Product Overview

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

The ETSI compliant Alien® ALR-9900-EMA Enterprise Category Reader supports the latest EN 302-208-2 four channel plan, enabling users to deploy manageable, robust, best in class EPC Gen 2 RFID solutions for supply chain, manufacturing and asset management applications.

This feature-rich reader delivers exceptional performance with best-in-class receive sensitivity, enhanced interference rejection, Dynamic Authentication, a monostatic antenna architecture and a compact footprint, delivering high read rates for demanding applications in an easy-to-integrate, easy-to-manage package.

FEATURES

- EPC Gen 2 Interoperable
- Global hardware 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
- Auto "Seek" function for low duty cycle applications
- RSSI & speed filters
- Monostatic antenna design
- Easy RFID software integration
- RoHS EU 2002/95/EC compliant
- Easily configurable and upgradable
- Industrial, installation-friendly I/O connector
- Antenna reflection cancellation optimization
- Compact footprint (~18 cm x 20 cm x 4 cm)
- Supports ETSI EN 302-208-2 four channel plan
- Supports extended / custom Higgs-3™ IC features

Interoperable and Broadly Supported

Alien pioneered the network-ready EPC RFID reader with the widely-supported Alien Reader Protocol. The ALR-9900-EMA 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-EMA is backwards compatible with Alien's popular ALR-8800, enabling users to easily operate in a mixed population or to transition to the ALR-9900-EMA.

Monostatic Simplicity

The ALR-9900-EMA 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-EMA 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-EMA 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.

Good Citizen: *EPC Gen 2 Dense Reader Mode*

The ALR-9900-EMA 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 by the reader, thereby enabling larger numbers of readers to coexist without reducing read rates.

Developers Kit

Developer Kits come complete with all the essentials to get you started, including the ALR-9900-EMA reader, two circularly polarized antennas, a Software Developers Kit CD (SDK), a universal power supply, an RS-232 cable, a crossover Ethernet cable, sample tags, and a convenient carrying case.

Actual product may vary

Noise Resistant: *Strong Filtering for Interference Rejection*

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

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-EMA 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-EMA 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-EMA Enterprise RFID Reader

High Performance, Easy to Deploy, Easy to Manage

Model Number	ALR-9900-EMA
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
Frequency	865.7 MHz – 867.5 MHz
Transmit Channels	4
Channel Spacing	600 KHz
RF Power Capability	31.6dBm (Radiated power limited by local regulations &/or site licences) Typical: 2 watts ERP (33 dBm radiated)
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 Inputs/ Outputs	Optically isolated. 0-24VDC rail. 4 inputs. 8 outputs (500mA capacity). Installation-friendly connector.
Dimensions	(L) 20.3 cm x (W) 17.8 cm x (D) 4.1 cm
Weight	1.5 kg
Operational Temperature	-20°C to +50°C
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
Compliance Certification	Emissions: ETSI EN 302-208-2 (4 channel plan), ETSI EN 300-220, EN 301-489. Safety: EN 60950, EN 50364.
RoHS	EU 2002/95/EC compliant

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