



## Document Protection

Described Version:	Smarx OS 2.21.7.110
Also Applicable For:	Smarx OS 2.x
Target Platforms:	Windows Vista 32/64, XP, 2000, Linux, Mac OS
MARX Hardware:	CRYPTO-BOX® USB

### Secure distribution of documents!

Document Protection allows secure distribution of digital documents in PDF format. It provides information rights management (IRM) functionality as part of a DRM strategy to protect and have control over digital information. Only the user who has the appropriate CRYPTO-BOX can open, edit or print the PDF document. Multiple authorization levels and implementation of an expiration date are available. This provides real security compared to just a password based solution - a password can be known by many persons or may have been already compromised.

- Documents are protected with 128 bit encryption and the encryption key is stored safely inside the CRYPTO-BOX
- Document Protection is ideal for purchased eBooks, internet delivery, CDR distribution, company internal documents, subscription services and regular updates
- Virtual printer driver (PDF Converter), allowing customers to convert documents to PDF Format
- PDF Protector - an interactive application to encrypt/protect PDF documents, program CRYPTO-BOX security devices, and process remote update requests



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## 1. Introduction

MARX Document Protection (**DOC Protection**) is a powerful solution, allowing MARX customers (document distributors) to apply reliable protection and flexible licensing / rights management to distributed documents, so their end-users can access protected documents only if MARX hardware containing valid license is attached.

The solution doesn't require any serious efforts from distributors (MARX customers). All operations (conversion, protection, initial licensing and further license management) are highly automated and equipped with intuitive user friendly interface.

The protection itself is extremely reliable, because of MARX hardware encryption used.

With DOC Protection MARX customers are able to implement various licensing strategies and scenarios, starting with pure hardware protection and up to subscription services, involving automated online license management.

The following sections explain MARX Document Protection technology and overviews different Digital Rights Management / Licensing scenarios offered by this technology.

## 2. General concept and logic

DOC Protection assumes the following stages:

- All customer's documents requiring protection & licensing are initially converted to PDF (internal standard format for DOC Protection) – **MARX DOC Converter** is used for this purpose;
- Converted documents are placed to the internal **Document Pool**;
- Protection (encryption) and chosen licensing options are applied to selected documents, so they can be distributed to end-users together with properly programmed MARX hardware;
- Using **MARX DOC Viewer** end-users are able to view protected document(s) only in case if CRYPTO-BOX with valid license is attached to end-user's computer;
- Further license management is possible.

MARX provides a convenient user friendly environment, called **SmarxOS Application Framework**, automating all stages of DOC protection mentioned above. It will be discussed in more details in section 3 of this document.

PDF is chosen as internal standard format for this technology. Original documents prepared in popular environments, like: MS Office, Open Office, Adobe PhotoShop, Corel Draw, HTML, etc. are converted to PDF using a special virtual printer - **MARX DOC Converter**.

Most of PDF documents can be used "as is"; however in case of compatibility issues conversion of the original PDF document through MARX DOC Converter is recommended.

After being converted (printed to MARX virtual printer), processed documents are stored to internal Document Pool ready for protection. Using project oriented approach, provided by SmarxOS Application Framework; the customer can create a project associated with one of customer's product and add documents from the Pool for this project. While adding documents to the project the customer can structure them into groups inside the project. Every document/group or whole project can have specific license settings (expiration date, print enable/disable, license message). Selected documents from the project can be protected then (encrypted using hardware based encryption). Resulting documents will be saved as PPD format files (protected PDF). This format is supported by MARX DOC Viewer. The next step assumes MARX hardware programming with protection and licensing settings specific for the project. This task is completely automated in SmarxOS Application Framework.

Finally the product is ready for distribution. It includes: set of protected documents, properly programmed MARX hardware and DOC Protection Client's Package (DOC Viewer and smart MARX hardware setup).

The end-users will be able to view (and optionally print) protected documents only if MARX hardware with valid license data is attached to end-user's computer.

