Advanced Card Systems Ltd.
Card & Reader Technologies

AMR220-C1
Secure Bluetooth® mPOS Reader

Technical Specifications v1.01

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1.0. Introduction

Mobile devices have easy and intuitive interfaces that enable fast and convenient access to different applications, and provide myriad opportunities to shop, network, and explore. Leveraging on this, ACS introduces the AMR220-C1 Secure Bluetooth® mPOS reader, which can support EMV® chip–enabled contact cards, contactless cards, and most mobile NFC devices.

1.1. Smart Card Reader

AMR220-C1 supports ISO 7816 Class A, B, and C full-sized smart cards (5 V, 3 V, and 1.8 V) in the market, including microprocessor cards with T=0 and T=1 protocol as well as ISO 14443 Type A and B smart cards, MIFARE®, FeliCa, and most NFC tags and devices compliant with ISO 18092 standard. AMR220-C1 is designed to meet major payment and security standards, such as Mastercard® Contactless, Visa payWave®, and EMV® Level 1 & Level 2. It is also ready for Apple Pay® and Android Pay™. AMR220-C1 has both USB Full Speed and Bluetooth 4.1 interface for smart cards with read/write speed of up to 600 Kbps.

1.2. Compact Design

With its compact design and a rechargeable Lithium-ion battery for power, AMR220-C1 is extremely portable and convenient for use anytime, anywhere.

1.3. Firmware Upgradeable Feature

AMR220-C1 offers in-field firmware upgrade which lets users cope with the fast-changing technology utilized by different applications on various scenarios. With this feature, stakeholders can cut cost and save time, and users can benefit from the utmost convenience provided.

1.4. Secure Bluetooth® Connectivity

AMR220-C1 uses Bluetooth® technology that provides easy and secured integration without employing any physical connection to any terminal running Android™ 4.4 and later, iOS 8.0 and later, Windows®, and Mac OS®.

1.5. Ease of Integration

AMR220-C1 is PC/SC and CCID-compliant, making it easy to install and use with any computer-based environment. Its drivers are compatible with operating systems such as Windows®, Linux®, and Mac OS®.

With its numerous features, the AMR220-C1 is the perfect smart card reader for your smart card solution.

2.0. Features

- USB Full Speed Interface
- Bluetooth® Interface
- Plug and Play – CCID support brings utmost mobility
- Smart Card Reader:
  - Contactless Interface:
    - Read/Write speed of up to 848 Kbps
    - Built-in antenna for contactless tag access, with reading distance of up to 60 mm (depending on tag type)
    - Supports ISO 14443 Part 4 Type A and B cards, MIFARE®, FeliCa, and all 4 types of NFC (ISO/IEC 18092) tags
    - Supports Mastercard® Contactless and Visa payWave® compliant cards
    - Built-in anti-collision feature (only one tag is accessed at any time)
    - NFC Mode Supported:
      - Card reader/writer mode
  - Contact Interface:
    - Read/Write speed of up to 600 Kbps
    - Supports ISO 7816 Class A, B, and C (5 V, 3 V, 1.8 V) full-sized cards
    - Supports microprocessor cards with T=0 or T=1 protocol
    - Supports PPS (Protocol and Parameters Selection)
    - Features Short Circuit Protection
- Application Programming Interface:
  - Supports PC/SC
  - Supports CT-API (through wrapper on top of PC/SC)
- Built-in Peripherals:
  - LEDs:
    - Four User-controllable single-color LED (Green)
    - One Charging Status LED (Red)
    - One Bluetooth Status LED (Blue)
  - Buttons:
    - Power Switch
    - Bluetooth Switch
  - User-controllable speaker (audio tone indication)
- Supports several cryptographic algorithms (Upon Request) such as AES, DES, and 3DES
- USB Firmware Upgradeability[1]
- Supports Android™ 4.4 and later[2]
- Supports iOS 8.0 and later[3]
- Compliant with the following standards:
  - EN 60950/IEC 60950

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[1] Applicable under PC-linked mode
[2] Uses an ACS-defined Android Library
[3] Uses an ACS-defined iOS Library

- ISO 7816
- ISO 14443
- ISO 18092
- EMV® Levels 1 and 2
- Mastercard® Contactless
- Visa payWave®
- Bluetooth®
- PC/SC
- CCID
- CE
- FCC
- RoHS 2
- REACH
- TELEC (Japan)
- Microsoft® WHQL

3.0. Typical Applications

- e-Government
- e-Healthcare
- e-Purse and Loyalty
- Mobile Banking and Payment
- Network Security
- Access Control
- Public Key Infrastructure

