Intermec ALE Engine

User's Guide

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Document Change Record

This page records changes to this document. The document was originally released as Revision 001.

Version Number	Date	Description of Change
002	3/2009	Revised to support the ALE Engine on various Intermec platforms and added info about the ALE configuration file.

Contents

About This Guide

This user's guide explains how to configure and use the Application Level Events (ALE) Engine edgeware application on Intermec platforms. This guide is intended for the person who develops RFID applications using the ALE Engine. Developers should already be familiar with the details of the EPCglobal ALE 1.1 interface specification.

What's New

This version of the *Intermec ALE Engine User's Guide* supports the ALE Engine for the CV60 Vehicle-Mount Computer and the IF61 Fixed Reader, and contains the following enhancements:

- Updated "ale.conf" file syntax
- Updated BRI and LLRP Reader support
- Updated Intermec-specific ALE information

About the ALE Standard

The EPCglobal ALE standard specifies methods by which large volumes of tag data can be processed into "events" that applications can easily manage. Processing can include reading tag IDs from multiple data sources, reporting data, accumulating data over a specified time period, filtering data to eliminate duplication, counting and grouping tag IDs to reduce total data volume, and writing to tags.

Version 1.1 of the ALE specification provides:

- read and write access to EPC data as well as other data present on EPC data carriers.
- easy expansion to include other tag types.
- specific operations such as "lock" and "kill" for Gen 2 tags.
- additional interfaces for defining tag memory fields, naming data sources, and securing the use of APIs.

Refer to the information below to determine the set of ALE features supported on each Intermec platform.

For more information, see **www.epcglobalinc.org/standards**.

About the Intermec ALE Engine

The Intermec ALE Engine is an implementation of the EPCglobal ALE 1.1 specification and is supported on several Intermec platforms using multiple RFID reader protocols.

The following table lists the RFID reader protocols that are currently supported by the Intermec ALE.

Protocol	Description
Basic Reader Interface (BRI)	This is an Intermec proprietary protocol for use in RFID readers. For more information, see the *BRI Programmer's Reference Manual* (P/N 937-000-xxx).
Low-Level Reader Protocol (LLRP)	This is an EPCglobal specification for interfacing with RFID readers. For more information, see **www.epcglobalinc.org/standards**.

Some features defined in the ALE 1.1 specification are optional or implementation-dependent. For information on how these features are supported by the Intermec ALE Engine, see **"Intermec ALE-Specific Implementation of ALE 1.1" on page 19.**

Installing or Upgrading the ALE Engine

At startup, the Intermec ALE Engine reads its configuration from the ALE Configuration File. This is a text file named "ale.conf". The location of this file and the process for editing it varies depending on the platform where the ALE Engine is installed.

For the CV60, the ALE Engine is installed as part of the Forklift ARX package. The default installation directory is C:\Program Files\Intermec\IVAALE. The configuration directory for the CV60 is the same as the installation directory.

For more information on installing or uninstalling the ALE Engine, see the *Intermec Forklift Advanced RFID Extensions (ARX) User's Guide* (P/N 934-047-xxx). For more information on operating the CV60, see the *CV60 Vehicle Mount Computer User's Manual* (P/N 935-014-xxx).

