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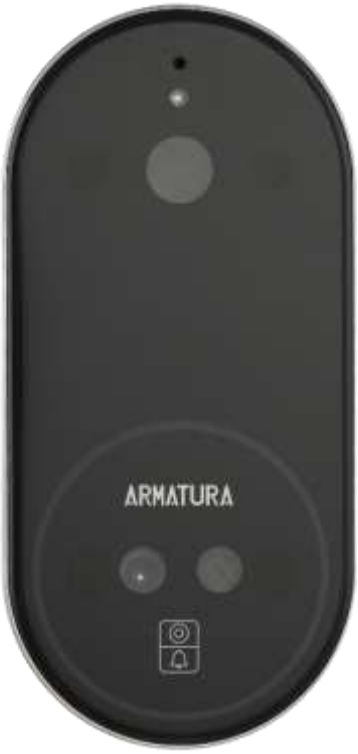
ARCHITECTURAUL & ENGINEERING SYSTEM SPECIFICATIONS

FT10CMQ
All-weather Multi-Tech
Smart Multimodal Biometric Terminal



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Date: 08 August 2024

Version 1.0

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Section 1

1. Purpose

The purpose of this architectural and engineering system specifications (A&E) document are intended to provide a comprehensive guide for the design, implementation, and installation of the FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal.

2. Goals and Objectives

The FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal's A&E document aims to achieve the following goals and objectives:

- Provide a highly secure and reliable multi-tech multimodal biometric terminal, with touchless palm and face authentication.
- Ensure scalability and flexibility to accommodate varying user and system requirements.
- Meet or exceed relevant industry standards and regulations.
- Provide a clear and detailed specifications for the design, supply, installation, and commissioning of the terminal.

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3. Key Features and Requirements

The FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal shall have the following key features and requirements:

- Multi-factor authentication with touchless palm and face authentication, mobile credentials, physical cards and QR code.
- Adopt Armatura's multi-biometric technology which combines touchless palm and face authentication with the unique deep learning algorithm and integrates with advanced biometric methods.
- Combines visible and NIR infrared authentication technology to ensure accuracy with anti-spoofing protection for palm and face authentication.
- Support standard SIP V2.0 for video intercom function, ideal for visitor scenarios. Includes two-way audio streaming with echo and noise cancellation.
- Features a Sleep-and-Wake mode, with a flashing breath light in sleep mode and a highlighted white ring light in wake mode. This reduces unnecessary heat loss, protecting the machine and enhancing long-term performance.
- Supports multi-card types in a standard package with an array of optional RFID modules that cover up to over 10 extra advanced secured RFID protocols.
- Supports 125 kHz and 13.56 MHz frequency credentials and support various card types including EM, MIFARE, DESFire, FeliCa and HID Prox/ iCLASS/ Seos.

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4. Design and Implementation Constraints

The design and implementation of the FT10 CMQ, all-weather multi-tech smart multimodal biometric terminal 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 ensure high-level cybersecurity to protect against unauthorized access or data breaches.

5. Existing Standards and Regulations

The FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal shall comply with the following standards and regulations:

- FCC Standards
- CE Standards
- RoHS Standards
- UL294 (Coming Soon)
-

6. Submittals

The following submittals shall be provided by the manufacturer.

- Product datasheets
- Installation and operation manuals
- Technical support contact information warranty information

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7. Qualifications

The manufacturer shall have the following qualifications:

- ISO27701, ISO27001, ISO9001, ISO14001 certifications.
- Minimum of 5 years' experience in producing access control equipment.

8. Warranty

The manufacturer shall provide a limited 36-month warranty for the all-weather multi-tech smart multimodal biometric terminal to be free of defects in material and workmanship.

