SAM-CRM-13a (Validator RF) Board H/W Specification

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Duali

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Project Manager

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Approved

Revision History

Version	Date	Author	Verifier	Description

1 Overview

SAM-CRM-13a is a high-end RF reader and it is the world first device which supports all three specification as following, (1) Conrtactless card spec_Mifare, ISO14443 Standard A/B, (2)Payment spec_Paywave, Paypass, JSMART, American Express and (3) EMVCo Type Approval Contact less Level 1 , NFC forum spec complaint.
It also has 8(EA) of SIM slot for secure communication, RS-232(2ea) as interface method.

1) Purpose (Use)

It is multi-purpose smartcard reader mainly use for credit card transaction at auto-gate at subway station or automatic ticket vending machine

2) Communication & Operation

It controls credit card transaction by sending command to Host Controller via RS232.
This terminal operates LED and Buzzer of the transaction operating and result.
The operation of LED & Buzzer can be different by each specification (refer to the Paypass, JSMART, American Express specification for detail information)

3) RF interface

①. Conrtactless card spec_Mifare,
②. ISO14443 Standard A/B

4) SAM interface

It is designed to capable of communicating SAM (ISO 7816) by attaching extended parts for future use.

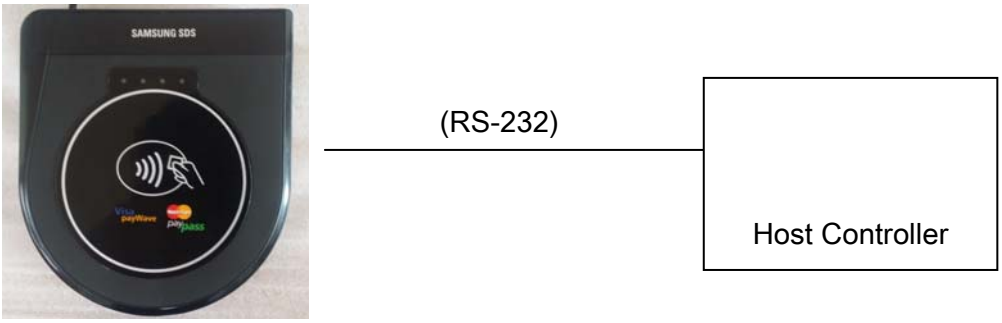
2 Summary

ITEM	Specification	Description
CPU	STM32F417ZGT6 (ARM Cortex_M4, 144pin)	ST
Program Memory	1MBytes FLASH (default) Up to 8Mbytes external Flash(Basically 4M byte)	On chip Option (1M,2M,4M,8M)
Data Memory	192KBytes SRAM (default) Up to 8Mbytes external SRAM(Basically 512K byte)	On chip Option (1M,2M,4M,8M)
DISPLAY	4 Status LED	
Communication	RS-232 * 2	Decide when order
BUZZER	Magnetic Buzzer	
RF CARD	Frequency : 13.56MHz Speed : 106,212,424,848Kbps ISO-14443 A/B ,MIFARE	
SAM	8 SAM slots Class A and B, T=0 and T=1	
Input Power	DC 12V	

3 Structure

The Structure of equipment

- SAM-CRM-13a itself contains all circuits include antenna, 8 SAM connectors.



