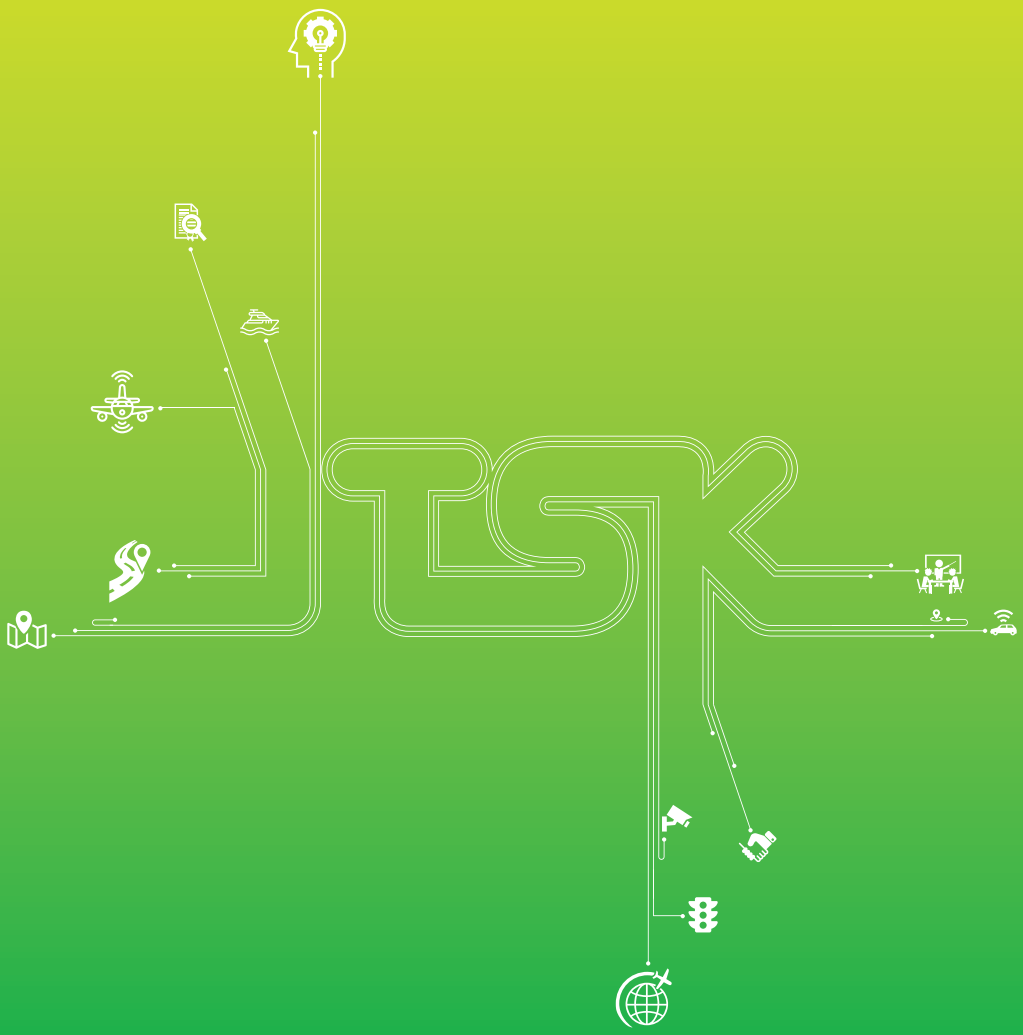
ITS KOREA & MEMBERS PROFILE

Intelligent Transport Society of Korea

ITS KOREA Intelligent Transport Society of Korea



ITS KOREA
Intelligent Transport Society of Korea

Welcome

I am Kim Seong-Soo, president of ITS Korea (Intelligent Transport Society of Korea). I am pleased to share this report with you all and hope to build mutual cooperation between countries.

Korea deployed ITS (Intelligent Transport Systems) services based on National Transport System Efficiency Act which was enacted in 1999.

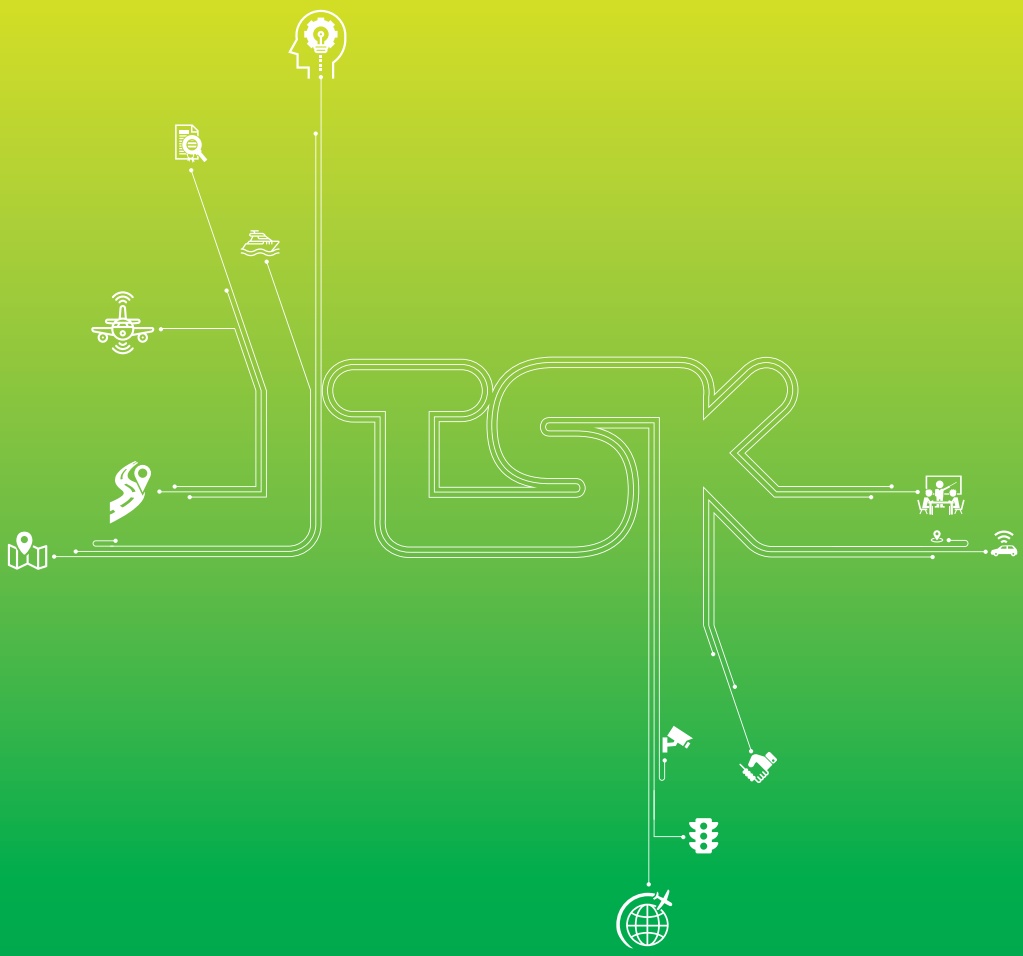
Since then, Korean ITS such as Advanced Traffic Management, Electronic Payment System, Real-time Traffic Information System has been improving the quality of life by solving traffic and environmental problems such as traffic congestion, traffic accidents, and air pollution. For these reasons, Korean ITS has been recognized and exported to many countries.

Since its foundation, ITS Korea has been working on Standardization, Performance Evaluation, ITS Standard Verification, R & D, and Overseas Business, etc. We are also making efforts to develop the automated driving and C-ITS implementation along with the global trend.

Finally, I hope the world will grow together in the ITS field by continuously sharing ITS experiences and know-how of each country.

I look forward to your cooperation and support.

Seongsoo Kim
President, ITS KOREA



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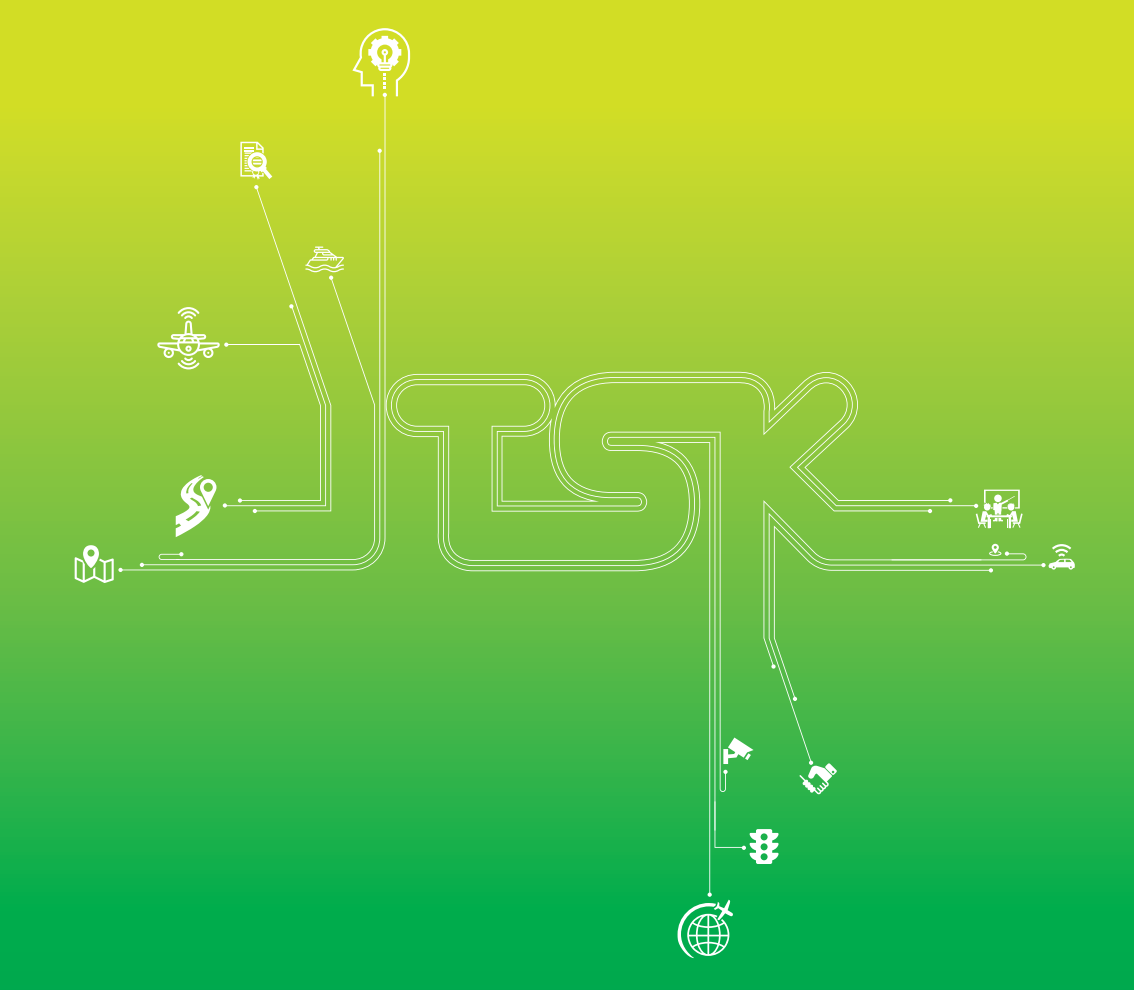


Part 1 Introduction of ITS KOREA

ITS KOREA Intelligent Transport Society of Korea

Introduction of ITS KOREA

ITS KOREA, right in the core of ITS industry in Korea,
reaching out to the world of tomorrow

Goals of ITS KOREA

ITS KOREA (Intelligent Transport Society of Korea) was established in year 1999 to leverage Korea's advanced ITS technologies to drive new global trend of ITS products and services. As the bridge for private and public sectors and academia, ITS KOREA is open to digest the industrial opinion, to propose the policy and to promote ITS business, propose R&D and many other activities to boost up the industry.

- To establish close cooperation relationship among private sectors, public sectors, and academia.
- To provide the technical advice on the national ITS policy and strategies.
- To strengthen international status by leading various international cooperation and overseas marketing.
- To secure advanced technologies by conducting specialized and creative researches and strengthening core abilities.
- To vitalize the market and promote growth in ITS industry by organizing and attending conference, exhibition, congress, forum, and so on.

Relevant Laws and Regulations

- National Transport Systems Efficiency Act (Article 91. Foundation of Intelligent Transport Society of Korea, ITS KOREA)
- It states that ITS KOREA is founded to foster growth of ITS as well as to effectively establish and manage ITS including ground, maritime, air transportation accredited by Minister of Ministry of Land, Infrastructure and Transport (MOLIT) and ITS KOREA was appointed as official organization to take this role by law (Feb. 2011).

Main Tasks

Standardization
- Build Standard Basis Environment
- Support Standard Development
- Disseminate and Maintain of Standard, Support Private Driving Standard Development

Standard Observance Verification & Certification
- ITS Standard Conformity Assessment
- ITS Testing / Inspection
- RSE ID Allocation

Performance Evaluation
- Inspection for Approval Construction & Regular Inspection
- Education, Public Relations, Training, Technology Exchange
- Regulation, Technology, Method Development
- Information, Collection & Dissemination

ITS KOREA

Designated by MOLIT as National Oranization for
- ITS Standards
- ITS Standard Observance Verification
- ITS Performance Evaluation
- International Cooperation
- C-ITS Pre-deployment

COSDI(Cooperation Organization for Standards Development)
by Korean Agency for Technology and Standards(KATS)

Dedicated ITS Educational Institute
by Ministry of Employment and Labor

ITS Inspection Body
by KOLAS(Korea Laboratory Accreditation Scheme)

Project Consulting
- Project Action Plan
- Project Ordering, Contract Assist
- Project Launching and Processing, Quality Control
- Inspection for Completion

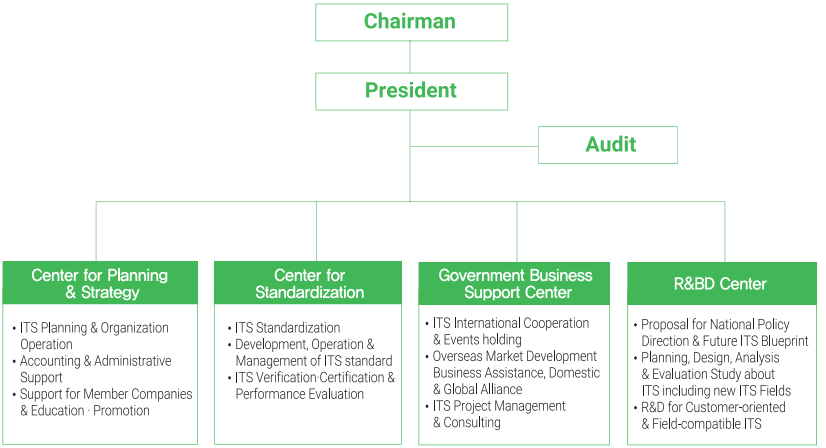
R & D
- Policy on Road and ITS
- Grand Scale of National R&D
- Projects Evaluation, Investigation, Analysis

Education
- Develop the Education Courses and Materials
- Conduct Basic and Professional Education
- Professional Instructors and Joint Education Program
- Manage Training Courses

Overseas Business
- Overseas Maketing Research
- Promote Korea ITS Technology
- Customized ITS Consulting
- 1:1 Business Matching
- ODA Project Development

Global / Domestic Alliance
- International Cooperation with the ITS Related Organization
- Assist Membership Company
- Organize Domestic & International Conference

Number of Employee : 68



History of ITS KOREA

History

2014-2019

Designated as National Organization for C-ITS Pilot Project for Local Governments by MOLIT
Designated as National Organization for International Cooperation on ITS by MOLIT
Accredited as KOLAS Inspection Agency for ITS Performance Evaluation
Designated as Joint Training Center for Transportation / ITS by MOEL (Consortium for HRD Capacity Building Program)
Designated as Exclusive National Organization for C-ITS Pilot Project by MOLIT

2010-2013

Designated as Exclusive National Organization for ITS Standard by MOLIT
Designated as Cooperating Organization for Standards Development (COSD) by KATS
Establish and Operate ITS Standards of Estimate
Accredited as Statutory Body
Host the 17th ITS World Congress in Busan, Korea
Designated as National Organization for ITS Performance Evaluation by MOLIT

2002-2009

Designated as National Organization for ITS Standardization by MOLIT
Designated as National Organization for ITS Standards Observance Verification by MOLIT
Host International Workshops & Seminars
Operate ITS Standards Assembly
Host the 5th Seoul ITS AP Forum

1998-2001

Establish the Long-term Development Plan for ITS Korea
Establish ITS Korea / as Registered Organization
Host the 5th ITS World Congress, in Seoul, Korea

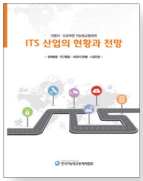
Publications

all about ITS

Issued on 2019.02.01.
USD 50

2018 Estimation Guides in ITS

Issued on 2018.04.01.
USD 20 (free online)



The Current Status and Prospect of ITS in Korea

Issued on 2017.04.14.
USD 350

News Letter (online)

Issued every Monday
for members

Monthly ITS

Issued every first Tuesday
for members

Standard ITS

Issued every 6 months
free of charge

Standardization

- *Designated the organization dedicated to ITS standardization by MOLIT (Ministry of Land, Infrastructure and Transport)*
- *Designated Cooperation Organization for Standards Development (COSD) by KATS (Korean Agency for Technology and Standards)*
- *Administration of the ITS Standards Assembly (Private Standards Bodies)*

Contributing to laying the foundation of ITS industry by carrying out standardization on behalf of MOLIT, administrating private standards bodies, and doing international standards cooperation activities, etc.

Laying the Foundation for Standards
- Preparation of systems related to standards
- Participation in the revision of national ITS architecture

Standard Development and Support
- Development and reorganization of national standards (KS) in the ITS area
- Support for the development and maintenance of technical regulations
- Administration of ITS general assembly

Standard Dissemination and Maintenance
- Regular training for ITS Standardization
- Support for cooperative activities of international standards
- Publication of ITS terminology dictionary, Korean ITS standardization activity report, etc.

