



Advanced Card Systems Ltd.
Card & Reader Technologies

AMR220-C1 ACS Secure Bluetooth[®] mPOS Reader



Technical Specifications v1.03



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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 ACS Secure Bluetooth® mPOS reader, which can support EMV® chip-enabled contact cards, contactless cards, and most mobile NFC devices.

1.1. Smart Card Reader

The 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™. The 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, the AMR220-C1 is extremely portable and convenient for use anytime, anywhere.



1.3. Firmware Upgradeable Feature

The 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

The 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

The 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 50 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 Upgradeability¹
- Supports Android™ 4.4 and later²
- Supports iOS 8.0 and later³
- Compliant with the following standards:
 - EN 60950/IEC 60950

¹ Applicable under PC-linked mode

² Uses an ACS-defined Android Library

³ Uses an ACS-defined iOS Library



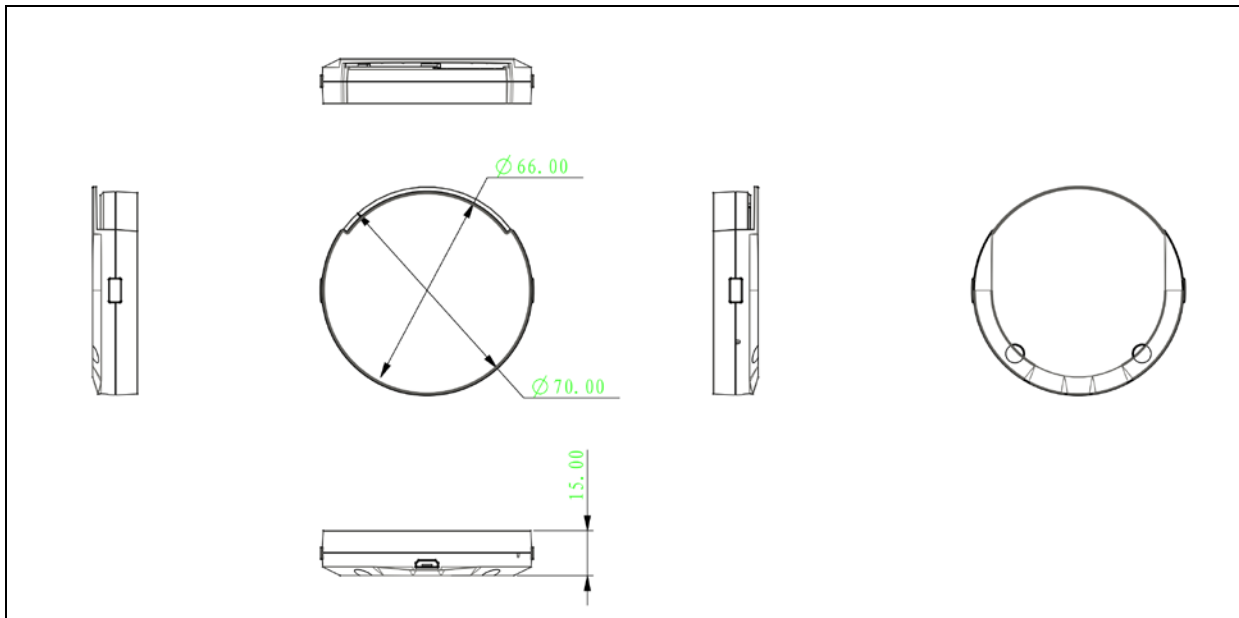
- ISO 7816
- ISO 14443
- ISO 18092
- EMV® Levels 1 and 2
- Mastercard® Contactless
- Visa payWave®
- Bluetooth®
- PC/SC
- CCID
- CE
- FCC
- RoHS 3
- REACH
- MIC (Japan)
- Microsoft® WHQL



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) x 70 mm (W) x 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 – 600 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 50 mm (depending on tag type)
Smart Card Read/Write Speed 106 Kbps, 212 Kbps, 424 Kbps, 848 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

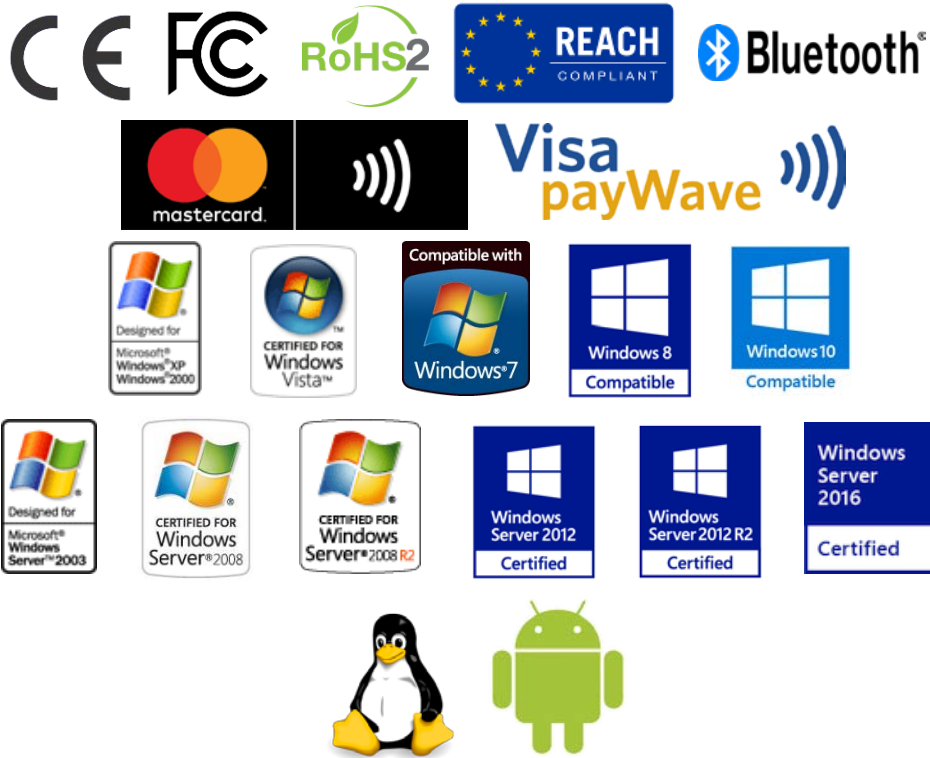
Temperature..... 0°C – 60°C⁴
Humidity Max. 80% (non-condensing)
MTBF 220,000 hrs

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 3, REACH MIC (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™⁵, iOS⁶



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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.

⁴ Charging Temperature: 0°C – 45°C
⁵ 4.4 or later Android version is required for Bluetooth 4.0
⁶ 8.0 and later iOS version is required