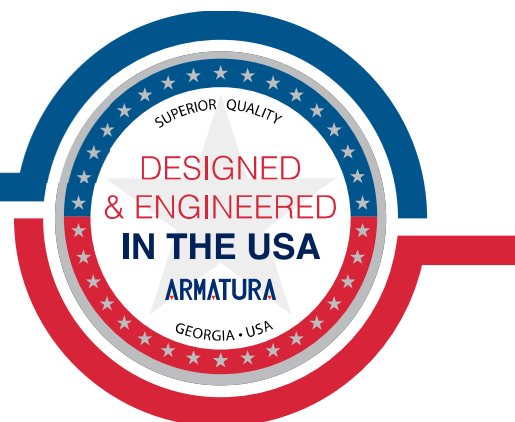


Architecture and Engineering Specifications

EP20 Series All Weather Outdoor
Multi-Tech Smart Reader



Bluetooth™



NFC



OSDP



IP68



IK07/10



All trademarks, logos and brand names are the property of their respective owners.

Address: 190 Bluegrass Valley Parkway Alpharetta, GA 30005

Email: sales@armatura.us

Date: 2 May 2023

Version Number: Version 1.0

Table of Contents

Section 1	3
1. Purpose	3
2. Goals And Objectives	3
3. Key Features and Requirements	3
4. Design And Implementation Constraints	4
5. Existing Standards and Regulations	5
6. Submittals	5
7. Qualifications	5
8. Warranty	5
Section 2	6
Key Features and Requirements	6
Maintenance and Support	8
Documentation	9
Technical Specifications	10
Armatura Card Modules Supporting List	12
Installation and Configuration	14
Warranty and Support	14
Training and Documentation	14

Section 1

1. Purpose

This architecture and engineering specifications document (A&E) outlines the minimum requirements for the design, supply, installation, and commissioning of the EP20C/ CK/ CQ/ CKQ multi-tech smart reader.

2. Goals And Objectives

This A&E specification aims to achieve the following goals and objectives:

- Provide a highly secure and reliable multi-tech smart reader with advanced authentication and access control capabilities.
- Ensure scalability and flexibility to accommodate varying user and system requirements.
- Meet or exceed relevant industry standards and regulations.
- Provide a clear and detailed specification for the design, supply, installation, and commissioning of the EP20C/ CK/ CQ/ CKQ multi-tech smart reader.

3. Key Features and Requirements

The EP20C/ CK/ CQ/ CKQ multi-tech smart reader shall have the following key features and requirements:

- Mobile credential capability for access control on both iOS and Android platforms. With the Armatura ID mobile app that supports NFC and Bluetooth, allowing users to easily open doors by presenting your smartphone to the reader, extending mobile access functions to almost all smartphone users.
- Supports Open Supervised Device Protocol (OSDP) for secure communication between the control panel and reader.
- Utilizes certified crypto chips with EAL6+ certification for advanced data protection.
- AES-128 end-to-end encryption for secure communication between the control panel and reader.
- Supports multi-tech reading including 125kHz, 13.56MHz and 2.4GHz Bluetooth frequency credentials.

- EP20CQ and EP20CKQ has QR-code scanner with an active pixel array area: 648*488. Also, it has a QR Code scan angle of 66° (Horizontal) and 50° (Vertical). The QR Code scanning print contrast includes 25% minimum reflectance difference rotation, pitch, skew: 360° , +/-40° and +/-60° .
- Supports over 100 card types, covering most of the common card formats in the market.
- Compact mullion mount design with optional gang box (Single gang, European gang and Asian gang box).
- Compliant with FCC, CE, RoHS3.0, WEEE and UL294 standards.
- Housing material made of Polycarbonate, and it is strictly UL94-V0 compliant.
- IK10 Vandal-proof and IP68 waterproof & dustproof protection levels enable operation under any installation environment.
- User management and access control capabilities.
- The system shall comply with GDPR privacy standards.

4. Design And Implementation Constraints

- The design and implementation of the EP20C/ CK/ CQ/ CKQ multi-tech smart reader shall adhere to the following constraints:
- The design shall be scalable and flexible to accommodate varying user and system requirements.
- The implementation shall be done by trained installers who have been certified by the manufacturer.
- The implementation shall comply with relevant standards and regulations.
- The implementation shall ensure high-level cybersecurity to protect against unauthorized access or data breaches.