Main Activities

- Supporting International Standardization Activities (ISO/TC 204)
- Supporting ISO/TC204 WG 1,5,9,10,18 Specialist Activities
- Develop the Technical Regulations and Support the Related Activities
- Develop the Technical Regulations Conformity Test
- Standardize De Facto Standards • Administrate the Standards Assembly • Establish and Publish Total 75 Standards
- Operate the National ITS Data Registry and ITS Architecture Website

- Carry out the standardization training course and education class every year

- Build and operate the website for National ITS Standards (National ITS Data Registry of Korea)

http://dr.its.go.kr

Verification of ITS Standards Observance

- *Designated ITS Standards Observance Verification Organization by MOLIT (Ministry of Land, Infrastructure and Transport)*
- *Designated the organization dedicated to ITS standardization by MOLIT (Ministry of Land, Infrastructure and Transport)*

Evaluating and determining whether or not systems subject to national standards meet the relevant ITS standards through objective test methods defined by third party when a new ITS is built or changed

Target systems

- Systems that are established (or changed) based on the implementation plan approved by the project operator
- Systems that are established by an operator after obtaining permission from relevant authorities
- Reference systems in connection with the verification target systems

Target Technologies

- Basic transport information exchange (between centers)
- Public transportation (bus) information exchange (between centers)

Verification of ITS Standard Observance

- The application of the national technical regulation "the basic traffic information exchange"
- The application of the national technical regulation "the basic traffic information exchange II"
- The application of the national technical regulation "the public transport (bus) information"
- The application of the national technical regulation "the basic traffic information exchange IV"
- The application of the national technical regulation "ETCS by DSRC"

Conformance Test of ITS Standard

- ETCS System Conformance Test
- OBU Conformance Test
- Traffic Information Collection&Provision by DSRC Conformance Test
- Toll Violation Enforcement System Conformance Test
- Tunnel Integrated Wireless Communication System Conformance Test
- Tunnel Incident Detection System Conformance Test
- Other ITS Related Conformance Test

Performance Evaluation

- *Designated organization dedicated to ITS Performance Evaluation by MOLIT (Ministry of Land, Infrastructure and Transport)*
- *Accredited inspection agency evaluating VDSs & AVIs by KOLAS (Korea Laboratory Accreditation Scheme)*

Improving traffic information traffic information quality by ensuring that the functions of ITS equipment are kept above a certain level according to ITS performance evaluation standards of MOLIT

Target equipment

- Vehicle Detection System (VDS)
- Automatic Vehicle Identification (AVI)
- DSRC Traffic Information System
- Incident Detection System (IDS)
- High Speed Weight In Motion (HS WIM)

Conformance Test of ITS Standard

Contributing to ITS quality improvement by testing whether the performance of ITS-related equipment products and services meet performance requirements of ITS group standards

Target System

- Electronic Toll Collection System (ETCS)
- On Board Unit (OBU)
- ANPR (Automatic Number Plate Recognition)
- Low Speed WIM System (LS WIM System)
- Tunnel Radio Rebroadcasting System
- Automated Tunnel Incident Detection System

To issue KOLAS inspection report for ITS Performance Evaluation

- Target devices : VDS (Vehicle Detection System), AVI (Automated Vehicle Identification)
- Execution : : Inspection for project completion, Regular inspection
- Methods : In accordance with the guidelines of ITS project implementation – VDS and AVI Performance Evaluation (latest version)
- After the inspection is completed, the official KOLAS inspection report will be issued

Project Management & Consulting

- *Designated ITS project consulting organization [Article 14 of ITS project implementation guidelines]*
- *Designated Project management organization dedicated to C-ITS pilot projects for local governments [by MOLIT]*

Evaluating and determining whether or not systems subject to national standards meet the relevant ITS standards through objective test methods defined by third party when a new ITS is built or changed

Planning of ITS Project	Consult the Ordering Body about Project Implement Action Plan Fundraising Method RFP and Bidding Guide Manual of Technology Proposal Pre-research and Analyze the Current Condition of Implement site
Conducting of ITS Project	• Manage the Implement Process • Report the Daily / Weekly / Monthly Process • Quality Control • Safety Management • Implement Management
Completing of Project	• Verification Standard Observance • Inspection for Completion • Evaluation of Unit and Integration Test • Evaluation of System Performance • Post Research & Analyze • Comparison Analysis of Before and After

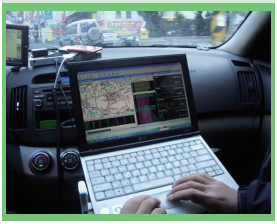
Work Scope of ITS Project Management by Period

01 Planning of ITS Project

- Consult the Ordering Body about Project Implement Action Plan Fundraising Method RFP and Bidding Guide Manual of Technology Proposal
- Pre-research and Analyze the Current Condition of Implement site

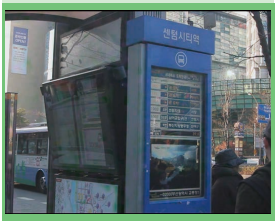
02 Conducting of ITS Project

- Manage the Implement Process
- Report the Daily / Weekly / Monthly Process
- Quality Control
- Safety Management
- Implement Management



03 Completing of Project

- Verification Standard Observance
- Inspection for Completion
- Evaluation of Unit and Integration Test
- Evaluation of System Performance
- Post Research & Analyze
- Comparison Analysis of Before and After

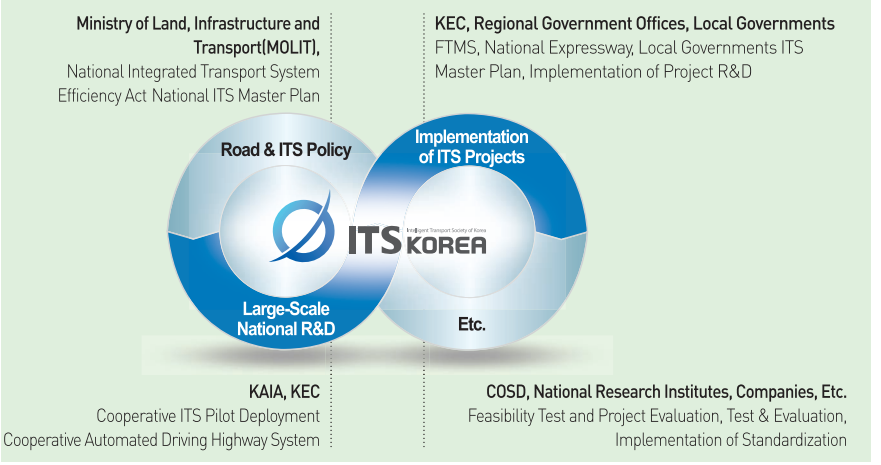


Research & Development

• Designated organization dedicated to management of C-ITS pilot project [by MOLIT]

Leading development of ITS industry by directly carrying out tasks for related policy · academic research, and technology development to support national ITS policy and to present the blueprint of future ITS

Proposal of National Policy Direction	• Study on the establishment of ITS policy of central/local government & road management organization • Study on laying foundation for Standardization, performance criteria, diagnosis evaluation, etc. • Planning, design, analysis and evaluation study for systematic ITS project
Proposal of Future ITS Blueprint	• National R&D proposal according to future traffic environment change • Development of new ITS fields & new growth Creation • Carrying out the development of C-ITS standardization and certification standard
Establishment of Leading Research System	• Establishment of a roadmap for research that has not yet been conducted • Customer-oriented & Field-compatible Research • Support for Korea's ITS export based on various research experience and development technology



KAIA (Korean Agency for Infrastructure Technology Advancement)
KEC (Korea Expressway Corporation)
COSD (Co-operation Organization for Standards Development)

Overseas business & International Cooperation

• Designated organization for international cooperation on ITS by MOLIT (Ministry of Land, Infrastructure and Transport)
• Operation of ITS International Business Assistance Center (intl.its.go.kr)

Contributing to Korean ITS export by carrying out international cooperation and supports for overseas market entry on behalf of the government

ITS KOREA assists Korean ITS businesses that want to enter overseas market as well as promotes overseas business. For overseas countries hoping to introduce ITS or to work with Korea, ITS KOREA also provides the customized consulting, the opportunities for sharing Korean ITS technologies and experience, and business matchmaking.

Global Cooperation to Provide the Chance to Share ITS Knowledge and Experience

- Host ITS Roadshow hosted 28 times in 23 countries which are evaluated as potential export market, since 2009.
- Organize Exhibition and Seminars to promote Korean ITS technologies and services
- Hold Invitation Workshop to provide professional training course for sharing ITS policy and technologies

ITS Roadshow

Exhibition

ITS Invitational Workshop

ODA Project Development in ITS

- Arrange EDCF loan and KOICA grant for carrying out overseas ITS projects
- Encourage overseas countries to establish ITS by using various Korea ODA like KSP and funding program proposed by government ministries (Ministry of Land, Infrastructure and Transport, Ministry of Foreign Affairs and etc.)
  - ODA for ITS projects in Colombia, India, Ukraine, Vietnam, Mongolia, and Indonesia proposed for funding.
    * In case of insufficient budget for ITS projects in your country, take advantage of funding assistance in Korea
    * ODA (Official Development Assistance), EDCF (Economic Development Cooperation Fund)
    * KOICA (Korea International Cooperation Agency), KSP (Knowledge Sharing Program)

Providing the Customized ITS Consulting for Overseas Countries

- Conduct Feasibility Study to lay the groundwork for successful projects
  - ITS KOREA conducted F/S on ITS construction projected in 4 cities in Colombia and in Santo Domingo, the Dominican Republic.
- Establish Project Master Plan for actual ITS project execution
  - Review and analyze the local transportation conditions, relevant policies and technologies on behalf of the client country
  - Provide the budget and the detailed action plan for project implementation
  - ITS KOREA established ITS masterplan for Medellin, Colombia in 2016
  - ITS Korea is establishing the masterplan for Integrated Center System of Southern Expressway Network of Vietnam in 2017

Analysis of local traffic conditions

Site Inspection

Specification for ITS

Global Business Hub for Korean & Overseas ITS Projects

- Arrange 1:1 Business Matching and Networking
- Search and introduce the optimal business partner for both Korean and oversea companies, if required for ITS project
- Build business network and strengthen cooperation among international ITS agencies (Signed MoU with 20 organizations from 17 countries; India, China(China, Hong Kong, Shenzhen), Sweden, U.K., Japan, Australia, Russia, Malaysia, Poland, Netherlands, Mongolia, Singapore, Croatia, Turkey, Kazakhstan, Canada, SIMUS
- Provide the best course of Technical Visits for introducing various traffic centers on demand

1:1 Business Matching

MoU Signing

Technical Visit

Overseas Projects List

No.	Name of Project	Year	Project Owner
1	Establishment of National ITS Master Plan for Colombia	2019	MOLIT
2	Feasibility Study on National Standard-based Interoperable Automatic Fare Collection System in Philippines Program	2018	KEXIM
3	Improving Urban Traffic Management in Medellin, Colombia	2018-2020	MOLIT
4	Support for the Establishment of Bus System Reform Strategy in Bandung, Indonesia	2017	KEXIM
5	Implementing an Automated Fare Collection System for Public Transport in Cairo and Alexandria, the Arab Republic of Egypt	2017	KEXIM
6	The Master Plan for Integrated Center System of Southern Expressway Network of Vietnam	2017	MOLIT
7	Feasibility study on Metro Manila's ITS implementation for EDCF	2017	ICAK
8	Public-Private Partnership for Urban Transportation Infrastructure in Colombia	2016	KEXIM
9	Feasibility Study to Install an Integrated Traffic Management Center, Malaysia	2016	ICAK
10	The Master Plan for Intelligent Transport Systems for Medellin, Colombia	2016	MOLIT
11	ITS invitational workshop for Colombia (2nd year)	2016	KOICA
12	Support for the Development of Transportation Infrastructure and Public Transport System in Bandung, Indonesia	2015	KEXIM
13	Traffic Management Plan for Jaber Causeway Project	2015	Hyundai Autoever
14	Nationwide Smart City ICT Master Plan for Kingdom of Saudi Arabia	2015	NIPA
15	ETCS feasibility study for Mongolia	2015	NIPA
16	ITS invitational workshop for Colombia(1st year)	2015	KOICA
17	Technical Assistance: Feasibility Study on establishment of BRT in Ulaanbaatar	2013	ADB
18	F/S of the establishment of ITS in Dominican Republic	2010	KEXIM
19	F/S of the establishment of ITS for 4 cities in the Republic of Colombia	2009	KEXIM

- MOLIT : Ministry of Land, Infrastructure and Transport of Korea
- KEXIM : Export-Import Bank of Korea
- ICAK : International Contractors Association of Korea
- KOICA : Korea International Cooperation Agency
- NIPA : National IT Industry Promotion Agency
- ADB : Asian Development Bank

Domestic / Global Cooperation

• ITS organization in Korea

• Facilitating mutual cooperation with public and private sectors

Conducting activities to share information on ITS-related policies, market, technology trend and collaborate on it for consolidating the private sector capacity of the ITS industry and maintaining a cooperative system between industry and academic research

- Operating member's meeting
- Hosting ITS Seminars
- Maintaining alliance with ITS related organizations
- Proposing Policies for ITS system improvement

ITS KOREA is your best partner for Global Business

• International Cooperation Exchange and Cooperation with Overseas ITS Organization Promote the Advanced Korean ITS

• MoU(Memorandum of Understanding) Signing

• Attend / Host ITS AP Forum and Exhibition
• Attend / Host ITS World Congress

Gateway to the Hub of the Global ITS

(Strengthen the Network and Meet the Right Contact Point for Your Business)

• Host the International/ Domestic Seminar
• Establish Forum Upon Members Needs and Request along with Market trend

• Business Matching (Find the Right Partner in Korea and Around the World)

• Membership Only Events (e.g. hope day, workshops, symposium and etc.)
• Arrangement for ITS Service & Technology Tour in Korea for Foreign Business Visitors

International ITS Workshop

• To show Korean ITS experience & know-how
• To build mutual cooperation with overseas countries

Objectives

- To understand concept, background and necessity ITS introduction in Korea
- To learn Korean strategies including laws and policies to effectively deploy ITS in Korea nationwide
- To learn individual ITS services in aspect of technology – Advanced Traffic Management Systems, Bus Information System, and Electronic Toll Collection System and etc.
- To learn the recent technological developments in ITS
- To exchange the statistical facts and ideas on urgent issues facing in each city and find out the customized solutions to deal with those problems
- To strengthen future cooperation in ITS area

KOICA ITS Workshop 2016

- Title: Building Capacity for Better Transport Using ITS (Intelligent Transport Systems)
- Duration: May 29 (Sun) ~ June 81 (Sun), 2016 (21 days)
- Number of Participants: 14 participants from Colombia
- Language: Spanish

DETAILED PROGRAM SCHEDULE

Date / Time	Program Description
May 29 (Sun)	Arrival
May 30 (Mon)	KOICA Orientation
	Introduction to KOICA & Program ICC(International Cooperation Center) tour Hompage registration Welcoming luncheon Introduction to daily life in Korea Training on basic Korean Training on ODA or gender issue
May 31 (Tue)	Orientation / Lecture / Country Report
	Orientation [Lecture 1] Current status of ITS in Korea Presentation on the country report (by each city) Action plan methodology
June 1 (Wed)	Lectures
	[Lecture 2] National ITS policy & plan [Lecture 3] ITS standardization Group Discussion on action plan

Date / Time	Program Description
June 2 (Thu)	Lectures / Study Visit
	[Lecture 4] Transportation Policy in Seoul city [Study Visit] Seoul TOPIS & hands-on experience of public Transportation [Study Visit] LG CNS
June 3 (Fri)	Field trip
	[Field trip] KIAP(Korea Intelligent Automotive Parts Promotion Institute) - Poving ground for driving [Field trip] Busan Traffic Information Center
June 4 (Sat)	Field trip
	[Field trip] Samwon FA - Transportation Card system and facilities Busan City Tour

Date / Time	Program Description
June 5 (Sun)	Field trip
Gyeongju Cultural experience	
June 6 (Mon)	Free time
June 7 (Tue)	Lectures / Study visit
[Lecture 5] Introduction of ITS in expressway Move to Anyang city [Study visit] Anyang U-traffic center	
June 8 (Wed)	Lectures
[Lecture 6] Traffic signal management & control [Lecture 7] Traffic center system Group work on Action plan	
June 9 (Thu)	Lectures / Study visit
[Lecture 8] Weigh-in-motion system Move to Korea Expressway Corporation (KEC) [Study visit] Smart Highway Demonstratio	
June 10 (Fri)	Lectures
[Lecture 9] Bus information system [Lecture 10] Electronic Payment for Public Transportation Group work on Action plan	
June 11 (Sat)	Cultural experience
Seoul City Tour	

Date / Time	Program Description
June 12 (Sun)	Free time
June 13 (Mon)	Lectures / Study visit
[Lecture 11] ITS communication and Network [Study visit] KEC traffic information center Group work on Action plan	
June 14 (Tue)	Lectures / Study visit
[Lecture 12] Traffic information and Big data [Study visit] NTIC (National Traffic Information Center)	
June 15 (Wed)	Lectures
[Lecture 13] Parking information system [Lecture 14] ITS project process flow Group work on Action plan	
June 16 (Thu)	Lectures
[Lecture 15] ITS performance evaluation Review and final check-up on Action plan Farewell Dinner - Seoul N Tower	
June 17 (Fri)	Action Plan / Closing Ceremony / KOICA Evaluation
Action plan presentation by each and giving feedback	
June 18 (Sat)	Departure

Lectures

Study visit to C-ITS demonstration site

Study visit to KEC center

Award certificate

Education

• Designated joint training center for Consortium for HRD Capacity Building Program (Strategy field) by Ministry of Employment and Labor

Providing systematic education programs and professional education to strengthen the capability of ITS workers and Training value-creating talented persons for development and promotion of ITS industry

Specialized ITS training

Training of ITS experts based on practical abilities as a joint training center of the Ministry of Employment and Labor

- Practical training for each job
- Combination of theories and practical training
- Demand-focused training reflecting feedback from the field works

Customized ITS training

Providing customized training that meets individual company's request to foster workforce

- Flexible program to meet corporate requirements
- Training program development based on the analysis of jobs of trainees
- Discussion about training direction and content with HR personnel