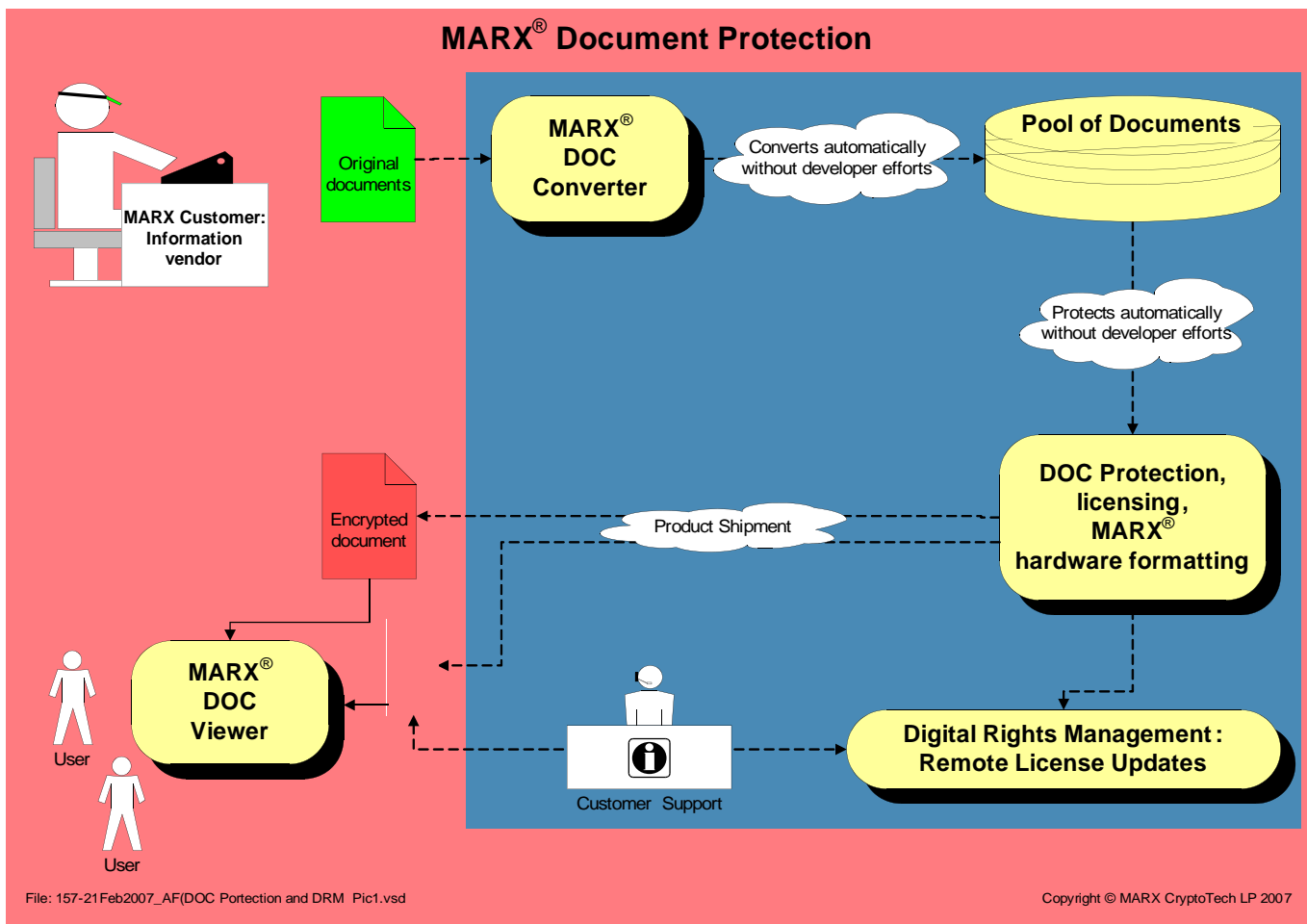
It's important to mention that distributors can add documents to the existing project later at any time; protect and distribute them to end-users. The same MARX hardware can be used to access these protected documents. This logic supports implementation of various subscription service strategies.

If extended licensing options are used the customer can update license data in MARX hardware remotely utilizing one of remote license management technologies offered by MARX:

- RUMS (Remote Update Management System) – component of SmarxOS Application Framework;
- OLM (Online License Management);
- Customer specific implementation (based on programming interfaces provided by MARX: RFP API and/or WEB API).

Although being based on PDF standard, this approach completely bypasses Adobe environment; MARX Document Protection doesn't involve Acrobat Reader at all.

The following picture illustrates main stages of DOC Protection logic discussed above.



Pic.1 Main steps of MARX® Document Protection

### 3. SmarxOS Application Framework

As mentioned above, DOC Protection is integrated into **SmarxOS Application Framework (SxAF)**, providing MARX customers with automated and efficient way of adding protection and licensing to distributed documents.

With its user friendly interface SxAF environment helps customers to:

- Add their documents to SxAF Document Pool;
- Structure protected documents and choose licensing options;
- Manage document protection and related MARX hardware programming;
- Organize efficient license management.

