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SC031-N-3021
Scope Change for ISO/IEC 29143

Air - 29143

Original Scope

Mobile RFID is a kind of RFID technology combined with mobile communication. Therefore, a Mobile RFID terminal device which has RFID reader functions embedded in a mobile phone, accesses RFID tags as the existing RFID interrogators. It, however, has particular characteristics, e.g. limited electric power, limited processing capability, and unpredictable interferences caused by many users in an area. In particular, there should be a high possibility of collision among multiple mobile RFID interrogators

Therefore, this work item covers the air interface for Mobile RFID interrogators. This work item is not going to develop any new air interface solely for Mobile RFID terminal device, but to arrange the air interface features of the ISO/IEC 18000-6C for Mobile RFID, for example, limiting the maximum EIRP and alleviating the spectrum mask.

This work item shall specify the transmitting and receiving parameters for UHF (860-960 MHz) air interface for Mobile RFID interrogators, which include data rates, modulation/demodulation format, data encoding/decoding, spectrum mask, and commands.

This work item may include basic requirements and technical norms for air-interface physical specifications for a Mobile RFID. Analysis and guidelines for Mobile RFID environment will be informed in this work item including channel spacing, channel access schemes.

This work item is required to facilitate the interoperability of multiple Mobile RFID interrogators. Also, this work item provides informative contents about a reference design specification for implementing Mobile RFID interrogators.

Balloted Scope

This international standard applies to Mobile RFID interrogator devices used to inventory passive or semi-passive backscatter tags at 860MHz to 960MHz in a mobile (non fixed) application independent from specific communication details, i.e. modulation technique and command set.

Furthermore, the scope of this International Standard is mobile consumer applications, whereas mobile enterprise applications are not covered as long as operating in a closed environment.

An operating environment is considered to be closed if belonging to a central administrative authority able to guarantee for sufficient isolation, i.e. preventing mobile enterprise interrogator

devices from being used outside the dedicated operating environment, and if sufficient spatial separation and/or electromagnetic shielding from adjacent operating environments is provided.

An application is considered a consumer application if at least one of two interacting entities is a private individual (consumer) and the interaction is taking place in the public domain. Consequently, a Mobile RFID consumer application is defined as Mobile RFID equipment (e.g. mobile phones equipped with an RFID interrogator) being used in a consumer application.

NOTE As there is currently no active contribution on Mobile HF interrogators, this document covers only UHF.

This document specifies

— Mobile RFID interrogator media access control,

— interrogator to interrogator and multiple interrogator to tag collision arbitration scheme, and

— interrogator to interrogator and multiple interrogator to tag collision avoidance scheme.

The following aspects are not covered by this document and are addressed by different International Standards published by ISO/IEC

— physical interactions (the signaling layer of the communication link) between interrogators and tags,

— interrogator and tag operating procedures and commands, and

— the collision arbitration algorithm used to singulate (separate to the current response slot) a specific tag in a multiple-tag environment.

In particular, this International Standard does not replace any existing RFID air interface specification issued by ISO/IEC but extends the existing methodologies for fixed RFID interrogators with mechanisms addressing the special challenges of Mobile RFID. The concepts and mechanisms described in this document may be integrated in any existing RFID protocol approved by ISO/IEC for the given frequency range of 860 MHz to 960 MHz (unless explicitly prohibited by such protocol) regardless of the actual command set.

The mechanisms defined by this International Standard should be used for Mobile RFID interrogators used in consumer applications and being compliant to the following International Standards:

ISO/IEC 18000-6 REV1, *Information technology — Radio frequency identification for item management — Part 6: Parameters for air interface communications at 860 MHz to 960 MHz*

BRM Approved Scope

This international standard applies to Mobile RFID interrogator devices used to inventory passive or semi-passive backscatter tags at 860MHz to 960MHz in a mobile (non fixed) application independent from specific communication details, i.e. modulation technique and command set.

Furthermore, the scope of this International Standard is mobile consumer applications, whereas mobile enterprise applications are not covered as long as operating in a closed environment.

An operating environment is considered to be closed if belonging to a central administrative authority able to guarantee for sufficient isolation, i.e. preventing mobile enterprise interrogator devices from being used outside the dedicated operating environment, and if sufficient spatial separation and/or electromagnetic shielding from adjacent operating environments is provided.

An application is considered a consumer application if at least one of two interacting entities is a private individual (consumer) and the interaction is taking place in the public domain. Consequently, a Mobile RFID consumer application is defined as Mobile RFID equipment (e.g. mobile phones equipped with an RFID interrogator) being used in a consumer application.

NOTE As there is currently no active contribution on Mobile HF interrogators, this document covers only UHF.