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Section 2

1. Key Features and Requirements

1.1 Key Features

i. Multi-factor authentication capability that offers a range of credential options, including touchless palm and face authentication, mobile credentials, physical cards and QR code.

ii. Adopt Armatura's multi-biometric technology which combines touchless palm and face authentication with the unique deep learning algorithm.

iii. Integrates advanced biometric methods, including touchless palm and face authentication, along with QR code scanning for both visitors and employees.

iv. Combines visible and NIR infrared authentication technology to ensure accuracy with anti-spoofing protection.

v. Support standard SIP V2.0 for video intercom function, ideal for visitor scenarios. Includes two-way audio streaming with echo and noise cancellation.

vi. Features a Sleep-and-Wake mode, with a breath light flashing in sleep mode and a highlighted white ring light in wake mode. This reduces unnecessary heat loss, protecting the machine and enhancing long-term performance.

vii. Supports multi-card types in a standard package with an array of optional RFID modules that cover up to over 10 extra advanced secured RFID protocols.

viii. Integrates a variety of technologies, including EM, MIFARE, DESFire, FeliCa and HID Prox/ iCLASS/ Seos.

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ix. Support operating frequency credentials including 125kHz ; 13.56MHz: ISO14443 types A & B, JIS X6319, ISO15693 and 2.4GHz Bluetooth.

x. Support a maximum transaction record of 1,000,000 and support user capacity up to 50,000. With a maximum RFID card capacity of 50,000 ; face capacity maximum at 10,000 (1:N)/ 50,000 (1:1) ; palm capacity maximum at 5,000 (1:N)/ 20,000 (1:1).

xi. The RFID reading distance for 13.56MHz & 125kHz operating frequency credentials is up to 1.96” (50mm), depends on environment and transponder.

xii. The dual camera liveness detection for face authentication distance ranges from 15.7” to 55.1” (400mm to 1,400mm). While the single camera liveness detection for face authentication ranges from 15.7” to 78.7” (400mm to 2,000mm).

xiii. Face authentication supports posture adaptability with Yaw ≤ 30°, Pitch ≤ 30° and Roll ≤45°.

xiv. The true accept rate (TAR) of face authentication equals to 99%. The false accept rate (FAR) is at 0.01%.

xv. The face authentication mode include 1:N and 1:1.

xvi. The speed of face authentication is less than 300ms (field test result).

xvii. Infrared-visible light mode and the infrared light mode supports face authentication liveness detection.

xviii. Support face mask detection.

xix. The liveness detection for palm authentication distance ranges from 7” to 15.7” (180mm to 400mm).

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xx. Palm authentication supports posture adaptability with Yaw ≤ 45°, Pitch ≤ 30°, Roll ≤ 90°, Bend ≤ 30°.

xxi. The true accept rate (TAR) for palm authentication equals 98.7%. False accept rate (FAR) for palm authentication is 0.01%.

xxii. The palm authentication mode includes 1:N and 1:1.

xxiii. The speed of palm authentication is less than 140ms (field test result).

xxiv. Supports infrared light mode for the palm authentication liveness detection.

xxv. Equipped with a QR code scanner with the QR code scanning pattern consist of a 720x1280 pixel array of area image, a scan angle of 37.9° horizontally and 62.9° vertically.

xxvi. Compatible with Armatura ID QR code and static QR code (customizable).

xxvii. The QR code scanning performance of the Armatura ID QR code ranges from 0.5' to 2.05" (12.7mm - 52.07mm), whereas the BioCode ranges from 0.59” to 1.26" (15mm - 32mm).

xxviii. Recommend installation height is at 55” (1400mm) using the plate with tilt angle.

xxix. Recommend installation height is at 59” (1500mm) using the plate with horizontal angle.

xxx. Supports palm and face tracking, which can more intelligently capture the user's biometrics and prevent the user's biometrics from continuing to be compared after verifying.

