ALR-9900+

Enterprise RFID Reader

Alien® ALR-9900+ enables users to deploy best-in-class EPC Gen 2 RFID solutions for supply chain, manufacturing and asset management applications.

FEATURES

- Global EPC Gen 2 platform
- Automatic inventory optimization
- Feature-rich Alien Reader Protocol
- Dynamic Authentication of Higgs ICs
- Exceptional sensitivity and performance
- Automode, with on-board state machine
- High read rates for demanding applications
- Enhanced noise rejection for reliable data capture

- RSSI & speed filters
- Easy RFID software integration
- Easily configurable and upgradable
- Industrial, installation-friendly I/O connector
- Antenna reflection cancellation optimization
- Supports extended / custom Higgs-3™ IC features
- Auto "Seek" function for low duty cycle applications
- RoHS EU 2002/95/EC compliant

Benefit	Enabled By:	What does this mean to me?
Ease of Use	• Alien Reader Protocol or LLRP • Smart reader/autonomous mode • Alien Reader Control Architecture & Ruby	• Easy to set up and deploy • No additional costly controllers • Less maintenance and overhead
Cost Savings	• Alien Reader Protocol • Smart reader/autonomous mode • Best-in-class sensitivity/selectivity	• Minimizes network infrastructure • Minimizes tag size (cost) • Less read errors/robust reading
Industry Leading Read Capability	• Best-in-class sensitivity/selectivity • Premier industry read rates • Built for challenging RF environments	• Reduces the number of read points • Less equipment required • Minimized tag size
Industry Leading Robustness, Intelligence & Security	• Dynamic Authentication™ • Leading reader sensitivity/selectivity • Highest build quality • Optically isolated I/O's	• Industry leading anti-cloning • Robust & repeatable performance • Built for challenging environments • Robust physically and electrically

The ALR-9900+ will integrate into your existing business processes easily and efficiently because it supports a multitude of platforms including Microsoft® BizTalk RFID, IBM Websphere®, Oracle®, Xterprise and others.

Its industry leading Autonomous Mode and superior sensitivity enables the ALR-9900+ reader to obtain best-in-class read rates, allowing it to accommodate dynamic, fast paced environments with minimal network infrastructure and read points.

The readers flexible GPIO system allows simultaneous communication with up to 12 external devices (4 inputs and 8 outputs), allowing control of various gates, switches and devices expected in today's complex industrial and commercial systems.

Interoperable and Broadly Supported

Alien pioneered the network-ready EPC RFID reader with the widely-supported Alien Reader Protocol (ARP). When the ALR-9900+ is turned on, the unit can be set up for either ARP or Low-Level Reader Protocol (LLRP). The ALR-9900+ is supported by key RFID platforms including Microsoft® BizTalk RFID, IBM WebSphere®, Oat Systems, Oracle® and Xterprise. Proven support for SAP through 3rd-party middleware is also available. A well-documented SDK featuring .NET, Java and Ruby libraries enables easy, custom interfaces to control the reader if desired.

Powerful Interfaces for Effective Integration

The Alien Reader Protocol features industry leading Autonomous Mode, a programmable state machine that enables the reader to operate independently based on external triggers, timing, or software inputs. This flexible system leads to best-in-class read rates by enabling users to precisely control the parameters for timing, protocol, antenna usage, and other critical variables without network latency delays. Automatic parameter adjustments ensure optimum inventory settings and conform to dynamic tag populations with user-defined boundaries.

A flexible general-purpose input-output (GPIO) system enables tight integration with external sensors and actuators for effective integration with existing business processes. High-capacity, optically isolated General Purpose I/O (GPIO) signals can drive many external devices directly, eliminating the need for costly digital I/O equipment and relays. Optical isolation ensures accurate reception of triggering signals in noisy, industrial environments. Middleware access to GPIO inputs and outputs enables direct control via software.

Configurable filtering, notification modes, data routing options, and data formats provide flexibility and ease-of-integration. Filtered tag data options, tag streaming, and I/O monitoring and streaming offer additional flexibility. The ALR-9900+ is fully backwards compatible with Alien's previous generation, the ALR-9900, enabling users to easily operate in a mixed population or to transition to the new-and-improved ALR-9900+ platform.

Monostatic Simplicity

The ALR-9900+ provides the added simplicity of a monostatic antenna topology, which provides a compact footprint and easy integration. Only one antenna per read point is required, reducing system cost and complexity. A proprietary, active, noise cancellation and optimization circuit ensures high read rates from the monostatic antenna system by correcting phase distortion introduced by antenna, cable, and environmental factors.

Power and LAN Failsafe Mechanisms Protect Data

The loss of power or LAN connectivity does not lead to the loss of critical tag data. The ALR-9900+ caches up to 2500 tag records in non-volatile memory, preserving data even in the event of a power loss.

When operating in Autonomous Mode, the reader will continue to collect up to 6000 tag records even if the LAN connection is interrupted. Upon recovery of the LAN connection, middleware can download accumulated tag data from the reader.

Interference Management

The ALR-9900+ offers several methods for interference mitigation that provide a powerful solution to the challenge of noisy environments. The reader facilitates a low duty cycle "sniff & read" ("Seek") mode for applications where motion detection is not an option, or where power conservation or RF interference is of prime concern.

Noise Resistant: Strong Filtering for Interference Rejection

The powerful, dynamically adjustable signal processing architecture of the ALR-9900+ ensures strong interference rejection in the presence of other readers or devices.

