

RFID

RFID Standardization and Technology Trends

<p>& RFID/USN</p> <p>.....</p> <p>. RFID</p> <p>. RFID</p> <p>.</p>	<table border="1"> <tr> <td>(S.W. Oh)</td> <td>RFID/USN</td> </tr> <tr> <td>(C.S. Pyo)</td> <td>RFID/USN</td> </tr> <tr> <td>(J.S. Chae)</td> <td>· USN</td> </tr> </table>	(S.W. Oh)	RFID/USN	(C.S. Pyo)	RFID/USN	(J.S. Chae)	· USN
(S.W. Oh)	RFID/USN						
(C.S. Pyo)	RFID/USN						
(J.S. Chae)	· USN						

RFID

USN

RFID

가

RFID

EPCglobal,

ISO/IEC
, RFID

/ RFID

I.

IT

RFID , RFID

, RFID

, RFID

(smart cards) ,

, RFID

가

,

(AIDC)

가

가

[1]. , RFID

USN

가

가가

가

. RFID

가

. 가

RFID

가 . (1)

RFID

RFID EPCglobal

ISO/IEC, EPCglobal, Inc. (EPC-global),

RFID 2

RFID

IFF

, 1960

가 ,

가 . 1990

RFID 가

, / ,

IPv6

. RFID

RFID

1990

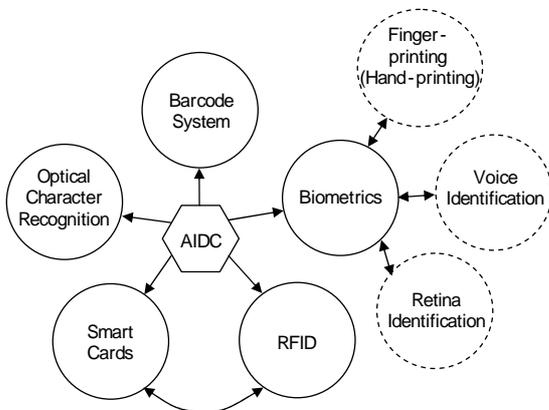
ISO/IEC

EPC-

global,

, RFID

, RFID ITU, IETF



(1)

UID ETSI, AIM, Inc. RFID 가 2003 RFID



1. ISO/IEC JTC1/SC31

ISO/IEC JTC1 SC31
 [2]. ISO/IEC JTC1
 ISO IEC
 (JTC1) , SC31 JTC1
 31 (Sub-Committee) ,¹⁾

RFID (automatic identification and data capture techniques)
 28 (participating member)
 2001 (2) ISO IEC RFID

[3]. 1990 (ISO TC104), IC (ISO/IEC JTC1/SC17) RFID 가

ISO/IEC JTC1/SC31 2005 4 , SC31 (3) 5 WG , WG1, WG2, WG3, WG4

(data carrier), (data structure), (conformance), RFID (RFID for item management) , 2004

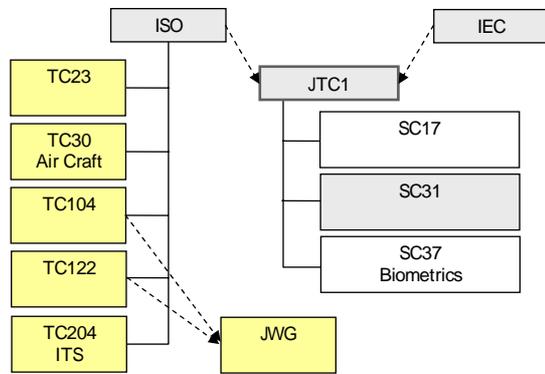
1) 1987 SC가 37 SC SC31 1996 18 JTC1 1800 ISO IEC , JTC1
 2) 'P' observer 'O' 6 가

