Advanced Card Systems Ltd.

acs

ACR120 Contactless Reader/Writer

TECHNICAL SPECIFICATIONS

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ACR120 Contactless Reader/Writer

1.0 Introduction

The ACR120 is a compact and cost-effective contactless reader and writer. It is developed on the 13.56MHz contactless smart card (RFID) technology, supporting Mifare® (Classics, DESFire), ISO 14443 A and B cards.   Its proximity operating distance is up to 5 cm, depending on the type of contactless tag in use.

The versatile reader is available in both USB and Serial interface version, which can be easily integrated into PC environment as well as other systems in a snap. It is ideal for a board range of applications, including public transport terminals, physical and logical access controls, and even vending machines

The operation of ACR120 is extremely easy, quick and convenient. All read/write operations can be done via waving the contactless card to the device. Moreover, its compact design enables it to be mounted and located in anywhere with ease.

In addition, ACR120 also available in a module form, which is extremely easy to design-in giving you maximum design and development flexibility. Own casing, logo, color, size can all now be materialized.

2.0 Features

- USB PnP or serial interface (RS232)
- Read and write functionality
- Built-in Antenna
- Fully tested and compliant with major contactless smart cards that conform to ISO14443 A/B in the market.
- Operation LED
- High-speed transactions
- Compact size: 120 X 73 X 20mm
- Wall mountable
- Built-in contact/contactless smart card slots (on request)
- SAM slot (on request)

6.4cm

9.9cm
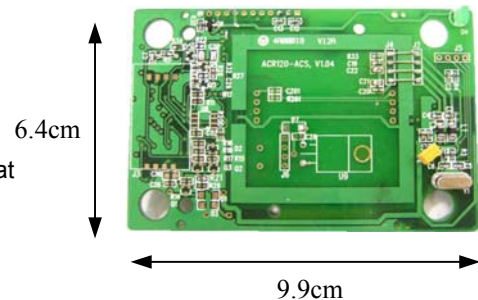
3.0 Supported Card Types

The ACR120 works with a variety of 13.56MHz contactless smart cards including, but not limited to:
- MIFARE® cards (Classics, DESFire)
- All ISO 14443 A cards, like:
  - JCOP30 cards
  - MPCOS COMBI cards (need to accompany with the ACS ACR38DT Dual Key)
- ISO 14443 Type B cards, like:
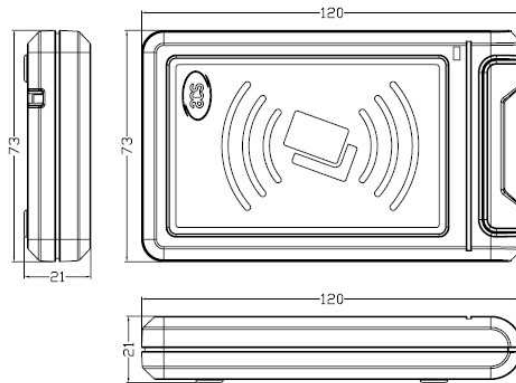 - Calypso cards
  - ST cards (ST19XRF58)

4.0 Typical Applications

- Public transportation Terminals
- Automatic fare collection
- Vending machines
- Physical access control
- Time attendance
- Contactless public phones
- Metering
- Windows Logon

5.0 Technical Specification

(i) Configuration of ACR120 reader

Serial Interface
Type....................................... RS232 (Standard)
Operation Baud Rate............................ 9,600-115,200 bps
Power source....................................... From PS/2 mouse interface
Supply Voltage .... Regulated 5V DC
Supply Current.................................... 100mA

Universal Serial Bus Interface
Power source....................................... From USB
Speed .... 1.5 Mbps (Low Speed)
Supply Voltage .... Regulated 5V DC
Supply Current 100mA

Contactless Smart Card Interface
Standard .... ISO 14443 A & B
Protocol .... Mifare$^®$ Classics protocols, Mifare$^®$ DESFire protocols
Smart card read / write speed .... 106 kbps

Contact Card Interface (optional)
Standard .... ISO 7816 1/2/3, T=0 and T=1
Supply current .... max. 50mA
Smart card read / write speed .... 9,600 –96,000 bps
Short circuit protection .... +5V / GND on all pins
            The presence of the smart card power supply voltage is indicated through a green LED on the reader
CLK frequency .... 4 MHz
Card connector .... Contact
Card insertion cycles .... min. 100,000

Case
Dimensions.. 120 mm (L) x 73 mm (W) x 20 mm (H)
Material.. ABS
Color .... Metallic Silver Grey

Antenna
Antenna Size .... 55mm x 85mm
Operating distance .... up to 50 mm

Operating Frequency
Operating Frequency............................ 13.56 MHz

Operating Conditions
Temperature .... 0 - 50° C
Humidity... 10% - 80%

Cable Connector
Length... 1.5 m (USB/ Serial RS232)