This document specifies

— Mobile RFID interrogator media access control,

— interrogator to interrogator and multiple interrogator to tag collision arbitration scheme including interrogator requirements,

— interrogator to interrogator and multiple interrogator to tag collision avoidance scheme, and

— tag memory use for Mobile RFID applications

The following aspects are not covered by this document and are addressed by different International Standards published by ISO/IEC

— physical interactions (the signaling layer of the communication link) between interrogators and tags,

— interrogator and tag operating procedures and commands, and

— the collision arbitration algorithm used to singulate (separate to the current response slot) a specific tag in a multiple-tag environment.

In particular, this International Standard does not replace any existing RFID air interface specification issued by ISO/IEC but extends the existing methodologies for fixed RFID interrogators with mechanisms addressing the special challenges of Mobile RFID. The concepts and mechanisms described in this document may be integrated in any existing RFID protocol approved by ISO/IEC for the given frequency range of 860 MHz to 960 MHz (unless explicitly prohibited by such protocol) regardless of the actual command set.

The mechanisms defined by this International Standard should be used for Mobile RFID interrogators used in consumer applications and being compliant to the following International Standards:

> ISO/IEC 18000-6 REV1, *Information technology — Radio frequency identification for item management — Part 6: Parameters for air interface communications at 860 MHz to 960 MHz*

SC031-N-3022
Scope Change for ISO/IEC 29172

Reference Architecture - 29172

Original Scope

> Mobile AIDC services mean consumer-oriented information services provided via mobile telecommunication networks and triggered by AIDC technologies like RFID and barcode. They consist of two types of Mobile RFID and Mobile ORM services. Mobile RFID services are those triggered by RFID and Mobile ORM services are those triggered by barcode. An example service case is described below.
>
> This work item is intended to be developed as a Technical Report to describe the reference architecture for Mobile AIDC services which provide information contents to consumers via RFID and barcode technologies. For example, a RFID or barcode tag is affixed to a movie poster; a Mobile RFID interrogator or barcode capturing camera, i.e. Mobile ORM reader, is built in a cell phone; a consumer aims or touches his/her cell phone at the ID tag of the movie poster; and then he/she gets a corresponding information content retrieved via Mobile AIDC technologies.
>
> This Technical Report deals with
>
> - Descriptions of Mobile AIDC services;
> - Reference architecture and service components for reader-based, tag-based, and P2P-based service models;
> - Service operation procedures; and
> - Relationship among relevant standards to enable the reference architecture.

Balloted Scope

Consisting of mobile RFID and mobile Optically Readable Media (ORM) services, mobile AIDC services refer to consumer-oriented information services provided via telecommunication networks and triggered by AIDC technologies such as RFID and linear bar codes or two-dimensional (2D) symbols. Although mobile AIDC services are provided mainly to ordinary consumers, they do not limit other types of end-users such as sales persons and repairpersons. The mobile RFID services are those triggered by RFID and the mobile ORM services are those triggered by linear bar codes or 2D symbols.

This Technical Report describes the reference architecture for mobile AIDC services that provide information contents to end-users via RFID and linear bar code or 2D symbol technologies. For example, an RFID tag or a linear bar code or 2D symbol called a *"data carrier"* is affixed to a movie poster; a mobile RFID interrogator or a symbol capturing camera, i.e. a mobile ORM reader, is built into a cell phone; an end-user aims or touches the cell phone to the data carrier on the movie poster; and the corresponding information content is retrieved via the networks.

This Technical Report includes:

- Descriptions of mobile AIDC services;
- Reference architecture and service components;
- Service operation procedures; and
- Relationship among relevant standards to enable the reference architecture.

BRM Approved Scope

Consisting of mobile RFID and mobile Optically Readable Media (ORM) services, mobile AIDC services refer to consumer-oriented information services provided via telecommunication networks and triggered by AIDC technologies such as RFID and linear bar codes or two-dimensional (2D) symbols. Although mobile AIDC services are provided mainly to ordinary consumers, they do not limit other types of end-users such as sales persons and repairpersons. The mobile RFID services are those triggered by RFID and the mobile ORM services are those triggered by linear bar codes or two-dimensional (2D) symbols.

This Technical Report describes a reference architecture for mobile AIDC services. For example, an RFID tag or a linear bar code or 2D symbol called a "data carrier" is affixed to a movie poster; a mobile RFID interrogator or a symbol capturing camera, i.e. a mobile ORM reader, is built into a cell phone; an end-user aims or touches the cell phone to the data carrier on the movie poster; and the corresponding information content is retrieved via the networks. This reference architecture does not restrict exploitation of other service architectures and aims at supporting the mobile AIDC service models described in the clause 5.