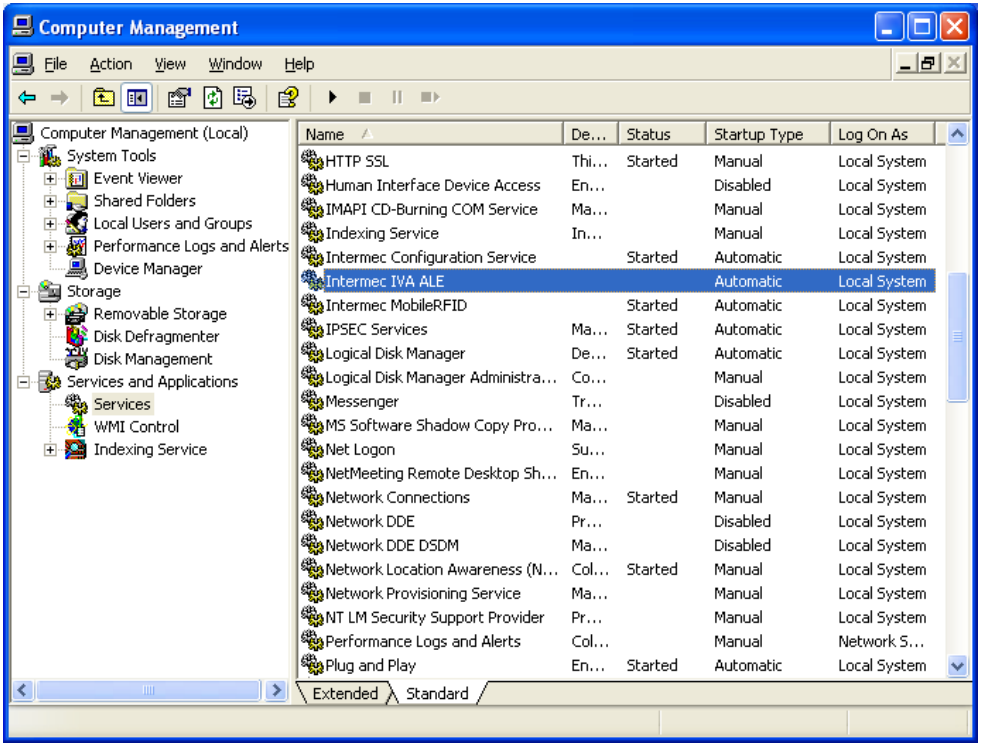
The IF61 Fixed Reader (with firmware version 2.10 or later) includes the Intermec ALE Engine. This is Intermec's implementation of the EPCglobal ALE 1.1 middleware specification. The default installation directory for the IF61 ALE Engine is /home/developer/edgeware/ale. The configuration directory for ALE on the IF61 is /home/developer/edgeware/ale/conf.

Use the IF61 web browser interface to install or upgrade ALE Engine firmware. For more information on installing edgeware applications, see the *IF61 Fixed Reader User's Manual* (P/N 935-011-xxx).

Starting, Stopping, and Managing the ALE Engine

For the CV60, the ALE Engine is implemented as a Windows Service and can be configured to start and stop via standard Windows Service APIs. The service name is **Intermec IVA ALE**. By default, the ALE Engine is configured to start automatically after a system boot.

The Windows XP MMC (Microsoft Management Console) can be used to manually control the ALE Engine. The MMC is accessed from the Windows Start menu/Control Panel/Administrative Tools/Services.

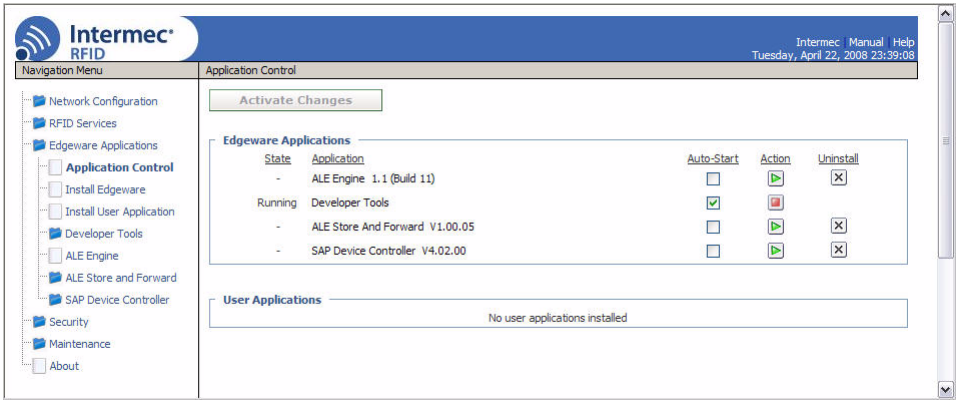


Windows XP MMC

For the IF61, you can configure the ALE Engine to auto-start when the IF61 boots, or you can start and stop the ALE Engine manually. Follow the next procedure to start, stop, or manage the ALE Engine.