(RTLS) WG5

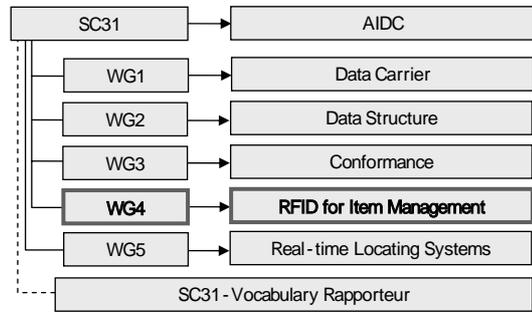
, SC31

(rapporteur) WG4 (4) 5 (SG) , SG1 RFID

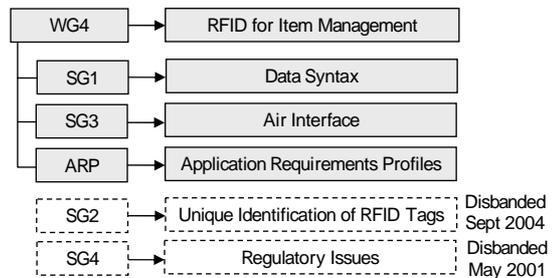
SG2 RFID



(2) ISO/IEC RFID



(3) SC31



(4) WG4

/ RFID

interface , SG3 RFID air 가 , 2005 'SG5' , RFID가 , SC31/WG4 RFID 가 'Item Management' SG4가 , RFID , ARP가 WG4 , ISO (TC) (liaison) SG2 SG4 , 2004 2005 4 SC31/WG4 2 TR 2001 , 3 11 (IS) (SG1, SG3, ARP) , 12 ARP , RFID . < 1> SC31/ < 1> ISO/IEC JTC1/SC31/WG4

Sub Group	Area (Information Technology – Radio Frequency for Item Identification)	Project Number	Status	Date	Note
SG1	Data Protocol: Application Interface	ISO/IEC 15961:2004	IS	2004. 10.	
	Data Protocol: Data Encoding Rules and Logical Memory Functions	ISO/IEC 15962:2004	IS	2004. 10.	
	System Management Protocol	-	NP		2007
SG2	Unique Identification for RF Tag	ISO/IEC 15963:2004	IS	2004. 9.	
SG3	Part 1: Reference Architecture and Definition of Parameters to be Standardized	ISO/IEC 18000-1:2004	IS	2004. 9.	
	Part 2: Parameters for Air Interface Communications below 135kHz	ISO/IEC 18000-2:2004	IS	2004. 9.	
	Part 3: Parameters for Air Interface Communications at 13.56MHz	ISO/IEC 18000-3:2004	IS	2004. 9.	
	Part 4: Parameters for Air Interface Communications at 2.45GHz	ISO/IEC 18000-4:2004	IS	2004. 8.	
	Part 6: Parameters for Air Interface Communications at 860MHz to 960MHz	ISO/IEC 18000-6:2004	IS	2004. 8.	
	Part 6: Parameters for Air Interface Communications at 860MHz to 960MHz	ISO/IEC 18000-6	PDAM		18000-6C 가
	Part 7: Parameters for Active Air Interface Communications at 433MHz	ISO/IEC 18000-7:2004	IS	2004. 8.	
	Elementary Tag License Plate Functionality for ISO/IEC 18000 Air Interface Definitions	ISO/IEC 24710	IS(TR)	2005. 1.	
ARP	Application Requirements Profiles	ISO/IEC TR 18001:2004	IS(TR)	2004. 10.	
	Implementation Guidelines – Part 1: RFID-Enabled Labels	ISO/IEC 24729-1	WD		
	Implementation Guidelines – Part 2: Recyclability of RF Tags	ISO/IEC 24729-2	WD		
	Implementation Guidelines – Part 3: RFID Interrogator/Antenna Installation	ISO/IEC 24729-3	WD		