This Technical Report includes:

- Descriptions of mobile AIDC services;
- Reference architecture and service components;
- Service operation procedures; and
- Relationship among relevant standards to enable the reference architecture.

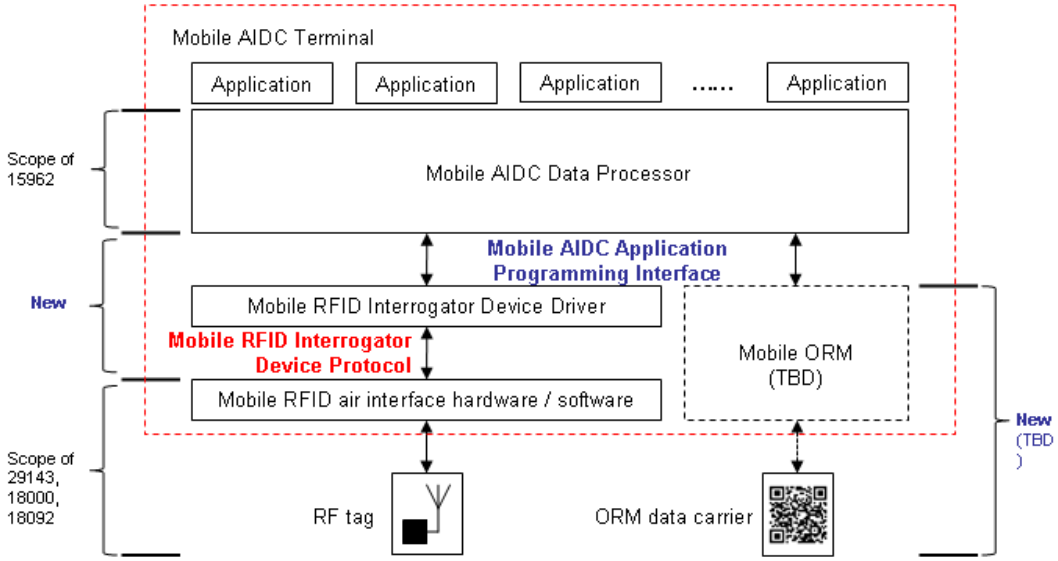
SC031-N-3023
Scope Change for ISO/IEC 29173-1

Device Protocol - 29173-1

Original Scope

This work item defines an interface protocol between “Mobile RFID Interrogator Device Driver” and “Mobile RFID air interface hardware/software” within a Mobile AIDC terminal as shown in the following figure.

The proposed “Mobile RFID Interrogator Device Protocol” is positioned to be implemented in both Mobile RFID Interrogator Device Driver and Mobile RFID Interrogator’s software. Mobile RFID Interrogator Device Driver is the software allowing the higher-level Mobile AIDC Data Processor to interact with the Mobile RFID air interface.



Without the standardized protocol, manufactures of Mobile RFID air interface hardware should develop multiple Mobile RFID Interrogator Device Drivers for different Mobile AIDC terminal platforms. Moreover, they also should develop a proprietary protocol between Mobile RFID Interrogator Device Driver and Mobile RFID air interface hardware. On the other hand, if both Mobile AIDC terminal manufactures and Mobile RFID air interface hardware

manufactures follow the standardized Mobile RFID Interrogator Device Protocol, various independent products will be mutually interoperable without extra costs.

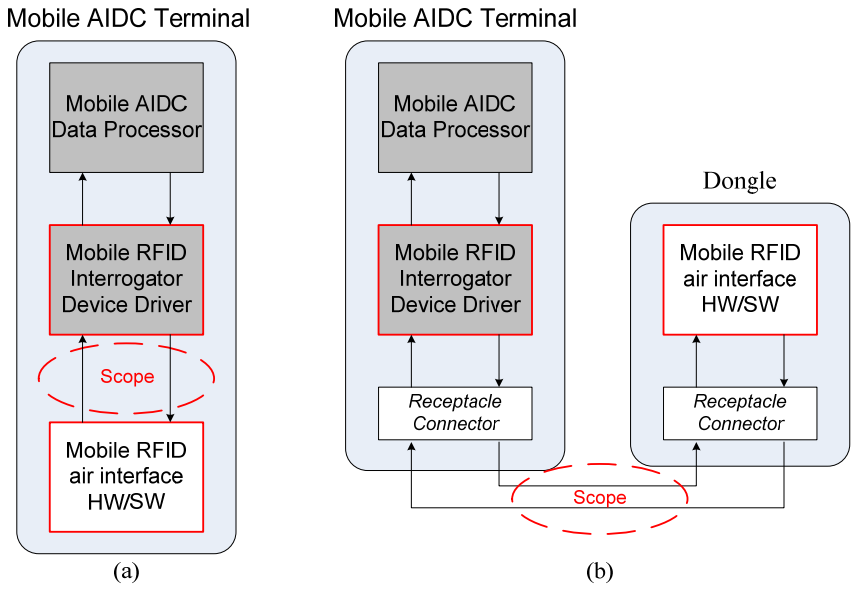
In accordance to the following RFID air interface standards, this work item will be composed of 4 parts:

- Part 1: Mobile RFID Interrogator Device Protocol for ISO/IEC 18000-6B
- Part 2: Mobile RFID Interrogator Device Protocol for ISO/IEC 18000-6C
- Part 3: Mobile RFID Interrogator Device Protocol for ISO/IEC 18000-3
- Part 4: Mobile RFID Interrogator Device Protocol for ISO/IEC 18092

The above multi-part standards will include:

- Types of command / response / notification protocol messages and their usages;
- Protocol message format; and
- Protocol message exchange procedures.

The following diagram shows the scope of this work item in cases where (a) a Mobile RFID air interface hardware is embedded in a Mobile AIDC terminal and (b) a Mobile RFID air interface hardware is connected to a Mobile AIDC terminal as a dongle.



Balloted Scope

This standard defines an interface protocol between a mobile AIDC application platform and a mobile RFID interrogator within a mobile AIDC terminal. This standard is positioned to be implemented in both mobile AIDC application platform and mobile RFID interrogator.

Without this standard protocol, manufactures of mobile RFID interrogator should develop multiple mobile RFID interrogator device drivers for different mobile AIDC application platforms. Moreover, they also should develop a proprietary interface protocol between mobile AIDC terminal platform and mobile RFID interrogator. On the other hand, if both mobile AIDC application terminal platform and mobile RFID interrogator developers follow this standardized

mobile RFID interrogator device protocol, various independent products will be mutually interoperable without extra costs.

In accordance to the ISO/IEC 18000-6B/C RFID air interface standards, this standard will include:

— Types of command / response / notification protocol messages and their usages;

— Protocol message format; and

— Protocol message exchange procedures.

The following diagram shows the scope of this standard in cases where (a) mobile RFID interrogator hardware is embedded in a mobile AIDC terminal and (b) mobile RFID interrogator hardware is connected to a mobile AIDC terminal as a dongle.

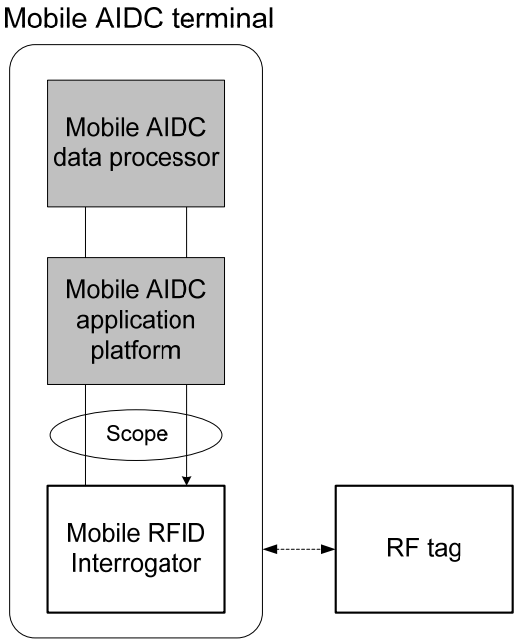


Figure 1

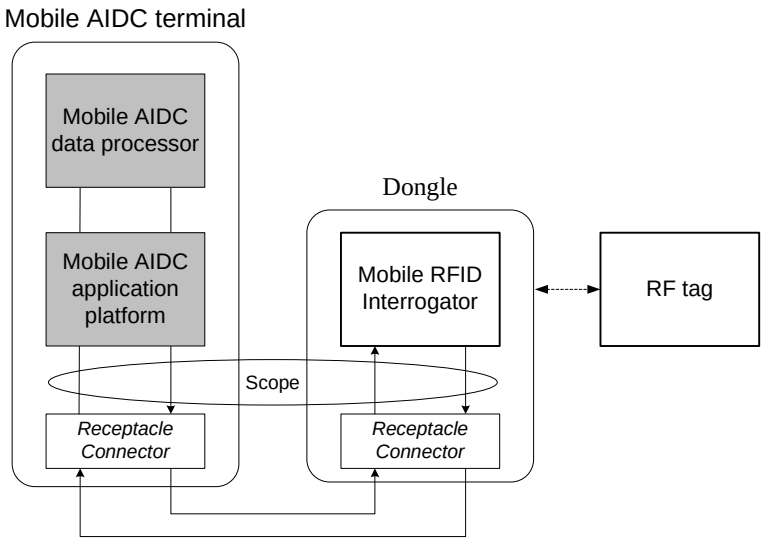


Figure 2

Referring to Fig. 1, a mobile AIDC terminal includes a mobile AIDC application platform and a mobile RFID interrogator. This standard specifies a mobile RFID interrogator device protocol between a mobile AIDC application platform and a mobile RFID interrogator.