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xxxi. Equipped with the palm and face automatic exposure function which enables the capture of higher quality images, thereby enhancing the accuracy of authentication.

xxxii. The RFID and biometrics reader interface output voltage ranges from 12V to 24V (equal to primary power input). With a maximum output current at 0.8A.

xxxiii. The RFID and biometrics reader interface supports RS-485 protocol, OSDP (V2.2) secure channel and adopts AES-128 encryption for enhanced security.

xxxiv. The RFID and biometrics reader interface supports OSDP mode with 9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.

xxxv. The RFID and biometrics reader interface supports Wiegand In and Wiegand Out (up to 64 bits).

xxxvi. The RFID and biometrics reader interface is compatible with TCP/IP, RS-485, OSDP and Wiegand standards data inputs.

xxxvii. Support primary power at DC 12V@3A-24V@1.5A ±10%.

xxxviii. Support Power-over-Ethernet (PoE) and complies with IEEE 802.3at standards.

xxxix. Support RS-485 standard/ OSDP Version 2.2 connection.

xl. Equipped with 1.2GHz Quad core ARM processor with 2.4 TOPs NPU ; 2 GB RAM and 16 GB Flash memory.

xli. Featuring the CMOS sensors with 2MP resolution, IR technology with a global shutter CMOS at 1.3MP resolution, IR-CUT functionality with 2MP resolution, and a resolution of 720 x 960 pixels.

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xlii. Connect to the Ethernet network using 10 Base-T or 100 Base-TX speeds automatically, with its auto MDI/MDIX feature.

xliii. Compliant with TLS 1.2 for end-to-end secure communication channel (secured communication between the terminal and server) (Standalone Mode). Adopt AES-128 encryption (secure communication between the terminal and OSDP readers) (Standalone Mode).

xliv. Use certified EAL6+ encryption chips for advanced data protection.

xlv. FT10CMQ Inputs include Wiegand, Button, Sensor and Auxiliary inputs.

xlvi. FT10CMQ Outputs include Wiegand, Lock Relay, Alarm Relay (Relay via dry contacts), and Bell Relay (Relay via dry contacts).

xlvii. Normally open contact rating is 2A @ 30Vdc resistive.

xlviii. Normally closed contact rating is 2A @ 30Vdc resistive.

xlix. A magnetic tamper detection system along with a tamper switch.

l. Equipped with an internal speaker with adjustable intensity and support a microphone.

li. Support a maximum of 99 access group. And support 1 access point on board for access point control.

lii. Support 1 OSDP over RS-485 reader and support 1 Wiegand Input reader. The software interface for TCP/IP mode is 10 Base-T / 100 Base-T and Auto MDI / MDIX.

The software interface for TCP/IP protocol includes VLAN, SSH, HTTP, IPv4 and DNS.

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liii. The software interface for TCP/IP encryption is complied up to TLS1.2 end to end secure communication channel.

liv. The software interface for TCP/IP communication includes Push protocol over HTTP and HTTPS.

lv. Support Armatura One Security system.

lvi. Attain IP66 protection rating, providing waterproof and dustproof, fully operate in extreme weather conditions, including cold winters, heavy rains, and dry/hot summers.

lvii. Attain IK07 certification for vandal-proof structure.

lviii. The cable requirement for power is 16AWG or 18AWG. (Do not extend the length of power cable when using the power adapter). Twisted pair relays require cables with a gauge between 18 and 16 AWG.

lix. The Ethernet cable requirement (CAT-5E) requires a wire diameter (24AWG), with a maximum length of 330ft. (100m).

lx. The Power-over-Ethernet (PoE) cable requirement requires a wire diameter (23AWG), with a maximum length of 330ft. (100m).

lxi. The cable requirement of the RS-485 reader port is 9600-115200 bps, asynchronous communication, half-duplex mode, 1 start bit, 8 data bits, and 1 stop bit. One twisted pair with drain wire and shield with a resistance of 120 ohm, and a gauge of 22-18 AWG. The cable length can extend up to 1970 ft. (600m).