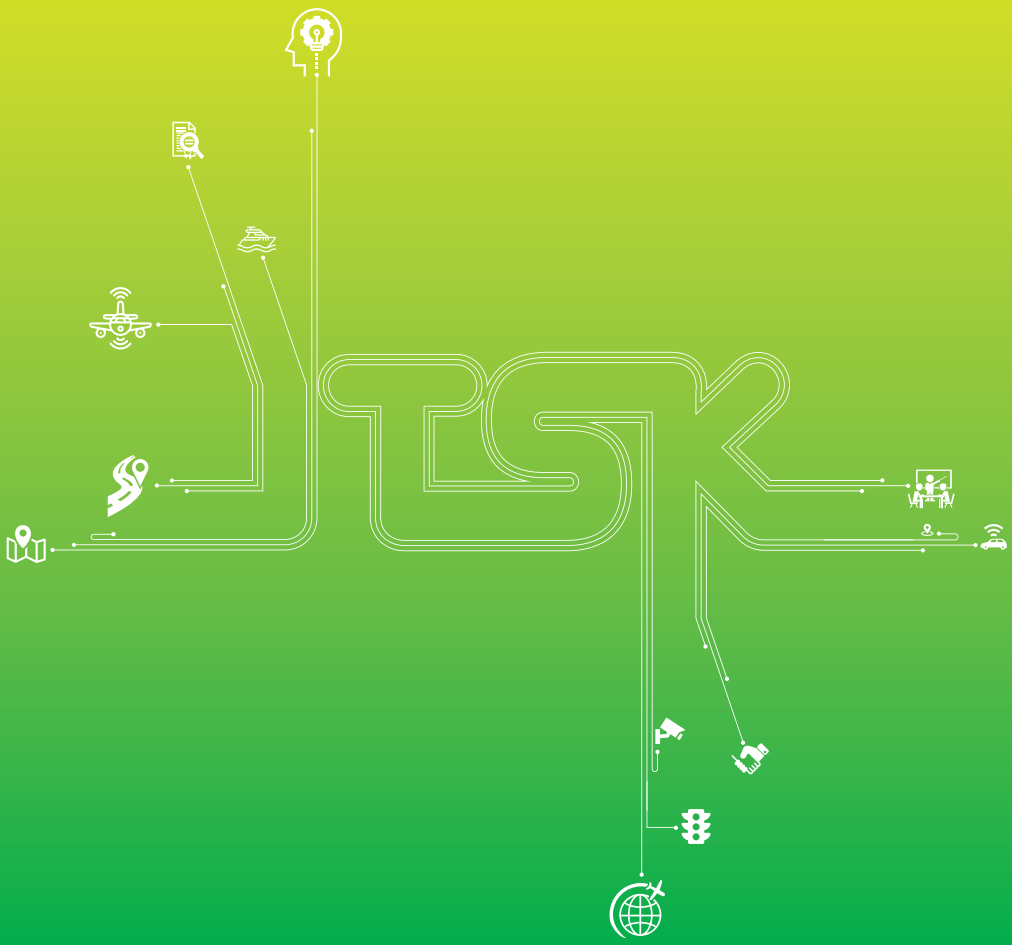
ITS Education Courses

• Program

	Project Planning & Management	System Design & Implementation	System Operation & Management
Advanced	Understanding Big Data and How to utilize it for ITS		
	Advanced and connected Technology with C-ITS		
Upper Intermediate	Development of ITS Overseas project	Network & Security Solutions for ICT Integrated Monitoring System	Quality Management of ITS System
	How to make a Proposal for Overseas Project	V2X Communication and Security Technology	Operation and Maintenance of Sever and Database for Traffic Center
	How to make a Proposal for Public ITS project	Services Specification and Implementation for C-ITS	Operation and Maintenance of communication for ITS
Intermediate		How to Utilize Network Technology for ITS	
	Understanding and Practice on EMME4	Technology and Application on Smart Tolling	Operation and Maintenance for ETCS
	Understanding and Practice on VISSIM	Technology and Application on Incident Detection System	Operation and Maintenance for TTMS (Tunnel Traffic Management System)
	ITS Project Management based on Case Study	Implementation and Operation for Signal Control System	Operation and Maintenance for FTMS/ATMS
Beginner	Blueprint and Bill of Quantity for ITS Project	Detailed Design of ITS System	
Pre-Beginner	Basic Practice for ITS Project		

Member List of ITS KOREA

ex Korea Expressway Corporation	DAEBO	GITSN	HYUNDAI MOBIS	HYUNDAI	posco ICT
METABUILD CO.,LTD.	NEIGHBOR SYSTEM	SK telecom	VITZRO SYS	SAT	소스텔 RFDACS
ETRI 한국전자통신연구원	KR INDUSTRY COMPANY	THINKWARE	사인텔레콤 www.signtelecom.com	SD SYSTEM	HDC
UTi	HANIL STM	주식회사 대로 DAERO CO., LTD	DAYLI Blockchain	SMART VISION	HYUNDAI AutoEver
STraffic	SK holdings	JW	Hanwha S&C	ERICSSON LG	LG Electronics
LOTTE DATA COMMUNICATION	KSI	LG CNS	DAELIM CORPORATION	LEDO	INPEG
iTtelecom	iTRONICS	KEON-A	GnT Solution Inc.	BusanUlsan Expressway Corporation	hi PASS
eSys	HYUNDAI MnSOFT	TRACOM	RANIX	Topes	AirPoint
SAMWON FA	Global (주)지정보통신	wavecom	RK RoadKorea Inc.	(주)엘에이시스템 LKsystem	Rex Gen
EO JIN	Hyundai ITS Electron Co., Ltd.	HMC (주)에이치엠씨	KOREA CONSULTANTS INTERNATIONAL	Korea Smart Card Co., Ltd	easytrafficstechnologies
MORU	Wayties	IDC	(주)대한티피에스 Korea Total Power Solution	SONGAM	KSL
ONLINE	K3global Co., Ltd	High Gain Antenna	HNTECH	DaeU media systems	CEST
novacos	ITS	DAEJU	Seoul Tech	EB CARD	HANIL DNS CO.,LTD.
TSMART	STC Networks	OSCO	KWANG MYUNG D&C 광명D&C	CHEMTRONICS	DILAB
Continental	INNOCA	here	KISTLER measure. analyze. innovate.	enb ENB GROUP	ANT
MONIC	carnavi.com	Anritsu	Media Devices	(주)동방데이타테크놀러지 DONGBANG DATA TECHNOLOGY LTD	SA TECH
jastecM	MPEON	KETI Korea Electronics Technology Institute	HanMec	DLSV	ivs
Bluekite	CUDO COMMUNICATION	DELI - i		SHINKWANG	LX Korea Land and Geospatial Informatix Corporation
Penta SECURITY	NHNETWORKS	woojoo telecom	KI&T Korea Information & Technology	Seoul Facilities Corporation	가온ITS(주)
SHINSUNG NO TECH	LG U+	algo-thing	JD SOLUTION	kt	Fantasia BUCHEON
Best Bucheon City Urban Corporation	UNISEOU				



Part 2 Members Profile

ITS KOREA Intelligent Transport Society of Korea

Chart of Membership Categories

Company Name	Traffic Management	Public Transportation	Electronic Payment	Traffic Information Integration/ Management	Traveler Information	Advanced Vehicle/Road	Commercial Vehicle Operation	Others
AIRPOINT Co., Ltd			●	●				
Bucheon City	●	●	●	●		●		
Bucheon City Urban Corporation	●	●	●	●				
CARNAVICOM Co., Ltd.	●		●					
CEST Co., Ltd						●		
Chemtronics				●				
DAEBO COMMUNICATION & SYSTEMS Co., Ltd	●	●	●	●		●	●	●
DAEYEONG UBITEC Co., Ltd	●	●	●	●		●		
Easy Traffic Technologies, Co., Ltd.	●							
EB CARD	●	●	●	●		●		
Ericsson-LG	●	●	●	●	●	●	●	
essys Co., Ltd			●			●		●
ETRI						●		
GITSN Inc.		●	●	●				
HANATECH SYSTEM Co., Ltd.	●	●		●				
HANILSTM Co., Ltd	●		●	●				
HANWHA S&C CO., LTD	●	●	●	●	●			
HighGain Antenna			●			●		
Hitecom system Co., Ltd				●				
HYUNDAI ITS ELECTRON CO., LTD	●	●		●	●	●	●	
HYUNDAI MNSOFT	●					●	●	
Icontrols Inc.	●	●	●	●				
Inpeg Vision Co., Ltd	●	●	●	●				
IT TELECOM Co., Ltd	●	●	●	●	●			
ITRONICS CO., LTD			●	●	●			
Jin Woo Industrial Co., Ltd	●	●	●	●	●			
Keon-A Information Technology Co., Ltd	●							
Korea Consultants International Co., Ltd	●	●	●	●				
Korea Expressway Corporation	●		●	●		●		
KOREA SMART CARD CO., LTD		●	●				●	
KOROAD	●			●		●		
KT				●		●		

Company Name	Traffic Management	Public Transportation	Electronic Payment	Traffic Information Integration/ Management	Traveler Information	Advanced Vehicle/Road	Commercial Vehicle Operation	Others
Kyungbong Co,. Ltd	●	●		●	●			
LG CNS	●	●	●	●	●	●	●	●
LOTTE Data Communications Company		●	●		●		●	
METABUILD Co., Ltd	●					●		
MORU Industrial Systems Co., Ltd	●							●
MQNIC Co,.Ltd.	●	●		●	●	●	●	
NDS Corporation	●	●		●		●		
Neighbor System	●	●	●	●				
NOVACOS Co., Ltd	●			●				
Penta Security Systems Inc								●
POSCO ICT	●	●	●	●		●	●	
RANIX			●			●	●	
RexGen Co.,Ltd	●							
ROADKOREA Inc.	●	●						
SAMWON FA Co., Ltd	●	●	●					
SANE Co., Ltd.	●	●		●				
SAT(System and Application Technology) Co., Ltd) Co., Ltd			●			●		
SA TECH CO.,LTD	●	●		●				
SDsystem	●	●	●	●	●	●		
SEOUL TECH CO., LTD	●	●		●				●
Signtelecom Co., Ltd.	●	●		●				●
SK Holdings Co., Ltd	●	●	●	●	●	●	●	
Songam Syscom Co., Ltd		●						
sTraffic	●	●	●	●	●			
THINKWARE Systems Corporation	●			●	●	●		
TmaxData Co., Ltd	●	●		●				
TOPES Co., Ltd	●			●				
TRACOM. Co., Ltd.	●	●		●				
UNISECU INC	●							
VITZROSYS Co., Ltd	●	●		●				
Wayties Inc.					●	●		

AIRPOINT Co., LTD.

Company Overview

Airpoint's ETC (Electronic Toll Collection)Total Solution includes RSE (Road side equipment), OBE (On board Equipment), Chip Solution and DSRC protocol Communication Analyzer.
Especially, Using the chip solutions (RF IC&MODEM IC) which were developed and manufactured from Airpoint, the global leader of Radio Signal processing technology, the problem of 'Delay' has been solved. Variety of special OBE line such as Solar type and Hybrid type which were developed and manufactured from Airpoint are highly popular in global Market currently and it can be easily applied to world market. RSE, the one equipped on the road side for communicating with OBE, it also has lot of sales references to many local governments of Korea. Together with Communication analyzer for all the test like Protocol Conformance Analyzing, L2/L7 Test and S/W Reliability Test to get the certification, all the integrated and excellent solution relating ETC can be provided by Airpoint.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Intelligent RF IC for OBE/RSE in ITS(ETC/TIS) ITS
- One chip solution (MODEM IC+ RFIC+ CPU) (will be released in second half of 2012)
- Joint Working with China OBE Manufacturer

Others

(Patent No) 10-0745014: Traffic Information Utilization Method by using Complex-type RSE

(Applied No) 10-2012-0012095: Smart Phone SW Architecture and Algorithms to exchange real-time video data between driving vehicles by using Smart-phone (or Smart-type terminal)

(Applied No) 10-2012-0158076: Vehicle Management System Architecture and Algorithms to check real-time site situation and vehicle position in airports and harbors.

ITS Product & Technologies

Modem IC

- Coretex-M3 Core – Memory : 512 KB internal RAM
- ASK/FSK DSRC modem embedded
- Smart card controller – Flexible memory interface
- 32 GPIO – 2 timer – 2 PWM
- 4 UART – SPI master – I2C/I2S interface
- 10 external interrupt source – USB Interface

5.8GHz DSRC RF Transceiver

- Frequency range: 5.3GHz ~ 6GHz
- Data rate: 128kbps ~ 1.024 Mbps
- Modulation: ASK/FSK modulation
- Modulation index control: 55% ~ 95%
- Sensitivity Control range: -78dBm ~ -44dBm
- OBE (On-Board Equipment) speed: 0~160 Km/h
- OBE temperature range: -40˚C ~ +100˚C
- Automatic Channel Search (ACS)
- Temperature Compensation Circuit (TCC)
- RX sensitivity level control
- Programmable output power control
- TX duty ratio control

OBE

RSE

Express Way Type Downtown Type Controller

1. Radio Signal Processing Technology
   – Radio Signaling Processing
   – CDMA/WCDMA/WiMAX/LTE Baseband Signal Processing Technology
   – Radio Channel Control Technology
2. Radio Propagation Analysis Technology for Wireless System
   – Digitalized RF Technology – Radio Propagation Analysis
3. Wireless System Technology
4. IEEE802.11n WiFi Access Point for Wireless Device
5. Operating Technology of Multi-functional Complex Unit in Car

General Information

Company Name : AIRPOINT Co., Ltd.
Website : www.airpointglobal.com
Address : #204 Miguntechnoworld II, 533-1 Yongsan-dong, Yuseong-gu, Daejeon-city, 305-500, Republic of Korea

Contacts

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Fax (office) : 82-42-485-5460
Phone (mobile) : 82-10-5596-9655
E-mail : rahnwoo@airpointglobal.com

Bucheon City

Company Overview

Bucheon City, a creative city of UNESCO, is a vibrant cultural metropolis in the Republic of Korea known for its rich contributions to modern arts such as comics, film, and music.
Bucheon City is the proud home to the Bucheon Philharmonic orchestra, Korea's top orchestra, and the Bucheon International Fantastic Film Festival, which is filled with thrills audiences with tales of love, fantasy, and adventures. Bucheon is also known as a high-tech city that has smart transportation systems and is implementing people-centered smart cities.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

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- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ■ Others (Smart City Infrastructure such as Self-Network)

Ongoing ITS project or R&D

Ongoing ITS Project
- Real-time-based bus route dynamic allocation system
- Cloud computing-based BIS sharing business at home and abroad
- Smart Parking System : Pre-payment system, Immediate parking fee discount system
  · Smart Parking Sharing Hub Center : Sharing and integration public and private parking information

R&D Division : Smart Intersections Based on AI(Adaptive Signal System)

Others

Smart Bus Information Terminal
- 2-Apr 2015 : Technical Patent Registration
- 25-Nov 2015 : Design Patent Registration
- 22-Mar 2015 : Government Procurement Excellence Designation

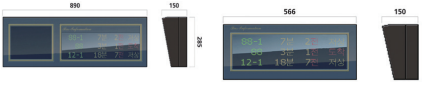
Smart Parking Lot Unmanned Settlement System
- 31-Jul 2019 : Design Patent Registration

Cloud computing based BIS sharing Cooperation Project at home and aborad
- 2016 Seosan City
- 2018 Namwon City, Oksheon County, Boeun County
- 2018 Mongolian Ulaanbaatar City

ITS Product & Technologies

Product Offerings

Smart Bus Information Terminal
- Real-time LED module defect detection function
- 33% increase in module resolution the distance
- Real-time media delivery
- Light weighting



Smart Parking Lot Unmanned Settlement System
- Standard settlement process
- 35mm to 120mm forward, recognizing
- Between the car and the calculator

Technologies

Real-time-based bus route dynamic allocation system : To operate bus routes 2,700 times from 14 bus stops into 6 bus stops, ITS is applied and 8 ITS unit systems are integrated and integrated to create new technologies. A system that detects the bus number of the bus entering the transfer facility and matches it with the bus route based, Information to assign the bus route in real time to the zones (3 zones of A, B, C) of the corresponding routes.

Cloud computing-based BIS sharing Cooperative Project : A project to share BIS with local governments that do not have the resources to do BIS service. BIS public resources (human resources, technical resources, hardware and software resources) held by local governments are shared with local governments that do not have resources under the cloud computing environment to eliminate disruption of public transportation information services and promote balanced development.

General Information

Company Name : Bucheon City
Website : www.bucheon.go.kr
Address : Bucheon City, 210, Gilju-ro, Bucheon-si, Gyeonggi-do, Republic of Korea (Postal Code 14547)

Contacts

Name : Kim, Dong-Suk
Department : Transportation Project Division
Phone (office) : 82-32-625-3832
Fax (office) : 82-032-625-3839
Phone (mobile) : 82-10-2260-7964
E-mail : kylkyn@gmail.com

Bucheon City Urban Corporation

Company Overview

Bucheon City Urban Corporation was established in July 1, 1999, Since then, we have managed and operated parking, transportation, sports, living and cultural facilities. In addition, the company has been continuously expanding its business area with regional urban development.
In particular, Bucheon City Urban Corporation is the only public institution that operates the Traffic Information Center directly, and has accumulated technical and empirical know-how with the operation and improvement of the ITS system function. Recently, cities are trying to evolve into Smart Cities, and the development of transportation technologies is a key area of Smart City construction. Bucheon City Urban Corporation is preparing to play a leading role in the Smart City era through continuous advancement of human resources in urban development and ITS.

Business Area

1st category

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- Pedestrian/Disabled Support System

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- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ☐ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Local city bus information system installation and operation

Others

Business Registration(License)
- Certificate of Transportation, Information and Communications Engineering

Patent
- Display device self error recognition on electric consumption

ITS Product & Technologies

Product Offerings

LED 4 Tiers 12 Raws

LCD+LED(3 Tiers 10 Raws)

- Bus Information Terminal jointly developed by Bucheon City and Bucheon Urban Corpration
- Design Web Service based on Service Orientated Architecture
- Simplify the guide software with centralized management
- Easy to open and share the information
- Provide a function to collect the urban environment information (atmospheric, temperature and fine dust etc)

General Information

Company Name : Bucheon City Urban Corporation
Website : www.bcits.go.kr
Address : 92 Oksan road Bucheon, Gyeonggi 14551, Rep. of Korea

Contacts

Name : Dongsoon Kye
Department : Traffic Information Center
Phone (office) : 82-32-340-0980
Fax (office) : 82-32-667-0996
Phone (mobile) : 82-10-4055-8858
E-mail : silverbullet@best.or.kr

CARNAVICOM Co., Ltd.

Company Overview

Since its establishment in January 2001, carnavicom has developed automobile electronics including navigation, Hi-pass, black boxes(dash cams) and wireless charging systems. The reason why carnavicom focuses on electronics is that a car is not just a means of transportation but also a part of life with which people would spend a long time with. Thus, the development of automobile electronics is highly dependent on the customer's needs.
Currently, carnavicom is making continuous efforts to produce more stable products as well as to concentrate on wave communication devices and radar technology development with the midterm autonomous vehicle development project in the future as ICT technology is quickly expanding to the automobile industry and technologies for convenience and safety are emerging. Moreover, we have patents for mobile data devices for use with the lift control technology developed for the maritime industry and always promote marine safety with the Korean e-navigation application.

Business Area

1st category

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2nd category

■ Hardware ☐ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

National R&D Project
- Ministry of Land, Infrastructure and Transport : Development of cooperative automated driving highway systems(2015~)

- Ministry of Trade, Industry and Energy : The Development of the 8ch 15f/s grade scanning LiDAR Sensor for autonomous car(2015~)
- Small and Medium Business Administration : Development of European ETSI message set compliant V2X system and applications based on ITS-G5(2016~)

Others

Patents and Design Utility Models


Design registration
(fixture for automobile Hi-pass)


Design registration
(navigation finishing)


Design registration
(navigation finishing)


Design registration
(navigation finishing)


Design registration
(navigation finishing)


Design registration
(built-in wireless charger)


Design registration
(connector for PCB)


Design registration
(connector for PCB)


Design registration
(automobile black box)


Design registration
(fixture for automobile Hi-pass)


Design registration
(VG-T0 30-0665205)


Design registration
(30-0838280)


Design registration
(30-0538281)


Design registration
(VG-50)


Design registration
(VG-50K(S))


Trademark of Vugera
(logo)


Trademark of Vugera
(English)


Trademark of Vugera
(Korean)


Trademark registration
(Mypot in English)


Trademark registration
(Mypot)


Songgangjeong
Service table registration (English)


Songgangjeong
Service table registration (Korean)


Utility model
(rain sensor cover connection)


Utility model
(built-in wireless charger for table)


Utility model
(overseas VG-10)


Utility model
(VG-10 20-0469332)


Patent
(marine mobile lift)


Patent
(rail of the marine mobile lift)


Patent
(steering of the marine mobile lift)


Patent
(vehicle control device)

CARNAVICOM Co., Ltd.