Standard/Certifications
CE, FCC

OS
Windows 98, ME, NT – Serial Interface (RS232), 2K, XP

OEM
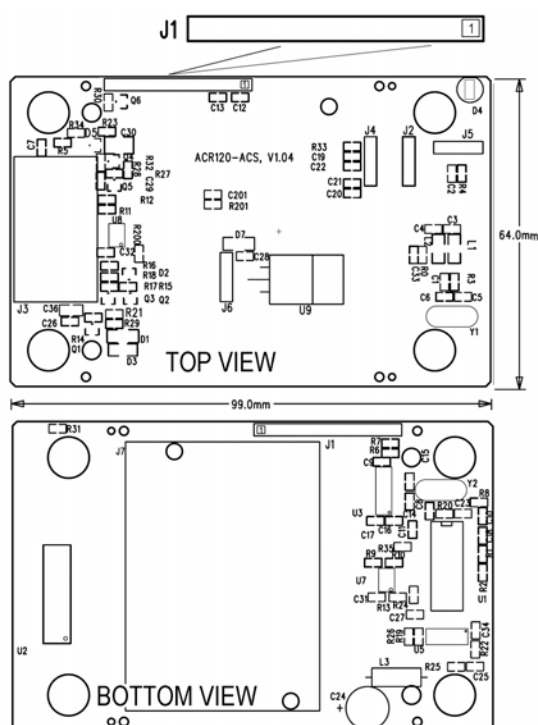OEM-Logo possible, customer-specific colors, casing, and card connector

(ii) Configuration of ACR120 reader module

Board Diagram

(A) PIN Assignment (for Serial Communication Interface)

Pin	Signal	Description
1	-RESET	Pulling the signal to ground resets the module.
2	USB-/RS232Tx/RS485+	USB-: not available RS485+: not available RS232Tx: RS232 Transmit
3	USB+/RS232Rx/RX485-	USB+: not available RS485-: not available RS232Rx: RS232 Receive. Pulling this signal low for 100ms will trigger a reset to the module
4	RS422Rx+	Not available
5	RS422Rx-	Not available
6	SDA	I^2C Data
7	SCL	I^2C Clock
8	VCC	+5V supply to the module
9	N.C.	Not connected
10	LED-/User Port	Cathode of on module LED. Can be configured as User Port (Open Collector).
11	VPP	Should connect to GND signal.
12	GND	Power and signal Ground.

(B) PIN Assignment (for USB interface)

Pin	Signal	Description
1	-RESET	Not available
2	USB-/RS232Tx/RS485+	USB-: available
3	USB+/RS232Rx/RX485-	USB+: available
4	RS422Rx+	Not available
5	RS422Rx-	Not available
6	SDA	Not available
7	SCL	Not available
8	VCC	+5V supply to the module
9	N.C.	Not available
10	LED-/User Port	Not available
11	VPP	Not available
12	GND	Power and signal Ground.

5.0 Software Development Kit Specifications

The ACR120 Software Development Kit (SDK) enables effective development of customized applications and systems using Mifare® cards, contactless readers, and PCs.

Reflecting ACS expertise in smart card technologies, the ACR120 SDK is a complete package containing all the vital components required for contactless smart card application development..

It is also an ideal training and development tool for those who want to know more about contactless smart card technologies. Software development companies can use the kit to develop systems specific to their requirements to meet customers' demanding needs or to incorporate various contactless smart card technologies into their current applications.

Package Contents

- 1 x ACR120 Contactless Smart Card Reader (Serial or USB version)
- 1 x ACR38DT DualKey (A key for both physical and logical access control)
- 5 x 1K MIFARE® Contactless Cards
- 1 x Combi Card
- 1 x Installation and Operation CD-ROM (Includes drivers, sample codes, demo applications, utility tools etc.)

The SDK CD-ROM

- Sample Applications - ACR120 Multi-Application Demo shows how the ACR120 is used in real-world applications. The card is used as stored-value for Parking Card, Train Ticket Card, Vending Machine, Weighing Machine and Loyalty Application
- Sample Codes - Sample codes given are written in C++, Borland Delphi and Visual Basic
- Tools & Utilities - QuickView – a useful program to check for proper driver installation of ACR38DT DualKey. ACR120 Tool - which helps you to analyze the reader settings, change the communication speed, protocol configuration and manipulate data on your MIFARE® card.
- User Manuals & Reference Materials
  - ACR120 Technical Specifications
  - ACR120 Multi-Application Demo Guide
    ACR120U API
  - Reference Manual for Mifare 1K card
  - ACR120S - ACR120U Porting Guide
  - Product and Service Guide
  - ACR38DT Technical Specifications
  - ACR120S API
  - ACR120S Communication Protocol
  - Reference Manual for Mifare 4K card
  - ACR120 Wall Mounting Procedures
- SDK User Manuals