#### 3.1 Project oriented approach

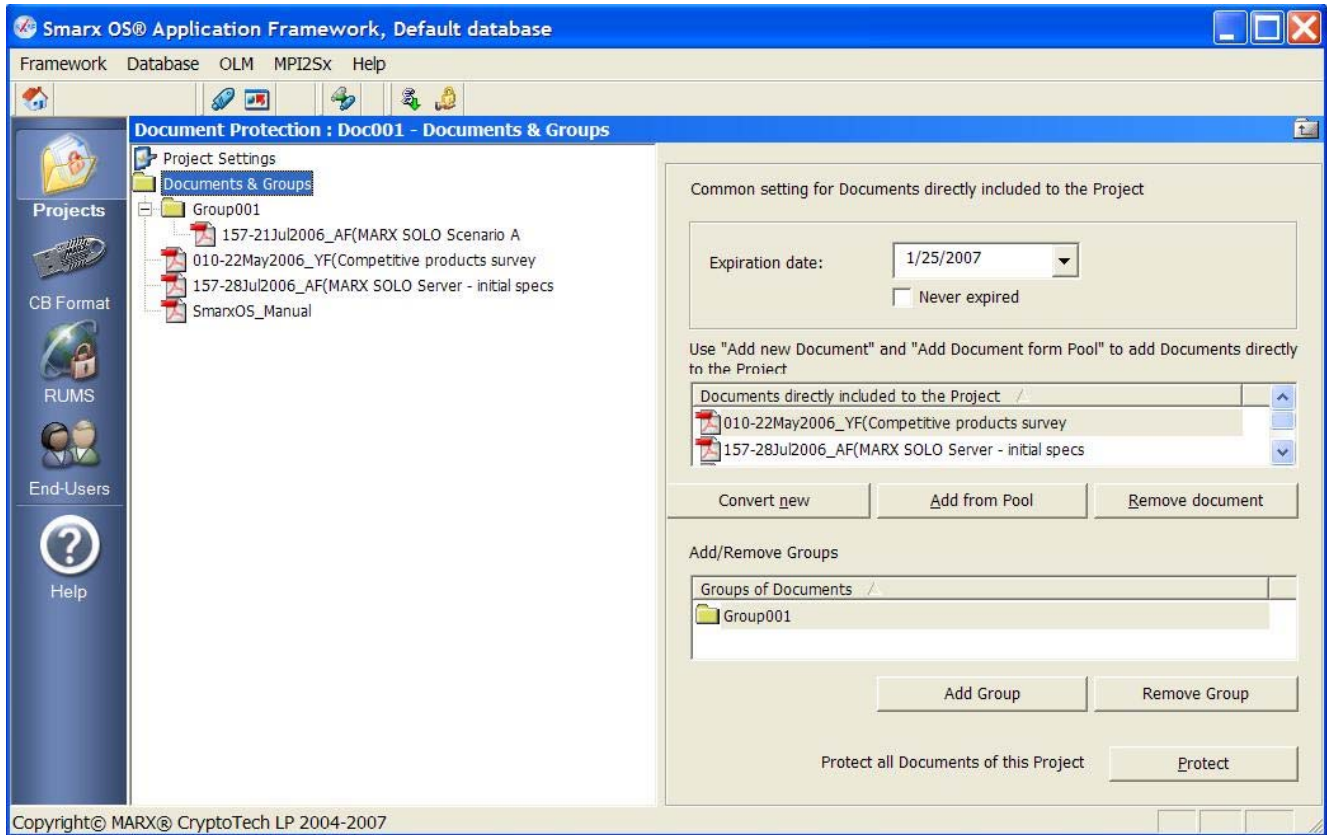
**SxAF** uses **project oriented approach**. Project serves as a convenient abstract for controlling protection and licensing options. The customer (distributor) creates a special project for every information product (program or series of documents) he wants to license to his end-users.

For DOC Protection every **project** contains information on one or more included documents. The customer adds documents to the project from **SxAF Document Pool**. Besides of adding documents to the root folder of the project, the customer can create **groups** of non-recurring documents in the project.

Every group is associated with unique encryption key and optionally expiration date. Good examples of using groups are:

- Set of lectures organized as several courses (groups): introductory, intermediate, advanced...
- Various subscriptions (provided to end-users/subscribers as series of protected documents), containing periodic news/reviews on some areas: trading, market analysis, politics, etc.

The following picture shows SxAF environment with active DOC Protection project (Doc001), containing several documents in its root and one group (Group001) with one document in it.