5. Existing Standards and Regulations

The EP20 series shall comply with the following standards and regulations:

- OSDP V2.2 Standards
- Bluetooth 5.2 Standards
- FCC Standards
- CE Standards
- UL294 Standards
- RoHS3.0 Standards
- WEEE Standards

6. Submittals

The following submittals shall be provided by the manufacturer.

- Product data sheets
- Installation manuals
- Operation manuals
- Test reports

7. Qualifications

The manufacturer shall have the following qualifications:

- ISO 9001, ISO27001, ISO27701, ISO27017, CMMI5 certification.
- Minimum of 5 years' experience in producing access control equipment

8. Warranty

The manufacturer shall provide a limited 36-month warranty for the product to be free of defects in material and workmanship.

SECTION 2

Key Features and Requirements

Key Features

1. Multi-tech RFID & Mobile Credential
 - Supports over 100 RFID card types and both mobile NFC and Bluetooth (Low Energy).
2. Support Multi-card Types
 - The standard package supports over 100 RFID card types, with optional modules available to cover an additional over 100 secured RFID protocols. This provides high flexibility for multi-card types and mobile credential situations, satisfying most end-user requests.
3. Dynamic QR Code (EP20CK & EP20CKQ) Supports dynamic QR code reading for enhanced security and verification. When used with the Armatura mobile credential application, Armatura ID, the QR code mode can generate a dynamic QR code on the app that automatically regenerates every 3 seconds to prevent security leaks. The dynamic QR code is encrypted using the AES256 standard for added security. This feature allows for a seamless and secure verification process.
4. IP68 waterproof & dustproof protection level.
5. IK10 vandal-proof rating enables protection from multiple attacks up to 20 joules. IK07 for EP20CQ & EP20CKQ, IK10 for EP20C & EP20CK.
6. Anti-SPA/ DPA/ EMA/ DEMA Attack.
7. Housing material meets UL 94V-0 Standard.
8. Provides three mobile identification modes when using the Armatura ID mobile App across the iOS and Android systems on smartphones.

The card mode presents your smartphone to the reader like an access card. The remote mode conducts the verification on the reader by clicking a button in the Armatura ID App. Present your QR Code and get access and activated and paired up with reader for fully automated door access in the express mode.

9. Operating Frequency: 125kHz, 13.56MHz: ISO14443 types A & B, ISO15693, 2.4GHz Bluetooth® and QR code.
10. For communications and panel connection, it offers Wiegand and adopts OSDP (v2.2) via RS-485 (up to 128bits SCP Secure Communication).

11. 13.56MHz & 125kHz multi-tech card reading distance is up to 60mm (depending on the environment and transponder).
12. Bluetooth Smartphone reading distance is up to 10m (configurable on each reader).
13. Adopts AES128 for data protection between reader & controller communication.
14. Provides RGB LED visual indicators and it is configurable by 'Armatura Connect' mobile App.
15. The EP20C series is compatible with Asian, European and single-gang installations or any flat surface mounting.
16. The EP20C series can fully operate at -30°C to 70°C (-22°F - 158°F), which ensures operation under extreme weather conditions.
17. The EP20C series casing material is compliant with the UL94-V0 standards for flammability, ensuring burning combustion is not sustained for more than 10 seconds after applying a controlled flame.
18. A tamper switch with magnetic tamper detection system.
19. Power supply at 9 VDC to 24 VDC.
20. The dimension is 3.54" in width, 4.24" in height and 0.93" in depth (89.8 x 107.8 x 23.6 mm).

Maintenance and Support

The EP20 series shall be supported by a comprehensive support program, which shall include the following:

- Regular software updates and security patches.
- Technical support via phone and email.
- Spare parts availability.
- Training for system administrators and end-users.