To start or stop the ALE Engine

1. Open the IF61 web browser interface.
2. In the menu, choose **Edgeware Applications**. The Application Control screen appears.



3 To run the ALE Engine whenever the IF61 boots, check the **Auto-Start** check box for the ALE Engine, and then click **Activate Changes**. The engine will automatically start the next time the IF61 boots.

You can also manually start or stop the ALE Engine as follows:

- If the ALE Engine is running, click to stop it.
- If the ALE Engine is not currently running, click to start it.

Using the ALE Configuration File

For the CV60, the "ale.conf" file is placed in the default configuration directory and must be updated with a text editor through remote file transfer mechanisms or by accessing the file through a network share.

For the IF61, the "ale.conf" file is placed in the /home/developer/edgeware/ale/conf directory and can be edited directly through the web browser interface page. For more information, see **"Changing the ALE Configuration File" on page 18.**

Host applications can also use file transfer mechanisms such as FTP, Intermec SmartSystems™ Foundation, or other network facilities to update this file remotely.

The ALE configuration file

```
;General ALE Configuration Section
;   Note: All section names and configuration item names
;         are CASE SENSITIVE
[config]
;IP Port number to which ALE listens
ALE_ServerPort=8512

;Maximum number of characters in any ALE
;  identifier (ECSpec Name, ReaderName, etc)
ALE_MaxIdentifierLength=128

;Number of threads servicing incoming ALE requests
ALE_RequestServerThreads=10

;Number of threads servicing outgoing ALE notifications
ALE_NotificationThreads=10

;ALE Version string returned by ALE GetStandardVersion() API
ALE_Version="1.1"
ALE_CCVersion="1.1"
ALE_LRVersion="1.1"
ALE_TMVersion="1.1"
ALE_ACVersion="1.1"

;Version string returned by ALE GetVendorVersion() API
ALE_VendorVersion=""
ALE_CCVendorVersion=""
ALE_LRVendorVersion=""
ALE_TMVendorVersion=""
ALE_ACVendorVersion=""

;ALE ID string returned in ECReports
ALE_ID="Intermec ALE"

;String prefix for temporary ECSpec created
;   for Immediate() and Poll() API calls
;   Note: an integer value will be appended to
;         this string to form a unique
;         identifier for the temporary ECSpec.
ALE_ImmediateSpecName="___INTERMEC___IMMEDIATE___"

;ALE schema version returned in all ALE responses
ALE_SchemaVersion="1.0"

;Maximum backlog (in number of bytes) of unprocessed reader reports
ALE_MaxQueueSize=5000000

;Maximum number of unprocessed reader reports (per reader)
ALE_QueueThreshold=20
```

```
;Number of seconds ALE waits for a connection
;    when sending an ECReports Notification
SOAP_ConnectTimeout=5

;Number of seconds ALE waits for a send when
;    sending an ECReports Notification
SOAP_SendTimeout=5

;Number of seconds ALE waits for a response
;    when sending an ECReports Notification
SOAP_RecvTimeout=5
```

All of the above settings apply to all ALE implementations. The following settings apply to BRI and LLRP readers, and depend upon the platform.

