

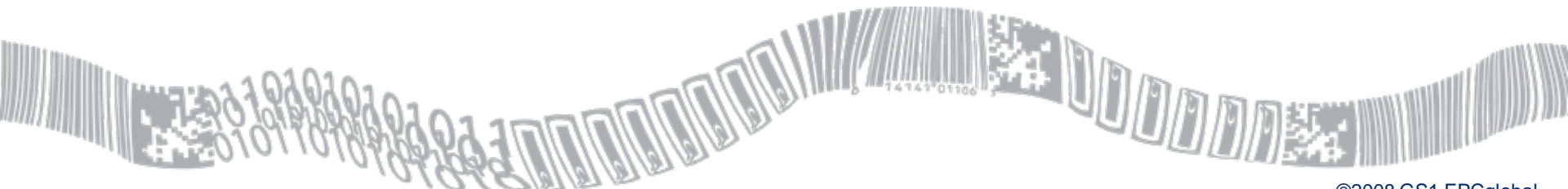
# Introduction to Reader Protocol (LLRP) Version 1.1

October 13, 2010



# Overview of LLRP 1.1

- What is LLRP?
- Audience for this Specification
- Basis for Changes to the Existing LLRP 1.0.1
- Key Technical Changes
- Process work done
- Request to advance this specification to POC



# What is a LLRP?

- The LLRP interface protocol is called *low-level* because it provides control of RFID air protocol operation timing and access to air protocol command parameters.
- The design of this interface recognizes that in some RFID systems, there is a requirement for explicit knowledge of RFID air protocols and the ability to control Readers that implement RFID air protocol communications
- LLRP is specifically concerned with providing the formats and procedures of communications between a Client and a Reader

# Audience for this Standard

- RFID Network Infrastructure vendors
- Reader vendors
- EPC Middleware vendors
- System integrators
- Chip Manufacturers
- Importance to businesses, since it provides a standard way to access business data for further communication to EPCIS repositories.
- It can be upgradeable to handle new commands and messages required for UHF, HF and Active tagging.

# Basis for Changing LLRP 1.0.1

Three areas of change for LLRP which was last updated in August of 2007 with the overall **Guiding Principle that LLRP 1.1 would be backwards compatible.**

- Since the first version, thousands of readers have been installed and more issues were discovered by companies using the interface. This has resulted in housecleaning issues that needed to be done with the specification.
- Gen 2 version 1.2.0 Air Interface Standard was ratified in October of 2008 and there were light impacts on LLRP.
- A few adjustments for the impacts of global regulations

# Key Technical Changes

## Protocol Enhancements

- LLRP 1.0.1 implementations and deployments have exposed protocol limitations
- LLRP 1.1 attempts to solve some of these limitations by adding additional protocol functionality
  - AISpec looping (continuous inventory)
  - Enhanced reporting triggers (time-based report generation)
  - Additional reader capabilities (RFSurvey frequencies, maximum receive sensitivity)
  - Clarification of LLRP 1.0.1 document ambiguities

# Key Technical Changes

## Version Negotiation

- LLRP 1.0.1 did not provide a means for Clients and Readers to discover/negotiate a protocol version
- LLRP 1.1 introduces a simple version negotiation mechanism allowing Client applications to discover what protocol versions are supported by the Reader, and select a mutually supported version
- This allows future versions of LLRP (including version 1.1) to be more easily deployed

# Key Technical Changes

## C1G2 Version 1.2.0 Compatibility

- C1G2 version 1.2.0 added functionality between the reader and tag that was not available via LLRP 1.0.1
- LLRP 1.1 exposes these new features to Client applications in a standard way (as opposed to vendors using custom extensions for C1G2 v1.2.1 support)
  - BlockPermalock
  - Tag Recommissioning
  - Tag XPC

# Key Technical Changes

## Regulatory Expansion

- Additional regulatory region information added to the LLRP enumeration

A few examples of what was added in Section 9.2.4 for RegulatoryCapabilitiesParameter:

- 16 Israel 915-917 MHz
- 17 Japan 952-954 MHz 4W LBT
- 18 Japan 952-955 MHz 20mW LBT
- Allows the LLRP protocol to be deployed in additional region

Comments on this document and the related LLRP 1.1 Standard should be sent to GS1 at [GS1help@gs1.org](mailto:GS1help@gs1.org).