ITS Product & Technologies Product Offerings

1. WAVE Communication OBU

Development of WAVE

- Communication environment test on Yeoju experience road (actual V2V and V2I driving tests)
- Display with an improved recognition with augmented reality
- Smart autonomous cooperative driving road system developed for the Pyeongchang Winter Olympics(Seoul-Hobeop section)

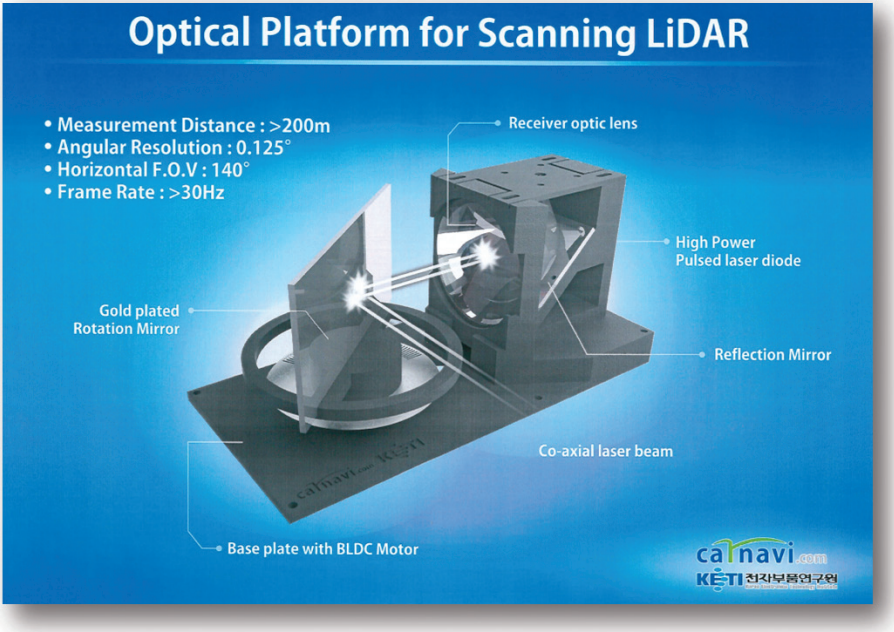
Augmented reality display

Communication condition test (actual driving)

2. LiDAR Sensor

Eight-channel Mirror Rotation
Specifications of high-speed scanning LiDAR
- Maximum measuring distance:200m
- Operatin range: 145° horizontally and 6.4° vertically
- Development of an integrated TX/RX Optical System
- Horizeontal measurement resolution: 0.125°
- Measurement speed: Maximum of 15 f/s (Hz)
- Obstacle detection rate (day/night): 95%

History of Technical Development and Business
- Transfer of technology
  (June 2015; Korea Electronics Technology Institute)
- Ongoing national projects (High-tech Sensor Development Project organized by the Ministry of Industry)
  · Eight-channel scanning LiDAR for autonomous vehicles
- Establishment of the LiDAR research center
  (2015; Gwangju Electronics Technology Institute)



CARNAVICOM Co., Ltd.

[Technologies]

Navigation

VN-800A
- 8" built-in and mounting type
- Atlan 3-D map

VN-80i
- 8" built-in and mounting type
- Atlan 3-D map

NTG-5200
- 8" built-in type
- Gini 3-D map
- For Mercedes-Benz

NTG-4500CE
- 7" built-in type
- Gini 3-D map
- For Mercedes-Benz

NTG-4500AB
- 7" built-in type
- Gini 3-D map
- For Mercedes-Benz

NTG-4000
- 7" built-in type
- Gini 3-D map
- For Mercedes-Benz

VG-7000
- 8" built-in type
- Atlan 3-D map
- For Volkswagen (7th-generation Golf)

GN-3000
- Box-type navigation
- Gini 3-D and Atlan 3-D maps

Hi-pass

HP-9000 / 7000
- Built-in Hi-pass in the glove box
- GN-3000 for Audi/Volkswagen

RM 400 / 320 / 210
- Rear View Mirror Hi-pass
- For Mercedes-Benz

MBH-1000
- Built-in Hi-pass in the glove box
- For Mercedes-Benz

One-channel Black Box(Dash Cam)

VG-05H
- Front HD
- Support for Korean, English and Japanese

VG-10S
- Front HD

VG-10RS
- Front HD

VG-20S
- Front HD
- Colorful Selection
- Best Video Quality / Original Design prizes in Russia

Two-channel Black Box(Dash Cam)

VG-10Z
- Front HD and Rear VGA
- Wi-Fi

VG-50D2
- Front HD and Rear VGA
- 3.5" touch LCD

VG-MILLET
- Front HD and Rear VGA
- 3.5" touch LCD

VG-50H
- Front HD and Rear HD
- 3.5"Touch LCD

VG-50F
- Front HD and Rear HD
- 3.5"Touch LCD

VG-50S
- Front HD and Rear HD
- 3.5"Touch LCD

VG-PICASSO
- Front HD and Rear HD
- 3.5"Touch LCD

VG-900V
- Front HD and Rear HD
- 3.5"Touch LCD
- Support for Korean and English
- ADAS (LDWS, FVSA)

VG-900S
- Front HD and Rear HD
- 3.5"Touch LCD
- Support for Korean and English
- ADAS (LDWS, FVSA)

VG-700V / 700VA
- Front HD and Rear HD
- 3.5"Touch LCD
- Support for Korean and English
- ADAS (700 VA)

General Information

Company Name : CARNAVICOM Co., Ltd.
Website : www.carnavi.com
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Contacts

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CEST Co., Ltd

Center for Embedded Software Technology

Company Overview

CEST Co., Ltd. has intensively developed the IT technology for a ubiquitous computing environment to achieve the highest level of technology in the short-distance wireless communication field. We aim to provide service based on new technology to various fields such as distribution, logistics, U-Tour, U-Hospital, safety facilities, and V2X solutions. CEST is the only company to offer complete V2X solutions – Road-Side Units, On-Board Units, Hardware products, and Software stacks from PHY/MAC to the Application Layer.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Low Cost, High Accurate Positioning system using WAVE communication

CEST Co., Ltd

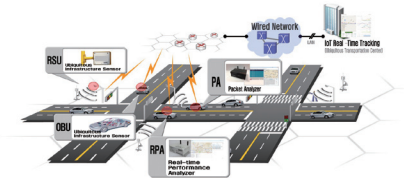
Others

Certification
- ISO 9001:2008 - CE

Patent
- Unmanned Vehicle Photographing Equipment
- Automatic Vehicle Number Recognition System
- Vehicle Speed Detection System
- Traffic Law Violation Enforcement System

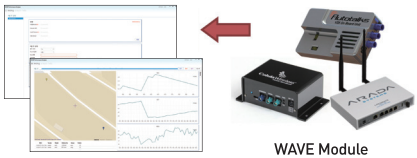
ITS Product & Technologies

V2X communication performance Analysis syster
- Automated measurement system development
- Real-time performance Measurement / Analysis / Views
- Overall V2X communication performance measurement
- Scalability considerations for increasing the module



Packet Analyzer
- WSMP/WSA/CSM Packet Capturing,
- User define data formatted Packet analysis
- Real-Time Protocol Validation/Verification
- Real_Time Tx Packet Location tracking
  (if GPS data is in Packet)

Performance Analyzer
- In-Vehicle Real-Time Performance analysis
- Testing Scenario Creating/Customizing
- Test results monitoring & analysis Based Cloud system
- For WAVE Modules based linux OS , Testing Standardization
- Testbed setup & operation in KNU
- Adapted Common Safety Message of ITSK
- Adapted IEEE Std 1609.2



WAVE Module

RT Tracking Analyzer
- Cloud based monitoring/data integration
- Big-Data analysis

General Information

Company Name : CEST Co., Ltd
Website : www.cest.co.kr
Address : #301 Business Incubator Kyungpook National University 80 Daehak-ro Buk-gu Daegu, 702-701 Korea

Contacts

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Department : Technical Sales Team
Phone (office) : 82-53-954-5410
Fax (office) : 82-53-954-5420
Phone (mobile) : 82-10-4508-3631
E-mail : jilee@cest.co.kr

Chemtronics

CHEMTRONICS

Company Overview

CHEMTRONICS has focused on the development of new technologies through expanding the R&D sector to automotive electronics and communications and we are about to develop products which can compete with those made by global market leaders.
The development of V2X (DSRC/C-V2X) technologies, which are core parts in future automotive road environments for safety and automated driving, is a result of our willingness to face and overcome challenges and endless technological development and will serve as the starting point of our development roadmap to be a leading player in the industry of the future.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic - Enforcement - Parking Management

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- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

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☐ Commercial Vehicle Operation
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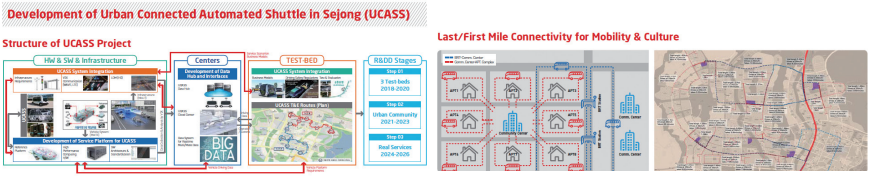
☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

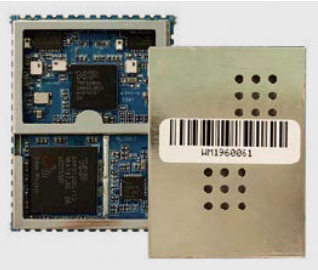
Urban Connected Automated Shuttle in Sejong(UCASS)



Chemtronics

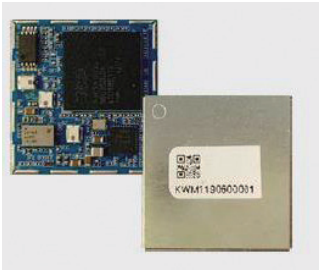
ITS Product & Technologies

Product Offerings



Module | DSRC Gen1

- Frequency Bands : 5850 - 5925 MHz
- Transmit Power : +23dBm (max)
- Reciver Sens. : -97dBm (typ)
- Antenna Diversity : 2Tx 2Rx support
- Temperature Range : -40˚C ~ +85˚C
- Dimensions : 40 x 30 x 4 mm
- Standards Conformance :
  IEEE 802.11p - 2010
  IEEE 1609.2/3/4 – 2016



Module | DSRC Gen2

- Frequency Bands : 5850 - 5925 MHz
- Transmit Power : +23dBm (max)
- Reciver Sens. : -97dBm (typ)
- Antenna Diversity : 1Tx 1Rx support
- Temperature Range : -40˚C ~ +105˚C
- Dimensions : 24 x 23 x 3mm
- Standards Conformance :
  IEEE 802.11p - 2010
  IEEE 1609.2/3/4 – 2016

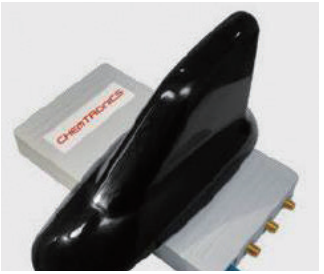
OBU | DSRC+LTE Hybrid

- Frequency Bands : 5850-5925 MHz
- Transmit Power : +23dBm (max)
- Reciver Sens. : -97dBm (typ)
- Antenna Diversity : 2Tx 2Rx support
- Temperature Range : -40˚C ~ +85˚C
- Dimensions : 149.5 x 133 x 27.5mm
- Standards Conformance :
  IEEE 802.11p - 2010
  IEEE 1609.2/3/4 – 2016

OBU | DSRC+C-V2X Hybrid

- Frequency Bands : 5850-5925MHz (Band 47)
- Transmit Power : +23dBm (max)
- Reciver Sens. :
  ·90.4dBm @QPSK(10MHz) (min)
  ·87.5dBm @QPSK(20MHz) (min)
- Antenna Diversity : Support
- Temperature Range : -40˚C ~ +85˚C
- Standards Conformance :
  (C-V2X) 3GPP Rel.14
  (DSRC) IEEE 802.11p – 2010
  IEEE 1609.2/3/4-2016

CHEMTRONICS



Smart Antenna

- Frequency Bands : 5850 - 5925 MHz
- Transmit Power : +23dBm (max)
- Reciver Sens. : -97dBm (typ)
- Antenna Diversity : 2Tx 2Rx support
- Temperature Range : -40°C ~ +85°C
- Dimensions : 170 x 90 x 90 mm

RSU

- Frequency Bands : 5850 - 5925 MHz
- Transmit Power : +23dBm (max)
- Reciver Sens. : -97dBm (typ)
- Antenna Diversity : 2Tx 2Rx support
- Temperature Range : -34°C ~ +74°C
- Dimensions : 255 x 185 x 100 mm
- Standards Conformance :
  IEEE 802.11p - 2010
  IEEE 1609.2/3/4-2016

Technologies

In-house V2X stack

Supported US, EU and 3GPP Standards

Interoperability Testing

- Omniair 2019 Plugfest Tested "IEEE 802.11p/1609.2/3/4"
- KOREA/CHINA/US SAEJ 2735

OMNIAIR CONSORTIUM

V2X Applications

1. Probe Data Service based on Location
2. Traffic information provision
3. Pedestrian collision warning
4. Smart Tolling Service
5. Collision prevention support
6. Hazardous location notification
7. Emergency vehicle warning
8. Information provision about road condition Service
9. Notification of emergency situation
10. Safe driving support at work zone
11. Signal violation warning
12. Right Turn Assist
13. Bus operation and management
14. Provision of yellow bus
15. Intersection Movement Assist
16. Emergency Electronic Brake Lights
17. Left Turn Assist

General Information

Company Name : Chemtronics
Website : http://chemtronics-automateddriving.co.kr/
Address : 7F DTC Tower, 49, 644 beon-gil, Daewangpangyo-ro, Bundang-gu, Seongnam-si, Gyeonggi-do, Korea

Contacts

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DAEBO COMMUNICATION & SYSTEMS

DAEBO COMMUNICATION & SYSTEMS CO., LTD.

Company Overview

DBCS is specialized in traffic IT service. It was established in 1996 for efficient operation and enhancement of IT system installed for the convenient and safe use of highways. We are contributing to the development of national industries and improvement of national life through the sustainable development of techniques, fostering of talents and innovation activities, and etc. And we provide total services throughout the traffic IT field from designing the traffic systems of national roads and municipality roads, as well as highways to the establishment, operation, and management of them.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control · Incident Management · Traffic Information · Safe-driving Support · Traffic Enforcement · Parking Management

■ Public Transportation
- Bus Information/ Management System · Public Transportation Information/Management
- Multi Modal Information/Management · Bus Rapid Transit System/Solution · Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection · Electronic Parking Payment · Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

□ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (Smart Tolling, C-ITS, VES, DSRC, VDS)

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

Project : C-ITS/ hipass [ETCS]/ DSRC Traffic Data Collection System/ Maintenance ITS BIS, BMS/ Image-based Intelligent Transportation System/ AVI/ UTIS

R&D : Multi-functional CCTV/ Smart Tolling System/ High Speed Track Measurement System for Railways

Others

Certification

- ISO9001:2008, ISO/IEC 20000, 27001
- CMI(Capability Maturity Model Integration) Level.3
- Non-stop, Multi-lane ETCS Performance Test(Smart Tolling)
- Qualification as the Outstanding Company for Service Quality from MKE(Ministry of Knowledge Economy)

Technology Ranking

- Ranked 2nd (148M$) among about 9,000 IT companies in Korea.

(million $ unit)

Technology Ranking on IT System Construction Ability in 2018

Ranking	Company	Amount
1	KDN	163
2	DBCS	148
3	SK TNS	122
4	GS Neotek	137
5	F2 Telecom	119
6	GS ENC	106
7	HDC I-Controls	85
8	SKT	84
9	KT Service(South)	82
10	Global Telecom	81

Patents

- Method for Detecting Lane in Toll Collection Apparatus based on Multi-lane
- Apparatus for Detecting Axle and Method Thereof
- Apparatus for Displaying Traffic Information and Control Method Thereof

*Obtaining about 90 patents related to ITS Technology

Awards

- Achievement Award for a Maintenance Work of Merit from KEC(Korea Expressway Co.)
- Korea National Quality Award (Presidential Prize)
- The Highest Standing Award (Prime Minister's Award)

DAEBO COMMUNICATION & SYSTEMS

ITS Product & Technologies

Products & Technologies

Hipass(ETCS)

DAEBO implemented about 600 ETCS lanes with the highest market share in Korea. Not only do we have the total solutions for ETCS, but also provide the efficient and optimized services. We've provided a consultation for the implementation to many foreign countries such as Malaysia, Indonesia, Iran, and etc.

Solution	Specification	Solution	Specification
Antenna	▪ IR: 850nm ▪ RF: 5.8Ghz	OBU	▪ IR: 850nm ▪ RF: 5.8Ghz
VES	▪ 2 megapixel ▪ CMOS Sensor	Smart Card	▪ ISO7816 ▪ ISO14443A, B
Vehicle Detector	▪ Range: 3~7m ▪ Object: Ø30mm	DFS	▪ 4*8 LED Module ▪ RS-422 Interface
LCS	▪ DSRC Control Unit ▪ TCP/IP Interface to Server		

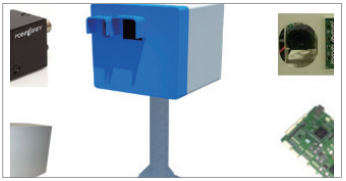
Smart Toiling

In addition to the successful implementation of hipass by DAEBO in Korea, we've developed the advanced ETCS, Smart Tolling, which guarantees traffic free flow of smart highway by collecting tolls from vehicles in the multi-lanes. Smart Tolling yields the better benefits than the ETCS in terms of the environment, the individual and social economy.

C-ITS(Cooperative-ITS)

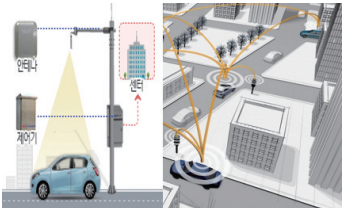
C-ITS, advanced intelligent transport system, is a technology, utilizing a V2I and V2V communication system that enables to communicate among vehicles. C-ITS will provide new service for road users, bring major social and economic benefits and values, and lead to greater traffic efficiency and safety. DAEBO is the initial company to develop and implement C-ITS in Korea and is expected to open the new ITS paradigm in the near future.

DAEBO COMMUNICATION & SYSTEMS CO. LTD.



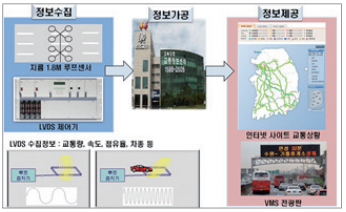
VES(Vehicle Enforcement System)

VES is required for TCS, ETCS and Smart Tolling in order to collect tolls from drivers efficiently and completely. Also, it prevents illegal activities that occur when collecting tolls. VES consists of Lens, controller, lightening, and etc., and we provide the total VES solutions with the highest performance.