Examples of Logical/Physical Reader Definitions for BRI Readers

```
;Logical Reader definitions
;   Each definition contains the physical readers
;       that comprise the Logical Reader
;   Multiple physical readers can be specified under
;       each logical reader
[LogicalReaders\LocalAntenna1]
physAntenna1="First Antenna"

[LogicalReaders\LocalAntenna2]
physAntenna2="Second Antenna"

[LogicalReaders\LocalAntenna3]
physAntenna3="Third Antenna"

[LogicalReaders\LocalAntenna4]
physAntenna4="Fourth Antenna"

;BRI Physical Reader Definitions
;  ReaderType=BRI
;    --Reader conforms to the Intermec Basic Reader Interface
;  Address="ipaddr:port"
;    -- IP address (or hostname) and IP port of
;       the BRI port on this reader
;  Command="..."
;    -- BRI command for initializing BRI attributes
;  PollingInterval=integer_milliseconds
;    --Integer number of milliseconds between polling cycles
;  TriggerSetupCommand=bri_command(s)
;    -- Semi-colon separated BRI commands, usually
```

```
;       used to create triggers
[PhysicalReaders\physAntenna1]
ReaderType=BRI
Address="localhost:2189"
Command="attrib ants=1"
PollingInterval=1000
;TriggerSetupCommand=TRIGGER "NAME1" GPIO 1 1 FILTER 5000;TRIGGER
"NAME2" GPIO 1 1 FILTER 5000

[PhysicalReaders\physAntenna2]
ReaderType=BRI
Address="localhost:2189"
Command="attrib ants=2"
PollingInterval=1000

[PhysicalReaders\physAntenna3]
ReaderType=BRI
Address="localhost:2189"
PollingInterval=1000
Command="attrib ants=3"

[PhysicalReaders\physAntenna4]
ReaderType=BRI
Address="localhost:2189"
PollingInterval=1000
Command="attrib ants=4"
```

Using theTriggerSetupCommand

You use TriggerSetupCommand to provide BRI commands that create named triggers. As with any BRI command, a semicolon separator allows you to define multiple BRI commands. No validation is performed on the provided commands, so you can use any valid BRI command.

Note: The BRI commands are executed in a separate BRI session, so only commands that affect the global BRI state will have any effect on ALE behavior.

After you define the triggers, you can reference them in EC/CC Specs with the following URI syntax:

`//intermec.com/trigger:`*xxxx*

where *xxxx* is the case-sensitive name created by the BRI TRIGGER command.

The BRI TRIGGER commands in the sample configuration file section shown above, are presented only to provide an example of the command syntax and the use of semi-colons to concatenate multiple BRI commands. The parameters of the TRIGGER command are application-specific and need to be researched carefully before use. For more information, see the *BRI Programmer's Reference Manual* (P/N 937-000-xxx).

Examples of Logical/Physical Reader Definitions for LLRP Readers

```
;Logical Reader definitions
;   Each definition contains the physical readers that
;     comprise the Logical Reader
;   Multiple physical readers can be specified
;     under each logical reader
[LogicalReaders\LLRPreader]
llrpReader1="LLRP Reader"

;LLRP Physical Reader Definitions
;  ReaderType=LLRP
;       --EPCglobal LLRP-compliant
;  Address="ipaddr:port"
;       -- IP address (or hostname) and IP port of the LLRP
;          port on this reader (usually 5084)
;  ROSpecPacketFilename="..."
;       -- File containing a binary image of an ADD_ROSPEC
;          command containing the preferred settings for this reader
;  Trigger[1-99]=GPI_[1-99]_[TRUE|FALSE],triggername
;       -- Mapping of GPI Trigger Numbers/States to Named Triggers
;          The Trigger[1-99] specs need not be consecutive, all
;          values 1 thru 99 will be queried
[PhysicalReaders\llrpReader1]
ReaderType=LLRP
Address="localhost:5084"
ROSpecPacketFilename="RoSpec_Add.bin"
Trigger1=GPI_1_TRUE,InZoneStart
Trigger2=GPI_1_FALSE,InZoneStop
```

About ROSpecPacketFilename Setting

This setting specifies the filename of a file containing the binary content of an LLRP ADD_ROSPEC request message. This setting allows complete control over the behavior of the reader options such as antenna sequencing, timing, power levels, and all other values available in a ROSPEC. The only requirement is that the ROSPEC ID number must be 1.

The LLRP message can be hand-built or it can be generated using tools that are in the LLRP.org Toolkit (**http://www.llrp.org**). The file must be placed in the ALE configuration directory.