Referring to Fig. 2, a mobile AIDC terminal includes a mobile AIDC application platform and a receptacle connector. A dongle includes a mobile RFID interrogator and a receptacle connector. The mobile AIDC terminal is connected to the dongle by the receptacle connectors. The present standard specifies a mobile RFID interrogator device protocol executed between a mobile AIDC application platform and a mobile RFID interrogator.

BRM Approved Scope

This standard defines an interface protocol between a mobile AIDC application platform and a mobile RFID interrogator within a mobile AIDC terminal. This standard is positioned to be implemented in both mobile AIDC application platform and mobile RFID interrogator.

Without this standard protocol, manufactures of mobile RFID interrogator should develop multiple mobile RFID interrogator device drivers for different mobile AIDC application platforms. Moreover, they also should develop a proprietary interface protocol between mobile AIDC terminal platform and mobile RFID interrogator. On the other hand, if both mobile AIDC application terminal platform and mobile RFID interrogator developers follow this standardized mobile RFID interrogator device protocol, various independent products will be mutually interoperable without extra costs.

In accordance to the ISO/IEC 18000-6 Type B and Type C RFID air interface standards, this standard will include:

— Types of command / response / notification protocol messages and their usages;

— Protocol message format; and

— Protocol message exchange procedures.

The following diagram shows the scope of this standard in cases where (a) mobile RFID interrogator hardware is embedded in a mobile AIDC terminal and (b) mobile RFID interrogator hardware is connected to a mobile AIDC terminal as a dongle.

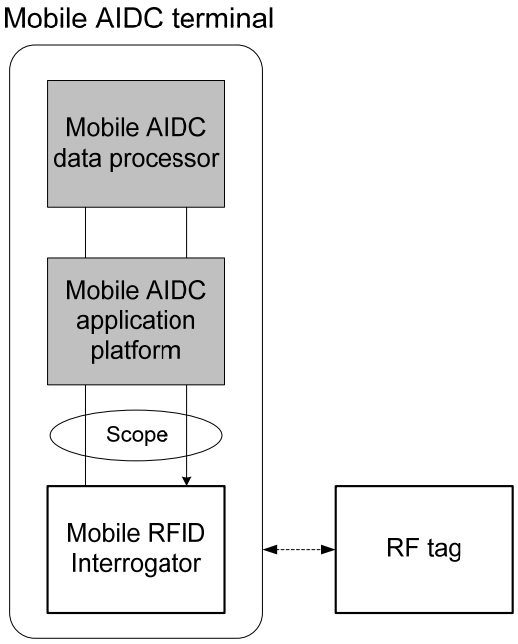


Figure 3

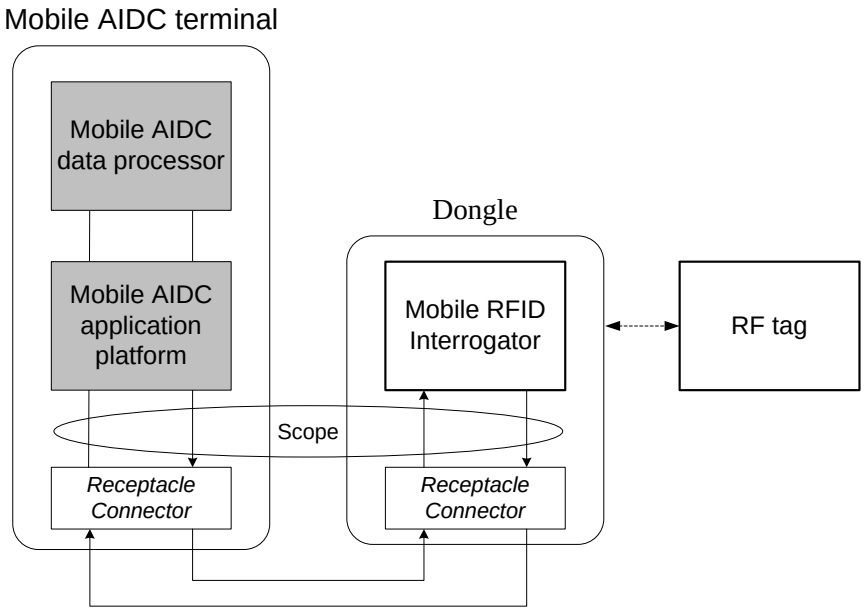


Figure 4

Referring to Fig. 1, a mobile AIDC terminal includes a mobile AIDC application platform and a mobile RFID interrogator. This standard specifies a mobile RFID interrogator device protocol between a mobile AIDC application platform and a mobile RFID interrogator.