DSRC(Dedicated Short Range Communication)

DSRC is a wireless communication technologydesigned to allow automobiles in ITS to communicate with other automobiles or infra technology.Itcollects real-time traffic information and provides it, processed by a traffic center to drivers through DSRC communication between RSE installed on the roadside and vehicles equipped with OBU.



VDS(Vehicle Detection System)

VDS detects real-time information such as traffic volume, speed, and etc. of vehicles through loopsensors installed on the roads. We install facilities on the roads to collect data and implement control center for the data processing in order to provide useful and informative traffic information to users in various ways.

General Information

Company Name : DAEBO COMMUNICATION & SYSTEMS
Website : www.dbcs.co.kr
Address : 06367 6F Rosedale Bldg. 280 Gwangpyeong-ro Gangnam-gu Seoul, Korea

Contacts

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Department : IT Business Team
Phone (office) : 82-2-3470-7744
Fax (office) : 82-2-3470-7799
Phone (mobile) : 82-10-9189-8800
E-mail : sak88@dbcs.co.kr

DAEYEONG UBITEC Co., Ltd.

DAEYEONG UBITEC Co.,LTD.

Company Overview

DAEYEONG UBITEC was established in March 1988, as a professional engineering company in Korea. Since then, we have been contributing an important part in ICT infrastructure building in and outside of the country by providing our clients with top quality engineering consulting services namely Planning, Feasibility Study, Design, Analysis, Supervision, Evaluation of ICT projects.
Based on our accumulated experience and technology in the domain of Telecommunication Network, ITS, BRT, GIS, e-Government, e-Procurement, U-city, etc., our customized approach combined with our passion for customer value has enabled us to sustain our growth and lead the Korean IT service industry for more than 24 years. Daeyeong Ubitec is on its way to becoming the world's leading consulting firm in ICT field. We will keep striving to provide quality expert services and to satisfy our customers' needs.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

□ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

Name of Project	Name of Authority	Project Period
Overseas		
Intelligent Transport System Consultancy Services in Kazakhstan (CSP-3)	ADB (Asian Development Bank)	12.01.02~12.07.01
Consultancy Services for Development of Intelligent Transportation System (ITS) in Kazakhstan	ADB (Asian Development Bank)	11.12.29~12.06.21
Public Security Innovation Project in the Republic of Angola	ANP(Angola National Police)	11.11.30~14.05.31
Feasibility Study for Establishment of Intelligent Transportation System in the Addis Ababa in Ethiopia	KENCA (Korea Engineering & Consulting Association)	11.09.01~11.12.31
Feasibility Study for Establishment of Intelligent Transportation System in the Addis Ababa in Ethiopia	KENCA (Korea Engineering & Consulting Association)	11.09.01~11.12.31
Technical Assistance of Public Transport Information and Communication Technology in Mongolia	ADB (Asian Development Bank)	11.06.15~11.12.15
Feasibility Study for Construction of ITS Project in the Dominican Republic	Korea Exim Bank	10.06.08~10.10.13
Consulting Service for Ulaanbaatar ITS Project in Mongolia	Ulaanbaatar City Government	07.12.07~10.06.30
Consulting Service for Toll Road ITS FS Project in Indonesia	KIPA/LG CNS	07.04.01~07.06.30
Establishment of ITS & Bus Information Management System Project in Iran	KENCA (Korea Engineering & Consulting Association)	07.03.08~07.11.30
F/S for Establishment of Traffic Signal System in Argentina	KOPIA (Korea Plant Industries Association)	06.12.01~07.04.30
Domestic		
Supervision on Installation of National Road ITS in Busan in 2011	Korea Institute of Construction Technology	11.11.28~11.12.30
Detail Design for Construction of Digital Traffic Management System in 2011	Korea Expressway Corporation	11.09.02~11.10.31
2nd Detail Design for Construction of Infrastructure U-Traffic Information Telecommunication Network-based	Seoul Metropolitan Government	11.08.02~11.09.20
Responsible Supervision on Construction of ITS in Mokpo-Gwangyang Line (1st)	Honam District of Korea Expressway Corporation	11.07.05~11.12.31
Supervision on Construction of TTMS in Jeonju-Gwangyang Line (2nd)	Honam District of Korea Expressway Corporation	11.01.18~11.06.20
Detail Design on Digital Traffic Management System FTMS, TTMS in 2011	Korea Expressway Corporation	11.03.11~11.11.15
Responsible Supervision on Construction of ITS in Iksan City (4th)	Iksan-si, Jeollabuk-do	10.12.09~11.05.23
Responsible Supervision on Construction of BIS (phase 3)	Seoul Metropolitan Government	10.03.01~11.02.20
Detail Design on Re-Construction of ITS Infrastructure in National road No. 1 (Public Administration-Daejeon Yooseong city)	Korea Expressway Corporation	10.10.27~10.11.05
Responsible Supervision on Construction of BIS (phase 2)	Seoul Metropolitan Government	09.10.16~10.02.28

DAEYEONG UBITEC Co., Ltd.

Others

Certification

- Overseas Construction Business - Int'l Organization Procurement
- Registration of Electricity Business - InfoSystem Supervision &ICT Engineering Business
- KS Q ISO 9001/ ISO 14001 - INNO-BIZ / MAIN-BIZ

Patent

- Certificate of Appreciation (Indonesia-MCIT), 2010.12.13
- Award of Honour (Mongolia – UCG), 2010.06.21
- Presidential Commendation, 2008.10.19
- Minister of Construction and Transportation Commendation, 2006.07.19
- Korea Rail Network Authority Commendation, 2008.12.23
- Chairman of Korea Communication Commission, 2010.10.18

ITS Product & Technologies

Product Offerings

Intelligent Transportation System(ITS)

- Integration of traffic management center system (H/W and S/W)
- Development of S/W related to ITS
- Design / Supervision for ITS in expressway
- Toll Collection System (TCS)
- Design / Supervision for Transportation Management System (TMS)
- Operation and Maintenance (O&M) of Traffic Lights
- On-line traffic survey and data processin

DAEYEONG UBITEC Co.,LTD.

Technologies

Category	Items	Registration No.	Established Date	Expired Date
Patent	Metho D For Converting Compressed Moving Pictures In an Image	10-0312411	1988-11-18	2018-11-18
Patent	A Restoration Method Using K-shortest Control Paths in ATM	10-0411247	2001-12-26	2021-12-26
Patent	Recording Device of Multiplex Data for Vehicle	10-0943410	2009-10-27	2029-10-27
Patent	High Linearity RF Mixer Applicable to Zigbee System	10-0966581	2009-12-01	2029-12-01
Patent	Facility for Protecting Optical Cable used in Information and Communications	10-0959409	2010-01-28	2030-01-28
Patent	Apparatus for Connecting Underground Tunnel CCTV Camera and Ground Monitor for Information and Communications	10-0977307	2010-01-28	2030-01-28
Patent	Rotary Joint Apparatus Having Multiple Channels for Transferring Data and Electric Current	10-0988549	2010-05-04	2030-05-04
Patent	Apparatus for Guiding Train Operation Information Using Mobile Communication Network	10-1214929	2012-05-04	2032-05-04

General Information

Company Name : DAEYEONG UBITEC Co., Ltd.
Website : www.dyeng.net
Address : 7F, 6th, Ace High-End Tower, #60-25, Gasan-dong, Geumcheon-gu, Seoul 153-801, Korea

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Fax (office) : 82-2-2633-5838
Phone (mobile) : 82-10-8550-8231
E-mail : cookiejj75@hanmail.net

Easy Traffic Technologies, Co., Ltd.

Company Overview

more easy and more simple ITS. This is our raison d'etre.
"Easy Traffic Technology, co.,ltd." was established in 2013 to benefit the world with transportation technology. We are a traffic system company with more than 20 years of expertise in ITS. Especially, we are trying to export the COSMOS adaptive traffic signal control system to overseas.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- 2nd Upgrading of Traffic Signal Control System at MMDA Center, Philippines
- Traffic Signal Control System for Sejeong-City BRT in Korea
- Intelligent Traffic Signal Control System of Icheon-City in Korea
- Wire/Wireless Traffic Signal Control System of Ulsan-Merto City in Korea
- Wireless LTE Modem Providing of Seoul Merto City with LG U+ in Korea
- (R&D) Traffic Signal Priority Control System for Emergency Vehicles or Bus using Samrt phone
- (R&D) Degital Traffic Signal Control System for Next Korea-Standard
- (R&D) 3rd Generation Traffic Signal Control System of Korea, etc

Others

Certification
- Korea-First Good Software (Level 1) to the "Real-Time Traffic Signal Control System"
- Korea-First KC (Korea Certification mark) to the "Wireless LTE Model for Traffic Signal Controller"

Patent
- Wire & Wireless-Integrated Traffic Signal Control System
- Traffic Signal Priority Control System for Emergency Vehicles using Samrt phone
- CCTV and GIS-Integrated Center Control System

Award
- Citation of Gyeonggi-do Governor for Exellent Start-Up Company

ITS Product & Technologies

Product Offerings

Product 1: COSMOS Plus Software (Good Software, Certificate of Software Quality)

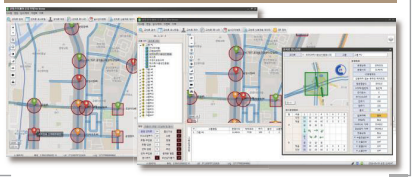
- (Korea Standard) Real-Time Traffic Control System Software
- Traffic Responsive Control by Detector
- TOD(Time-Of-Day) Control and Remote Operator Control
- Emergency Vehicle or Bus Priority Control

Center Software characteristics

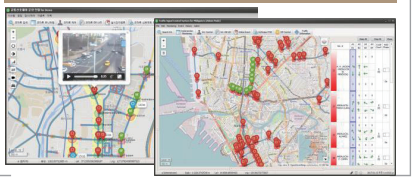
Easy Traffic Technologies, Co., Ltd.

User-frendly User Interface

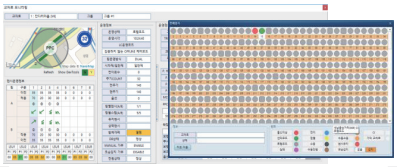
Two-Type Display (Full GIS or Classic)



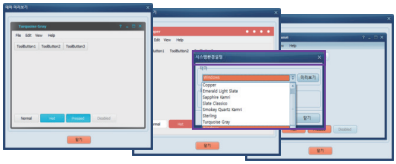
VIP Route Green Control



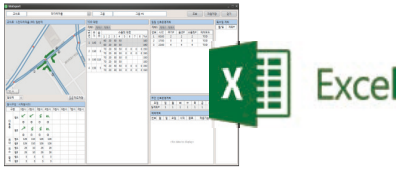
Monitoring (Int , Full comm. status)



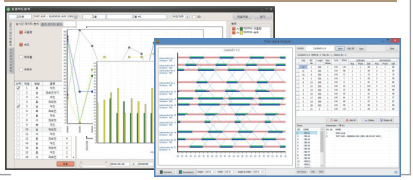
8-type window theme



Reporting & File Save

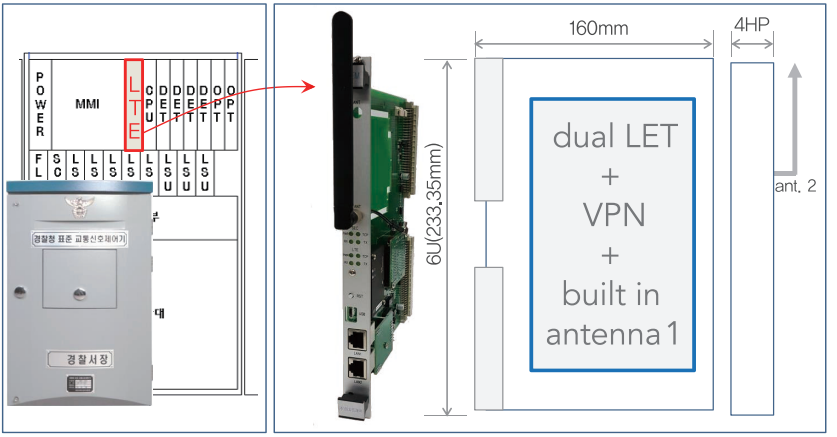


Anlysis & Graph, Time-Space Diagram



Product 2: Wireless LTE Modem for Traffic Signal Controller

- Center to Local controller Communication Equipment
- LTE(4-G Long Term Evolution) Wireless Modem
- including VPN S/W Module for Security



Technologies

Software Technology
- More than 1,000~2,000 traffic controllers by one-computer Server machine
- Any Korean-Standard Signal Controllers
- Real-time communication per 1-second
- Stable operation even DBMS Failure

Lastest GIS Technology
- Applying Open GIS Technology
- Mobile and Web Friendly GIS Technology
- Open-Street Map or Google Map

Open Software
- My-SQL, MariaDB oy Any DBMS
- Linux Server

Supporting Tools
- easy Time-Space Diagram S/W for signal co-ordination, supporting on-line and off-line DB
- easy Node-Link Editor for Newtork Building

General Information

Company Name : easy traffic technologies, Co., Ltd.
Website : www.easytraffic.co.kr
Address : 1101-ho, 111, Anyang-ro, Manan-gu, Anyang-si, Gyeonggi-do, Republic of Korea

Contacts

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Fax (office) : 82-70-4009-4330
Phone (mobile) : 82-10-7737-4174
E-mail : Easy.hansc@gmail.com

EB CARD

EB CARD

Company Overview

EB CARD is a global Automatic Fare Collection System(AFCS) providing management, consulting, technology service, system installation and company operation. EB CARD is one of the LOTTE pre-paid Card Affiliated company with priority given to Seoul-metropolitan area. The LOTTE Pre-paid Card Affiliates is a digital payment platform that provides fare collection system and customer service across multiple transit authorities and modes of transportation. Combining unique service experience, comprehensive capabilities across all of the industries and business and extensive micro payment, EB CARD collaborates with clients to help them operate high-performance businesses and governments. EB CARD has an abundance of excellent specialist in the field of pre-paid payment business/ transit payment service/ pre-paid, credit, online, mobile payment system. We provides cutting-edge system to ensure customer convenience based on optimal and comprehensive technologies as a reputable and reliable supplier.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

□ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ■ Others (Mobile Payment, Wearable pre-paid card)

Ongoing ITS project or R&D

- Project of Automatic Fare Collection(AFC) system in Ferry Transportation in Korea
- L-PAY (LOTTE global payments platform)
- Consulting and Proposal of Automatic Fare Collection(AFC) system of Peru /THE KOREA TRANSPORT INSTITUTE

- Proposal with consortium in Vietnam and Malaysia for Automatic Fare Collection(AFC) system
- Development of Mobile Payment Application including Smart-watch.

Others

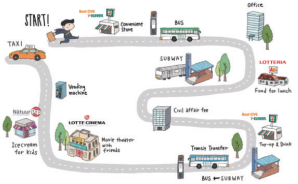
Certification
- KS Q ISO 9001:2009 / ISO 9001:2008
- KS I ISO 14001:2009 / ISO 14001:2004

Patent
- Automatic Traffic Card System Charging Mileage Points
- Method for managing a stolen or lost card and card reader therefor
- System for Managing for Non-payment Fees of Food Waste and Method therefor
- Traffic Law Violation Enforcement System
- Apparatus for charging a transportation card and method therefor
- Apparatus for compress credit card number and method of the same

ITS Product & Technologies

Pre-paid Payment Business

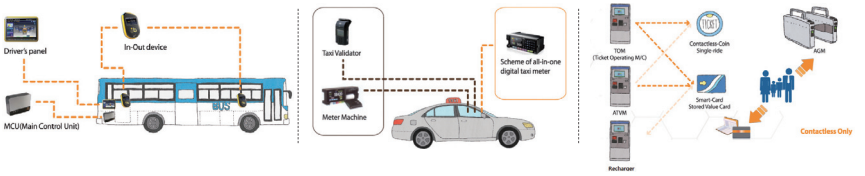
Domestic & international AFCS Business,
NFC Business and U-city Business, Smart card



Pre-paid/Credit/Online/Mobile payment

Transit Payment Service

Payment for bus, taxi, subway and supply related equipment



General Information

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Ericsson-LG

Company Overview

<About Ericsson-LG>

Ericsson-LG (formerly LG-Ericsson) was launched as a joint venture between Ericsson and LG Electronics, in July 2010. The company is a leader in the Korean telecommunication industry, providing customized solutions for operators and corporations, with a portfolio ranging from mobile, fixed network infrastructure and enterprise.

<About Ericsson>

Ericsson is the driving force behind the Networked Society – a world leader in communications technology and services. Our long-term relationships with every major telecom operator in the world allow people, business and society to fulfill their potential and create a more sustainable future.

With approximately 115,000 professionals and customers in 180 countries, we combine global scale with technology and services leadership. We support networks that connect more than 2.5 billion subscribers. Forty percent of the world's mobile traffic is carried over Ericsson networks. And our investments in research and development ensure that our solutions – and our customers – stay in front. Founded in 1876, Ericsson has its headquarters in Stockholm, Sweden. Net sales in 2014 were SEK 228.0 billion (USD 33.1 billion). Ericsson is listed on NASDAQ OMX stock exchange in Stockholm and the NASDAQ in New York.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ■ Others (Managed Services)

ITS Product & Technologies

Communication technology and services are crucial parts of C-ITC, in this area, Ericsson has leading competence and market traction. Ericsson has been leading or acting in ITS related research projects like CoCar, CoCarX, Converge, HeERO, the Swedish roadmap for a connected and cooperative transport system, ELVIIS. Ericsson also invests heavily in research in relevant areas for ITS, such as communication technologies for the Networked Society, including Transport specific applications. Among CITS domains, Ericsson offerings are focusing on ICT Infrastructure, Traffic Management and Transport Transactions.

ICT Infrastructure

The rapidly growing demand for communication and connected services for road, rail and public transport requires a strong and future-proof ICT Infrastructure. Ericsson delivers and operates ICT Infrastructure and services for road, rail and public transport based on our leading products and services for telecommunication.

Connected Roads and Traffic for safety and more efficiency. Connected Public Transport for more attractiveness.

- Multi-service Backbone Networks
- Railway Telecommunications
- Road/Rail surveillance
- Tunnel/Metro Coverage
- Onboard Connectivity

Traffic Management

Road, rail and public transport is facing growing challenges regarding safety, efficiency and sustainability. By connecting vehicles, transport infrastructure, travelers and goods - new possibilities arise to manage traffic in a more efficient and safe way. Ericsson solutions enable a truly cooperative and intelligent transport system – based on our leading products and services for telecommunication.

Connected traffic can be managed more efficiently.

- Traffic Management Services
- Connected Traffic Cloud
- Connected Traffic Analytics

Transport Transactions

Ericsson creates better conditions for sustainable travel by supporting new business models and partnerships for travel service providers and giving the customers one-stop access to a range of travel services such as public transportation, car sharing, car rentals, bike rentals and taxi.

Smart fees and payment enabling multimodal transport

- Road user charging
- Fear collection
- Passenger information

General Information

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eSSys Co., Ltd.

eSSys Co., Ltd.

