only be loaded and decrypted in the authorized and licensed controller.

Licensing: Features can be activated with secure licenses.

Based on the popular CodeMeter solution for desktop and embedded systems, CodeMeter µEmbedded was developed specifically with the needs of microcontroller-operated systems in mind: code integrity, license controls, protection against reverse engineering, and copy protection. Everything with a tiny footprint of approximately 60KB.

CodeMeter µEmbedded protects the controller's firmware against tampering, reverse engineering, and illicit copying during transmission and update processes. It also empowers OEMs (whose software is running on the controller) to add or authorize additional features in their software or hardware in later license updates, putting even more capabilities at the disposal of the end user without having to change the device in question.

The XMC4500 controllers are initially programmed by the OEM in a secure environment, where the secure Boot Strap Loader (BSL) is added and an individual license file is created, bound to the chip ID, and loaded onto the microcontroller. The BSL includes the ExEngine, CmActLicense, and CodeMeter µEmbedded, all of which work together to decrypt the firmware when it is needed. Once completed, the BSL and license can only be modified by the OEMs themselves, since the copy protections of the XMC prevent any changes to the loader in the field.

The OEM develops the firmware in Infineon DAVE™ or a similar environment and can then execute the encryption capabilities of ExProtector via a visual DAVE plug-in. This creates an encrypted version of the firmware that can be loaded onto the controller or sent as a secure update file even via normally insecure channels like emails.

To make the footprint as small as possible, the features of CodeMeter were kept to the bare-bones minimum. This naturally includes the chosen encryption capabilities and compatibility to the full-scale CodeMeter versions and CodeMeter License Central. Licenses can still be created directly from within the OEM's code.

CodeMeter µEmbedded is available now. It comes with a plug-in for DAVE and Protection Suite with AxProtector included. With this powerful package, creating secure firmware could not be easier.

Licensing Models for CodeMeter

Do you know a butcher who is a vegetarian or a passionate car salesman who drives a model from a different brand? These are just examples of professions where jobs tend to feel like vocations and where the affection for one's own product is obvious by how their makers would not use anything else themselves. Since we are fully dedicated to CodeMeter, we naturally use it ourselves for secure licensing.

With the introduction of the new Universal Firm Code, we now use CodeMeter License Central Internet Edition to renew licenses for CodeMeter.

Available Licensing Models

You can choose one of three licensing models for CodeMeter:

- Standard,
- Pay-Per-Use, and
- Unlimited License.

There are also additional trial license and protection only license options.

Standard Model

In the standard model, you pay for a license for each CmContainer. Using the secure CmDongle hardware means one license for each dongle. With your Firm Code, you can create, modify, or delete as many licenses in that CmDongle as you wish. When using the software-based CmActLicense, you pay for one license for each virtual dongle. Normally, this means creating one CmContainer per machine, so the rule of thumb is: One license per computer that stores licenses. In the case of network servers, this would be exactly one machine. If you want to allow your customers to borrow licenses to a client, you need an additional CmContainer for each client, which you need to define and activate beforehand.

Pay-Per-Use-Model

The pay-per-use model was created specifically with simple licenses in mind. The licenses are rarely or never modified and only required in small numbers. It represents a cost-efficient entry option. You need one license for each creation or modification of a product item. The standard model is preferable when you need to create as few as two different product items or make other changes in a license's lifecycle. Licenses cannot be borrowed in the pay-per-use model, which is why most software developers opt for the standard or unlimited license model when they use networked license servers.

Trial Licenses and Protection Only Licenses

These two additional options enable you to create any number of licenses not bound to specific devices. These unbound licenses represent a type of general license, which could be used for two typical applications:

Trial licenses are needed for demo versions that should run for a maximum period of 90 days without activation, and only once on every machine. These licenses can also be used to allow the user to work with the full version of an application without committing to it by activating within a 90-day window (or any other period of your choosing between 1 and 90 days).