About TriggerN Setting

LLRP does not support the concept of named triggers, so the configuration file must provide mappings between the GPI states and a name that can be specified in ALE EC/CC Specs. You can use TriggerN to provide mappings between GPI states and named triggers.

The LLRP specification states that a GPI is referenced by its number and its state. The GPI numbers are 1 and higher, and must be formatted with no leading zeros. The GPI states are TRUE and FALSE. You should refer to your LLRP implementation documentation to determine how the TRUE and FALSE states map to the actual GPI electrical states.

After you define the named triggers, you can reference them in EC/CC Specs with the following URI syntax:

`//intermec.com/trigger:`*xxxx*

where *xxxx* is the case-sensitive name specified in the TriggerN setting.

Default ALE Logical Reader Names

The CV60 supports only LLRP-compatible interfaces and the default logical reader is LLRPreader.

The IF61 supports both BRI and LLRP-compatible interfaces.

For BRI, the default logical reader is specified as LocalAntenna*n*, where n is the number of the RFID antenna port. For example, LocalAntenna1 is the antenna connected to RFID antenna port 1. All readers default to a polling value of 1 second.

The ALE Engine is preconfigured to define each of the antenna ports as individual logical readers. External BRI-compatible devices, such as other IF61s, can be configured by creating new "PhysicalReader" sections for each of its antennas, and then assigning a unique name and IP address to the reader. Each of the newly defined physical readers can be assigned to a pre-existing "LogicalReader" section or assigned to a newly created "LogicalReader" section.

The default configuration file is "ale.conf" and all settings are case-sensitive.

Predefining ECSpec Definitions

You can predefine ECSpec definitions by placing files containing the ECSpec definition XML in the ALE configuration directory.

The filenames must end with an extension of **.ecs**. The base name of the file is used as the name of the ECSpec and is always case-sensitive. All files ending with an .ecs extension in the configuration directory will be processed as ECSpec definitions in no particular order.

The XML must conform to the ALE v1.1 XML schema for an ECSpec. To download the ALE schema files, see **http://www.epcglobal.org/standards**.

For example, if a file named intermec.ExampleECSpec.ecs is placed in the ALE configuration directory, it will be processed upon ALE startup and if there are no XML formatting errors or ECSpec validation errors, an ECSpec named **intermec.ExampleECSpec** will be created. The ALE Engine will continue the startup process regardless of any ECSpec definition errors. Consult the operating system log to verify that the ECSpec definitions are accepted.

```
Example File Contents:
<?xml version="1.0" encoding="UTF-8"?>
<spec creationDate="2008-08-22T10:33:22" schemaVersion="1.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema"
```

```
xmlns:ex="urn:epcglobal:xsd:1" xmlns:eax="urn:epcglobal:ale:xsd:1"
xmlns:eaw="urn:epcglobal:ale:wsdl:1" xsi:type="eax:ECSpec">

<logicalReaders>
<logicalReader>LLRPreader</logicalReader>
</logicalReaders>

<boundarySpec>
        <duration unit="MS">10000</duration>
</boundarySpec>

<reportSpecs>
<reportSpec reportName="Example" reportIfEmpty="true"
reportOnlyOnChange="false">

<reportSet set="CURRENT" />
<output includeEPC="true" includeTag="true" includeRawHex="true"
includeRawDecimal="false" includeCount="true">
</output>
</reportSpec>
</reportSpecs>
</spec>
```