Company Overview

eSSys vision is to become the global IT leader in Automotive Industry. Founded in the year of 2005, eSSys now reached the position of Korean Market Leader for Before Market DSRC OBE
eSSys is working on a joint venture project with leading ITS System Integrators of Korea for the realization of WAVE and Working close with Korean Express way corporation and a consortium member for the WAVE ETCS in Korea.
eSSys is the world best supplier for a global Information Technology component of Bluetooth and Wi-Fi modules & Telematics unit (e-Call, Cubis-T)
Lead by the Veterans of Automotive Industry, strictly following quality principles, and with tie up with International companies, eSSys will achieve its vision in the near future

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (Telematics Unit for Safety, Bluetooth/WiFi for Automotive)

2nd category

■ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- V2V, V2I Communication Solution using WAVE Technology
- ISRM OBE for Korea & China ETCS
- Road Side Equipment for Korea & China ETCS
- Bluetooth & WI-FI module for Automotive
- Telematics Unit for Safety & e-Call system Unit for EU

Others

- TS16949 / ISO9001 / ISO14000 / SQ (Supplier Quality) : Certified by Hyundai-Kia Motors / Inno-Biz Club
- Awarded with the Presidential Award for Best Company (2008)
- Awarded with the Best Venture Company of Korea (2008)

ITS Product & Technologies

V2V, V2I Communication using WAVE Technology

(V2V, V2I 기반 도로 · 자동차 협업 서비스 예시도)

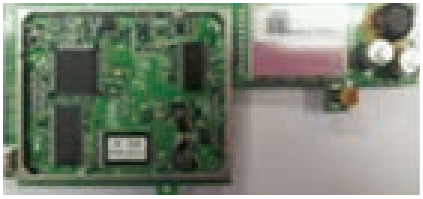
Wireless vehicular networks operating on the dedicated short-range Communications frequency bands are the key enabling technologies for the emerging market of intelligent transport system.

- ETCS OBE and RSE : Used for toll collection application.
- Safety OBE and RSE : Used for transferring safety messages between vehicles and between Vehicles and RSE.

eSSys Co., Ltd.

ITS Product & Technologies

ISRM OBE for Korea & China ETCS



Before Market In Side Room Mirror OBU (ISRM OBU) for DSRC Based Electronic Toll Collection System. This is an OBU for before market application which is preinstalled in car before sales to user. That is when a user want to buy a car, they can choose the before market OBU option and will be preinstalled in the car before been delivered to user. It is of much convenient to user that they don't need to install OBU by themselves.

OBE : It is used for electronic toll collection

Road Side Equipment for Korea & China ETCS

RSE stands for Road Side equipment. It provides a bidirectional short range communication with multiple OBE installed in the cars. The RSE controls the protocol, schedules the activation of the OBE, reads from or writes to the OBE, and assures message delivery and validity. RSE is typically, but not necessarily, installed at a fixed location on the roadway.

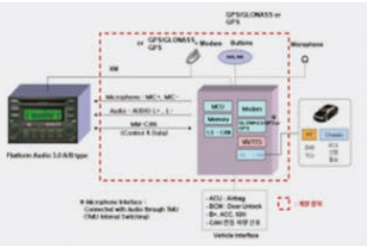
eSSys Co., Ltd.

Bluetooth & WI-FI module for Automotive

Bluetooth and Wi-Fi Module for global AVN Application, eSSys is one of leading supplier of Bluetooth and Wi-Fi modules for Automotive Industry in Korea and across the globe.

Telematics Unit for Safety

e-Call system Unit for EU]



General Information

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Factory : Bucheon Technopark, Ojungg-u, Bucheon, Kyung-ki , Korea

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ETRI

Company Overview

ETRI (Electronics and Telecommunications Research Institute) is the largest government funded research institute in Korea, which strives to advance science by means of formulating innovative ideas; developing new techniques; and training professional individuals in the area of information telecommunications to ultimately enhance social and economical aspects of the modern society.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- SMART Highway

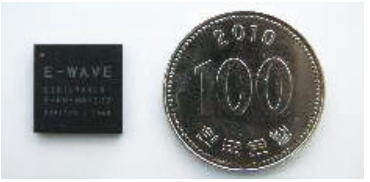
Others

WAVE Handover technology

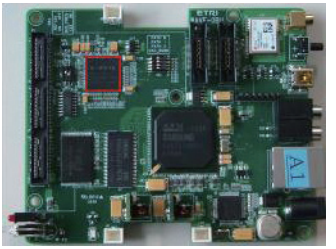
ITS Product & Technologies

- Development of WAVE chip
- Development of WAVE Communication module prototype
- Development of WAVE Software
- Development & Research on advanced vehicular communication technologies (Physical/MAC/Networking/Application Layers)

WAVE chip



WAVE Communication module prototype



General Information

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GITSN Inc.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Construction technology Innovation Project
- Traffic system efficiency project

Others

1. Intelligence based smart shopping method using RFID
2. Data storage method according to the size of ASN.1 file
3. System and data linkage device which interlocks data using ASN.1, Outgoing data encoding method through heterogeneous system using ASN.1 & data linkage method with heterogeneous system
4. Integrated processing terminal for traffic data using ASN.1, Integrated processing method for traffic data using ASN.1 & Controlling method of integrated processing terminal for traffic data using ASN.1
5. Intelligent energy saving type BIT (Bus Information Terminal)

ITS Product & Technologies

1. BIT (Bus Information Terminal) Total Solution

- Cutting edge functions such as information of bus location, bus service route search, bus stop search, and etc. installed
- Patent technology based energy reduction function installed – Green BIT
- It collects and processes real-time information of location, speed, and etc of running buses and provides relevant information to passengers, drivers, transportation companies, and person in charge in local government.
- Structure of BIS: Bus information center, BIT (Bus Information Terminal), Vehicle terminal, Wireless Data Network, GPS

2. Standard Communication S/W for Traffic System

- Gitsn is the only one to contain the original technology of ASN.1 Toolkit, which is the core standard S/W for ITS info-communication
- Gitsn has joint ownership of the license with the MLTM (Ministry of Land, Transport, and Maritime Affairs)

A. GN-B101 (Independent Type)

B. GN-B201 (Shelter Standing Type)

General Information

Company Name : GITSN Inc.
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Phone (mobile) : 82-11-212-4182
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HANATECH SYSTEM Co., Ltd.

Company Overview

HANATECH SYSTEM has been growing and developing into a leading company thanks to our customer's supporting and encouraging which inspired us to thrive with great strides in globalizing our business strategy and expanding our global presence in key emerging markets.
Our growth vision embodies our commitment to achieving both quantitative growth and quantitatively building our brand and our human capital. We aspire to be an industry leader in our businesses as we strategically develop and invest in new enterprises and business engines that will drive future growth. We will continue to build a corporate culture that fosters mutual growth and prosperity for our employees as well our stakeholder alike.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Improvement of obsolescence equipment in New-DAEGU BUSAN Expressway
- Construction of u-City in Sejong City
- Construction of ITS in Jeju Province

Others

Certification - ISO 9001:2009 / ISO 9001:2008

Patent

- CCTV Camera Controller
- Virtual image displaying apparatus for load control
- Unmanned Vehicle Photographing Equipment
- Lighting controller in vision system
- Apparatus for vehicle regulation with vehicle black box
- FPCB(flexible printed circuit board) base plate eccentric test device

ITS Product & Technologies

HD CCTV Controller
Model : HCC19-L7

-Function
- HD CCTV controller
- LCD Monitor 7 inches insertable
- Set the control and status monitoring through CCTV
- HD-SDI character generator (optional)

-Specification
- CPU : 32bit, Real-time OS
- Communication : 3 Serial ports(RS232/422/485), 5 Ethernet HUB ports
- Control : Lens, Pan/Tilt, Preset
- State : Door, Fan/Heater, Temp, In/Out Power etc
- UPS : 220V 60Hz, 30min Backup, Removable (include Camera)
- Size : 19inch x 4U, Standard Rack

CCTV Character Generator
Model : HNO-NDCK

-Function
- CCTV Video signals and the video signal of characters and symbols (an arrow, etc.) expressing
- Video Source Loss function
- 15inch 1U Size simple installation
- power supply Data communication via the control variable character

-Specification
- Video Signal : NTSC, BNC type
- Communication : RS232C(RJ45 type)
- Stat LED : PWR, TxD, RxD, V-L
- Text D/L : By external port
- Power Consumption : 10W under
- Input Power : AC220V 50/60Hz
- Size : 15inch x 1U

Video vehicle detectors
Model : HNV-VVK

-Function
- Passing vehicle by using the camera Videos of the vehicle traffic volume, speed, and the center transmits share analysis
- Detection area of up to 06 car lanes set
- Traffic / Speed / Occupancy rate : Superior /Superior / higher
Korea Institute of Construction Technology)

-Specification
- CPU : 32bit ARM
- MEM : 32MB
- Communication : 4 Ethernet ports,
- LED : Vehicle detection On/Off
- OS : Real time OS, Linux
- Vehicle data collection and communication
- Power: AC220V
- Size : 15inch x 1U

Integrated video detection camera
Model : HMNH-CAMVC

-Function
- Shoot the image vehicle detection in video transmission controller
- CE Certification

-Specification
- System : Camera / lens / housing
- Integrated CCD : 1.4 ", 410,000 pixels
- Lens : Zoom x25
- Material: Aluminum
- Front: plat heated glass
- Sun Shield
- Power : AC220V
- Weight: about 3kg

• Surge Protector
• Model : HSPD-120K

-Function
- Surge voltage and current on the outside of the unstable install equipment to protect against

-Specification
- Input : AC230V(50/60Hz)
- Maximum protection current : 120KA
- Connection Type: Parallel
- Built-in thermal fuse
- Status LED : Power, Protect
- Mode : L-N, L-G, N-G
- Operating temperature : -40℃ - 80 ℃
- Cable Specifications : AWG #12
- Weight: about 450g

CE certified multi-function power supply
Model : HCUI-1000C

-Function
- Stable AC power supply
- The temperature of the enclosure, fan / heater operation status, Door's open position to collect
- CE Certification

-Specification
- CPU : 8bit u-processor
- MEM : 256KB
- Communication : 3 Serial ports (RS232/422/485 select) 1Ethernet port
- The front window of the TCP / IP settings function
- LED : Check the operation status, etc.
- Power Capacity : 1KVA
- Output Stability : ± 2%

General Information

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HANILSTM Co., Ltd.

HANIL STM

Company Overview

HanilSTM is an SI enterprise in the field of ITS (Intelligent Transportation System). HanilSTM provides one-stop solutions for building-up and managing ITS related businesses, which cover proposal, design, development and maintenance. HanilSTM has a branch in Vietnam that is playing an important role strategically in launching overseas business in the field of ITS. HanilSTM keeps on carrying out research and development with its own research institute. HanilSTM has accumulated a lot of know-how based on domestic and overseas experiences and has many experts specialized in various parts, so that it can provide better services, products and caring even after sales.
HanilSTM will be a trustworthy business partner for you

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Ongoing ITS Project
- Incheon International Airport expressway FTMS and Toll System Design · Construction
- Construction of Gangnam Circular Expressway Operation Facility
- Construction of Restraint System for Old Diesel Automobiles
- Sangju-Yeongcheon Expressway ITS Design · Construction

R&D projects
- Development and Demonstration of Smart Safe Society Solutions using Big data and Deep learning
- Development of Operation Technology for V2X Truck Platooning

- Development of Roadway Systems based on LDM and V2X for Cooperative Automated Driving
- Development of Multi Lane Automatic Number Plate Recognition System with a Single Camera
- Development of Energy Saving Smart- plug for ITS

Others

Certification:

- NET* (Multi-Lane ANPR) * New Excellent Technology
- ISO 9001:2008 - ISO 9001:2008
- Certification for Eco Label - Inno-Biz / Main-Biz
- Registered agency for traffic effect analysis and improvement measure establishment

Patent: 25 patents registered including

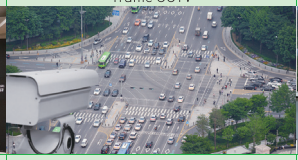
- An apparatus for recognizing plate number of a vehicle
- An apparatus for recognizing plate number of a vehicle

ITS Product & Technologies

Product Offerings

Smart power management device	Multi-Lane ANPR	CCTV camera
		
Video server	**Radar**	**Multi-function controller**
		

Technologies

Traffic information center	Traffic CCTV	AVI (ANPR)
		
VDS	**VMS**	**Accident detection system**
		

General Information

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Hanwha S&C Co., Ltd.

Company Overview

Hanwha S&C was formed in 1994 with the original mission of managing and updating all of the integrated IT network systems and associated services for the entire Hanwha group. The unit was spun off in the spring of 2001 and has since emerged as a leading IT services provider offering world standard services. We offer services for all industries and provide IT consulting, IT outsourcing, SI(System Integration), NI(Network Integration), industry automation, cyber education, ITS and home network solutions as well as our own U-City technologies. We have ensured the quality of our-services by establishing ITSM systems based on ITIL and acquiring IOS9001, ISO2000, ISO 27001 certifications. We at Hanwha S&C endeavor to create corporate value through client oriented management that will lead them to achieve success in this era of ubiquitous information.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

□ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

- Proposal of Bongdam-Songsan Expressway ITS design & construction project (FTMS/TCS/ETCS)
- Proposal of Asan-Pyeongtaek Expressway ITS design & construction project (FTMS/TCS/ETCS)
- West Suwon-Uiwang Expressway ITS design & construction project (FTMS/TCS/ETCS)
- Eco-Bike Service in Goyang (Public-bike system) - Project of Vietnam ITS feasibility study
- Seoul Metro Line No.2 Vehicle Information System

Others

Certification - ISO 9001:2008 - ISO/IEC 20000-1:2005 - ISO/IEC 27001:2005

ITS Product & Technologies

Product Offerings

- To use the Eco-Bike 'Fifteen' , join the homepage (Fifteen Life) and receive a card and membership. After obtaining certification at a station (Fifteen Park) nearby the subways or other areas where the public gather, rent a bicycle and enjoy riding. The bicycle rental status, station map, and bicycle route information can be obtained from the homepage and also through smart phones.
- Users are classified into members and non-members where the membership card is used to rent bicycles by identifying it through the KIOSK. Fifteen emerged by benchmarking the French public bicycle rental service named Velib, however, Fifteen is specialized for daily life through the advanced IT technology, design, health management, various services and a local area vitalization program.

Technologies

Real Time Traffic Control
- Gathering crossroad traffic information - Real time traffic signal control

Gathering Traffic Information
- Gathering traffic information including traffic volume, speed, and share
- Real time monitoring of traffic and road status

Providing Traffic Information
- Providing real time traffic information
- Regardless of time and place using various media such as Variable Message Sign (VMS) and the Internet

Traffic Law Violation Regulation
- Regulating parking violation vehicles, overspeeding vehicles, traffic signal violation vehicles

Providing Bus Information
- Gathering bus location information using wireless communication
- Providing bus location and arrival information & Calculating station arrival time

Management of Emergency Situations
- Real time Monitoring of Traffic Situations
- Handling emergency situations with cooperation from related organizations

Toll Collection system / Electronic Toll Collection system
- Classification of vehicle type through vehicle detecting sensor
- Imposing toll according to vehicle type (cash/card)
- Toll collecting through wireless communication (DSRC : dedicated short range communications)

General Information

Company Name : HANWHA S&C CO., LTD
Website : www.hsnc.co.kr
Address : Hanwha S&C, 19F/20F Hanwha Building,86 Cheonggyecheon-ro, Jung-gu, Seoul, Korea

Contacts

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Phone (mobile) : 82-10-9727-3537
E-mail : hglee@hanwha.com

HighGainAntenna

High Gain Antenna

Company Overview

Since its establishment in 1970, High Gain Antenna Co., Ltd. is the only company in Korea that has been in pursuit of a single path for the future of communication from satelite, moblie, telecommunications vehicle room mirror type Hi-Pass(ETCS) and WAVE device to hi-tech communications.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- V2V, V2I communication Solution using WAVE Technology
- OBE for Korea ETCS - OBE for China ETCS - Compenser for Vehicle

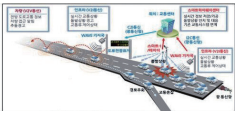
Others

Certification
- ISO 9001, TL 9000(Certificate obtained from TUV - Rheinland, Germany and KMA - QA, Korea)
- ISO 14001 : 2004(Certificate obtained from TUV - Rheinland, Germany)

Patents
- http://www.highgain.co.kr/eng/company/p1.asp?stat1=92&stat2=100&stat3=115

ITS Product & Technologies

V2V, V2I Communication using WAVE Technology

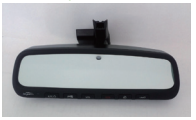

WAVE Inform


WAVE OBE


WAVE RSE

- Reducing accident rates through a chain collision accident status and warning of the front.
- Information of traffic jam and road conditions are given to drivers.
- Enabling rapid response to emergencies with connected car about vehicle diagnostics and location information.
- Can be linked to various devices (ex. Navigation HUD, Application(ex. easy tolling), etc).

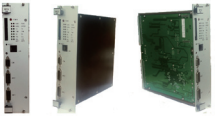
ETCS System OBE

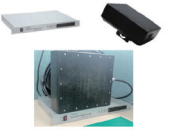

Room mirror type ETCS


ETCS module

- Built-in vehicle Room mirror type ETCS device
- Internal speaker voice service for payment history and balance
- Checking Green/Red LED device state

ETCS System RSE


RSU-Korea

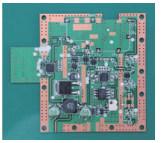

RSU-China

- It is mounted to main control unit and a communication unit that is responsible for communicating with OBU. Forwarding information to communicate with the RF OBU CCU board and uses the microprocess to give higher reliability.

Compenser

- If the Car Booster installed in the vehicle, it serives to shade area in the vehicle and also look good as a simple design. Installation is easy with simple plug & play method inside of wireless charging device. It consists of 800MHz ~ 2.7GHz Band. if a lot of input, a vehicle in good reception sensitivity is automatically shutdown, because of embedding shutdown auto recovery function. when the reception is poor, a vehicle enables reliable service because of changing the recovery.

Compenser Inform


Compenser module

General Information

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E-mail : hjchu@highgain.co.kr

Hitecom system Co., Ltd.

HTC HITECOM

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

-Developed Software which distinguish the car type based on dimension of wheelbase
- Developed mobile standard car detecting equipment. /Developed small auto detecting air robot which featured as vertical takeoff and landing.

