Advanced Card Systems Ltd.
Card & Reader Technologies

ACR330 Validator with QR code Scanner

Technical Specifications V1.00

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1.0. Introduction

The ACR330 Bus Validator is designed specifically for Automatic Fare Collection (AFC) systems to offer the convenience of cashless payment in buses, ferries, trams, railways and other transportation modes.

The bus validator enables high-speed transaction processing and records collection through 13.56 MHz contactless (RFID) technology. It supports ISO 14443 Type A and B cards, MIFARE®, and FeliCa. Being certified with major payment standards such as PBOC Level 1 (Contactless) and EMV™ Levels 1 and 2 (Contactless) including MasterCard® Contactless and Visa PayWave® offers flexibility to adapt to an open loop payment system. An embedded barcode scanner enables transactions through the use of print or mobile barcodes.

It has advanced wireless connectivity options for data transfer such as GSM/GPRS, 3G/4G, and Wi-Fi. With an optional GPS feature, it can also locate vehicles, manage fleets and set flexible distance-based fares. Protecting the bus validator from harsh environments is its IP54 rating for dust and water protection and the additional Military Standard MIL-STD-810 for Shock and Vibration.

2.0. Features

- 32-bit Processor running Linux® 4.4
- 900 MB Flash and 512 MB RAM
- UPS via SuperCap (5 second interval after primary power source is lost)
- Military Standard MIL-STD-810 for Shock and Vibration
- IP54 Rating for Dust and Water Protection
- Expandable Micro SD Card support with memory from 1 GB up to 32 GB
- Connectivity Options:
  - USB Host
  - Serial Port
  - Ethernet Port
  - Wi-Fi
  - GPRS/GSM, 3G, and 4G[1]
  - Ethernet
  - Bluetooth 4.0 Dual Mode
  - GPS[2]
- Smart Card Interface:
  - Contactless Interface:
    - Read/Write speed of up to 424 Kbps
    - Built-in antenna for contactless tag access, with card reading distance of up to 50 mm (depending on tag type)
    - Supports ISO 14443 Part 4 Type A and B cards, MIFARE Classic®, and FeliCa
    - Built-in anti-collision feature (only one tag is accessed at any time)
  - SAM Interface:
    - Four SAM-sized Card Slots
    - Supports ISO 7816 Class A, B, and C (5 V, 3 V and 1.8 V) cards
  - SIM Interface:
    - One SIM-sized Card Slot for GPRS/3G/4G connectivity
- Built-in-Peripherals
  - 4.3-inch Easy-to-Read, TFT Colored LCD
  - Capacitive Type Touch Panel
  - Barcode Scanner (Linear/2D)[3]
  - Real-time Clock (RTC) with independent backup battery
  - 6 LED Status Indicators (Front: Blue, Orange, Green, and Red; Back: Green and Red)
  - User-controllable buzzer

[1] *Please see Appendix A for a more detailed frequency band support; Can be optional*
[2] *Can be optional*
[3] *Can be optional*

- Compliant with the following standards:
  - ISO 14443
  - EMV® Levels 1 and 2 (Contactless)
  - PBOC Level 1 (Contactless)
  - MasterCard® Contactless
  - Visa payWave®
  - CE
  - FCC
  - REACH
  - RoHS

3.0. Typical Applications

- e-Banking and e-Payment
- Transportation
- Access Control

4.0. Technical Specifications

Physical Characteristics	
Dimensions	Main Body: 245 mm (H) x 135 mm (W) x 91mm (T)
	With Back Mount: 245 mm (H) x 135 mm (W) x 159mm (T)
Weight	Main Body: 1.08kg
	With Back Mount: 1.88kg
Case Color	Grey and Black
Pole Support	31mm, 32mm, 35mm (Both Vertical and Horizontal)
Processor	
ARM Cortex-A8 1GHz Processor	
Operating System	
Linux 4.4	
Memory	
Flash	900 MB (available for user)
RAM	512 MB
Tamper Protected Memory	32KB (for sensitive data storage with API provided)
Power	
Power Source	External Power Adapter (9 V – 36 V)
SuperCap UPS	5 seconds with full function after primary power source is lost
Connectivity	
USB Host	2.0 Full Speed
Serial Port	RS-232 x 1, RS-485 x 1
GPS[4]	Supported with internal antenna (external antenna port available)
Wi-Fi	IEEE 802.11 b/g/n
Cellular[5]	4G/3G/GPRS
Ethernet	Built-in 10/100-base-T Ethernet
Bluetooth	Bluetooth 4.0 Dual Mode