Referring to Fig. 2, a mobile AIDC terminal includes a mobile AIDC application platform and a receptacle connector. A dongle includes a mobile RFID interrogator and a receptacle connector. The mobile AIDC terminal is connected to the dongle by the receptacle connectors. The present standard specifies a mobile RFID interrogator device protocol executed between a mobile AIDC application platform and a mobile RFID interrogator.

SC031-N-3024
Scope Change for ISO/IEC 29174

MII - 29174

Original Scope

This work item defines a UII structure and UII encoding format for Mobile AIDC services. The UII structure is proposed to support unique characteristics of Mobile AIDC services compared to legacy AIDC applications and services. Encoding formats of the proposed UII scheme follow existing encoding standards, ISO/IEC 15962 for RFID and ISO/IEC 15434 for barcode.

This work item deals with:

- UII structure for Mobile AIDC services; and
- UII encoding formats base on ISO/IEC 15962 for RFID tag and ISO/IEC 15434 for barcode tag.

The UII registration procedure is out of scope of this work item.

Balloted Scope

This standard describes an identifier scheme for a Mobile Item Identifier and encoding formats for data carriers for Mobile AIDC services. The Mobile Item Identifier scheme named mCode was developed to support service requirements of an identifier scheme for Mobile AIDC services. The encoding formats of this standard follow ISO/IEC 15962 and 15434 and focus on how to incorporate them to encode an MII into a data carrier.

BRM Approved Scope

This standard describes an identifier scheme for a Mobile Item Identifier and encoding formats for data carriers for Mobile AIDC services. The Mobile Item Identifier scheme named mCode was developed to support service requirements of an identifier scheme for Mobile AIDC services. The encoding formats of this standard follow ISO/IEC 15962 and 15434.

SC031-N-3025
Scope Change for ISO/IEC 29175

AD - 29175

Original Scope

Typical Mobile AIDC services are provided through network communication such as UII resolution and information content retrieval. Once UII is read by Mobile AIDC terminals, all information and services related to the UII are acquired through network.

But using additional application data stored on RFID tag or barcode enables user to get information or services without network operations. For example, additional application data can be simple product information, service name, URL and so forth.

This work item defines;

- Types of application data in Mobile AIDC services; and
- Application data structure and its encoding format.

Balloted Scope

This standard defines the structure encoding format for mobile AIDC Application Data in the user memory/data area of RFID tags, bar codes and two-dimensional symbols. Types of mobile AIDC Application Data are defined in Annex A.

BRM Approved Scope

This standard defines a structure encoding format for mobile AIDC application data in the user memory/data area of RFID tags, bar codes and two-dimensional symbols. Types of mobile AIDC application data are defined in Annex A.

SC031-N-3026
Scope Change for ISO/IEC 29176

Privacy - 29176

Original Scope

Mobile AIDC services aims for consumers and privacy protection is an important issue to be taken into account more. This work item defines a standard for lightweight functions and relevant parameters to provide consumer privacy-protection services, and specifies requirements to provide conformance with ISO/IEC 29143 interrogator and ISO/IEC 18000-6 Type C tag.

This work item focuses on technical solutions for protecting consumer privacy. Interrogator-to-host and host system (back-end enterprise) security issues are out of scope and covered by a variety of other best practices.

The scope of the work includes the followings:

- Requirements of consumer privacy-protection services for Mobile RFID
- Functions and parameters for UII hiding
- Functions and parameters for User memory data confidentiality
- Functions and parameters for access password management

This standard doesn't conflict with ISO/IEC 29143 and ISO/IEC 18000-6 Type C air interface. That is, the consumer privacy-protection services defined in this standard are accomplished by using the existing operation capability, command/response messages and access password.

This standard has to be treated as an optional specification because Mobile RFID services may be provided without privacy protection.

Balloted Scope

This standard provides a technical solution for addressing the privacy concern with tagged items for consumers.

There are many possible concerns regarding the authenticity and integrity of mobile RFID systems. For example, an unauthorized interrogator could can easily read a UII (Unique Item Identifier), TID (Tag Identifier), and the User memory banks of ISO/IEC 18000-6C tags and ISO/IEC 18000-3m3 tags because there is no read-protection for these memory banks. In this case, the unauthorized interrogator could gather the product information by analyzing the UII coding rules. Therefore, a privacy protection function should be included in a mobile RFID system utilizing those tags.