Others

Awarded as grand prize for digital technology (Ministry of Knowledge Economy 2007)/ Patent for method to measure vehicle density. (KO 0625678, 2009.06)/ Patent for contactless car detecting equipment (KO10-2009-0050979, 2009.06)/ Patent for standard multi laned car detecting equipment. (KO 10-2009-0057765, 2009.06) / Patent for equipment to distinguish the vehicle type(KO 10-2009-0058132, 2009, 11)

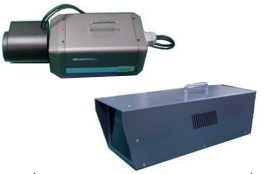
ITS Product & Technologies

V2V, V2I Communication using WAVE Technology

AVI (AUTOMATIC VEHICLES IDENTIFICATION) / VES (VIOLATION ENFORCEMENT SYSTEM) / TTMS (TunnelTraffic Management System) / ILLEGAL PARKING ENFORCEMENTS / BUSES LANES ENFORCEMENT

SDU SIGNAL DISTRIBUTOR

ELCB AUTO RECOVERY DEVICE

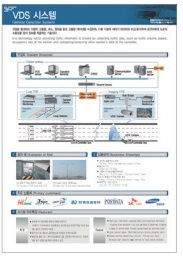


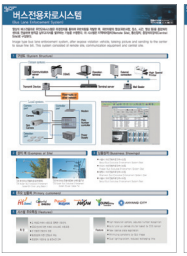
LPR (license plate reorganization)

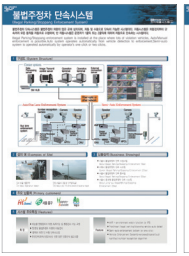
MULTI
FUNCTION POWER CONTROL DEVICE

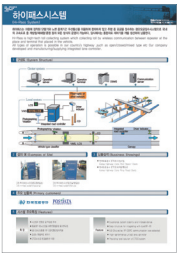
INTELLIGENT
FUNCTION POWER DEVICE

POWER
TYPE SURGE PROTECTOR









General Information

Company Name : Hitecom system Co., Ltd.
Website : www.hitecom.co.kr
Address : 6F Kolon-Techno Valley 60-4, Gasan-Dong, Geumcheon-gu, Seoul, Korea, 153-023

Contacts

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HYUNDAI ITS ELECTRON CO., LTD

HYUNDAI ITS ELECTRON CO., LTD.

Company Overview

Hyundai ITS Electron was founded in November 1998. It is a company specializing in the development, manufacture and construction of road sign boards. Major development and manufacturing items are hardware and software of VMS, LCS, MCU, VCU, CCTV products. We also provide consulting and construction related to ITS products to our customers.
Currently, Hyundai ITS Electron develops high-safety technology based on ITS technology and concentrates on product production and technology development.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - ublic Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

ITS Solution and VMS(Variable Message Signs) fire notification system
- Development of new product for Variable Message Signs
- Development of new product for Line Control System
- Development of CCTV System
- Development of VMS fire notification system

Others

Patents
- Apparatus and method for controlling LED display board for defective detection
- Emergency situation guidance system and method in tunnel

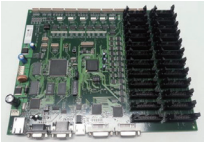
Certification
- Performance certification by government agency
- Good Software certification by government agency

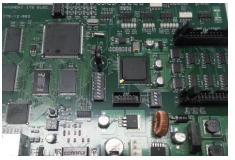
ITS Product & Technologies

Hyundai ITS Electronics develops ITS solutions including Variable Message Sign, Line Control System and Closed Circuit Television System.

Product

Main Control Unit	
	**Communication** - TCP/IP, RS232, DVI **Main Process** - Dual Core 1.8GHz or Higher

Variable Message Sign and Toll Gate Sign Unit		
		**Communication** - TCP/IP, RS232, DVI **Main Process** - 32 bit ARM Processor **Control Unit** - LED Module, Temp Module, Hum Module, Power Module

Line Control System Unit	
	**Communication** - TCP/IP, RS23 **Main Process** - 32 bit ARM Processor

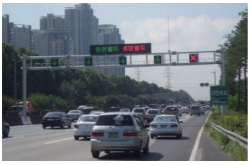
VMS System (Variable Message Signs)

Electric Road Sign and Video Road Sign

Door-Style Road Light Sign and Solar System Application

Side Road Light Sign and Tunnel Road Sign

LCS System (Line Control System)



LCS System (Line Control System)	
	

ITS Product & Technologies

VMS (Variable Message Signs) System Development

- Hardware design of the product
- Development of pc program for users
- Firmware development for device operation
- Development using TCP / IP communication
- Road VMS display development technology

VMS (Variable Message Signs) System Development

- LCS hardware design technology
- LCS software design technology
- Road LCS display development technology

Construction Capability

- Construction of VMS, LCS for roads and highways

General Information

Company Name : HYUNDAI ITS ELECTRON CO., LTD
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Contacts

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Phone (mobile) : 82-10-9897-4172
E-mail : itselec@hanmail.net

HYUNDAI MNSOFT, Inc.

Company Overview

A specialized digital map solutions provider established in 1998, HYUNDAI MNSOFT offers services in LBS and telematics to Hyundai Motor Group companies. The company developed maps for next-generation navigation systems in collaboration with Hyundai Motor Company. The company offers, in conjunction with Hyundai and Kia Motors, telematics services that apply wireless communications technology to automobiles. HYUNDAI MNSOFT seeks to acquire cutting-edge technologies, enhance in-house capabilities, and expands its LBS and telematics business to establish itself as a global vehicle information systems provider.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Digital map base ADAS (Advanced Driver Assistant System)
- ultra-high precision map for ADAS
- ADAS output system (solution)[V2V Device (After Market)] [Communication based ADAS (including V2V, V2I)]
- Developing/Producing WAVE Communications chip (cooperating with Hyundai Autron)
- Developing V2V Software
- Building LDM (Local Dynamic Map), Developing Solutions

Developing Autonomous Vehicle

- Developing Autonomous vehicle related system (cooperating with Hyundai Autron)
- Processing/Analysing Big Data (Social Context Awareness, Intelligentism, etc.)
- Enhancing ultra-high precision mapping system
- Centron Industries(USA), DMC Wireless(Argentina), JCDC

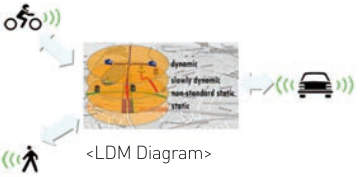
Others

- SYSTEM AND METHOD FOR PROVIDING DRIVING-PATH PRESENTATION SERVICE BY USING REAL TIME TRAFFIC INFORMATION
- System and method for partial updating keep reference data with adiacency map
- Traffic information generation system and method for intersection road considering enterance and exit
- Method of controlling home network using telematics terminal and telematics terminal for performing the same
- Car Navigation System and Method for Updating Map-Data of that
- Navigation and Method for Express Traffic Information
- LOCAL TRANSPORTATION MANAGEMENT SYSTEM

ITS Product & Technologies

LDM(Loca1 Dynamic Map)

- Contents integration technology
- LDM Building Technology



<LDM Diagram>

* LDM : New conceptual Spatial DB concept which contained all information (Static, Dynamic, Moving Object, etc) about the road

V2V, V2I Navi S/W

Function

- Indicating Vehicle, Pedestrian, etc.
- Alerting emergency car, hazardous car
- Alerting emergency situation ahead HUD, Navi)

<Navigation Display>

<Pedestrian Solution>

<Alerting emergency situation ahead on HUD>

General Information

Company Name : HYUNDAI MNSOFT, Inc.
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Contacts

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Phone (mobile) : 82-10-7621-5757
E-mail : chaeri.kim@hyundai-mnsoft.com

Icontrols Inc.

HDC I·CONTROLS

Company Overview

I·Controls is one of the best SI companies in Korea. Its business areas are IBS (Intelligent Building System), Home Network System, SI for Social Infrastructure (SOC), and LED. SI business for social infrastructure includes ITS, Railway E&M, and Container terminal automation.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
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- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

1. ITS and Tunnel TTMS/TGMS Project for Suseok-Hopyeong Expressway in Progress
2. Tunnel TGMS Project for Jinju-Masan (Sanin Tunnel) Expressway in Progress
3. Tunnel TTMS Project for Jeonju-Gwangyang Expressway in Progress
4. ITS Project for Changwon-Busan Expressway in Progress
5. ITS and Tunnel TTMS/TGMS Project for Seoul-Chuncheon Expressway in Progress
6. ITS and Tunnel TTMS/TGMS Project for Daegu-Busan Expressway in Progress

Others

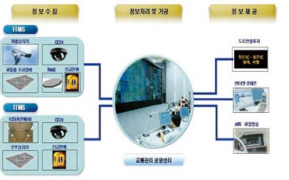
1. Korean Civil/environmental engineer 2011 (Traffic infra system division)
2. Kyeongin daily's 2010 winner of systems award, Information/telecommunication system
3. Constructed integrated connected system of FTMS/TTMS/TGMS for the first time in Korea.
4. Execution experience in One Cycle such as highway ITS field planning, design, construction, maintenance and so on.

ITS Product & Technologies

1. FTMS (Freeway Traffic Management System) : The system performs various functions including real-time acquisition and processing of traffic information, processing and analysis of information creation, provision of processed information, efficient center operation, and facility maintenance for various field equipments.
2. TTMS (Tunnel Traffic Management System) : Tunnel traffic management system is for quick and proper handling through accident detection and emergency broadcast in case of emergency as well as collection of real-time traffic information for inside the tunnel in normal situations.
3. TGMS (Tunnel Group Management System) : Tunnel group management system for saving the cost for tunnel operation and maintenance and for maximizing the efficiency of management by managing multiple tunnels for one management office.

FTMS





TTMS/TGMS



Etc


Citation


KS A 9001 / ISO 9001


KS A ISO 14001 / ISO 14001


Patent

General Information

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InPEG Vision Co.,Ltd.

Company Overview

Inpeg Vision has developed image processing and license plate recognition system by its own technology, and applied in various field of ITS (Intelligent Transport System), and provides core algorithm and technologies to a lot of customers in domestic and overseas market.
With the goals and continuous efforts to make the differentiation of recognition rate, reliability and technology, Inpeg Vision will always take a further step to develop sole image processing technology thereby positioning itself as a pioneer of techniques.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

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- Traffic Information Integration - Traffic Information Center Traffic Data Management

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- Pre/On-Trip Traveler Information Service - Telematics Service

□ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

KINTEX - Integrated Total Parking Management System(Parking Guidance/Parking Position Inquiry)
POSCO - Integrated Total Security System
Busan , Gangseo gu - Urban Integrated Traffic & Security System
Gyung-ki Province national Highway ITS - Integrated Intelligent Traffic System
Busan Bank, Head Office - Parking Guidance& Parking Position Inquiry
Japan Gas station - Gas-Station CRM System(48 sites)
Philippines, Subic, Hanjin Apartment - Vehicle Access Control System

Others

Patent Status
- Retention : 38 cases (Country 32cases, Overseas 3cases, Brand 1case, Design 2cases)
- Application : 3 cases - PCT Enrollment : 4cases

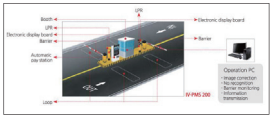
Technical Certification - Total 72 cases
- CE / UL , AVI test (excellent grade : recognition rate 98%)
- NET (New Technology), Excellent Procurement Product 2 case , etc.

Management Certification - Total 33 cases

ITS Product & Technologies

Product Name : LPR device (for rear)
Model Name : IV-PIRR-100
Overview : This dust and water proof LPR device is installed small space and capture images of entering vehicles and improve recognition rate.

Advantage of product
1. High recognition rate (over 98%)
2. Semi-permanent illuminator
3. Remote maintenance
4. Simple design and installation



Product Name : Parking management system
Model Name : IV-PMS 200
Overview : LPR based advanced access control system enables high-efficient and user convenient parking lot operation overcoming all the weak points of legacy RF card type system.
Advantage of product
1. High recognition rate (98~99%)
2. Vehicle access control
3. GOOD DESIGN certification
4. Durability (IP 45 certification)

Product Name : iCLCU (Camera Lens Control Unit)
Model Name : IV-PIMS-400
Overview : LPR based advanced access control system takes images of entering/leaving vehicles with high-definition mega pixel camera and it automatically recognizes plate number then access control/manage them.

Advantage of product
1. High recognition rate (over 98%)
2. Semi-permanent illuminator
3. Remote maintenance
4. High speed recognition speed

Product Name : Road security camera
Model Name : IV-COHL-400 (for 1 line), IV-COHL-401 (for 2 lines)
Overview : LPR based road security camera system (ITS) capturing all the vehicles passing by the road and provide the real-time information to operator of wanted, stolen and related vehicles.
Advantage of product
1. High recognition rate (98~99%)
2. Various vehicle detection by site environment
3. Semi-permanent IR illuminator
4. Durability (IP 66 certification)

General Information

Company Name : InPEG Vision Co.,Ltd.
Website : www.inpeg.com/eng
Address : 59 Muhaksong-ro, Geumjeong-gu, Busan, Korea.

Contacts

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E-mail : dhkoo@inpeg.com

IT Telecom Co., LTD.

Company Overview

IT Telecom (ITT) is a leading edge Intelligent Transportation System (ITS) company with WAVE (Wireless Access in Vehicle Environment) solutions,the next generation ITS communication technology. ITT has incorporated since 2004 as a turnkey solution provider for ITS communication product development, radio engineering, and maintenance. Also, ITT has proactively developed WAVE technology and successfully finished a field trial in 2010 ITS World Congress in Busan, South Korea.ITT is well positioned to tap and grow in the emerging world WAVE market for V2X, Airport, Train, Subway, Harbor communication network solution. ITT will do our best to provide the leading edge ITS solutions (DSRC/WAWE) to our customers

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

□ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI □ Consulting □ Others ( )

Ongoing ITS project or R&D

Korea Government Project("Smart Highway")
- V2X pilot test : providing 100 sets of WAVE OBU's

WAVE OBU samples for Tier 1 Automotive Suppliers
- Hyundai Mobis - Mando

Strategic Partnership with Telco's and global ITS SI companies.
- KRT, POSCO-ICT, SK Telecom, Aldridge Electrical Pty(Australia), Telnorm(Mexico)
- Centron Industries(USA), DMC Wireless(Argentina), JCDC

Others

(Patent No) 10-0745014: Traffic Information Utilization Method by using Complex-type RSE
(Applied No) 10-2012-0012095: Smart Phone SW Architecture and Algorithms to exchange realtimevideo data between driving vehicles by using Smart-phone (or Smart-type terminal)
(Applied No) 10-2012-0158076: Vehicle Management System Architecture and Algorithms to check real-time site situation and vehicle position in airports and harbors.

ITS Product & Technologies

Product Offerings

- Modulation: OFDM(BPSK, QPSK, 16QAM, 64QAM)
- Interoperability: meet the required products
- Data rate: up to 27Mbps
- RF Frequency: 5.850 ~ 5.925GHz

- Modulation: OFDM(BPSK, QPSK, 16QAM, 64QAM)
- Interoperability: meet the required products
- Data rate: up to 27Mbps
- RF Frequency: 5.850 ~ 5.925GHz
- Number of Channels: 7 Channel
- Channel Bandwidth: 10MHz

- Channel Card : 2 RF channels(Max.7 Channels)
- EDCA Test Available
- Multi-channel Operation Test Available
- Protocol Analyzing forV2X Communications
- Can be used for RSU or OBU emulator
- IP/WSM Data Analyzing Available
- Compatibility Test between Other OBU's/RSU's
- Security Test : IEEE 1609.2(Optional)
- LED indicators and alarm notification for system fault detection

Technologies

5.9GHz DSRC WAVE(IEEE 802.11p, 1609.2~4)
- Baseband Modem & Mac
- Embeded software
- Hardware including RF transceiver

5.8GHz Legacy(Korea Standard) DSRC
- Baseband Modem & Mac
- Embeded software
- Hardware including RF transceiver

General Information

Company Name : IT Telecom Co., Ltd.
Website : www.it-telecom.co.kr
Address : 555-9 Hogae-dong, TheOvalley #517

Contacts

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ITRONICS CO., LTD

iTRONICS

Company Overview

ITRONICS CO., LTD is a leading Korean manufacturer who has its own technology for ITS system & OBU design, Digital Image Processing, ASIC & RF design. It offers full range of ITS system related products and Automotive IT products such as ETC OBU, Vehicle Driving Recorder, Personal Naviagtion Device and so on.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
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- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )=

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Certification

Project

- Hi-pass system(ETCS)
- RF antenna and Control unit for DSRC Traffic data collection/provision system

R&D

- WAVE RSE & OBE

ITS Product & Technologies

Product Offerings

Hi-pass system(ETCS)
- Original type Hi-pass system
- Slim type Hi-pass system
- Service area type Hi-pass system

- Specification
  Slim type system and Small size lane control unit(15' subrack)
  All in one CCU (CCU, IRCU, RFCU, SAM)
  All in one antenna (IR-DSRC 800~900nm, RF-DSRC 5.8GHz)
  RF antenna and Control unit for DSRC Traffic data collection/provision system
- All in one 5.8GHz RF-DSRC antenna and Control unit
- Range : 100~400m

Technologies

- Hi-pass system(ETCS)
  ETCS means Electronic Toll Collection System using the IR / RF Dedicated Short Range Communication (DSRC) technology which enables communicate with between On-Board Unit (OBU)installed inside the vehicles and Stations (IR RSE, RF RSE) installed in Roadside.
- RF antenna and Control unit for DSRC Traffic data collection/provision system It is the system to deliver the traffic information collected by using Dedicated Short Range Communication (DSRC) technology between ETC based Roadside Equipment and OBU.

General Information

Company Name : ITRONICS CO., LTD
Website : www.itronics.co.kr
Address : 15, 56 gil, Joongbu-daero, Giheung-gu, Yongin-si, Gyeonggi-Do, Korea

Contacts

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Phone (mobile) : 82-10-2314-2786
E-mail : sphong@itronics.co.kr

Jin Woo Industrial Co., Ltd.

JINWOO Industrial Systems
www.jin-woo.com

Company Overview

JINWOO transportation system solution helps to build a faster, safer, more eco-friendly transportation system by incorporating cutting-edge technologies of electronics, electricity, control, and information.
communication fields into a transportation system, such as UTMS, DSRC, ATES, FTMS and TCS / ETCS. Experience our transportation system solution, the fittest of all in the ever-evolving ubiquitous environment.

Business Area

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□ Others ( )

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■ Hardware ■ Software ■ SI □ Consulting □ Others ( )

Ongoing ITS project or R&D

- Toll Collection System implementation for Korea Expressway Corp. in 2014
- Toll Collection System implementation for Seoul Beltway Corp. in 2014
- Toll Collection System implementation for Daegu-Busan Expressway Corp. in 2014
- Toll Collection System implementation for Cheonan-Nonsan Expressway Corp. in 2014
- Freeway Traffic Management System implementation for Cheonan-Nonsan Expressway Corp. in 2014
- Traffic Law Violation Enforcement System implementation for Seoul, Inchon, Gyeonggi, GyeongNam. in 2014

- Vehicle classification system supply for Korea Expressway Corp. in 2013
- Unmanned Toll System development and supply for Korea Expressway Corp.

