



Alien[®] Reader Protocol

A powerful and Flexible Toolkit
for Implementing RFID Solutions

The Alien Reader Protocol gives RFID users a well-equipped toolkit for implementing effective RFID solutions. Using the Alien command set, Alien readers deliver the power and flexibility that software professionals and solutions engineers need.

Human-readable, intuitively-designed commands simplify application development, speeding the delivery of results to users. A well-documented software development kit (SDK) with sample code in Java, .NET and Visual Basic serves as a model for the development of custom software.

READER STATUS	
ReaderName:	Alien RFID Reader
ReaderVersion:	08.06.26.00_beta030706mj
DSP Version:	03.07.06
DSP Filter:	06.01.19
Type, Country:	0x08 , 0x01
Radio, Logio:	0x35 , 0x04
OS Version:	Linux 2.6.16.18.alien.x900
Hostname:	alien-000028
MACAddress:	00:1B:5F:00:00:28
DHCP:	On
IPAddress:	10.1.70.99
Subnet:	255.255.0.0
Gateway:	10.1.1.10
DNS:	10.1.4.22
Uptime:	9019
AutoMode:	OFF
NetworkUpgrade:	OFF
UpgradeAddress:	0.0.0.0

The Alien Reader Protocol provides:

- › Autonomous and interactive operating modes
- › Buffered, streaming and interactive data communication methods
- › Configurable data formats
- › Extensive filtering and collection controls
- › Integrated tag and I/O data
- › Radio controls to optimize reading and programming performance

APIUsers control Alien Technology readers through software API, terminal or web-based control panel



Alien Reader Protocol

AutoMode and Interactive Mode

AutoMode features a user-programmable state machine that enables automatic operation under the control of software commands, external hardware inputs and data events. Users can control antenna timing, cycle counts, duty cycle and other parameters to optimize performance. Hardware outputs can be used to trigger actuator and indicators. With AutoMode, solution engineers can create highly-integrated, automated systems with tight coordination between software, readers, sensors and actuators.

Example commands available in AutoMode include:

Command	Description
AutoMode	Switch auto mode on and off
AutoAction	Get or Set the action to perform in AutoMode
AutoStartTrigger	Get or Set the trigger that starts the reader
AutoStartPause	Get or Set the delay after a start trigger before starting the reader
AutoStopTrigger	Get or Set the trigger that will stop the reader

In Interactive mode, the reader responds immediately to simple text commands such as "Get TagList" submitted through software, terminal or web interfaces.

Data Communication Modes and Data Formats

The reader can communicate tag and I/O data in three distinctive ways that enable solution designers to optimize reader behavior and deliver more value to users:

- › Notification mode, in which the data is buffered and reported to an I/P address, serial port or email address
- › Streaming mode, in which tag and I/O data is streamed in real time
- › Interactive mode, in which the reader responds to a text command with an immediate response

Below are examples of commands used to manage these communication modes:

Command	Description
NotifyMode	Switch notify mode on and off
NotifyAddress	Get and Set the address to push TagLists to
NotifyTrigger	Get and Set the trigger for pushing TagLists
MailServer	Get and Set an SMTP mail server
MailFrom	Get and Set the email address of the RFID Reader
TagStreamMode	Turn Tag Streaming On and Off
TagStreamAddress	Get and Set the address (IP:port or "Serial") for streaming Tag events
TagStreamFormat	Get and Set the format of the Tag Stream

Users format data according to their needs, choosing between XML, custom, verbose and terse text formats.



Extensive Filtering and Collection Controls

The Alien reader protocol provides a complete toolkit for filtering tag and I/O data. To minimize network traffic, programmers configure readers to report tags only once, no matter how many times they are read, noting the number of reads and the start and stop times.

Users filter tags within the reader choosing from the following parameters:

- › Masking all or portions of EPC, User or TID data inclusively or exclusively
- › Tag velocity, signal intensity or direction
- › I/O state when read

Middleware can further filter tag data using a rich set of tokens that can be appended to tag records:

- › Reader that reported the tag
- › Physical antenna or virtual read point that reported the tag
- › First or last time and date the tag was seen
- › Number of reads of the same tag
- › I/O state when read
- › Tag velocity, signal intensity or direction using Intelligent Tag Radar



Intelligent Tag Radar™

Using Intelligent Tag Radar (ITR™), the reader can filter and report tags based on tag velocity, directional phase shift and signal intensity. This powerful tool can be used to implement functions like these:

- › Precise singulation on conveyors
- › Direction of travel
- › Segregation of moving and stationary tags

These capabilities have many applications in asset tracking, retail and manufacturing. ITR™ is available with reader models ALR-9900, ALR-9800 and ALR-8800.

Cost-Saving Deployment and Management Tools

To reduce overall solution costs, Alien readers are designed to be easy to deploy and manage. The Alien Reader protocol supports the following functions:

- › Remote, push or pull firmware management
- › Configurable UDP-based heartbeat for auto-detection
- › Simple Network Management Protocol (SNMP)
- › Antenna detection
- › HTTP web server and configuration page
- › Macros
- › Loadable configuration profiles



Alien RFID Gateway demonstration and test software



Alien Reader Protocol

Firmware updates can be delivered in both pull and push modes. For example, the reader can be configured to check a designated IP address at regular intervals for new firmware, which it will install automatically. Software can command the reader to upgrade to a new version of firmware immediately. Alternatively, users can use a handy web configuration utility or Alien Gateway software to upgrade firmware.

Precise Control of Reader Parameters Provides Application Flexibility

Solutions providers can control many parameters that determine the behavior of the reader, ensuring the ability to adapt reader behavior to the application. The Alien Reader protocol enables control of:

- › Individual antenna power
- › Antenna timing and order
- › Gen 2 parameters including Q and Dense Reader Mode
- › Duty cycle



Portal

All Alien Readers use the Alien Reader Protocol
All Alien Readers use the Alien Reader Protocol, ensuring easy mixing of different form factors using the same software investment. The following readers are supported:

- › ALR-9900 Enterprise Class, 4-port reader
- › ALR-9800 Enterprise Class, Reader and Portals
- › ALR-8800 Enterprise Class reader for Europe
- › ALR-9650 Smart Antenna Class reader with integrated antenna

The Alien Reader protocol helps users and solutions providers deliver effective, highly integrated RFID solutions quickly.

For more information, contact Alien Technology at www.alientechnology.com.



ALR-9650



ALR-9900



ALR-9800

Copyright © 2008 Alien Technology Corporation. All rights reserved. Alien, Alien Technology, the Alien Technology logo, Intelligent Tag Radar and ITR are trademarks or registered trademarks of Alien Technology Corporation in the U.S. and other countries.



Alien Technology
18220 Butterfield Blvd.
Morgan Hill, CA 95037
866-RFID NOW
www.alientechnology.com