

# Rademacher: Secure control unit for smart living

As a leading provider of drive systems and controllers for sight and sun protection, Rademacher Geräte-Elektronik GmbH offers a wide range of solutions to transform one's own house or rented flat into a smart home. Various devices such as the roller shutters control and heating systems can be connected with each other. The desired room temperature can be set automatically and the awnings draw in or out at the touch of a button as well as per voice command.

The Rademacher smart home system consists of three components: a central control unit, the HomePilot®, intelligent actuators and sensors and a HomePilot® Smart Home App. Using the app, it is possible to control all integrated devices via an internet connection with a smartphone or tablet, even while on the way.

The HomePilot® is not only compatible with the large number of Rademacher smart home devices, like for example the RolloTron electronic belt winder, RolloTube tubular motors and RolloPort garage door drives, but also with the voice assistants Amazon Alexa and Google Assistant as well as Philips Hue lights. Up to 100 sensors and actuators can be connected to the control unit. Here, Rademacher uses its own wireless standard „DuoFern“.

For the development of the HomePilot®, Rademacher has been cooperating successfully with emlix for several years now. emlix was – in close consultation with Rademacher – responsible for the conception of an embedded Linux-based platform for the HomePilot®. The main focus of the project were the high security requirements, because intelligent devices transmit personal data (e.g. camera feed) to the control unit. Furthermore, emlix supports Rademacher throughout the entire product life cycle to maintain the IT security level of the product.



## Increased cyber security through maintainability

From the start, emlix has conceptualized the embedded Linux-based platform in close cooperation with the developers in Rhede. A requirement-driven composition of the board support package (BSP) was ensured through transparent development processes and short communication channels.

To meet the high security requirements, the primary design goal was to develop an easily maintainable BSP. This is a prerequisite to integrate patches and updates on the BSP efficiently and on a regular basis.

As the first step, emlix ported an existing Yocto BSP to a build environment which has been optimized for long-term maintenance. Only required software components were integrated in order to build a less complex BSP with a smaller package size and without unwanted patches, version conflicts and dependencies. The emlix build automation framework e2factory was used to compile the new system. This framework is open source software under the GPLv3.

The specified software components are – unlike with distribution-based development – taken from the corresponding open source community in unchanged form (mainline compliance). In this way, Rademacher can benefit directly from security patches and innovations for the Linux kernel or individual software components. Another advantage

*„With emlix, we have an important and professional partner by our side: Through professional consulting and expert realization of projects, the cooperation with emlix has simplified the use of Linux as an operating system for our products considerably. The periodic security monitoring and maintenance by emlix is an important part of our product maintenance and allows our development team to focus on the application development.“*

(Volker Mösker, Projektleiter HomePilot®)

resulting from the use of e2factory is that maintenance costs and expenses can be reduced through the ease of use, a lower level of complexity, availability of documentation and transparent processes.

In the e2factory build environment, all changes made to the source code, build recipes or the toolchain are traceable. This allows Rademacher to roll out updates in the development process and throughout the entire product life cycle with consistent versioning. Older software versions can be reproduced and developed further years later through a build process that is not dependent on individual persons or hardware. With these properties, the HomePilot® BSP has been stable in use for quite some time now.

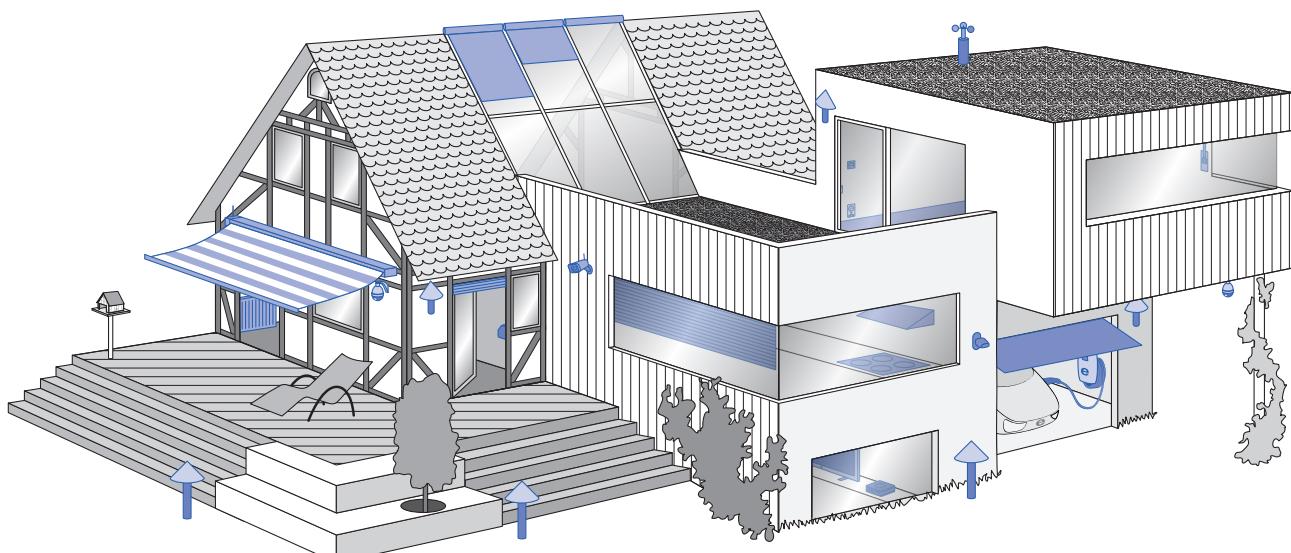
## Security Monitoring

As a reliable partner, emlix provides Rademacher long-term support for constantly keeping the security level of the platform up to date and at a high level. With continuous security monitoring of, among other things, common vulnerabilities and exposures (CVEs), emlix checks whether vulnerabilities and patches as well as improvements for the Linux kernel or individual software components are available in the corresponding open source community.

In a monthly report, emlix informs about safety-critical changes and improvements for the software platform. After consultation with Rademacher as well as in connection with the planned releases, updates are being provided. The installation on the user's devices is being carried out via the HomePilot® update mechanism. In this way, the HomePilot® BSP always complies with the latest state of the art.

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e2factory-based Linux platform and continuous CVE-based security monitoring