Documentation

The supplier shall provide the following documentation for the EP20 series:

- User manual
- Installation guide
- Technical specifications
- Software release notes

Technical Specifications

Dimensions



Specifications

Specifications				
Internal Number	EP20C	EP20CK	EP20CQ	EP20CKQ
Operating Frequency / Standards	125 kHz 13.56 MHz: ISO14443 types A & B, ISO15693 2.4 GHz Bluetooth®			
Functions	RFID, Bluetooth® and QR code			
Keypad	N/A	Touch Keypad	N/A	Touch Keypad
QR Code Scanner	N/A		Supported	
QR Code Scanning Pattern	N/A		Area image (648°488 pixel array)	
QR Code Scan Angle	N/A		Horizontal: 66°/ Vertical: 50°	
QR Code Scanning Print Contrast	N/A		Print Contrast: 25% minimum reflectance difference Rotation, Pitch, Skew: 360°, +/-40°, +/-60°	
QR Code Capability	One-Dimensional Code: UPC-A, UPC-E, UPC-E1, EAN-8, EAN-13, EAN-14, EAN-128, UCC128, ISBN1SSN, CODE11, CODE32, CODE39, CODE39 Full ASCII, CODE93, CODE128, Interleaved 2 of 5 code, Industrial 2 of 5 code, Matrix 2 of 5 code, Toshiba code, UK/Plessey, GS1			
	Two-Dimensional Code: QR code, PDF417, Data matrix, MicroPDF417, Aztec			
QR Code Scanning Performance*	N/A	Narrow Width		Depth of Field
		6.0 mil (Code128)		2.0"-3.1" (5cm-8cm)
		9.0 mil (Code128)		2.0"-4.7" (5cm-12cm)
		15.0 mil (Code128)		2.3"-7.7" (6cm-19.5cm)
		20.0 mil (Code128)		2.3"-9.8" (6cm-25cm)
		6.0 mil (QR)		2.0"-2.3" (5cm-6cm)
		9.0 mil (QR)		2.0"-3.5" (5cm-9cm)
		15.0 mil (QR)		2.0"-6.3" (5cm-16cm)
20.0 mil (QR)		2.3"-7.9" (6cm-20cm)		

Internal Number	EP20C	EP20CK	EP20CQ	EP20CKQ
Communications & Panel Connection	Wiegand OSDP (v2.2) via RS-485 (Up to 128bits SCP Secure Communication)			
Reading Distance	13.56MHz & 125kHz: Up to 2.3"/60 mm (depending on environment and transponder) Up to 393.7' / 10m with a Bluetooth Smartphone (configurable distances on each reader)			
Data Protection	AES128 (Secured Communication between Reader & Controller) Secure Data Storage in EAL6+ Certified Crypto Chip			
Visual Indicator	RGB LEDs (Configurable By 'Armatura Connect' Mobile APP)			
Audio Indicator	Internal buzzer with adjustable intensity (Configurable By 'Armatura Connect' Mobile APP)			
Power Requirement / Power Supply	9 VDC to 24 VDC			
Operating Temperature	-22°F - 158°F / -30°C to 70°C			
Dimensions	3.54" W x 4.24" H x 0.93" D (89.8 x 107.8 x 23.6mm)			
Tamper Switch	Magnetic tamper detection system			
Certifications	CE, FCC, RoHs3.0, WEEE, UL294			
Mounting	Suited for Asian / European / single-gang installations or any flat surface mounting			
Protection / Resistance	Weather & Dust Proof Protection Rating compliant with IP68 Reinforced Vandal-proof Structure IK10 certified	Weather & Dust Proof Protection Rating compliant with IP68 Reinforced Vandal-proof Structure IK07 certified	Weather & Dust Proof Protection Rating compliant with IP68 Reinforced Vandal-proof Structure IK10 certified	Weather & Dust Proof Protection Rating compliant with IP68 Reinforced Vandal-proof Structure IK07 certified
UV Stability	Nil structural degradation for the life of the reader in 3 years			
Housing Material	Polycarbonate UL94-V0 & UL746C (F1)			

Remarks:

**Standard version provides "Read only" function. Customization is required for "Read & Write" function.

*This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<http://www.openssl.org/>)

QR scanning performance was resulted in a laboratory testing environment, the luminance was recorded as 250 Lux