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lxii. The cable requirement of the Wiegand port is 20AWG shielded, cable length is up to 164ft. (60m).

lxiii. The dimensions of FT10CMQ has a length of 5.71”, a width of 2.76”, and a height of 1.25”; which is equivalent to 145mm in length, 70mm in width and a height of 3.18mm.

lxiv. The weight of the FT10CMQ is 15.85oz, which is around 449.5g.

lxv. It is suited for mullion-mount door installations or any flat surface mounting.

lxvi. The housing material for FT10CMQ is aluminum alloy and tempered glass.

lxvii. Operating temperature ranges from -4°F to 131°F (-20°C to 55°C).

lxviii. Storage temperature ranges from -13°F to 140°F (-25°C to 60°C).

lxix. Operating humidity from 0% to 90% RH (non-condensing).

lxx. It is compliant with CE, FCC, RoHS 3.0, and UL294 (coming soon) standards.

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2. Technical Specifications

General Information	
Primary Power	DC 12V@3A-24V@1.5A ±10%
Operating Frequency/ Standards:	125KHz; 13.56MHz: ISO14443 types A&B, JIS X6319, ISO15693 2.4GHz Bluetooth
POE	Supported (IEEE 802.3 at compliant)
RS-485 connection	RS-485 standard/ OSDP V2.2
CPU	1.2GHz Quad Core ARM Processor
NPU	2.4 TOPs NPU
Memory	2 GB RAM + 16 GB Flash
Camera	CMOS, 2 MP resolution IR: Global shutter CMOS, 1.3 MP resolution IR-CUT: CMOS, 2 MP resolution Resolution: 720*960 pixels
Ethernet network connection	10 Base-T/ 100 Base-TX, Auto MDI/ MDIX
Data Protection	Complies with TLS 1.2 for end-to-end secure communication channel (Secured Communication between the FT10 & Server) (Standalone Mode) AES128 (Secured Communication between the FT10 & OSDP Readers) (Standalone Mode)
Number of Ports	1*TCP/ IP 1*RS-485 4ch TTL Inputs 1ch TTL Output 1 Mechanical Relays & 2 Photorelay
Inputs	Wiegand, Button, Sensor, Aux
Outputs	Wiegand, Lock Relay, Alarm Relay (Relay via dry contacts), Bell Relay(Relay via dry contacts)
Normally Open Contact Rating	2A @30Vdc resistive
Normally Closed Contact Rating	2A @30Vdc resistive
Tamper Switch	Magnetic tamper detection system

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Audio Indicator	Internal speaker with adjustable intensity
MIC	Supported
Video Intercom	Support Standard SIP V2.0
User Capacity	50,000
RFID Card Capacity	50,000
Maximum Wiegand Bits	Wiegand In & Out (up to 64 bits)
Face Capacity	10,000 (1:N)/ 50,000 (1:1)
Palm Capacity	5,000 (1:N)/ 20,000 (1:1)
RFID Reading Distance	13.56MHz & 125kHz: Up to 1.96"/ 50 mm (depending on environment and transponder)
Face Authentication Distance	Dual Camera Liveness Detection On: 15.7" - 55.1" (400mm - 1400mm) Single Camera Liveness Detection On: 15.7" - 78.7" (400mm - 2000mm)
Face Authentication Posture Adaptability	Yaw ≤ 30°, Pitch ≤ 30°, Roll ≤45°
Face Authentication Accuracy	True Accept Rate (TAR)=99%, False Accept Rate(FAR)=0.01%
Face Authentication Mode	1:1, 1:N
Face Authentication Speed	<300ms (Field Test Result)
Face Authentication Liveness Detection	Yes (Infrared-visible light mode, Infrared Light Mode)
Face Mask Detection	Yes
Palm Authentication Distance	Liveness Detection On: 7" -15.7" (180mm - 400mm)
Palm Authentication Posture Adaptability	Yaw ≤ 45°, Pitch ≤ 30°, Roll ≤ 90°, Bend ≤ 30°
Palm Authentication Accuracy	True Accept Rate(TAR)=98.7%, False Accept Rate(FAR)=0.01%
Palm Authentication Mode	1:1, 1:N
Palm Authentication Speed	< 140ms (Field Test Result)
Palm Authentication Liveness Detection	Yes (Infrared Light Mode)
QR Code Detection	QR Code Scanner: Supported QR Code Scanning Pattern: Area Image (720*1280 pixel array) QR Code Scan Angle: Horizontal: 37.9°/ Vertical: 62.9° QR Code Capability: QR Code (Armatura ID); Static QR (customizable) QR Code Scanning Performance[1]: Armatura ID QR Code: 0.5"-2.05" (12.7mm - 52.07mm); BioCode: 0.59"-1.26" (15mm - 32mm)
Recommend Installation Height	55" (1400mm) (Using the plate with tilt angle) 59" (1500mm) (Plate with horizontal angle)
Transaction Buffer	Records: 1,000,000
Access group	99
Access Point Control	1 access point on board
Reader Support	1 (OSDP over RS-485) or 1 (Wiegand Input)
Protection / Resistance	Weather & Dust Proof Protection Rating compliant with IP66 Reinforced Vandal-proof Structure IK07 certified

