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BLUEBIRD

FR901

Fixed RFID Reader

Powerful Fixed RFID Reader

The FR901 is a high-performance fixed RFID reader designed to deliver reliable, accurate, and efficient RFID data capture in demanding environments. Combining a compact form factor with rugged durability, it delivers reliable performance across a wide range of industrial applications.

Key Features

Superior Reading Accuracy

FR901 achieves exceptional RFID tag recognition accuracy, even in metallic or liquid environments, through Dense Reader Mode.

Flexible Reading Range

FR901 supports configurable RF output power of up to 33 dBm, enabling optimized reading performance across various deployment environments.

Global Standard Compliance

Fully compliant with EPC Class 1 Gen 2 v2, with support for Gen2X to ensure reliable global interoperability.

Wide Operating Temperature

Operates reliably across a wide temperature range from -40°C to +65°C.

Simplified Installation

Supports PoE+ for both power and network connectivity, simplifying installation and reducing cabling costs.

Applications

Retail

- Self-checkout
- Inventory Visibility
- Item Location
- Loss Prevention
- Smart Shelf Monitoring
- Click & Collect

Warehouse & Distribution

- Dock Door Monitoring
- Inbound / Outbound Logistics
- Tunnel-based Reading
- Inventory Verification
- Pallet & Carton Tracking
- Cross-docking Automation

Manufacturing

- WIP Tracking
- Asset Tracking
- Production Line Automation
- Returnable Asset Management
- Finished Goods Tracking

Logistics

- Transportation Visibility
- Yard Management
- Trailer Tracking
- Container Tracking
- Automated Shipment Verification

Healthcare

- Asset Tracking
- Patient Identification
- Medical Equipment Tracking
- Pharmacy Inventory
- Specimen Tracking

Key Features

Next-Generation Processing
Powered by the Impinj E910 reader chip, delivering advanced Gen2X support and high-speed RFID processing.

Extreme Environment Durability
IP53-rated sealing and MIL-STD-810G durability ensure reliable operation in demanding industrial environments.

Flexible OS Support
Supports Linux with optional Android OS, enabling flexible integration with enterprise systems.

Multi-Antenna Support
Supports up to 8 RFID antennas and 2 Wi-Fi antennas, enabling scalable and cost-effective deployments.

High-Performance Processing
Powered by the Qualcomm® QCM6490 processor with up to 8 GB RAM and 64 GB UFS Flash for fast and reliable performance.

Real-time Tracking
Enhances operational visibility through real-time inventory, asset, and personnel tracking.

Advanced Security
Supports secure enterprise deployment with TLS encryption, network security, and industry-specific applications including loss prevention, medication management, and patient monitoring.

Versatile Industry Deployment
Designed for retail, warehousing, manufacturing, logistics, transportation, and healthcare applications.

FR901 Specifications

Physical Characteristics

Dimensions (L x W x D)	253 x 160 x 58.5 mm
Weight	1.3 kg
Visual Status Indicators	Power, Activity, Status, Connect

RFID Characteristics

Max Receive Sensitivity	-103dBm monostatic	
Return Loss (minimum)	10dB	
Air Protocols	ISO 18000-63 (EPC Class 1 Gen 2v2), Gen2X	
Max Tag Read	1300+ Tags / Sec	
Engine (RFID Chip)	E910	
Frequency (UHF Band)	US: 902–928MHz; EU: 865–868MHz; 916.3, 917.5, and 918.7MHz	
Transmit Power Output	1. Power Adapter US: 902–928MHz; 5–30dBm EU: 865–868MHz; 5–33dBm 916.3, 917.5, and 918.7MHz; 5–33dBm Japan: 916–921MHz (w LBT), 5–30dBm	2. POE Adapter US: 902–928MHz; 5–30dBm EU: 865–868MHz; 5–31.5dBm 916.3, 917.5, and 918.7MHz; 5–31.5dBm Japan: 916–921MHz (w LBT), 5–30dBm

Connectivity

Communications	10/100 Base-T Ethernet; USB Host & Client (Type-A & Type-C) DB9 1ea, RJ-45 1ea, HW Reset Button
General Purpose I/O	4 Inputs, 4 Outputs, Optically Isolated (Terminal Block)
Power Supply	PoE+ / 24 V DC Universal Power Supply
Antenna Ports	8 Monostatic Ports (Reverse-Polarity TNC) (Optional) 4 Monostatic Ports (Reverse-Polarity TNC) / 2 Wi-Fi Ports (SMA) (Optional)

Environmental

Operating Temp	–40 °C to +65 °C / –40 °F to +149 °F
Storage Temp	–40 °C to +70 °C / –40 °F to +158 °F
Humidity	5–95% Non-Condensing
Sealing	IP53
Shock/Vibration	MIL-STD-810G