[4] *Can be optional*

[5] *Can be optional*

Contactless Smart Card Interface	
Standard	ISO 14443 A & B, Parts 1-4, MIFARE Classic®, MIFARE DESFire®, MIFARE Ultralight®, MIFARE Ultralight C®, MIFARE Plus®, FeliCa, Calypso
Protocol	MIFARE Classic Card Protocol, T=CL
Operating Frequency	13.56 MHz
Operating Distance	Up to 50 mm
SAM Card Interface	
Card Connector Type	Contact
Standard	ISO 7816 Class A, B and C (5 V, 3 V, 1.8 V), T=0 and T=1
Number of Slots	Four (4) SAM Slots, ID-000
Built-in Peripherals	
Buttons	4 back-lit buttons
LCD Display	4.3-in TFT-LCD, 480 x 272 Colors
Touch Panel	Capacitive Type
Audio Speaker	3W Speaker, Buzzer
	Around 80 dB in 1 m distance
LED Indicators	Front: Blue, Orange, Green, Red
	Back: Green, Red
Memory	MicroSD memory card expansion slot
	Supports MicroSD memory card from 1 GB to 32 GB
Temperature Sensor	Supported
Barcode Scanner[6]	
Linear	Code 128, EAN, Code 39, UPC, Code 2 of 5, Interleaved 2 of 5, Codabar, etc
2D	PDF417, Data Matrix, QR Code
Illumination	White LED
Supported Print Materials	Paper, Mobile phones and Tablets
Other Features	
Security	Tamper Switch (internal anti-intrusion detections and protection)
Real-time Clock	Supported
Firmware Upgrade	Supported
Operating Conditions	
Operating Temperature	-20 °C – 60 °C
Storage Temperature	-30 °C – 80 °C
Humidity	90 % max, non-condensing
Shock and Vibration	Military Standard MIL-STD-810
Protection from dust & water	IP54
Certifications/Compliance	
ISO 14443, EMV® Levels 1 & 2 (Contactless), PBOC Level 1 (Contactless), MasterCard® Contactless, Visa payWave®, CE, FCC, REACH, RoHS	

[6] *Can be optional*

Appendix A. Frequency Band Support

<table>
<tr><th colspan="3">ACR330-A1 (US 4G Module)</th></tr>
<tr><td></td><td>3G: UMTS / HSPA+</td><td>4G: FDD-LTE</td></tr>
<tr><td></td><td>Band 2: 1900 MHz (PCS)</td><td>Band 2: 1900 MHz (PCS)
Band 4: 1700 MHz (AWS)</td></tr>
<tr><th colspan="3">ACR330-A4 (EU 4G Module)</th></tr>
<tr><td>2G: GPRS / EDGE / GSM</td><td>3G: UMTS / HSPA+</td><td>4G: FDD-LTE</td></tr>
<tr><td rowspan="3">900 MHz
1800 MHz</td><td rowspan="3">Band 1: 2100 MHz (IMT)
Band 8: 900 MHz (E-GSM)</td><td>Band 1: 2100 MHz (IMT)
Band 3: 1800 MHz (DCS)
Band 7: 2600 MHz (IMT-E)
Band 8: 900 MHz (E-GSM)</td></tr>
<tr><td>4G: TDD-LTE</td></tr>
<tr><td>Band 38: 2600 MHz (IMT-E)
Band 40: 2300 MHz
Band 41: 2500 MHz</td></tr>
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