



White paper

# A turnkey software solution of a STB for mass production

## **RT-RK Computer Based Systems LLC**

Narodnog Fronta 23a  
21000 Novi Sad  
Serbia

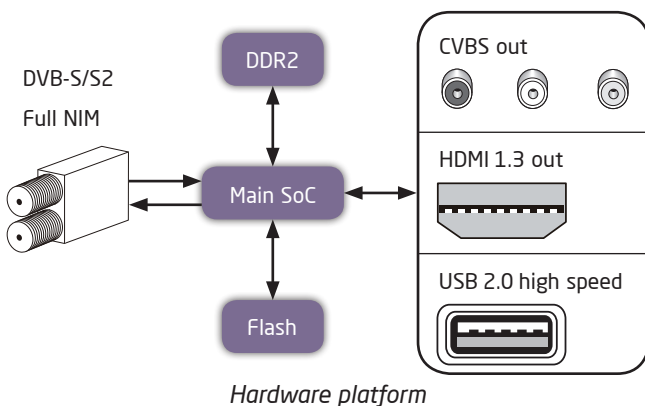
phone: +381 (0)21 4801 100  
fax: +381 (0)21 450 721  
e-mail: [info@rt-rk.com](mailto:info@rt-rk.com)  
[www.rt-rk.com](http://www.rt-rk.com)

## Customer

The Customer is a producer of consumer electronic devices, one of the biggest in Europe, owned by a satellite digital service provider with a base of more than 10 million subscribers.

## Project overview

The goal of the project was to develop Set-Top box (STB) software according to Customer's requirements. The starting point was a hardware platform with a specified main System-on-Chip (SoC), Linux OS that had already run on the main SoC, specified middleware (MW) and a Conditional Access System (CAS) solution that was to be ported on the SoC. All the mentioned components were predefined by the Customer.



The project execution was divided in four phases:

### Phase 1:

- Porting of the MW on the main SoC
- Porting of the CAS library on the main SoC

### Phase 2:

- Implementation of the Set-Top box Application User Interface (STB APP UI)
- Implementation of special Conditional Access (CA) services

### Phase 3:

- Final SW optimizations and precertification

### Phase 4:

- Support in mass production (MP) and thereafter

In the first phase the MW Hardware Abstraction Layer was prepared to support all the software and hardware requirements. At this stage MW functionality was visible through a default MW APP that came as part of the MW package. Basic STB features were available at the middle of the phase: channel watching, auto channel search, channel zapping, volume change, HDMI/CVBS output selection, EPG, etc. The next step was porting of the CAS library, a process instructed by the CAS vendor. The porting process was executed in two steps, each successfully finished by passing corresponding tests. At the end of the first phase the STB had all the main features available including the ability to descramble channels from the target DTV network.

In the second phase the MW default APP was customized to fulfill the UI requirements of the Customer. Additionally, four CA related services were implemented:

- Display of advertisement
- Display of notifications
- Email viewer
- TV Chat

At the end of this project phase the STB had all the required features implemented including the following: favorite lists manipulation, LCN support, network search, help menu, settings menu, etc.



The third project phase was used for bug-fixing and optimization of the work done in previous phases. In this phase OTA and USB update were tested in details, CAS precertification testing was performed, and the SW was optimized for factory environment: faster testing on the production line, faster writing of a serial number and other keys during the production process. At this project phase several pilot series were produced at the factory, where the SW engineers were also present as support in case of any problems visible only in the factory environment.

The phase four was support of the MP process as well as support and SW improvements based on the end-user-satisfaction response.

During the project, RT-RK was also providing Quality Assurance (QA) services where the SW and the STB were tested in details.

## **Benefits**

At the end of the project all the Customer requirements were fulfilled at an expected level. On the other side, RT-RK team has grown in knowledge on working with constraints introduced by the Customer, and the specificity of the market the product was targeted at.

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