Armatura Card Modules Supporting List

ARMATURA ARMATURA RFID Card Module Supporting List ArmaSec-22112022											
Frequency	Classification	Card Module Abbreviation	[DF]	[SFMH]	[NO]	[NP]	[NI]	[NOL]	[NPL]	[NOH]	[NIH]
		Compatible Readers	EP10C/ EP20C/ EP20CK/ EP20CKG/ EP20CKG Series	EP10C/ EP20C/ EP20CK/ EP20CKG/ EP20CKG Series	EP10C	EP10C/ EP20CK/ EP20CKG	EP10C/ EP20CK/ EP20CKG	EP10C	EP10C	EP10C	EP10C
13.56MHz	ISO14443A	LEGIC Advant		✓	✓(1)	✓(1)	✓(1)			✓(1)	✓(1)
		MIFARE Classic, Mini S50, S70, S50	✓(4)	✓	✓	✓	✓			✓	✓
		MIFARE Classic EV1		✓(2)	✓(2)	✓(2)	✓(2)			✓(2)	✓(2)
		MIFARE DESFire Light		✓(11)	✓(11)	✓(11)	✓(11)			✓(11)	✓(11)
		MIFARE DESFire EV1	✓(4)	✓	✓	✓	✓			✓	✓
		MIFARE DESFire EV2	✓(4)	✓(11)	✓(11)	✓(11)	✓(11)			✓(11)	✓(11)
		MIFARE Plus S, X		✓	✓	✓	✓			✓	✓
		MIFARE Pro X			✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		MIFARE Smart MX		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		MIFARE Ultralight		✓	✓	✓	✓			✓	✓
		MIFARE Ultralight C		✓	✓	✓	✓			✓	✓
		MIFARE Ultralight EV1		✓(2)	✓(2)	✓(2)	✓(2)			✓(2)	✓(2)
		NFC (NTAG2xx)	✓		✓	✓	✓			✓	✓
		PayPass		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		SLE44R35		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		SLE66Rxx (my-d move)		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		Topaz			✓	✓	✓			✓	✓
	ISO14443B	HID iCLASS SEOS					✓(20)			✓	✓(20)
		NFC (HCE & NTAG2xx)		✓	✓	✓				✓	✓
		Calypto	✓(3)	✓(3)	✓(3)	✓(3)				✓(3)	✓(3)
		Calypto Innovatron protocol	✓(3)	✓(3)	✓(3)	✓(3)				✓(3)	✓(3)
		CEPAS	✓(3)	✓(3)	✓(3)	✓(3)				✓(3)	✓(3)
		HID iCLASS		✓	✓(1)	✓(1)	✓(10)			✓(1)	✓(10)
		CTS		✓	✓	✓	✓			✓	✓(10)
		Moneo		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(10)
		Pico Pass	✓(4)	✓(4)	✓(4)	✓(4)				✓(4)	✓(4)
		SRI4K, SRI4K4		✓	✓	✓	✓			✓	✓
		SRI512, SRT512		✓	✓	✓	✓			✓	✓
	ISO18092/ ECMA-340	Sony FeliCa		✓(5)	✓(5)	✓(5)	✓(5)			✓(5)	✓(5)
		EM4x33		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
	ISO15693	EM4x35		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		HID iCLASS		✓	✓(1)	✓(1)	✓(10)			✓(1)	✓(10)
		HID iCLASS SE/ SR/ Elite		✓	✓(1)	✓(1)	✓(10)			✓(1)	✓(10)
		iCODE SLI		✓	✓	✓	✓			✓	✓(10)
		LEGIC Advant		✓(1)	✓(1)	✓(1)	✓(1)			✓(1)	✓(1)
		M24LR16/64		✓	✓	✓	✓			✓	✓
		MB89R118/119			MT2, MT3, Nano, Palon, Wall, Panel	MT2, MT3, Nano, Palon, Wall, Panel	MT2, MT3, Nano, Palon, Wall, Panel			MT2, MT3, Nano, Palon, Wall, Panel	MT2, MT3, Nano, Palon, Wall, Panel
		SRF55Vxx (my-d vicinity)		✓(3)	✓(3)	✓(3)	✓(3)			✓(3)	✓(3)
		Tag-It		✓	✓	✓	✓			✓	✓
		Pico Pass			✓(4)	✓(4)	✓(4)			✓(4)	✓(4)
		LEGIC Prime		✓							
		CPU Card									