This standard focuses on tag-to-interrogator communications for providing a consumer privacy-protection solution. Interrogator-to-host and host (back-end enterprise) system security issues

are not in the scope of this standard, but are covered by a variety of other best practice documents.

BRM Approved Scope

This standard provides a technical solution for addressing the privacy concern with tagged items for consumers.

There are many possible concerns regarding the authenticity and integrity of mobile RFID systems. For example, an unauthorized interrogator can easily read a UII (Unique Item Identifier), TID (Tag Identifier), and the User memory banks of ISO/IEC 18000-6 Type C tags and ISO/IEC 18000-3 MODE 3 tags because there is no read-protection for these memory banks. In this case, the unauthorized interrogator could gather the product information by analyzing the UII coding rules. Therefore, a privacy protection function should be included in a mobile RFID system utilizing those tags.

This standard focuses on tag-to-interrogator communications for providing a consumer privacy-protection solution. Interrogator-to-host and host (back-end enterprise) system security issues are not in the scope of this standard, but are covered by a variety of other best practice documents.

SC031-N-3027
Scope Change for ISO/IEC 29179

API - 29179

Original Scope

This standard defines the abstract application programming interface for Mobile AIDC applications at Mobile AIDC terminals like cell phone, PDA, or smart phone.

The Mobile AIDC applications are a type of mobile network applications running on an embedded software platform like WIPI (Wireless Internet Platform for Interoperability), Symbian, BREW (Binary Runtime Environment for Wireless), or Windows mobile, at Mobile AIDC terminals. Mobile AIDC applications use Mobile AIDC devices such as Mobile RFID interrogator or Mobile ORM reader, to access the data carriers such as RF tag, barcode, etc.

This standard defines generic access interfaces to AIDC devices such as open, close, read, etc. for Mobile AIDC applications at an abstract level because of heterogeneity of the software platforms. Figure 1 describes where this standard works in.

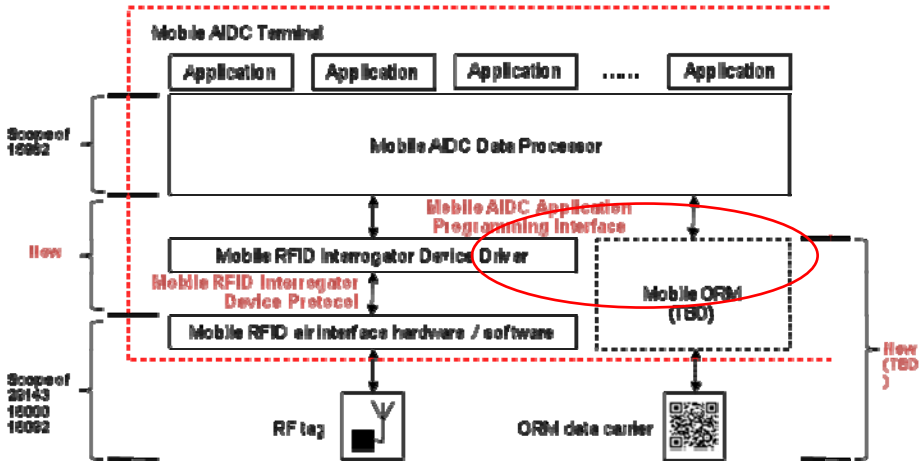


Figure 5 Mobile AIDC standard architecture

The scope of this work item includes the followings:

- Mobile AIDC applications description
- Mobile AIDC service scenarios description
- Functional requirements of the Mobile AIDC application interfaces

Abstract Mobile AIDC application programming interfaces (open, read, write, lock, etc.)

Balloted Scope

A mobile AIDC application is a type of mobile applications, which run on mobile application platforms. A mobile application platform is the development and running environment for mobile applications for the management and coordination of activities and sharing of the limited resources of the mobile terminal. And there exist many kinds of mobile application platforms, which provide different environment for mobile applications. Mobile AIDC applications need to access data carriers such as RF tags, barcodes, etc for reading and/or writing contents. For this purpose, mobile AIDC applications use embedded mobile AIDC devices such as mobile RFID interrogators or barcode readers. To make it possible, mobile application platforms provide appropriate application programming interfaces to mobile applications.

The goal of this standard is to define mobile AIDC application programming interfaces such as *open, close, read, write, lock*, etc. This standard does not specify implementation level interfaces but abstract level interfaces because of the heterogeneity of mobile application platforms. Different mobile application platforms have their own particular application programming interface sets or data dictionaries. Figure 1 describes where this standard works.