4.0. Technical Specifications
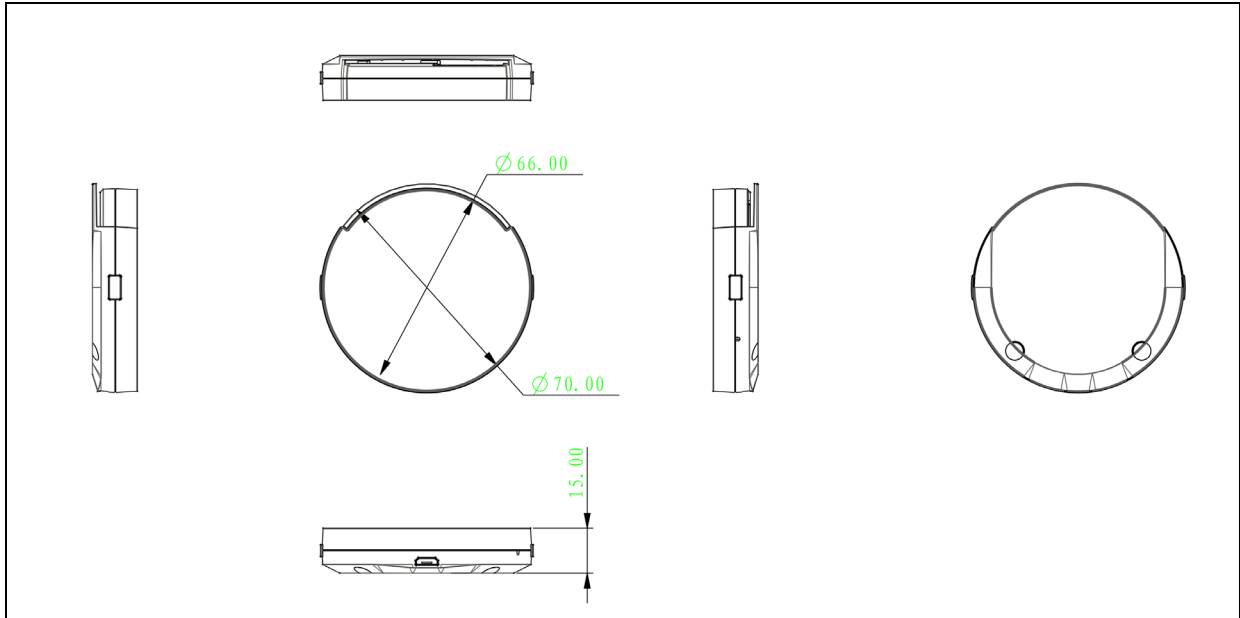
Physical Characteristics	
Dimensions	70 mm (L) × 70 mm (W) × 15 mm (H)
Weight	50.8 g (70.8 g with cable ± 5 g tolerance)
Color	White

Bluetooth Interface	
Protocol	Bluetooth (Bluetooth Low Energy/Bluetooth 4.1)
Power Source	Rechargeable Lithium-ion Battery (charging through USB)
Speed	1 Mbps

USB Host Interface	
Protocol	USB CCID
Connector Type	Micro-USB
Power Source	From USB port
Speed	USB Full Speed (12 Mbps)
Supply Voltage	5 V
Cable Length	1 m, Detachable

Contact Smart Card Interface	
Number of Slot	1 Full-sized Card Slot
Standard	ISO 7816 Class A, B, C (5 V, 3 V, 1.8 V)
Protocol	T=0; T=1
Supply Current	Max. 50 mA
Smart Card Read/Write Speed	9.6 Kbps – 420 Kbps
Short Circuit Protection	(+5) V/GND on all pins
Clock Frequency	4.80 MHz
Card Connector Type	ICC Slot 0: Contact
Card Insertion Cycles	Min. 100,000

Contactless Smart Card Interface	
Standard	ISO/IEC 18092 NFC, ISO 14443 Type A & B, MIFARE®, FeliCa
Protocol	ISO 14443 T=CL for ISO 14443-4–compliant cards
	T=CL Emulation for MIFARE Classic®, ISO 18092, FeliCa and NFC tags
Operating Frequency	13.56 MHz
Operating Distance	Up to 60 mm (depending on tag type)
Smart Card Read/Write Speed	106 Kbps, 212 Kbps, 424 Kbps
Antenna Size	approx. 62mm in Diameter

Built-in Peripherals	
LED	4 User-controllable single-color LED: Green
	1 Charging Status LED: Red
	1 Bluetooth Status LED: Blue
Button	Power Switch
	Bluetooth Switch
Speaker	Audio Tone Indication

Other Features
Firmware Upgrade .... Supported (upgradeable through USB Interface)

Application Programming Interface
PC-linked Mode............................. PC/SC
.... CT-API (through wrapper on top of PC/SC)

Operating Conditions
Temperature .... 0°C – 60°C
Humidity .... Max. 90% (non-condensing)
MTBF .... 220,000 hrs

Certifications/Compliance
EN 60950/IEC 60950, ISO 7816, ISO 14443, ISO 18092, USB Full Speed, Bluetooth®, EMV® Levels 1 and 2, Mastercard® Contactless, Visa payWave®, PC/SC, CCID, CE, FCC, RoHS 2, REACH
TELEC (Japan), Microsoft® WHQL

Device Driver Operating System Support
Windows® XP, Windows Vista®, Windows® 7, Windows® 8, Windows® 8.1, Windows® 10
Windows® Server 2003, Windows® Server 2008, Windows® Server 2008 R2, Windows® Server 2012,
Windows® Server 2012 R2, Windows® Server 2016
Linux®, Mac OS®, Android™[4], iOS[5]

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MIFARE and MIFARE Classic are registered trademarks of NXP B.V. and are used under license.
VISA payWave is a registered trademark of Visa International Service Association.

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[4] *4.4 or later Android version is required for Bluetooth 4.0*

[5] *8.0 and later iOS version is required*