Good Citizen: EPC Gen 2 Dense Reader Mode

The ALR-9900+ is compliant with the EPC Gen 2 Dense Interrogator specification, which reduces interference impact on other readers. Dense Reader Mode (DRM) significantly reduces the out-of-channel noise introduced.

Actual product may vary

Developers Kit

Developer Kits come complete with all the essentials to get you started:

- ALR-9900+ reader
- Two circular polarized antennas
- Software Developers Kit CD (SDK)
- Universal power supply
- RS-232 cable
- Crossover Ethernet cable
- Sample tags
- Convenient carrying case

Noise Resistant: Strong Filtering for Interference Rejection

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Intelligent Operator: Event-triggered operation and Autonomous Mode

The Autonomous Mode functionality of the Alien Reader Protocol enables the reader to collect tag data when triggered by external events detected by photo eyes and other sensors. In this mode, readers are activated only when needed, thereby reducing the ambient environmental noise level of readers operating at any given moment.

Dynamic Authentication: Authentication of Higgs-3 RFID ICs

The ALR-9900+ includes a security filter to authenticate Higgs-3 ICs. The algorithm is based upon a challenge/response and confirmation dialog between the reader and the Higgs-3 IC and can be configured to differentiate between verified Higgs-3 ICs and potentially cloned Higgs-3 ICs, thereby further securing product authenticity.

High Performance, Easy to Deploy, Easy to Manage

The Alien ALR-9900+ Enterprise Reader enables users to deploy manageable, robust, best-in-class RFID thanks to:

- A flexible API with broad software support
- A high performance radio
- Data protection
- Robust dense reader interference management

ALR-9900+ Enterprise RFID Reader
High Performance, Easy to Deploy, Easy to Manage

Model Number	ALR-9900+ (All Models and Country Variants)
Architecture	XScale processor, Linux, 64 MBytes RAM, 64 MBytes Flash
Supported RFID Tag Protocols	EPC Gen 2; ISO 18000-6c
Reader Protocols	Alien Reader Protocol, firmware upgradable
LAN Protocols	TCP/IP, NTP, DNS, DHCP, SNMP
Dense reader management	Dense Reader Mode, auto event triggering and event management
Power	Robust universal AC-DC power converter; 100-240 VAC, 50/60Hz
Communications	LAN TCPI/IP (RJ-45), RS-232 (DB-9 F)
Antennas	4 reverse polarity TNC monostatic ports; circular or linear polarization; near and far field compatible
General Purpose I/O	Optically isolated. 0-24VDC rail. 4 inputs. 8 outputs (500mA capacity).
Dimensions	(L) 20.3 cm x (W) 17.8 cm x (D) 4.1 cm (8" x 8.3" x 1.8")
Weight	1.5 kg (4.4 lb)
Operational Temperature	-20°C to +55°C (-4°F to +131°F)
Environmental Rating	IP53
LED Indicators	Power, Link, Active, Ant 0-3, CPU, Read, Sniff, Fault
Software SDK	Java, .NET, Ruby APIs
Shock	40 G's acceleration, 11ms duration, saw tooth wave
Vibration	MIL STD 810 514.5C-3 Composite wheeled vehicle profile
RoHS	EU 2002/95/EC compliant

Model Number	ALR-9900+ (US FCC)	ALR-9900+EMA (Europe, Middle East & Africa, New Zealand, South Africa)	ALR-9900-CHN (China, Singapore)	ALR-9900-BRZ (Brazil)
Frequency	902 MHz – 928 MHz	865.7 MHz – 867.5 MHz	920.625 MHz – 924.375 MHz	902 - 907.5MHz and 915-928 MHz
Transmit Channels	50	4	16	35
Channel Spacing	500 KHz	600 KHz	250 KHz	500KHz
RF Power	4 watts EIRP	2 watts ERP	2 watts ERP	4 watts EIRP
Compliance Certification	Emissions: FCC Part 15 Safety: cTUVus tested to: CAN/CSA–C22.2 No.60950-1-03, and UL 60950-1:2007 specifications IEC 60950-1 and EN60950-1	Emissions: ETSI EN 302-208-2 (4 channel plan), EN 301-489. Safety: EN 60950, EN 50364.	Emissions: CMII Safety: IEC 60950-1:2005 2nd edition & CCC	Emissions: Agência Nacional de Telecomunicações - ANATEL Safety: UL Brazil

Model Number	ALR-9900-WR1 (Australia, Bangladesh, Hong Kong, Thailand)	ALR-9900-ID (Indonesia)	ALR-9900+JP3 (Japan)	ALR-9900+KR2 (Korea)
Frequency	920-925 MHz	923-925MHz	916.7 - 920.9MHz	917 - 920.8MHz
Transmit Channels	8	4	4	6
Channel Spacing	500KHz	500KHz	600KHz	600KHz
RF Power	4 watts EIRP	2 watts ERP	4 watts EIRP	4 watts EIRP
Compliance Certification	ACMA, OFTA, NTC	MC&IT	ARIB STD-T106	KC

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Model Number	ALR-9900-MY (Malaysia)	ALR-9900+RSA (South Africa)	ALR-9900-TAI (Taiwan)	ALR-9900-EMA-Egypt
Frequency	919-923MHz	915.4-919MHz	922 - 928MHz	865.7 MHz – 867.5 MHz
Transmit Channels	8	17	12	4
Channel Spacing	500KHz	200KHz	500KHz	600KHz
RF Power	2 watts ERP	4 watts EIRP	1 watts ERP	20dBm ERP (at antenna)
Compliance Certification	MCMC	Emissions: ICASA Safety: NRCS	NCC	

September 16, 2015