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RFID / Biometrics Reader Interface	
Output Voltage	12V-24V (Equal to primary power input)
Maximum Output Current	0.8A
RS-485 Protocol	OSDP V2.2 Secure Channel, AES-128
OSDP Mode	9600-115200 bps, OSDP V2.2, asynchronous, half-duplex, 1 start bit, 8 data bits, and1 stop bit.
Wiegand	Wiegand In & Out (Up to 64 bits)
Data Inputs	TCP/IP, RS-485, OSDP and Wiegand standards supported.

Cable Requirement	
Power	16AWG or 18AWG (DO NOT extend the length of power cable when using the power adapter)
Relays	Twisted pair, 18 to 16 AWG
Ethernet	CAT-5E, Wire diameter (24AWG), maximum 330 ft. (100m) PoE : CAT-6A, Wire diameter (23AWG), maximum 330 ft. (100m)
RS-485 Reader Port	9600-115200 bps, asynchronous, half-duplex, 1 start bit, 8 data bits, and 1 stop bit. One twisted pair with drain wire and shield, 120 ohm resistance, 22-18 AWG, Maximum cable length: 1970 ft. (600m)
Wiegand Port	20 AWG shielded, 164 ft. (50m)

Mechanical	
Dimensions	5.71" x 2.76" x 1.25" (145mm*70mm*31.8mm)
Weight	15.85oz (449.5g)
Mounting	Suited for mullion-mount door installations or any flat surface mounting
Housing Material	Aluminum alloy + Tempered glass

Environmental	
Operating Temperature	-4°F -131°F (-20°C to 55°C)
Storage Temperature	-13°F -140°F (-25°C to 60°C)
Operating Humidity	0 - 90%RH (Non-condensing)
Certification(s)	CE, FCC, RoHS, UL294 (Coming Soon)

Software Interface	
TCP/IP Mode	10 Base-T/ 100 Base-TX, Auto MDI/ MDIX
TCP/IP Protocol	VLAN, SSH, HTTP, IPv4, DNS
TCP/IP Encryption	Complied up to TLS1.2 end to end secure communication channel
TCP/IP Communication	Push Protocol over HTTP, HTTPS
Supported Software	Armatura One Security System

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3. Armatura Card Module Support List