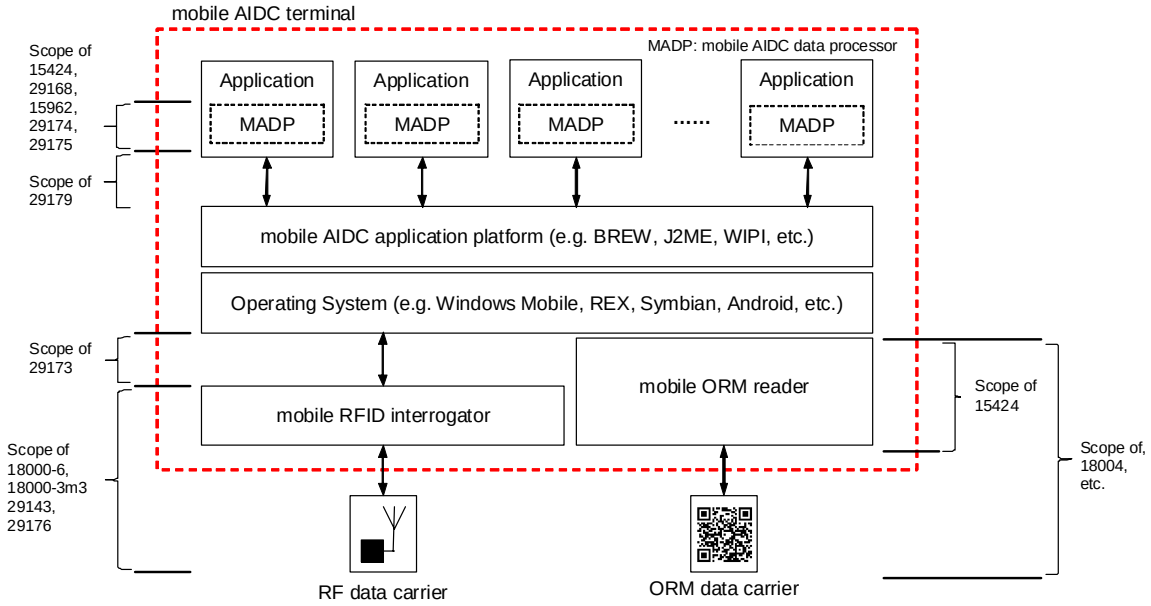


Figure 1 Mobile AIDC standard architecture

The exact data syntax and encoding for the data that are read from or writing to data carriers complies with ISO/IEC 15962.

This standard includes the followings:

— *mobile AIDC applications description*

— *mobile AIDC service scenarios*

— *Functional requirements of the mobile AIDC application interfaces*

— *Abstract mobile AIDC application programming interfaces (open, read, write, lock, etc)*

BRM Approved Scope

A mobile AIDC application is a type of mobile applications which run on mobile application platforms. A mobile application platform is the development and running environment for mobile applications for the management and coordination of activities and sharing of the limited resources of the mobile terminal. And there exist many kinds of mobile application platforms which provide different environment for mobile applications. Mobile AIDC applications need to access data carriers such as RF tags, barcodes, etc for reading and/or writing contents. For this purpose, mobile AIDC applications use embedded mobile AIDC devices such as mobile RFID

interrogators or barcode readers. To make it possible, mobile application platforms provide appropriate application programming interfaces to mobile applications.

The goal of this standard is to define mobile AIDC application programming interfaces such as *open, close, read, write, lock*, etc. This standard does not specify implementation level interfaces but abstract level interfaces because of the heterogeneity of mobile application platforms. Different mobile application platforms have their own particular application programming interface sets or data dictionaries.

This standard includes the followings:

— *mobile AIDC applications description*

— *Functional requirements of the mobile AIDC application interfaces*

— *Abstract mobile AIDC application programming interfaces (open, read, write, lock, etc)*

Scope Change for ISO/IEC 29173-1

Original Title

Information technology — Automatic identification and data capture techniques — Mobile item identification and management — Part 1 : Mobile RFID interrogator device protocol for ISO/IEC 18000-6C

Balloted Title

Information technology — Automatic identification and data capture techniques — Mobile item identification and management — Part 1 : Mobile RFID interrogator device protocol for ISO/IEC 18000-6 Type B and Type C

* This ballot passed without any comments from the National Bodies.

Scope Change for ISO/IEC 29175

Original Title

Information technology — Automatic identification and data capture techniques — Mobile item identification and management — Application data structure and encoding format for Mobile AIDC services

Balloted Title

Information technology — Automatic identification and data capture techniques — Mobile item identification and management — Application data structure encoding format for Mobile AIDC services

BRM Approved Title

Information technology – Automatic identification and data capture techniques -- Mobile item identification and management -- Application data structure encoding format for Mobile AIDC services