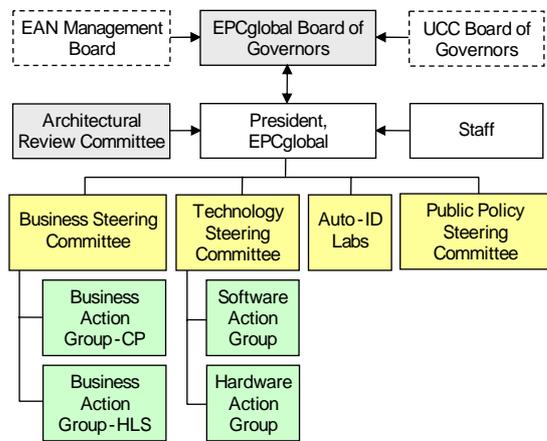
WG4

(TSC)

2. EPCglobal, Inc.

RFID EPC-global
 global
 MIT
 (UCC), (DoD), Gillette, P&G 100
 , 1999 Auto-ID
 RFID
 Auto-ID 2003 9 EAN • UCC(
 GS1)
 RFID
 (Walmart)
 EPCglobal 가 [4].
 EPCglobal EAN UCC
 (BOG) 가
 , EPCglobal
 (ARC) 4 (steering
 committee) 가 . (5) EPCglobal
 (BSC)

Auto-ID Labs Auto-ID
 100
 가
 (PPSC)가
 Auto-ID Labs MIT
 6
 RFID
 . 2005 4 (ICU)
 가 7 Auto-ID Lab
 'Auto-ID Lab ICU'가 , Auto-ID
 Lab
 RFID
 . < 2>
 Auto-ID Lab
 , EPCglobal
 , UHF air-interface, EPC
 , RFID



(5) EPCglobal

< 2> Auto-ID Labs

MIT	Head-quarter, http://web.mit.edu/auto-id/www
Cambridge	http://www.auto-idlabs.org.uk
Adelaide	RFID http://autoidlab.eleceng.adelaide.edu.au
Keio	http://www.auto-id.jp
Fudan	http://www.auto-idcenter.cn/english
St. Gallen	가 http://www.m-lab.ch/auto-id