Pic.2 SxAF: Using project oriented approach for Document Protection

### 3.2 DOC Protection: Licensing options

Main licensing option of MARX DOC Protection is **hardware protection** itself - properly programmed MARX hardware. If MARX DOC Viewer fails to find valid MARX hardware it displays a standard error message and prevents the document from visualization.

In addition to hardware protection customers can also define **expiration dates for every group** of documents included to the project. If the project doesn't include any groups, then expiration date still can be defined for the project root folder.

When programming MARX hardware for this project with SxAF this licensing information is written to MARX hardware keys associated with the project. Later at end-user's place when MARX DOC Viewer finds that license is expired for the requested document it displays a customizable "license expired" notification message and prevents the document from further visualization.

SxAF allows **flexible customization of license messages** associated with groups of documents in DOC protection projects. Besides changing the message text and caption, the customers are able to add some contact info, including web links addressing end-user to the web site for renewing/extending the license.

Besides options mentioned above SxAF DOC Protection supports **print enable/disable** feature allowing customers to control print functionality for every protected document in the project.

### 3.3 Automating licensing: Product Editions

When protecting some set of documents, the customer may want to define more than one license per project, or in other words to have more than one **edition** of his product.

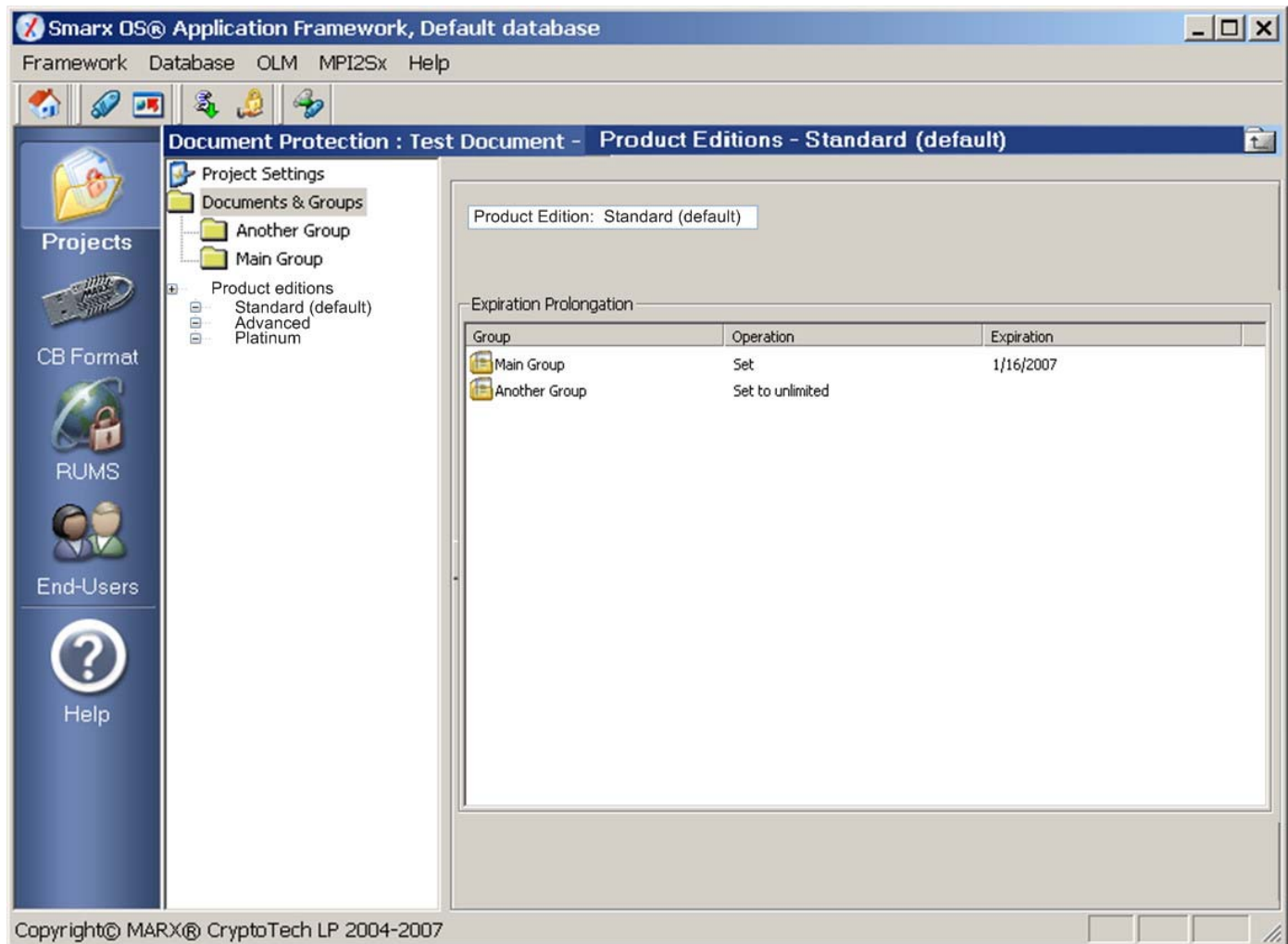
For example, for some product the following editions could be considered:

- Standard Edition: for 6 months
- Advanced Edition: for 1 year
- Unlimited Edition: unlimited
- And so on.

These editions will form customer's marketing strategy and appropriate pricing strategy.

SxAF allows customers to define more than one Product Editions per project. For projects containing more than one Product Edition, MARX hardware can be programmed for chosen Product Edition.

The following picture illustrates Product Edition Management for DOC protection project:



Pic.3 Product Edition Management for Document Protection projects

### 3.4 Support for bookmarks and hyperlinks; embedded Editor; set default zoom and bookmarks on/off

SxAF DOC Protection supports **bookmarks** and **hyperlinks** for protected documents. Bookmark support means that customers are able to create **electronic contents for quick navigation** on protected document. Hyperlinks allow including **references to web resources** and/or other documents located on local/network computers.

A special embedded Editor is integrated to SxAF DOC component, allowing customers to:

- Preview documents from the Document Pool after their conversion/before protection;
- Manage bookmarks (build e-contents) and/or define hyperlinks for any document from the Pool.

Visualization options can be defined for every protected document in the project, including:

- Default zoom level;
- Initial visualization mode for bookmarks (e-contents).

### 3.5 “Cloning project settings” for Document protection

This feature, recently added to SxAF, provides a possibility to create a new project, inheriting project settings from some existent project. This is especially useful in cases when some project settings are used for several projects and the rest could be customized individually.

## 4. License Management: Approaches and Strategies

For those customers who base their business on licensing and digital rights management MARX offers a wide range of continuously improved approaches and strategies of license management. This section of the white paper briefly reviews all of them.

### 4.1 SxAF: Remote Update Management System (RUMS)

SxAF includes a special subsystem, automating license management. The RUMS allows customers to update license information in MARX hardware distributed to their end-users remotely without sending the hardware back and forth.

Using RUMS the customer (RUMS operator) can process license update requests coming from end-users (clients) preparing special activation codes for them. Depending on the license management approach chosen the operator can process every license update request individually or use **Update Plans**.

### 4.2 RUMS: Update Plans

Besides requests for update, based on individual licensing and processed manually, RUMS also supports **Update Plan** management.

Each Update Plan defines a set of operations to be done on license data associated with protected product. Predefined update plans help to automate license management for those MARX customers, who consider intensive license management as a part of their marketing strategy (subscriptions, updates, extensions, etc.)

Any Update Plan can be universal (applied to any Product Edition) or specific to this or that Product Edition. Product Edition upgrade can be included to Update Plans.

### 4.3 WEB API

For those customers who are looking for online licensing and further license management integrated to their web site MARX offers WEB API – universal interface for developers.

WEB API provides a secure communication via Internet/Intranet between remote web server and MARX hardware attached to client’s computer.

WEB API opens a way to check/reprogram data stored in MARX hardware remotely. It allows customers to implement online scenarios, including but not limited to:

- Restricted access to some web areas/services based on license information stored in MARX hardware attached to end-user's computer;
- Automated online license update.

WEB API is supported for all popular platforms.

### 4.4 Online License Management (OLM)

The **Online License Management** is a special WEB API based technology, providing automated online update for licenses. **OLM** is used in cooperation with SxAF which generates **license update scripts** processed by server side OLM component

The **OLM** technology helps MARX customers to automate remote updates and significantly decrease human efforts, spent at software vendor's side.

Comparing to **RUMS** which generates activation code for every end-user's remote update request, **OLM** uses remote update plans generated once and deployed on the web server. All end-user requests for update are processed automatically on server side.

### 4.5 Remote Field Programming (RFP) API

RFP API is a special interface for developers allowing to customize remote license management and integrate it to customer specific applications. RFP API is supported for all popular platforms.

## Appendix

### Appendix A – Distributors

#### USA

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### Appendix B - CryptToken Certifications and MARX Memberships



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