ARMATURA											
ARMATURA RFID Card Module Supporting List											
Frequency	Classification	Card Module Abbreviation	[DF]	[SFMH]	[NO]	[NP]	[NI]	[NOL]	[NPL]	[NOH]	[NIH]
		Compatible Readers	EP10C/ EP20C/ EP20CK/ EP20CKQ/ EP20CKQK/ EP30 Series	EP10C/ EP20C/ EP20CK/ EP20CKQ/ EP20CKQK/ EP30 Series	EP10C	EP10C/ EP20CK/ EP20CKQ	EP10C/ EP20CK/ EP20CKQ	EP10C	EP10C	EP10C	EP10C
125kHz		AWID			✓	✓	✓	✓	✓		
		Cardax			✓	✓	✓	✓	✓		
		CASI-RUSCO			✓	✓	✓	✓	✓		
		Cotag									
		Deister			✓(6)	✓(6)	✓(6)	✓(6)	✓(6)		
		EM4100, 4102, 4200	✓		✓(7)	✓(7)	✓(7)	✓(7)	✓(7)		
		EM4050, 4150, 4450, 4550			✓	✓	✓	✓	✓		
		EM4305			✓(14)	✓(14)	✓(14)	✓(14)	✓(14)		
		FDX-B, EM4105			✓(15)	✓(15)	✓(15)	✓(15)	✓(15)		
		Ultra Prox			✓(15)	✓(15)	✓(15)	✓(15)	✓(15)		
		G-Prox				✓(6)	✓(6)		✓(6)		
		HID DuoProx II (1336)				✓	✓		✓		
		HID ISO Prox II (1386)				✓	✓		✓		
		HID Micro Prox II (1391)				✓	✓		✓		
		HID Prox III (1346)				✓	✓		✓		
		HID Prox				✓	✓		✓		
		HID Prox II (1326)				✓	✓		✓		
		HITAG 1, 2, S			✓(9)	✓(9)	✓(9)	✓(9)	✓(9)		
		ICT				✓(8)	✓(8)	✓(8)	✓(8)		
		IDTECK			✓	✓	✓	✓	✓		
		Indala									
		ioProx									
		ISONAS			✓	✓	✓	✓	✓		
		Keri			✓	✓	✓	✓	✓		
		Miro			✓	✓	✓	✓	✓		
		Nectap			✓(6)	✓(6)	✓(6)	✓(6)	✓(6)		
		Nexwatch				✓	✓		✓		
		PAC			✓(8)	✓(8)	✓(8)	✓(8)	✓(8)		
		Pyramid			✓	✓	✓	✓	✓		
		QS			✓	✓	✓	✓	✓		
		TS557, TS567, TS577			✓	✓	✓	✓	✓		
		TITAN (EM4050)			✓	✓	✓	✓	✓		
		UNIQUE			✓	✓	✓	✓	✓		
		ZODIAC			✓	✓	✓	✓	✓		
		Globally Available		✓		✓		✓	✓	✓	✓
	Availability	Except for U.S., E.U., Japan, Australia, Canada, U.K., Albania, Iceland, Liechtenstein, Monaco, North Macedonia, Norway, San Marino, Serbia, Switzerland, Turkey, and the United Kingdom	✓		✓	✓	✓				
1) UID only 2) Read /write enhanced security features on request 3) Read /write in direct chip command mode 4) UID only, read/write on request 5) UID + read /write public area 6) Hash value only 7) Only emulation of 4100, 4102 8) On request 9) Without encryption 10) UID+PAC (CSN & Facility Code), read /write on request 11) In preparation 13) EV2/EV3 supported as part of the EV1 upward compatibility 14) From FW V4.05 20) PAC (CSN & Facility Code), read /write on request											

Installation and Configuration

The EP20 series shall be installed and configured in accordance with the following requirements.

- The installation shall be carried out by qualified and experienced personnel in accordance with applicable codes, standards, and regulations.
- The controller shall be configured using the on-board webserver or through software provided by the manufacturer.
- The configuration shall include setting up access levels, user accounts, time schedules, and other relevant parameters.
- The controller shall be tested and commissioned to ensure proper operation and compliance with the specified requirements.

Warranty and Support

The EP20 series shall be covered by a minimum of 36-month manufacturer's warranty that covers defects in materials and workmanship. The manufacturer shall provide remote technical support and assistance to the installer and end-user during the installation and operation of the controller.

Training and Documentation

The manufacturer shall provide the following training and documentation for the EP20 series.

- User manuals and technical documentation for installation, configuration, and operation of the controller.
- Online training courses and videos for system administrators and operators.
- On-site or remote training sessions for system integrators and installers.
- Technical support and assistance for system integrators, installers, and end-users.

*Note Certifications may vary by region and country. Please consult the manufacturer for specific certifications applicable to your location.