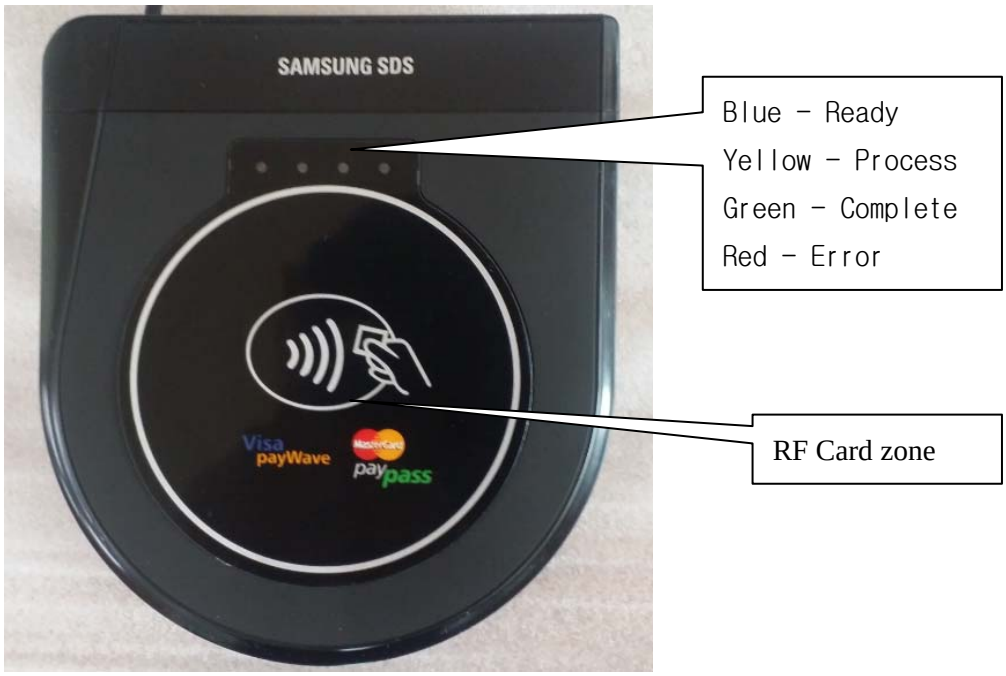
Description of SAM-CRM-13a

- CPU: 32bit RISC ARM core CPU, It is stm32f417 which is ARM-based 32-bit MCU with Flash, This CPU has 1Mbyte Flash memory, 192Kbyte SRAM.
- PN512 RF IC: This RF IC can control RF card like MIFARE card, type A/B card, Felica, simultaneously.
- RS-232 Driver: It's a Communication part for RS-232 communication.
- SAM part: It can control 8 SAMs for multi purpose. Each SAM slot can be operated independently and they don't affect the transmitted signal.
- LED: It has 4 LEDs to display status of communication and card process.
  - Ready : Blue
  - Process : Yellow
  - Complete : Green
  - Error : Red
- Battery: It maintains RTC and battery backup SRAM while power is not supplied.
- Tamper switch: Erase security memory when case is opened.
- SRAM : optional SRAM for user memory.
- Reset : External reset
- Buzzer : Displays transaction status (success result/ error). Detail

operation is defined by each Payment specification.

4 Description of Surface

The picture of device surface



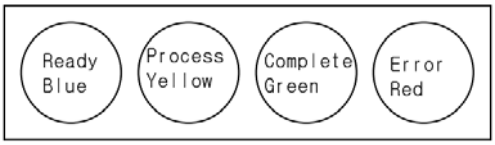
■ Communication Cable

Serial cable

■ The size of terminal

135.5(W) * 152.7(L) * 29(H)mm

■ LED configuration



5 Connector Pin Assignment

RS-232 Connector and Cable

Pin No	Description	
1	PWR_IN	DC 12V
2	GND	
3	TX1_RS232	For Host Controller
4	RX1_RX232	For Host Controller
5	GND	
6	TX2_RS232	For slave
7	RX2_RX232	For slave
8	IO	
9	RESET+	
10	RESET-	

6 Description of Electricity

The Description of power

- Input power : 12V

The using electric current

- Normal 12V, 130mA under
- MAX 12V, 300mA under

The Description of Serial communication

- 115200bps, 8 data, no parity, 1 stop bit

7 Description of Function

Protocol Specification

Refer to protocol specification for detail function. (provide on request)

Control Code Specification

Refer to control code specification for detail function. (provide on request)

Firmware Download

Refer download manual. (provide on request)

8 Property

Operating Condition

- Temperature to use : -10 ~ 60 ℃
- Humidity to use : 30 ~ 90 % (relative humidity)

Storage Condition

- Temperature to keep : -20 ~ 80 ℃
- Humidity to use : 30 ~ 90 % (relative humidity)

9 Warning and Notice

- For indoor use only.
- This product is affected by an element like metal or Magnetism. So one has to take precautions.

10 Certifications

EU

This product is CE marked according to the provision of the R&TTE Directive (99/5/EC). Here by DUALi Inc. declares that this product is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

CE 1177

FCC STATEMENT

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

-- Reorient or relocate the receiving antenna.

-- Increase the separation between the equipment and receiver.

-- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

-- Consult the dealer or an experienced radio/TV technician for help.