WLAN

Radio	Wi-Fi 802.11a/b/g/n/ac/ax, 2×2 MIMO (Optional)
Data Rate	5 GHz: Up to 1.2 Gbps / 2.4 GHz: Up to 286.8 Mbps
Operating Channel	Channel 1–13: 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13 Channel 36–165: 36, 40, 44, 48, 52, 56, 60, 64, 100, 104, 108, 112, 116, 120, 124, 128, 132, 136, 140, 144, 149, 153, 157, 161, 165 Channel Bandwidth: 20, 40, 80 MHz,160MHz
Security & Encryption	WEP (40 or 104 bit); Enhanced Open (OWE); WPA/ WPA2 Personal (TKIP, and AES); WPA3 Personal (SAE); WPA/WPA2 Enterprise (TKIP and AES); WPA3 Enterprise (AES) - EAP-TTLS (PAP, MSCHAP, MSCHAPv2), EAP-TLS, PEAPv0-MSCHAPv2, PEAPv1-EAP-GTC, LEAP, EAP-PWD; WPA3 Enterprise 192-bit mode (GCMP256) - EAP-TLS;
Fast Roam	N/A

Hardware, OS and Firmware Management

Processor	QCM 6490
Memory	2GB RAM / 64GB UFS Flash 4GB RAM / 64GB UFS Flash (Optional)
Operating System	Linux / Android (Optional)
Management Protocols	Bluebird Shell (SSH / USB)
Network Services	DHCP, HTTP, HTTPS, FTP, SSH, NTP, MQTT
Network Stack	IPv4 and IPv6
Security	Transport Layer Security Ver 1.2, FIPS 140-2
Host Interface	EPC global Low Level Reader Protocol (LLRP)
API Support	NET
Software Support	Bluebird Fixed Reader Middleware Solution)- MQTT / SOCKET / HTTP / USB CDC / RS-232

Regulatory Compliance

Safety	UL 62368-1, IEC 62368-1, EN 62368-1
RF/EMI/EMC	Part 15B, Part 15.247, Part 15.249, Part 15.407 ISED : ICES-003, RSS-247 Issue, RSS-248 Issue EN 300 440, EN 300 328, EN 301 893, EN 303 687, EN 302 208, EN 55032, EN 55035, EN 301 489-1/-3/-17
SAR/MPE	FCC 47 CFR2: OET Bulletin 65, EN 50566, EN50663, EN 50364
Other	RoHS, WEEE

Antennas Specifications

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ANS981	AN970	AN971	ANS961
Self-checkout POS Inventory management Portals Outdoor gates	Portals Portals- Outdoor gates Transition POS Retail Back-room Inventory Management	Portals, Outdoor gates Inventory management Backroom POS Hallway	Self-checkout Backroom Outdoor gates Inventory management

Features

Form-Factor	Circular Polarized Fan Beam Antenna	High Performance & General Purpose	High Performance & Large Area	Circular Polarized MID Range Antenna
Dimensions (L x W x D)	280 x 140 x 3.2 mm	260 x 260 x 30mm	575 x 260 x 33.5mm	255 x 255 x 12 mm
Weight	230g	1.1kg	1.9kg	200g
Connectors	SMA (Male)	RP TNC_F	Type N	SMA (Male)

Electrical Characteristics

Gain	EU: 8 dBiC' US: 8.4 dBiC	9.0dBic	9.0dBic	EU: 8 dBiC US: 8.5 dBiC
Polarization	LHCP	LHCP	LHCP or RHCP	LHCP
Frequency Range	865 ~ 868MHz / 902 ~ 928MHz	865MHz ~ 868MHz / 902 ~ 928MHz	865MHz ~ 868MHz / 902 ~ 928MHz	865MHz ~ 868MHz / 902 ~ 928MHz
VSWR (Return Loss)	1.4 : 1	1.4 : 1	1.4 : 1	1.4 : 1
3db Beam Width	60° / 90°	70°	70°	70°
Front to Back Ratio	20dB	20dB	20dB	15dB
Max Input Power		10W	10W	
Axial Ratio	EU : 0.6dBTypical US : 1.6dB Typical	1dB Typical	1dB Typical	1dB Typical

User Environment

Operating Temperatures	–20°C to +80°C / –4°F to +176°F	–25°C to +60°C / –13°F to +140°F	–25°C to +70°C / –13°F to +158°F	–20°C to +60°C / –4°F to +140°F
Storage Temperatures		–40°C to +70°C / –40°F to +158°F	–40°C to +85°C / –40°F to +185°F	
Sealing	IP62	IP67	IP67	IP67
Vibration			IEC-68-2-6	
Humidity			MIL-STD 810G, METHOD 507.5, Procedure II – Aggravated	

* Specifications are subject to change without notice and some features may vary by region.

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