



Advanced Card Systems Ltd.
Card & Reader Technologies

APG8201 PINhandy 1



Technical Specifications V2.03



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1.0. Introduction



As technology becomes more sophisticated, fraud-related incidents in banking sector becomes more prevalent. These occurrences generate billions of dollars worth of losses and bring distress among credit and debit cardholders. Certain security measures and systems are created specifically to protect cardholders from frauds, which makes the APG8201 PINhandy 1 a reliable tool to fight these occurrences.

1.1. What is APG8201 PINhandy 1?

APG8201 PINhandy 1 is a portable, low-cost, and hand-held smart card device which supports PC-linked and standalone modes to perform various authentication applications. It is capable of managing One-Time Passwords (OTP), Challenge-Response Authentication Codes, and Transaction Data Signing (Public Key Infrastructure digital signatures) based on the security keys stored in the EMV™ (Europay, MasterCard®, and Visa®) cards.

1.2. How does APG8201 PINhandy 1 work?

The APG8201 PINhandy 1 uses a two-level authentication process which requires the cardholder to insert the EMV card into the device and enter a Personal Identification Number (PIN) using the built-in PIN-pad. APG8201 PINhandy 1 then generates a dynamic one-time password on the display screen which can be used to log-in before performing several transactions like online transactions, banking logons and telephone orders.

1.3. How is APG8201 PINhandy 1 secure?

APG8201 PINhandy 1 is compliant with major banking, computing and safety standards such as MasterCard® Chip Authentication Program (CAP), MasterCard® Advanced Authentication for Chip (AA4C/PLA), VISA® Dynamic Passcode Authentication (DPA) and EMV™ Level 1 (Contact). It is specially designed to safeguard users from the emerging fraud attacks like Card-not-Present (CNP) fraud and emerging Man-in-the-Middle (MitM) attacks. It also provides proof that a card is present during an OTP process.

Likewise, APG8201 PINhandy 1 supports Secure PIN Entry (SPE), to assure safe PIN entry and PIN change while in PC-linked mode. The PIN is securely entered on the device rather than the vulnerable personal computer or workstation, hence eliminating the possibility of a virus (Trojan) getting hold of the PIN.

1.4. How can APG8201 PINhandy 1 help save money?

Banks can now distribute APG8201 PINhandy 1 most efficiently in bulk/volume to individual customers without the concern of handling sensitive data. More importantly, complicated device issuance or re-issuance strategy is no longer needed, hence the overall implementation cost is lowered. And since the APG8201 PINhandy 1 also works as a standalone device, no specialized programming is required.



2.0. Features

- Handheld device with compact and portable design
- Dual Operation Modes:
 - PC-linked
 - Standalone
- USB Powered (PC-linked Mode):
 - USB 2.0 Full Speed Interface
 - CCID-compliant
 - Application Programming Interface:
 - Supports PC/SC
 - Supports CT-API (through wrapper on top of PC/SC)
 - Supports PPS (Protocols and Parameters Selection)
 - Supports PC/SC 2.01 Part 10 Secure PIN Entry (SPE)
- Standalone Operation:
 - Supports OTP, Challenge-Response and Transaction Data Signing Modes
 - Two CR2032 batteries for power
 - Intelligent Battery Management – Life expectancy of five years (depending on usage)
- Smart Card Reader:
 - Supports full-sized microprocessor cards (T=0, T=1 Protocols)
 - Supports ISO 7816 Class A cards
 - Allows semi-insertion of cards
 - Short Circuit Protection
- Built-in Peripherals:
 - Graphical LCD for logos and multiple-language characters
 - Monotone buzzer
 - Durable tactile keypad with 20 silicone rubber keys
 - Key symbol on LCD to recognize SPE mode
- Value-added Calculator and e-Purse Function
- Supports Android™ 3.1 and later
- Compliant with the following standards:
 - ISO 7816
 - USB Full Speed
 - EMV™ Level 1 (Contact)
 - MasterCard® Chip Authentication Program (CAP)
 - MasterCard® Advanced Authentication for Chip (AA4C/PLA)
 - VISA® Dynamic Passcode Authentication (DPA)
 - PC/SC
 - CCID
 - CE
 - FCC
 - RoHS 2
 - FIPS 201 (USA)
 - Microsoft® WHQL



The figure below shows the various features of the APG8201:

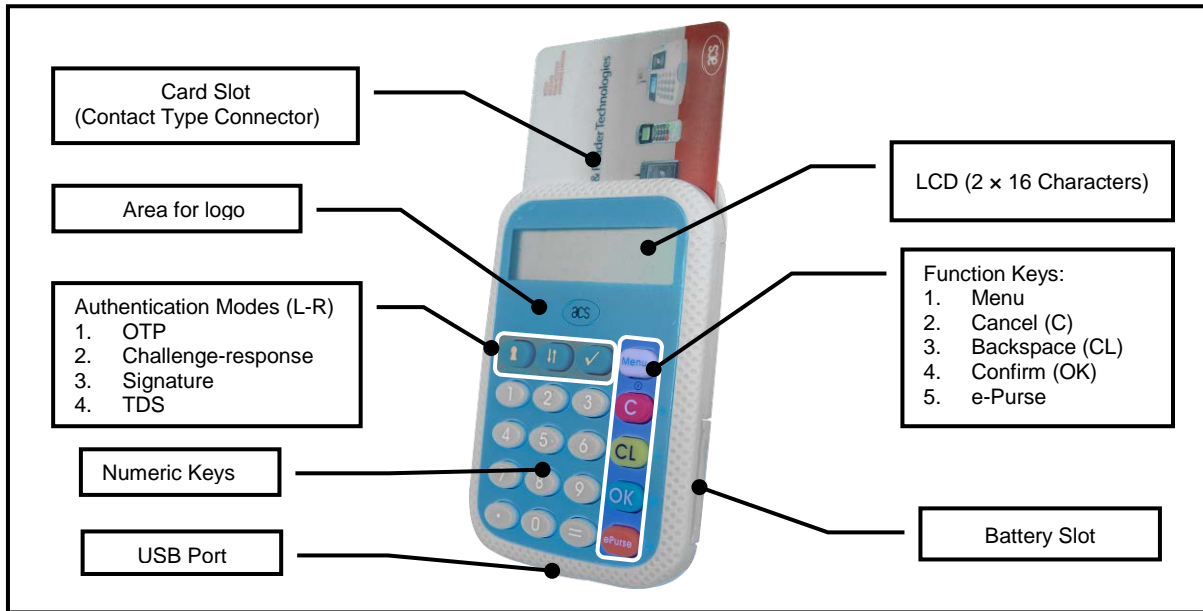


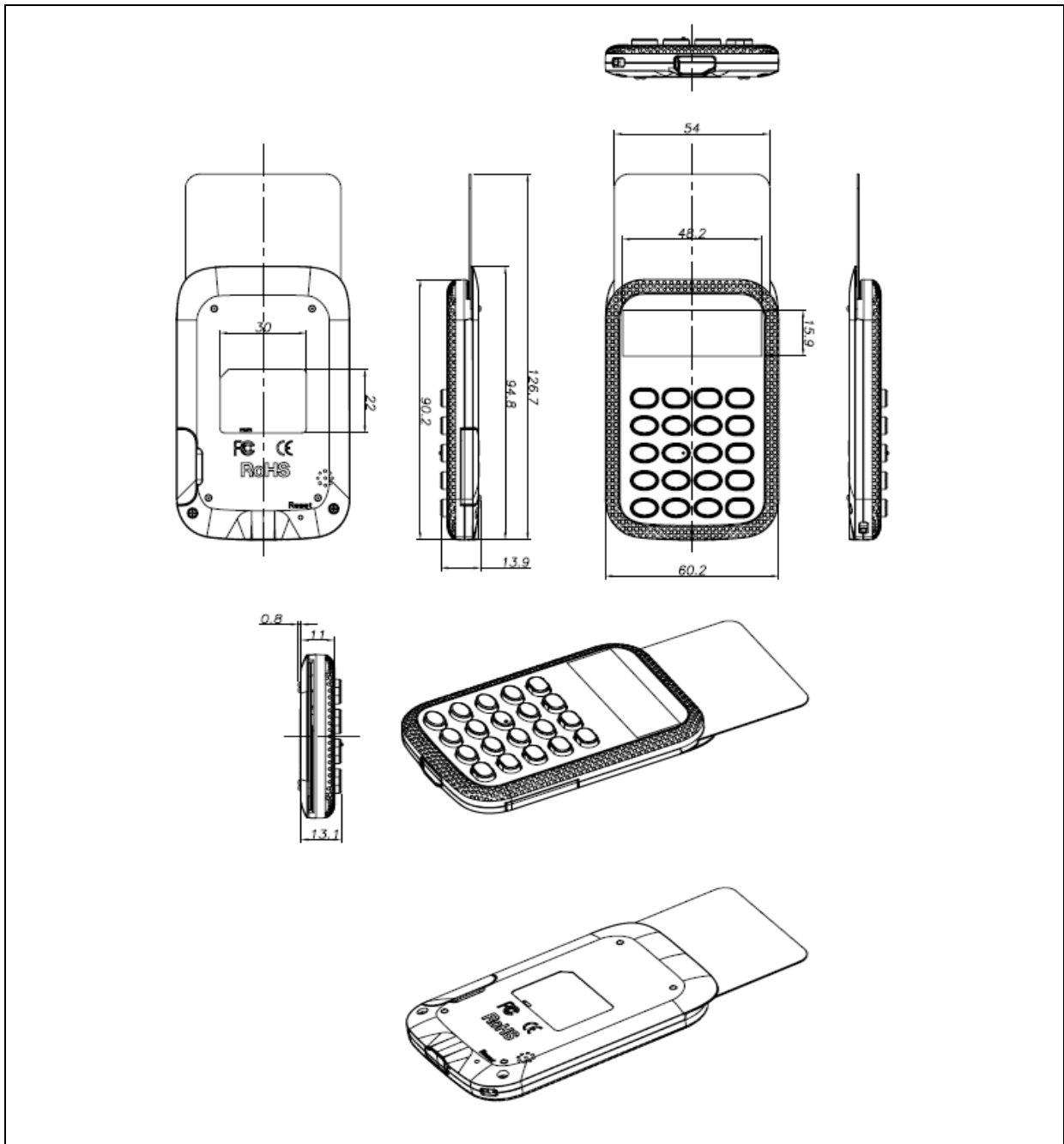
Figure 1: APG8201 Features



3.0. Typical Applications

- e-Banking and e-Payment
- e-Government
- e-Healthcare
- e-Purse and Loyalty
- Dynamic One-Time Password
- Remote Authentication
- Digital Signature
- Transportation

4.0. Technical Specifications



Physical Characteristics

Dimensions 95 mm (L) x 60 mm (W) x 11 mm (H)
 Weight 49 g (with batteries)
 Color White with blue cover

Standalone Mode

Power Source 2 x CR2032 batteries (replaceable)

USB Host Interface

Protocol USB CCID
 Connector Type Standard Type A
 Power Source From USB Port
 Speed USB Full Speed (12 Mbps)
 Supply Voltage 5 V
 Supply Current Max. 50 mA
 Cable Length 1.5 m, Detachable



Contact Smart Card Interface

Number of Slots	1 Full-sized Card Slot
Standard	ISO 7816 Class A (5 V)
Protocol	T=0; T=1; Memory Card Support
Supply Current	Max. 50 mA
Smart Card Read/Write Speed.....	1.743 Kbps – 250 Kbps
Short Circuit Protection	(+5) V/GND on all pins
Clock Frequency	2 MHz
Card Connector Type.....	ICC Slot 1: Contact
Card Insertion Cycles	Min. 100,000

Built-in Peripherals

LCD.....	Graphical LCD for logos and multiple-language characters
.....	Resolution: 128 pixels x 24 pixels
.....	Number of characters: 6 Chinese/16 alphanumeric characters x 1 line
Buzzer	Monotone
Keypad.....	20 keys

Other Features

Functions	Built-in Calculator
.....	e-Purse

Application Programming Interface

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

Operating Conditions

Temperature.....	0 °C – 50 °C
Humidity	Max. 90% (non-condensing)
MTBF	60,000 hrs

Certifications/Compliance

ISO 7816, USB Full Speed, EMV™ Level 1 (Contact), MasterCard® CAP, MasterCard® AA4C/PLA, Visa® DPA, PC/SC, CCID, CE, FCC, RoHS 2
FIPS 201 (USA), Microsoft® WHQL

Device Driver Operating System Support

Windows® 2000, 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
Linux®, Mac OS®, Android™ 3.1 and later



Android is a trademark of Google Inc.
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