AMR220-C1
Secure Bluetooth®
mPOS Reader

Technical Specifications v1.01
# Table of Contents

1.0. **Introduction** ............................................................................................................... 3
1.1. Smart Card Reader ........................................................................................................ 3
1.2. Compact Design .......................................................................................................... 3
1.3. Firmware Upgradeable Feature .................................................................................. 3
1.4. Secure Bluetooth® Connectivity ............................................................................... 3
1.5. Ease of Integration ...................................................................................................... 3
2.0. **Features** .................................................................................................................. 4
3.0. **Typical Applications** ............................................................................................... 6
4.0. **Technical Specifications** .......................................................................................... 7
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
- Supports Android™ 4.4 and later
- Supports iOS 8.0 and later
- 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 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
- **Clock 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
- **Power Switch**: 1 Charging Status LED: Red
- **Button**: 1 Bluetooth Status LED: Blue
- **Speaker**: Bluetooth Switch
- **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
Linux®, Mac OS®, Android™ 4, iOS®

Android and Android Pay are trademarks of Google Inc.
Apple Pay and Mac OS are trademarks of Apple Inc., registered in the U.S. and other countries.
The Bluetooth® word, mark and logos are registered trademarks owned by Bluetooth SIG, Inc. and any use of such marks by Advanced Card Systems Ltd. is under license. Other trademarks and trade names are those of their respective owners.
EMV® is a registered trademark or trademark of EMVCo LLC in the United States and other countries.
Linux® is the registered trademark of Linus Torvalds in the U.S. and other countries.
Mastercard is a registered trademark, and the circles design is a trademark of Mastercard International Incorporated.
Microsoft, Windows, and Windows Vista are either registered trademarks or trademarks of the Microsoft Corporation in the United States and/or other countries.
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 4.4 or later Android version is required for Bluetooth 4.0
5 8.0 and later iOS version is required