Linux Point of Sale (POS) Reader Solution

The SLN-POS-LRDR point of sale (POS) reader solution enables you to quickly build a Linux based smart card reader and address PCI®- and EMVCo® requirements for a PIN entry device (PED). The system supports an NFC reader, contact chip card reader and magnetic stripe reader (MSR) and is an expandable platform for embedded development.

OVERVIEW

Many companies are creating products today that would benefit from adding payment capabilities to the design. However, getting the necessary PCI and EMVCo certifications are a significant engineering and development barrier. This solution is pre-certified for EMVCo L1/L2 and PCI PTS 5.x to give companies confidence that they will have a high likelihood of passing certification without the added expense of failing and resubmitting. In addition, all documentation, design files and software are provided to reduce man-months from design time to achieve faster time-to-market.

The Linux POS reader solution (Figure 1) is based on a i.MX6UL System on Module (SOM) from our partner iWave and other Tower development boards. The Level 1 and Level 2 contact and contactless EMVCo pre-certified software is running in the i.MX6UL processor tower board (Figure 2).

The Linux POS Reader Solution has passed many PCI PTS POI 5.0 compliance evaluations including TDES/AES Side Channel Analysis and is designed considering the PCI Pin Transaction Security version 5.x standards and testing requirements.

The second major component of this reader solution is the TWR-POS-PN5180 Tower development board (Figure 3).

This board contains the high-power PN5180 contactless 13.56 MHz NFC reader as well as the TDA8035 contact reader. There is also a a 4.3" 480 x 272 – 16 bit parallel display.

From a software perspective (Diagram 1), the Linux POS reader solution uses a unique implementation of Linaro Group's Open-Source Trusted Execution Environment (OP-TEE) leveraging the Arm TrustZone® architecture. Secure Trusted Applications (TAs) and normal applications may be run in a single processor allowing custom user applications without jeopardizing PCI or EMV compliance. This OP-TEE implementation also has been optimized to ensure EMV timing constraints are met for the card reader interfaces.

The basis for the software implementation is the NXP BSP built on Linux 4.1.15. A trusted kernel is created using OP-TEE where applications such as the NXP Level 1 Contact and Contactless stack run in a Trusted Partition. This Trusted Partition is where the payment card contact and contactless stacks reside. Also the PIN Entry physical interface is protected in the secure world.

The level 2 contact and contactless software components are owned by Cardtek®, a major supplier of EMVCo-compliant software components. The EMV L2 stack can be licensed directly from Cardtek.

POS READER SOLUTION FEATURES

- EMVCo Level 1 CT/CL stacks by NXP
- EMVCo Level 2 CT/CL stacks by Cardtek
- EMVCo and PCI 5.x pre-certifications
  - EMVCo pre-certification on Level 1 CT/CL
  - PCI PTS chip level evaluation for i.MX6UL
  - PCI PTS DES/AES Side-Channel Attack Compliance Evaluation
  - Vendor Evidence form for PCI PTS logical security evaluation
- i.MX6UL single Arm Cortex-A7 Processor
  - Up to 528 MHz CPU speed
  - Advanced physical tamper security
  - Advanced public-key hardware with support for RSA and ECC
  - Secure Boot provided by ROM
- PN5180 contactless 13.56 MHz NFC front end IC
  - Dynamic power control for small antennae design
  - Full compliance with all NFC and EMVCo standards
- TDA8035 contact front end IC
  - 5 V, 3 V, 1.8 V smart card supply
  - Very low power consumption in deep shutdown mode

SOFTWARE AND TOOLS

Linux Point of Sale (LPOS) Reader Solution Quick Start Guide
Linux Point of Sale (LPOS) Reader Solution User's Guide
NDA secure boot Application Notes
i.MX6UL Reference Manual and NDA Security Reference Manual
PN5180 Data Sheet
PN5180 Reference Manual
TDA8035 Data Sheet
TDA8035 Reference Manual
Design Files for i.MX6UL and Card Reader boards