If you only want to use the protection capabilities of Protection Suite without CodeMeter licensing, then you require a protection only license. In this case, you deliver one pre-defined general license with your software. The installation wizard activates it on the end user's system, but you keep all the protections against reverse engineering you need.

Unlimited License-Model

The unlimited license model gives you maximum flexibility while keeping costs reasonable. You pay an annual fee, calculated to match the value of your software, and can produce an unlimited number of licenses. Trial and protection only licenses are automatically included in this licensing model.

The unlimited license model is also the ne-plus-ultra when it comes to borrowing licenses. As the software developer, the choice is yours whether the end user can borrow licenses for empty systems or whether you first have to be notified by registering the system online. In the former case, a new CmContainer is created in the background at the user's site; in the case of online registration, you create the CmContainer yourself via a dummy activation in CodeMeter License Central.

After one year, you can renew your license for unlimited licenses for another year. If you choose to not do this, your users can, of course, continue to use the protected applications for which they have licenses. They can also continue to borrow licenses. It only becomes impossible to create new licenses after that point.

The Firm Security Box

Your licenses are kept in your master dongle, the so-called Firm Security Box (FSB). The FSB plays a dual role: On one hand, it serves as the secure storage container for your private and secret keys for CodeMeter; on the other hand, it manages the licenses you acquired from Wibu-Systems.

Developers sometimes wonder why the FSB has to be a physical CmDongle, and why it is not available as a soft license. Only a dongle offers an appropriate level of security for your private keys. Imagine if those keys stored in your computer's memory were stolen by a virus. The lucky hacker would now have everything he needs to create as many valid licenses for your software as he wants. This would be the worst scenario possible, and a bit of hardware on your server is a small price to pay to avoid it.

Delivering Firm Security Box

The initial private keys are provided manually and internally by Wibu-Systems. None of these keys ever exist in plain text form outside of a CmDongle. The production of the Firm Security Boxes itself is fully shielded with so-called Wibu Security Boxes (WSBs).

When the FSBs are first delivered with a new Firm Code, the delivery is not specifically protected. In the unlikely (and so far, unheard-of) case that the delivery is lost, you would receive a new Firm Code with new keys, and no security breach would occur.

A more critical incident is the loss of additional FSBs delivered for an existing Firm Code. Losing these FSBs would indeed endanger the security of your existing licenses. That is why two alternative protections are put in place to avoid it. For the physical delivery, the FSB is protected with a password that you would receive separately. Without that password, the FSB has no value to anyone, legitimate or illegitimate. You can decide whether to deactivate or change that password after receiving the FSB. For remote delivery, you would send us a so-called remote context file (*.WibuCmRaC), which we use to create an encrypted remote update file (*.WibuCmRaU) that can only be decrypted by the designate target dongle. Your keys are transferred securely every time.

Charging and Extending Licenses

The new Universal Firm Code comes with a much simpler process for charging or extending licenses. Licenses are now separate from the keys and stored in a separate license entry (Firm Code 102688) in your FSB. They can be charged or extended with little effort via CodeMeter License Central.

Five entries are possible:

You receive Product Code 1 when you choose the standard model. The unit counter would display the number of available licenses in this case.

You receive Product Code 2 when you use a pay-per-use model. As in the standard model, the unit counter again shows the number of remaining licenses.