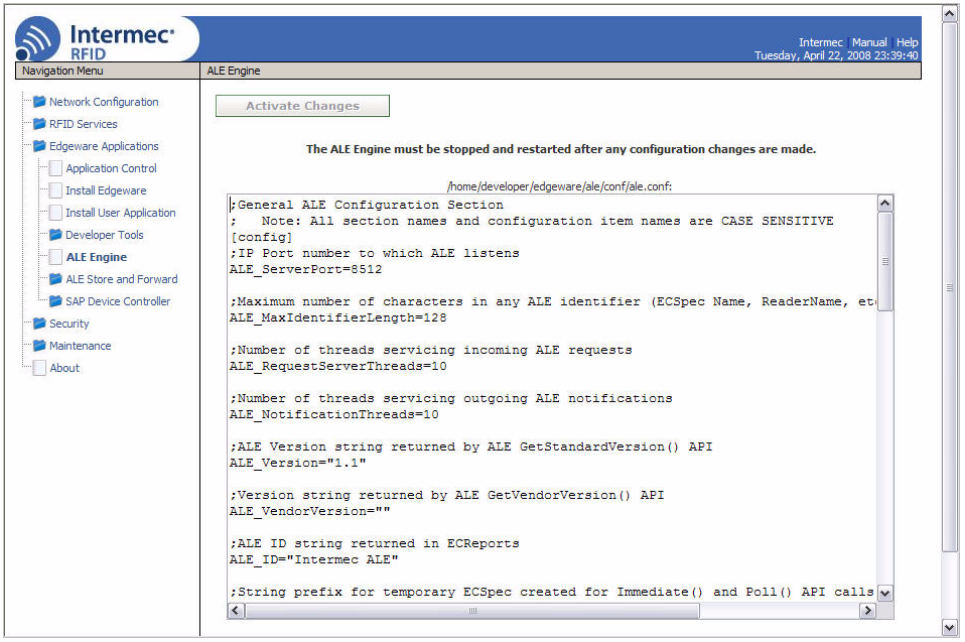
Changing the ALE Configuration File

For the CV60 and the IF61, the ALE configuration file is stored in the ALE Engine configuration directory and can be updated by replacing the "ale.conf" file. The ALE Engine must be restarted for the new settings to take effect.

For the IF61, you can also access and make changes to the ALE configuration file from the web browser interface as described in the following procedure.

To edit the ALE configuration file

1. In the IF61 web browser interface, click **Edgeware Applications** > **ALE Engine**. The ALE Engine screen appears.



2 Click in the text editor and make changes as necessary.

3 Click **Activate Changes**. Your changes are saved and will be made active the next time the ALE Engine is restarted.

If the ALE Engine is currently running and you want to make the changes active immediately, you need to manually stop and restart the ALE Engine. For help, see **"Starting, Stopping, and Managing the ALE Engine" on page 9.**

Intermec ALE-Specific Implementation of ALE 1.1

This section explains how Intermec ALE logs errors and status, and describes specific ALE features.

ALE Error and Status Logging

The Intermec ALE Engine logs operational information to the operating system-specific log. If you have problems when launching the ALE Engine, see the System Log for more information.

For the CV60, use the Windows XP Event Viewer Administrative Tool to view the system log. For help with viewing the log with an IF61, see the IF61 user's manual.

ALE Reader Protocol Features per API

This is a listing feature set of conditions and clarifications for the Intermec ALE.

ALE Reading API

The Intermec ALE Engine only supports returning the EPC field for LLRP readers. No other memory banks are supported.

ALE Writing API

The Intermec ALE Engine implementation does not support the Writing API for LLRP readers.

ALE Tag Mapping API

The Intermec ALE Engine implementation does not support the Tag Mapping API for LLRP readers.

ALE Logical Reader API

The Logical Reader API is independent of any reader protocol, so there are no implementation differences.

ALE Access Control API

The Access Control API is independent of any reader protocol, so there are no implementation differences.

ALE Implementation Notes

This section explains how Intermec ALE supports optional or implementation-dependent features of the ALE 1.1 specification. Section numbers listed here are from the ALE specification.

Section 4.3: Version Introspection Methods

Intermec ALE returns the empty string for all getVendorVersion() calls. Intermec ALE does not implement any vendor extensions and therefore returns the empty string. These return values can be overridden using settings in the "ale.conf" configuration file.

Section 4.5: Interpretation of Names

As a baseline, the specification requires that all implementations must accept non-empty strings that do not contain white space (Unicode PATTERN_WHITE_SPACE) or certain other "special"characters (Unicode PATTERN_SYNTAX).