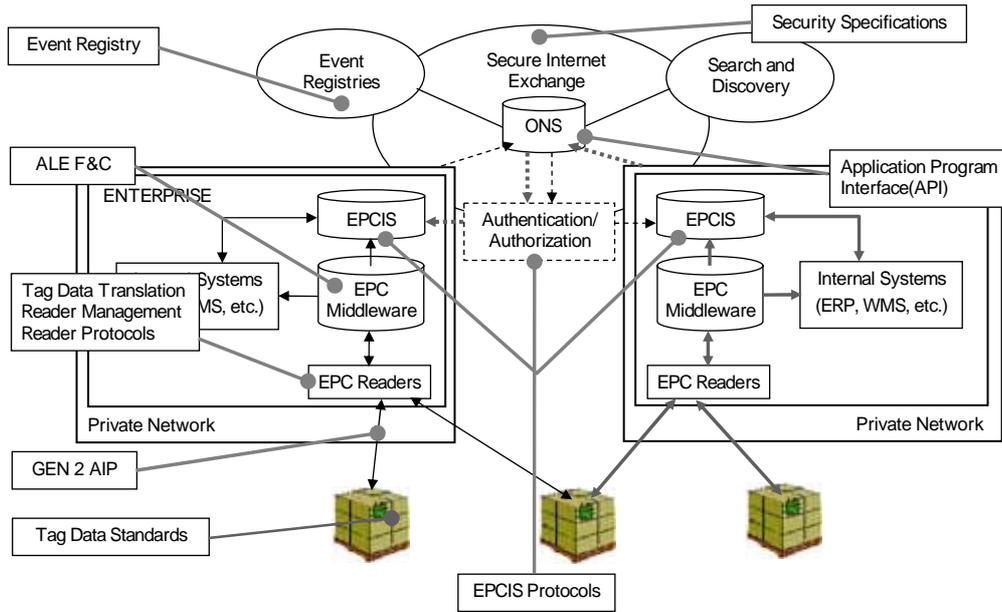
, ONS EPCIS

3. RFID

, API

[5]. (6) EPCglobal

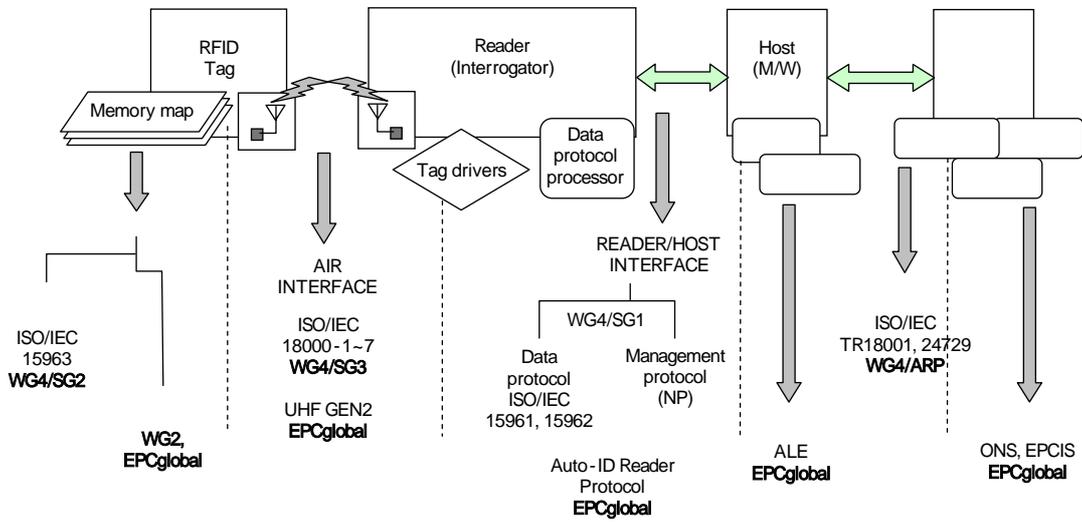
RFID/USN , RFID



(6) EPCglobal Network

< 3> RFID

RFID	
RFID/USN (PG311)	RFID (WG3111) RFID (WG3112) USN (WG3113) (WG3114)
http://www.tta.or.kr	(, , , USN) (, , ,) (ONS, ONS) (RFID , USN)
RFID/USN	SI
RFID/USN http://www.karus.or.kr	(, , ,)
Mobile RFID	/
RFID & RFID	SG1(,) SG2() SG3()
http://www.ksa.or.kr	



(7) RFID

RFID

RFID

3)

. < 3>

RFID

air-protocol),

(reader protocol),

, USN

2004 8

Mobile RFID

, 2005

(application interface)

. (7) RFID

15

TTA

, RFID

1.

RFID

ISO/IEC

RFID

가

4)

가

125kHz, 135kHz, 13.56MHz, 433MHz, 860~960 MHz, 2.45GHz, 5.8GHz

ISO/IEC 135kHz (ISO/IEC 18000-2), 13.56MHz(ISO/IEC 18000-3), 433MHz(ISO/IEC

. RFID

3)

(‘smart’ reader)

RFID

RFID

4)

가



(8)

18000-7), 860~960MHz(ISO/IEC 18000-6), 2.45 GHz(ISO/IEC 18000-4) 가 Class 1 Gen2 , UHF Gen2 protocol , 13.56MHz 2.45GHz , smart cards 가 Class 1 Gen2 2004 12 EPCglobal 가 UHF (433 860~960MHz) 2005 1 ISO/IEC ISO/IEC 18000-6 mode C 가 , Class 1 ISO/IEC Gen2 UHF passive RFID , ISO/IEC 18000-1, 2, 3, 4, 6, 7 2004 9 (8) ISO/IEC 18000 ISO/IEC 18000 (performance) , (conformance) TR ISO/IEC 18046 CEPT, ETSI, 18047 5) ITU 가 2005 ISO/IEC RFID/USN 2004 18000 EPCglobal 433.67~434.17MHz, 908.5~914MHz , Class 0, Class1, Class 1 Gen2 가 tag

5) ISO/IEC 18046 RFID Device Performance Test Methods TR 2005 1 , ISO/IEC 18047 RFID Device Conformance Test Methods 18047-3,4 IS 가 , 18047-2,6,7 2005 IS가