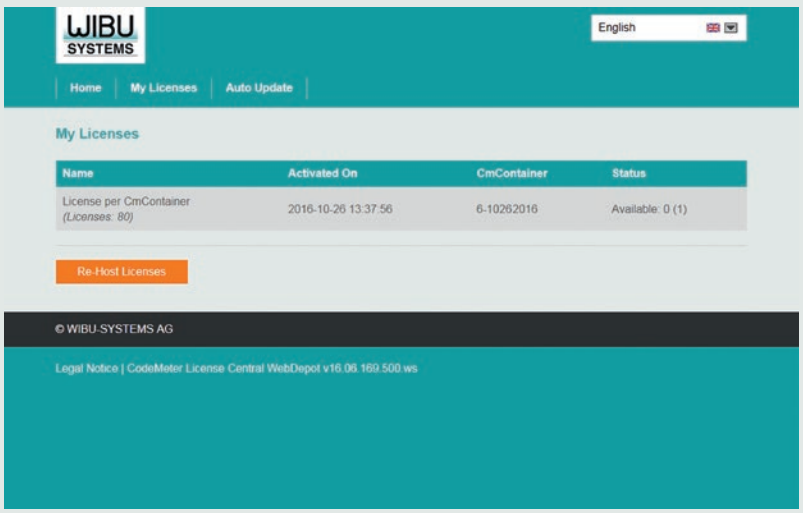
Product Codes 3 and 4 represent trial licenses and protection only licenses. These can be combined with Product Codes 1 or 2 and come with an expiry date that tells you how long the entry can remain active.

Product Code 5 is the universal license model. This also includes an expiry date to tell you when the license needs to be renewed.

You receive a ticket from Wibu-Systems for charging or renewing licenses, which you can do by entering your ticket at http://license.wibu.com, where you can also charge or renew your licenses. The ticket can also be used to transfer licenses from one FSB to another: You can remove the entire block of licenses you bought from one FSB and activate it on the next FSB. If parts of the licenses have already been used up, you will only receive the remaining licenses on the new FSB.

Encryption Only FSB

FSBs are important. They are used to create licenses and encrypt your software with Protection Suite. For the latter task, you can also use a special encryption only FSB, which can encrypt code, but not create any licenses. These FSBs are less critical and can even be given to individual developers or used in automatic build systems for continuous integration.



News in Brief

CodeMeter 6.40 Available Now

CodeMeter 6.40 introduces many improvements under the hood - easy-to-use Named User Licenses, a more versatile binding extension for CmActLicenses, and a completely revised Italian localization. AxProtector now comes with stronger security and an improved interface. License Central has also been updated to support the new features.

New CmCard/microSD 8GB

Equipped with hyperstone S8 flash controllers with hymap firmware, 2-bit MLC Flash, and Infineon's SLM97 as CodeMeter's smart card chip, the new model offers top reliability, speed, great price/value, and the complete CodeMeter functionality with Universal Firm Codes as an optimum choice for small-scale systems, like the Raspberry Pi.

CodeMeter Embedded 2.0 Supports License Cache and Communication with SPI for the CmASIC

CodeMeter Embedded 2.0 comes packed with exciting new features. The new license cache module gives faster access to licenses, while keeping keys and hidden data safely stored on the CmDongle. In addition to performance improvements, the new version brings support for multiple client applications. The CmDongle module now also supports SPI communication with CmASIC.

TRUMPF Trusts CodeMeter

TRUMPF has chosen CodeMeter for protection, licensing, and security for both its PC software tools and the software on its machines. A license portal was created with License Central and fully integrated with SAP. The first product – TruTopsCell – is already available.

Dr. Fischer, Head of Software Development at TRUMPF, stated: "The work with Wibu-Systems and the integration of our processes were an excellent experience."

BASTA!

Ruediger Kuegler, Wibu-Systems' security expert, introduces how our award-winning Blurry Box technology is already being used in CodeMeter to a crowd of interested members of the developer community.

News from China

Wibu-Systems exhibited its products at CISExpo in Nanjing in early September 2016. Cloud licensing with CodeMeter License Central raised much interest. Industrie 4.0 and software protection also figured prominently on the agenda of German Vice Chancellor Sigmar Gabriel during his journey from 1 to 5 November from Beijing to Chengdu, where the Western Chinese WCIF expo included a presence by Wibu-Systems, and on to Hong Kong for the Asia Pacific Conference. Wibu-Systems' CEO Oliver Winzenried accompanied him as part of the commercial delegation.