As the specification allows, Intermec ALE expands on this by allowing white space inside identifiers, but no leading or trailing white space, and does not limit the use of any special characters except for the equals sign ('=') or the vertical bar ('|'). All other characters are allowed.

Intermec ALE treats all identifiers as case-sensitive. For example, "fieldName" is not the same as "fieldname" or "FieldName".

Section 6.1: Built-in Fieldnames

Several built-in fields assume the capability of reading a tag bank of unknown length. The specification allows implementations that cannot read such a tag bank to raise an "operation not possible" condition if a client application attempts to use any of those fields.

Intermec ALE raises an "operation not possible" condition for the "epcBank" and "userBank" fields in the Reading API. As the specification requires, ECSpecs containing references to these fields are accepted, but the fields are reported as "null" fields in any subsequent ECReport. Additionally, as specified, the use of these fields in a primary key or filter causes the entire tag to be omitted.

Section 6.1.9: Generic Fieldnames

In several places in the specification, the behavior of ALE with regard to EPCglobal Gen 1 and Gen 2 tags is documented along with a mandate that ALE behavior with "other" tag types be documented by the implementation.

Intermec ALE only supports EPCGlobal Gen 2 tags (also adopted by ISO as 18000-6C). The behavior with regard to Gen1 (and "other") tags is undefined and untested.

Section 6.1.9.2: Variable Fieldnames

The specification requires that implementations be able to parse variable field definitions and accept EC/CC Specs that contain references to them. However, if an implementation does not support variable field operations, the specification allows the implementation to raise an "operation not possible" condition when actually interacting with tags.

Intermec ALE does not support read/write operations on tags for variable length fields.

Section 6.2.1.3: EPC Datatype Pattern Syntax

Intermec ALE does not support the "epc-pure" pattern syntax. Only the "epc-tag" pattern syntax is supported.

Section 6.2.1.4: EPC Datatype Grouping Pattern Syntax

Intermec ALE does not support the "epc-pure" grouping pattern syntax. Only the "epc-tag" grouping pattern syntax is supported.

Section 6.2.3.1: Binary Encoding and Decoding of the Bits Datatype

According to Table 22 (Rules for Writing bits Values to Fields of Differing Lengths) from the ALE 1.1 specification:

- For M > N:

  The bits value to be written is longer than the available number of bits, so an "out of range" condition SHALL be raised.

- For M = N:

  The lengths match exactly; the value SHALL be written without modification.

- For M < N:

  The field is longer than the value. The value SHALL be written to the leftmost M bits of the destination. That is, the most significant bit of the value shall be aligned with the most significant bit position of the field. The remaining N−M bits SHALL each either be set to 0 or retain their previous value, at the discretion of the implementation.

For the "M < N" case, the ALE specification leaves the bit padding behavior to the discretion of the implementation. For fields of a known length, Intermec ALE sets the remaining bits in the field to 0. For fields of unknown length (epcBank and userBank for example), Intermec ALE leaves the remaining bits unchanged.

Section 7: Tag Memory Specification API

All features of the Tag Memory API have been implemented.

Section 8: ALE Reading API

Intermec ALE is implemented only as a WS-I compliant SOAP binding. No other interfaces are supported.

Intermec ALE supports "http" and "tcp" reporting callback interfaces using XML. No other reporting methods are supported.

Section 8.2.4: ECTrigger

The ECTrigger data element allows for vendor-specific start and stop triggers. In addition to the standard ALE triggers (such as the RTC trigger), Intermec ALE supports named triggers. The triggers are created using the "TriggerSetupCommand" setting for BRI readers, and the TriggerN setting for LLRP readers in the "ale.conf" configuration file. The named triggers are referenced in the ECTrigger data element using this syntax:

`//intermec.com/trigger:`*`xxxx`*

where *xxxx* is the case-sensitive name of the trigger.