FIGURE 1: LINUX POINT OF SALE (POS) READER SOLUTION

FIGURE 2: TWR-MPU

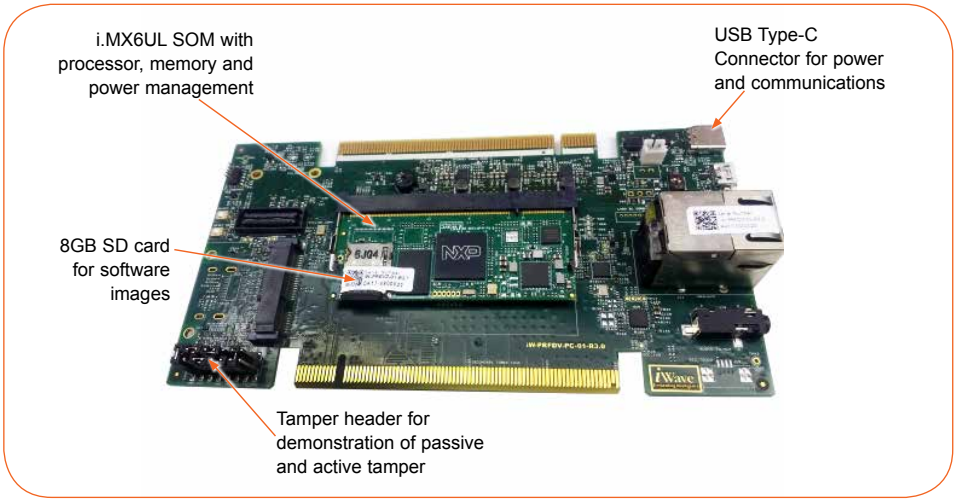


FIGURE 3: TWR-POS-PN5180

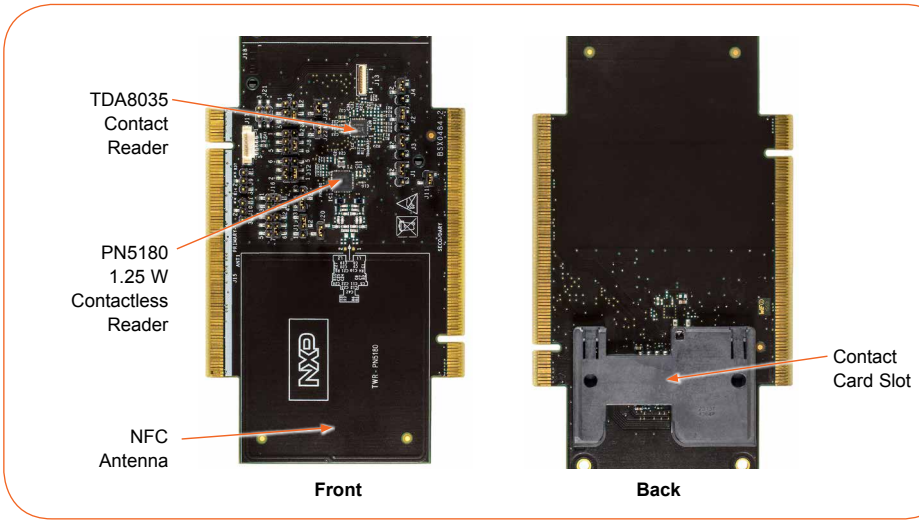
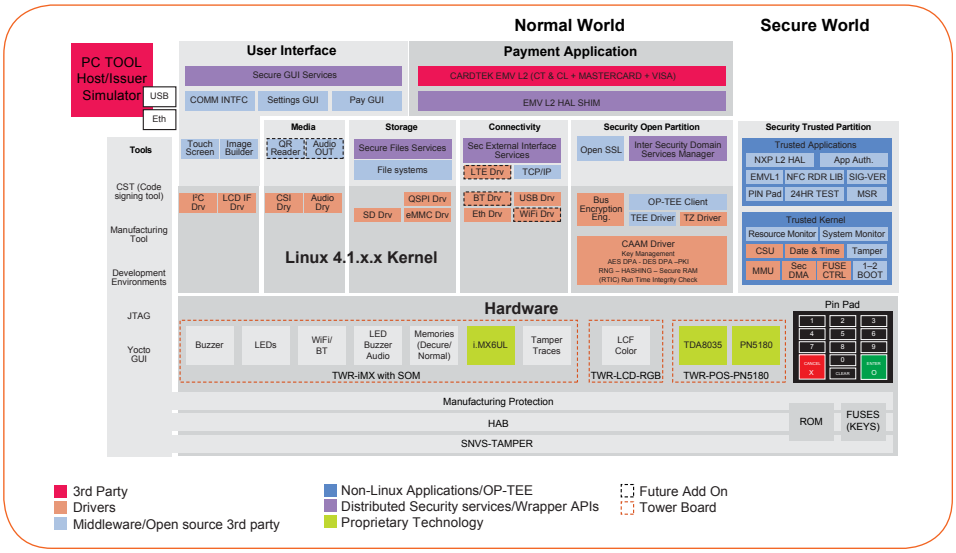


DIAGRAM 1: SECURE CARD READER BLOCK DIAGRAM



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