New Faces, New Competencies

New recruits in our professional service, software development, production & quality management, and Wibu Operating Service WOPS teams are boosting our capabilities in Germany. September also saw the addition of new apprentices in technical support and software development. The WIBU teams are also growing in the U.S., China, and the U.K.

Industrial Internet Security Framework Published by the Industrial Internet Consortium

Marcellus Buchheit of Wibu-Systems is one of the primary authors of the IIC Security Framework, which can be downloaded for free at https://www.iiconsortium.org/IISF.

Wibu-Systems was also an active contributor at the IIC Member Meeting Q3/2016 in Heidelberg.

Oliver Winzenried together with European Commissioner Günther Oettinger

Case Study | KABA & Reslam

KABA BEYOND SECURITY

Reslam SECURITY INSIDE

The Challenge

A large South African banking group was looking for a way to control their ATM cubicle estate with a single central system, which they also hoped would significantly reduce their costs. They found that most money was wasted on repeated technical service calls due to lost or damaged keys, internal or external vandalism, and arbitrary sabotage of the equipment in ATM cubicles. Their ideal solution did not exist yet; thus Reslam was born.

The Solution

The Reslam solution is a highly flexible, keyless, and geo-locating system that uses three main components to meet and exceed customers' expectations. This highly disruptive technology combines the industry leading features of the Kaba Axessor Series of electronic safe locks with an elegant Android or iOS mobile component and a secure Reslam server platform, protected by Wibu-Systems' CodeMeter technology.

The Success

At the top of the security pyramid sit the banking and financial institutions where the initial Reslam system was successfully implemented. A multitude of other applications for the Reslam technology immediately became apparent; Reslam developed versions for the mid-tier commercial space and ultimately the consumer space, where the IoT has become one of the hottest hypes of the age.

The Customer

Reslam was born in 2014 from a requirement within a large banking group using the Kaba Axessor Series of safe locks. By extending the functionality of the locks to enable online network connectivity via the Kaba E-B@x and adding an Android or iOS mobile component together with a high security server platform, the bank dramatically improved the operational efficiency of their ATM cubicle infrastructure.

Wibu-Systems' CodeMeter technology, which currently protects the software for installing and managing the Kaba Axessor Series of locks, has been used exclusively to protect the Reslam platform and installation software.

Peter Cordiner,
Chief Executive Officer at Reslam

"We have been collaborating with Wibu-Systems since 2014. CodeMeter is critical to our business, as it protects our intellectual property and safeguards our software from illegal copying. Reslam operates on an international level with partners in South Africa, the UK, and the US and has been receiving enquiries from other territories around the world. As such, it is important for us to work with a global company such as WIBU."

Ken Metcalf,
Chief Technology Officer at Reslam

"Security lies at the heart of our Reslam technology and WIBU has made it possible to retain the highest level of security without losing any flexibility. The wide range of licensing models offered by WIBU makes it easy for us to create various levels of authority per CodeMeter dongle for Administrators, Installers, Supervisors, and Users."

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
Arnhem (NL)	29 November	11.00-15.00

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.

United Kingdom / Ireland	+44 (0)2031474727	sales@wibu.co.uk
Netherlands	+31 (0)747501495	sales@wibu-systems.nl
Spain / Portugal	+34 (0)911230762	sales@wibu.es
Belgium / Luxembourg	+32 (0)38080381	sales@wibu.be
France	+33 (0)186266126	sales@wibu.fr

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HANNOVER MESSE

Hannover Messe 2017
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WIBU-SYSTEMS AG
Rueppurrer Strasse 52-54
76137 Karlsruhe, Germany
Tel. +49 721 93172-0
Fax +49 721 93172-22
info@wibu.com
www.wibu.com

Responsible for the content:
Oliver Winzenried

Editors:
Ruediger Kuegler
Wolfgang Voelker
Oliver Winzenried
Marco Blume

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Markus Quintus

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SECURITY
LICENSING
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WIBU SYSTEMS