6) Battery Assist and Sensor Functionality

2. -

RFID RFID



ISO/IEC 15961 15962
 7)
 8)
 EPCglobal , Class 0 Class 1
 reader protocol (LCWD)⁹⁾
 , reader ¹⁰⁾
 , 2005
 global EPC-
 EPCglobal , 'Savant'
 (ALE) , RFID
 , 2005

- RFID-enabled labels
- Recyclability¹²⁾ of RF tags
- RFID interrogator/antenna installation

EPCglobal
 ,
 EPCglobal
 , RFID
 'EPCglobal Network'
 , (6) RFID
 'EPC'
 ,
 ONS EPCIS
 , ONS EPCIS
 , EPCIS Class 1 Gen2
 Phase I Phase II
 , Phase I

3.

ISO/IEC ISO/IEC TR 18001 ,
 ISO/IEC 18000
 , 가
 ISO/IEC 24710 RFID
 가
 , 가 ¹¹⁾

4.

RFID
 , RFID 가
 가 EPCglobal
 RFID 가 가
 64bits, 96bits, 256bits EPC
 , 64bits 96bits
¹³⁾
 Class 1 Gen2 , RFID ¹⁴⁾ EPC

7) Data Formatting, Encoding, Compacting RFID

8) ISO/IEC 24752

9) Version 1.0 Class 1 Gen2 가

10) Reader Management 가
 11) 가 가

12) ' ' RFID

13) EPC™ Tag Data Standards Version 1.1 Rev.1.27, 2004. 12.

14) Access Password Kill Password

Class 1 Gen2 EPC 가

ISO/IEC 15963 , RFID
 15)

EPCglobal Class 1 Gen2

ISO/IEC 15459
 (UII)¹⁶⁾

RFID

ISO/IEC EPCglobal 가

RFID

ITU IETF

RFID , RFID

IT

RFID

가 가

- AIDC Automatic Identification and Data Capture
- AIM Association for Automatic Identification and Mobility
- ALE Application Level Events
- ARC Architectural Review Committee
- ARP Application Requirement Profile
- BOG Board of Governors
- BSC Business Steering Committee
- CEPT European Conference of Postal and Telecommunications Administration
- DoD US Department of Defense
- EAN European Article Number
- EPC Electronic Product Code
- EPCIS EPC Information Service
- ETSI European Telecommunications Standards Institute
- IEC International Electro-technical Commission
- IETF Internet Engineering Task Force
- IFF the Identification of Friend or Foe
- IS International Standards
- ISO International Organization for Standards
- ITU International Telecommunication Unit
- JTC Joint Technical Committee
- LCWD Last Call Working Draft
- ONS Object Name Service
- P&G Procter & Gamble
- PPSC Public Policy Steering Committee
- RFID Radio Frequency Identification
- RTLS Real Time Locating System
- SC Sub-Committee
- SG Sub-Group
- TC Technical Committee
- TR Technical Report
- TSC Technical Steering Committee
- UCC Uniform Code Council
- UHF Ultra-High Frequency
- UID Ubiquitous Identification
- UII Unique Item Identifier
- USN Ubiquitous Sensor Network
- WG Working Group

15) Chip ID Tag ID

16) An identification that uniquely identifies a specific entity during its life – may be used with qualifier: UII-Returnable, UII-Container, UII-Transport, etc.

[1] K. Finkenzeller, "RFID Handbook: Fundamentals



- and Applications in Contactless Smart Card Identification(2nd Ed.),” John Wiley & Sons, 2003.
- [2] ISO/IEC JTC1/SC31, <http://usnet03.uc-council.org/sc31>, 2005.
- [3] , “RFID ,” IITA ITFIND 1150 , 2004. 6., pp.1 - 13.
- [4] EPCglobal, Inc., <http://www.epcglobalinc.org/>
- [5] Chris Adcock, “Supply Chain Visibility – The EPC-global Network,” RFID/EPCglobal , Mar. 2005.
- [6] , , “RFID ,” TTA , 95 , Oct. 2004, pp.37 - 47.