Section 8.2.4.1: Real-time Clock Standardized Trigger

The specification makes it optional to implement this trigger type. Intermec ALE fully implements the Real-time Clock Standardized Trigger as specified.

The ALE V1.1 specification makes the following note for Real-time Clock Triggers:

"Note that if the specified period does not divide evenly into the number of milliseconds in a day (86,400,000), then the trigger will not be perfectly periodic, because the pattern will be realigned to the specified offset each day at midnight."

Since each RTC trigger can specify a different time zone, there is an ambiguity as to when such triggers are realigned. Intermec ALE realigns any such triggers at midnight in the time zone referenced by the trigger in its definition – not at midnight according to the local time zone of the host platform.

Section 8.2.13: ECStatProfileName

ECStatProfileName implementation is optional. Intermec ALE does not support ECStatProfileName.

Section 8.3.9: ECTagStat

All of the ECTagStat (and its related data items and sub-classes) features are optional. Intermec ALE does not implement any ECTagStat related features.

Section 9.3.5: CCOpType

Since ALE does not currently support ISO15962 encoded fields (variable length fields), the following CCOpType values are not allowed in CCSpecs, and will result in a CCSpecValidationException exception:

- "CHECK"
- "INITIALIZE"

In addition, the following CCOpType values will cause a CCSpecValidationException exception if they reference a variable length field:

- "ADD"
- "DELETE"

Section 9.3.9: CCStatProfileName

Intermec ALE does not support CCStatProfileName values.

Section 9.4.4: CCTagReport

The ALE specification is silent about behavior after an error. Intermec ALE stops processing the CCmdSpec for a tag as soon as any error occurs (reading or writing). CCOpReport instances are reported for all operations up through the errant operation.

Section 9.5: EPCCache

Many of the EPCCache-related methods return an EPCPatternList representing the EPC values contained in the cache before the method is performed. Unfortunately, this can easily lead to millions of EPC values being returned. Intermec ALE returns only the EPC patterns in the cache – not the realization of the individual EPC values represented by those patterns. For instance, a pattern such as "urn:epc:pat:sgtin-96:0.0614141.112345.*" would otherwise result in 274,877,906,943 EPC instances being returned.

Section 9.6.4: AssocTableEntry

The "key" for an Association Table Entry is an EPC value, but the ALE specification is silent on the format of the EPC value. Intermec ALE attempts to convert EPC values read from tags first into "epc-tag" format, and then (if that fails due to the tag not containing a valid EPC) into "epc-hex" format. No other formats are supported. Therefore, only "epc-tag" and "epc-hex" values should be specified as keys in an AssocTableEntry element.

It is possible to provide "epc-tag" and "epc-hex" key values that represent the same EPC value. In that case, the "epc-hex" key is never used since the "epc-tag" format match is always attempted first.

Section 9.7.2: RNGSpec

The ALE specification is silent on the behavior of the random number generator. Intermec ALE provides a pseudo random number generator (PRNG) that is seeded with the system time. The PRNG is not cryptographically secure and should not be used to encrypt information.

Section 10.3.2: Logical Reader API Conformance Requirements

This section of the spec lists the required behavior with regard to composite, externally-defined, and API-defined readers.

Intermec ALE only allows the creation and modification of composite readers. Externally-defined readers are defined in the "ale.conf" configuration file. Intermec ALE does not support creating base readers through the API. Modification of externally-defined readers is limited to adding/updating/changing the properties associated with those readers. No creation or deletion of those readers is supported.

Section 10.6: Tag Smoothing

Tag Smoothing is optional. Intermec ALE does not implement tag smoothing.

Section 11.8: Access Control API Partial Implementations

As explained in this section, a minimal Access Control API implementation consists of implementing three of the methods (getStandardVersion(), getVendorVersion(), and getSupportedOperations()). All other methods can return a UnsupportedOperationException.

Intermec ALE implements a minimal Access Control API by implementing only the getStandardVersion(), getVendorVersion(), and getSupportedOperations() methods. All other methods return an UnsupportedOperationException.

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