

EMV.LIB for embedded systems

A free trialware version of the EmvX Toolkit and the EMV.LIB HAL Files can be downloaded from the CreditCall website.



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background

EMV.LIB - Chip and PIN / EMV Level 2 for the Embedded Environment

Developing EMV Level 2 technology for embedded systems, or those based around a non-Windows operating system, presents its own unique set of challenges, particularly as many of the terminals that require the addition of EMV Level 2 functionality were not designed with CPU intensive encryption and hashing in mind.

The EMV specifications offer some flexibility in how these challenges are met by enabling certain terminal types to avoid the use of the more processor intensive elements, such as the RSA encryption used in Data Authentication. However it does not solve the problem of how to add the remaining functionality. CreditCall's solution to this problem was to develop an EMV Level 2 Kernel in strict ANSI C with all of the hardware and operating system specific functionality abstracted away from the core functions of the Kernel through the use of a Hardware Abstraction Layer (HAL).

This architecture and the use of ANSI C means that EMV.LIB can be ported to virtually any environment for which there is a suitable C compiler. This approach has enabled this version of the CreditCall EMV Kernel to become the critical component in many Chip and PIN solutions and is now the most widely certified EMV Level 2 Kernel available today.

The Hardware Abstraction Layer is essentially a C file that contains a number of empty function calls, each function deals with an element of EMV that cannot be addressed in a manner that is platform independent. Once these functions have been populated, the Kernel can be compiled for the target platform. The resulting Object code can then be linked with the payment application to create a fully functional EMV Level 2 compliant solution.

key highlights of EMV.LIB

- Very small memory footprint, stack and resource utilisation
- Compile in or out blocks of EMV functionality to suit your target platform and EMV ICS
- Specific optimisations for smaller 8 and 16 bit CPUs
- Hardware Abstraction Layer (HAL) enables easy integration into target platform
- Endian indifferent
- Caters for older compiler quirks such as short variable and function names

EMV supported features

EMV.LIB supports a variety of data authentication, configuration, CVM methods and other special features within the EMV Level 2 version 4.1 specification.

Data Authentication Methods:

Static, Dynamic and Combined Data Authentication (SDA, DDA and CDA).

Terminal Configuration:

Online Only, Online with Offline, Offline with Online, and Offline Only.

Acquirer Interfaces:

Authorisation Request, Financial Transaction Request, Batch Data Capture, Online Data Capture.

Cardholder Verification Methods:

Offline Plaintext PIN, Offline Enciphered PIN, Signature, No CVM, Fail CVM.

Miscellaneous:

Certificate Revocation, Velocity and Floor Limit Checking, Exception Lists, Recommended EMV Application Selection Algorithms.