ARMATURA RFID Card Module Supporting List — ArmaSec-03012023

Frequency	Classification	Card Module Abbreviation	[RNP]	[RNI]
		Compatible Readers	OmniAC20, OmniAC30, FT10, EP20CQ, EP20CKQ, EP30CF	OmniAC20, OmniAC30, FT10, EP20CQ, EP20CKQ, EP30CF
13.56MHz	ISO14443A	LEGIC Advant		
		MIFARE Classic, Mini S50,S70,S50	√4)	√4)
		MIFARE Classic EV1	√4)	√4)
		MIFARE DESFire Light	√4)	√4)
		MIFARE DESFire EV1	√4)	√4)
		MIFARE DESFire EV2	√4)	√4)
		MIFARE Plus S, X	√4)	√4)
		MIFARE Pro X	√4)	√4)
		MIFARE Smart MX	√4)	√4)
		MIFARE Ultralight	√4)	√4)
		MIFARE Ultralight C	√4)	√4)
		MIFARE Ultralight EV1	√4)	√4)
		NFC (NTAG2xx)		
		PayPass		
		SLE44R35		
		SLE66Rxx (my-d move)		
		Topaz		
		HID iCLASS SEOS		√2)3)
		NFC (HCE Mode, works with Armatura ID)		
	ISO14443B	Calypso		
		Calypso Innovatron protocol		
		CEPAS		
		HID iCLASS		
		CTS		
		Moneo		
		Pico Pass		
		SRI4K, SRIX4K		
		SRI512, SRT512		
	ISO18092/ ECMA-340	Sony FeliCa	√1)	√1)
	ISO15693	EM4x33		
		EM4x35		
		HID iCLASS	√1)	√1)3)
		HID iCLASS SE/ SR/ Elite	√1)	√1)3)
		ICODE SLI		
		LEGIC Advant		
		M24LR16/64		
		MB89R118/119		
		SRF55Vxx (my-d vicinity)		
		Tag-it		
		Pico Pass		
		LEGIC Prime		
		CPU Card		

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ARMATURA RFID Card Module Supporting List

Frequency	Classification	Card Module Abbreviation	[RNF]	[RNI]
		Compatible Readers	OmniAC20, OmniAC30, FT10, EP20CQ, EP20CKQ, EP30CF	OmniAC20, OmniAC30, FT10, EP20CQ, EP20CKQ, EP30CF
125kHz		AWID		
		Cardax		
		CASI-RUSCO	√	√
		Cotag		
		Deister		
		EM4100, 4102, 4200	√	√
		EM4050, 4150, 4450, 4550		
		EM4305		
		FDX-B, EM4105		
		Ultra Prox		
		G-Prox		
		HID DuoProx II (1336)	√1)	√1)
		HID ISO Prox II (1386)	√1)	√1)
		HID Micro Prox II (1391)	√1)	√1)
		HID Prox III (1346)	√1)	√1)
		HID Prox	√1)	√1)
		HID Prox II (1326)	√1)	√1)
		HITAG 1, 2, S		
		ICT		
		IDTECK		
		Indala		
		ioProx		
		ISONAS		
		Keri		
		Miro		
		Nedap		
		Nexwatch		
		PAC		
		Pyramid		
		Q5		
		T5557, T5567, T5577		
		TITAN (EM4050)		
		UNIQUE		
		ZODIAC		
		Globally Available	Y	Y
	Availability	Globally Available Except for U.S., E.U., Japan, Australia, Canada, U.K., Albania, Iceland, Liechtenstain, 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

*To be released

The final interpretation of this data sheet belongs to Armatura LLC.
All information regarding the card formats supported by the RFID card modules are claimed by the provider(s) of the card modules. Armatura LLC accepts no liability.

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4. Maintenance and Support

The FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal. 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.
- Onsite repair services as needed.
- Spare parts availability.
- Training for system administrators and end-users.

5. Documentation

The supplier shall provide the following documentation for the FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal:

- User manual
- Installation guide
- Technical specifications
- Software release notes
- Warranty terms and conditions

6. Warranty and Support

The FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal. 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.

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7. Training and Documentation

The manufacturer shall provide the following training and documentation for the FT10CMQ, an all-weather multi-tech smart multimodal biometric terminal:

- User manuals and technical documentation for installation, configuration, and operation of the reader.
- 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.

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