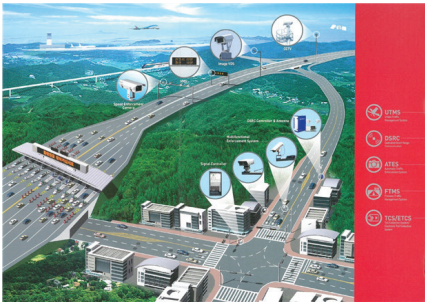
Others

Certification
- ISO 9001:2008 / - ISO 14001:2004 / - OHSAS 18001:2007

Patent
- 8 patents registered in Toll Collection related technologies.
- Unmanned Vehicle Photographing Equipment.
- Automatic Vehicle Number Recognition System.
- Vehicle Speed Detection System.
- Traffic Law Violation Enforcement System.

ITS Product & Technologies

Product Offerings



Technologies

Design, Development (S / W,H / W), Civil Work, system construction, enginnering for Intelligent Transport System (ITS)
- Toll Collection System (TCS)- open Type, Closed Type
- Electronic Toll Collection System (ETCS)
- Freeway Traffic Management System (FTMS)
- Urban Traffic Management System (UTMS)
- Dedicated Short Range Communication (DSRC)
- Automatic Traffic Enforcement System (ATES)
- Traffic Signal Control System

General Information

Company Name : Jin Woo Industrial Co., Ltd.
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Address : 11-24, Seongmisan-ro, Mapo-gu, Seoul, Korea

Contacts

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E-mail : dckwon@jwis.co.kr

Keon-A Information Technology Co.,Ltd.

Company Overview

KEON-A is a leading manufacturer and exporter of Traffic Enforcement System with domestic market share No.1 in South Korea since foundation of 1987. KEON-A has key solution of traffic enforcement system such as Speed, Traffic Signal, Criminal Vehicle Capturing and etc by using Automatic Number Plate Recognition system (LPR or ANPR).

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
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- Traffic Information Integration - Traffic Information Center Traffic Data Management

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☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (Traffic Law Enforcement System)

2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Project of Traffic Signal Control System in Manila, the Philippines
- Project of Speed & Traffic Signal Violation Enforcement System in Almaty, Kazakhstan
- Traffic Signal Control Equipment and Vehicle Mounted Vehicle Plate Number Recognition System in Turkmenistan

Others

Certification
- ISO 9001:2008
- CE

Patent
- Unmanned Vehicle Photographing Equipment
- Automatic Vehicle Number Recognition System
- Vehicle Speed Detection System
- Traffic Law Violation Enforcement System

ITS Product & Technologies

Mobile Speed Camera is mobile type speed detection camera based on laser sensor. This mobile camera can automatically detect and recognize the vehicle number plate at the designated point.

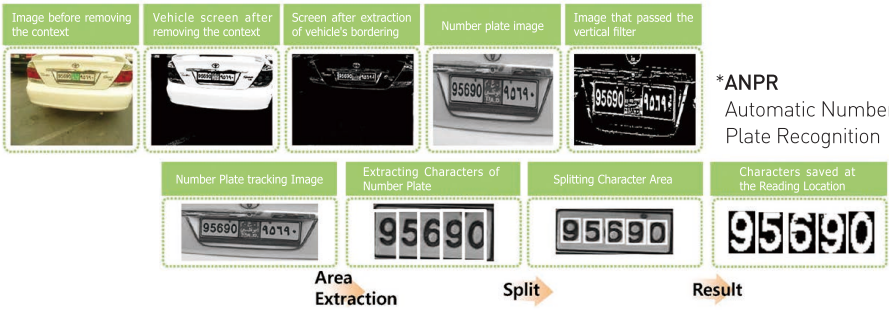
Specifications and Features

Camera	1.3M Pixel CCD Camera
Lens	Motorized 100mm to 120mm (include x2 Extender) Target Range : 80 to 120meters
Illuminator	Wire or Wireless Xenon Lamp 700nm IR Filter Life Time mort than 100,000 times
Sensor	Laser Sensor Measurement Speed : 10~300km/h Speed Error Rate : Less than ±1% 905nm, Class (Eye Safety)
Controller	Intel Embedded Atom 1.6GHz 5.7inch color TFT LCD monitor with touch screen Operating Temperature : -30°C to 70°C All-in-One compact module for easy maintenance USB Menory Device : Over 100,000 image storage ANPR(Automatic Number Plate Recognition) (Option)
Housing	Size : 507(L) × 175(W) × 165mm(H) Weight : 6kg
Battery	Sealed Lead Acid Battery, 12V

Keon-A Information Technology Co.,Ltd.

Technologies

ANPR(Automatic Number Plate Recognition) System



General Information

Company Name : Keon-A Information Technology Co., Ltd
Website : www.keona.co.kr
Address : Keon-A Bldg, 401-2, Poongnap-dong, Songpa-gu, Seoul, Korea

Contacts

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E-mail : cryu@keona.co.kr

Korea Consultants International Co., Ltd

KCI KOREA CONSULTANTS INTERNATIONAL

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ☐ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Trung Luong – My Thuan Expressway Construction Investment Project (Vietnam) – Technical Design of Traffic Management Systems and Toll Collection Systems, 2010~2011

Others

Ubiquitous Intelligent Disaster Prevention System, 2010, 1020080066210

ITS Product & Technologies

Feasibility Study, Master Plan, Basic and Technical Design, Supervision

General Information

Company Name : Korea Consultants International Co., ltd.
Website : www.kcieng.com
Address : 7F, Daerung Techotown 15, 224-5, Gwanyang-2dong, Dongan-gu, Anyang-si, Gyeonggi-do, Republic Of Korea

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Korea Expressway Corporation

Korea Expressway Corporation

Company Overview

The Korea Expressway Corporation ("KEC") was established in 1969 and is responsible for the construction and operation of the nation's expressways. It plays a pivotal role in national transportation policy. As a leading company in the nation's road construction industry, the KEC has been involved in constructing main expressways, which increase the nation's transportation cost efficiency by connecting key points, thus playing an instrumental role in the Korean economic growth.
The KEC has thus far laid 4,151km of domestic expressways. By 2020, the total length of the expressways nationwide will be 6,160km. The KEC has also established the Intelligent Transport System ("ITS"), which employs road construction and management technologies together with state-of-the-art information technology. It continues to make every effort to prepare the nation for a bright future of intelligent roads that are both faster and safer.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ☐ Software ☐ SI ☐ Consulting ☐ Others ( )

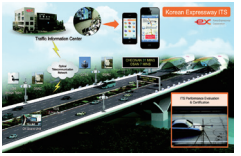
Ongoing ITS project or R&D

- Nationwide Establishment of the Comprehensive Traffic Information System
- Automatic Tunnel Accident Detection System
- High-Speed Weigh-In-Motion(HS-WIM)
- Smart Overloaded Vehicle Enforcement System

- Smart Toll Collection System
- Standard Slim Hi-Pass System
- Hi-Pass(NTCS, Nonstop Toll Collection System) Only Interchange(Smart IC)
- ITS Performance Evaluation & Certification

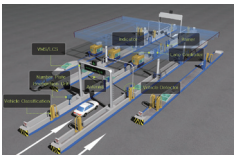
Others

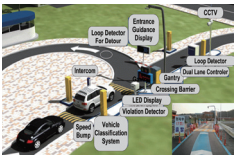
- Apparatus for sensing number of axles in vehicle(1999)
- Apparatus for determining tire width and wheel track of vehicle and method thereof(1999)
- Pass ticket withdrawal control device in ticket issuing unit(1999)
- Ticket issuing unit enabling continuous pass ticket issuing(1999)
- Ticket issuer for preventing double issuing(2000)
- Passport issuing device equipped with plural printing units(2000)
- Device for controlling printer head position of pass checking machine(2000)
- Driving control method of fixed amount pass confirming device(2000)
- Passage receiving apparatus for passage publisher(2000)
- Smart card for toll collection system installed at toll gate(2005)
- Hi-Pass(NTCS, Nonstop Toll Collection System) becomes available nationwide (2007)
- Implementing C-ITS pilot project of government(2014)



ITS Product & Technologies

Traffic information is provided through (1) collection of traffic data, (2) data processing, and (3) provision of traffic information. Traffic data including that on traffic flow or accidents are collected through such traffic management facilities as VDS, CCTV, AVC, and DSRC, as well as patrol teams and customers. The Traffic Information Center then combines and processes the data to provide traffic information to customers through the Internet, Traffic Broadcasting Services, Smart phones, VMS, and other devices.





Hi-pass is the KEC's proprietary brand for the unmanned electronic toll collection system (ETCS). If an electronic card is loaded into the Hi-pass device (On-Board Unit) in a vehicle, the vehicle is not required to stop at a tollgate to pay the toll as the toll is automatically paid through wireless communication between the device and the antenna installed on the lane. In short, it is an unmanned, no-stop, and non-cash toll payment system.

General Information

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Website : www.ex.co.kr
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KOREA SMART CARD CO., LTD

Korea Smart Card Co., Ltd

Company Overview

Korea Smart Card Co., Ltd(KSCC) is an internationally recognized and industry leading e-payment service provider based at the heart of Seoul, Korea. We were established by Seoul Metropolitan Government and LG Group in 2003 for the purpose of implementing the unified AFC system for the public transit.
We now deliver the best quality e-payment system, data settlement services, and other value added services such as vehicle information systems(BIS, TIS) and consultation services to both local and international customers. KSCC helps cities and businesses plan and implement their own unique e-booking and e-payment system for their transit modes or other places where these technologies play a significant role.
Smart technologies continue to reshape ways people plan and pay for their travels and make payments on-line. KSCC aims to make reality of 'Seamless Travel' come true; a reality where people no longer have to plan their travels in advance regardless of how many modes or how complicated the journey may be, and make this 'reality' a very much real, accessible and enjoyable experience for people all around the world.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Ulaanbaatar City E-Ticketing and Traffic Control System (Mongolia)
- Implementation of Integrated Devices and Bus Arrival Information System for Express Bus (Korea)
- Maintenance and Operation of Next Generation of Smartcard System for Seoul Metropolitan Area (Korea)
- Seoul Taxi AFC and STIS-Seoul Taxi Information System (Korea)
- Provision of Contactless Smartcard based System for Wellington City (New Zealand)
- S.P.A.D(Suruhanjaya Pengangkutan Awam Darat / Land Public Transport Commission) Project Management Consultancy

Others

AFC
- Ministry of Trade, Industry and Energy selected as World Best Solution.
- Transit card settlement system : the first ISO9001 certification in the industry.

Card
- Ministry of Land Infrastructure and Transport nationwide compatible transit card certification for the first time in the industry (Transit card : 2010, July 12 / Payment security application module SAM : 2010, November 16)

Mobile
- NFC form & WIMA's NFC Global Competition Awards in 2sectors in 2012 year (Total of 3 sectors, Best Business Viability, Best User Experiences, Best Innovative Solution)

Global
- EACOPS(East Asia Common Payment Scheme) Leader : Multi-National Interoperability

ITS Product & Technologies

Product Offerings

Bus Validator
- State-of-the-art Bus Validator with multiple connectivity and high performance
- Wide and clear user interfaces with 4.3" LCD
- Compatibility with international RF Card specification (ISO14443 type A/B, Mifare)
- Expandability up to 8 SAM slot as SIM type
- Easy maintenance control functions with Automatic Error Control and Data loss control

KOREA SMART CARD CO., LTD

Bus Driver Console

- Intensive and integrated on board computer inclusive of Driver Console, Display and GPS
- Unified device for both AFC and BMS function
- High Performance suitable for Multi-Fare / Multi-boarding
- Easy user interface and manipulation for driver

Taxi Validator

- Accepts diverse types of cards
  (IC card, Magnetic Stripe card, RF card)
- Flexible to deploy applications such as mobile call service and navigation
  (GPS)

Express Bus On Board Device

- Multi-payment method available such as RF type card, Mobile RF chip, Magnetic type card
- Ticket check through Barcode reader(QR code)

Payment Media

KSCC issues different types of smart cards such as pre-paid, post-paid and also NFC chips for mobile. We provide them in a variety of different styles suited for their functionalities and themes.

- Card

- Mobile

- Other accessory (Smart watch & etc)

Korea Smart Card Co., Ltd

Technologies

1. AFC Acquiring

- It is easy deployable system which enables passengers to easily integrate turn-key AFC solution into the bus system; a system designed to provide smart-card and mobile device(NFC) based AFC, real-time BMS, and Remote Device Control Services. OBU's(On-Board Units) transmit transaction and operation data to center system through wireless connection in real time. At center system, passengers are able to monitor fleet and passenger activities and update fare structures of the OBU's.

2. Smart Mobile Ticketing (Intercity Express Bus)

- IT is a total express bus solution that enables optimal Real-Time Monitoring System(RTMS) and innovative ticketing system. With the state of the art OBU, ways passenger can purchase the ticket are diversified; from mobile(T-money Express App) to on-board ticketing where you simply issue your ticket on the bus passengers are riding without booking in advance. The OBU's are wirelessly connected to operator's RTMS. Operators can send travel information to the OBU's. They are also able to manage their fleet effectively by obtaining database of operational information of each vehicle. They can monitor each vehicle's booking, ticketing and boarding status on a real time basis and use this information to maximize each vehicle's passenger load.

3. Consulting Service

- KSCC can provide you with best quality consulting service with a team of most accredited experts who have partaken in T-Money major projects of the past decade. The masterminds that not only designed and implemented but also are managing the currently in service e-payment system in many parts of the world, the customers can be assured to obtain highly reliable and trustworthy advices from our consultants.

General Information

Company Name : Korea Smart Card Co., Ltd
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Contacts

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KOREA SMART CARD CO., LTD

KoROAD

Company Overview

Road Traffic Authority (KoRoad) has been doing its best to reduce traffic accidents by providing traffic safety education, checking safety facilities, developing traffic technologies , broadcasting traffic information and so on.
Especially from this year, 26 of driver's license test courses around the nation take charges of license work and it became the road traffic safety total service provider.
KoRoad will maximize organization's competence to save more citizens from traffic accidents, and through 'Serving Management', 'Science Management', 'Moral management' KoRoad will grow as a organization that is representing Korea on road traffic safety, and will take full response as a life saver and road guide.

Business Area

1st category

■ Traffic Management
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☐ Others ( )

2nd category

☐ Hardware ☐ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Research of Traffic Science
- The operation of international certified test agency (KOLAS)
- R&D of testing and specifications for safety facilities
- R&D of traffic equipment and traffic information management systems using (ITS)

Traffic Broadcasting Network (TBN)
- Provides fast and accurate traffic information to prevent traffic congestion and accidents

Public Relations for Traffic Safety

- National public relations campaigns aimed at enhancing the national understanding of traffic order principles and preventing traffic accidents
- Pan-national campaign, 'Reduce Traffic Accidents'
- Children's Traffic Safety Public Relations Center

Technical Support for Traffic Safety

- Improving traffic safety in frequent accident areas and providing statistical analysis
- Technical support for traffic accident investigations
- Suggestions for the design, supervision, inspection, and improvement of traffic safety facilities
- Improvement of the 'Safety Zone'
- Technical support, design, and supervision for traffic signal systems
- Management and inspection of automated traffic enforcement systems on consignment

Others

International exchange

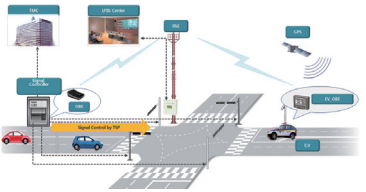
- PRI (La Prevention Routiere Internationale) regular member
- TR B (Transportation Research Board) regular member

Patent

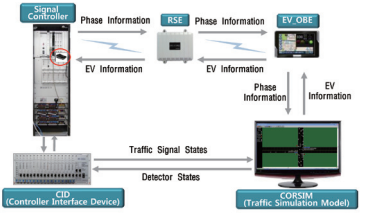
- total : 213 - a patent application : 27 - registration of patent : 186

ITS Product & Technologies

System(Based on UTIS)



Test and Evaluation



- Evaluation System based on HILS using existing devices (L/C, RSE, EV_OBE, LC_OBE etc.)
- Using CORSIM traffic simulation model
- Debugging the algorithm of TSP
- Evaluating the effectiveness of TSP

General Information

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KT

Company Overview

KT is the major telecommunications company in South Korea, leads the ICT industries especially in 5G and gigabit-Internet and has various business portfolio in media, finance, security, energy and convergence fields. Among those services, smart city and smart transportation including C-ITS and autonomous vehicles based on 5G network are one of the fast growing business fields which are to expand overseas.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

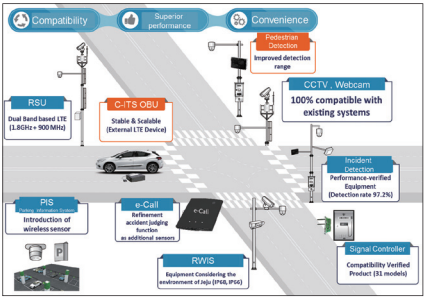
- **Jeju C-ITS empirical Project(2018~2020):** 15units C-ITS services through building center system and site support device
- **Giga Korea Project(2018~2020)**: Development 5G based Autonomous driving solutions
- **2nd Techno Valley, Pangyo**: building the world's first autonomous vehicle cluster
- **Sangam Digital Media City PoC**: Pilot operation of KT 5G self-driving bus in the Sangam-dong area, accelerating a verification of self-driving mobility.

ITS Product & Technologies

Product Offerings

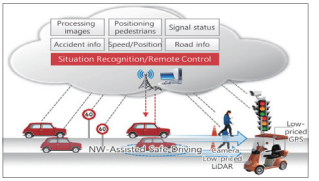
C-ITS Solutions

- C-ITS refers to Cooperative Intelligent Transport Systems using geo messaging technology to allow vehicles, traffic signals and roadside infrastructure to communicate with each other over the mobile network. The objective of C-ITS is to make road traffic safer and more efficient. KT provide 15 units of C-ITS services in Jeju province.



C-ITS Platform

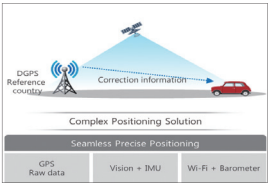
- KT's C-ITS Platform enables drivers to receive personalized traffic information instantaneously and to anticipate traffic conditions. This is a revolutionary opportunity to optimize travel times for drivers, improve safety on the road network and make it possible for road authorities to reach the road users.



Technologies

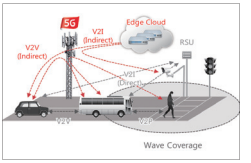
KT precision positioning

- KT have own position correction technology. This technology can make centimeter-precision positioning accuracy using cheap GPS. Such centimeter precision system could let autonomous vehicles navigate safely.



5G C-V2X

- The C-V2X technology uses mobile cellular communication networks to share vast amounts of data in real time between vehicles, infrastructure, pedestrians, traffic management centers and other connected systems, enhancing the safety of automated driving. Using a 5G network that is 100 times faster than existing 4G cellular systems, it becomes possible to reflect traffic information in real time.



General Information

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Contacts

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Kyungbong Co., Ltd.

Company Overview

Kyungbong, one of leading companies in the field of Transport Information System solution in Korea, has a strong position especially in the SOC (Social overhead capital) project, which is associated with the Korean government, local governments and public institutions.
Kyungbong has been providing with a systematic integrated transport information solution by reprocessing data from various individual transport solutions with accumulated technology and lots of years-experienced employees and also has enjoyed a good reputation by concertizing and realizing the various and complicated demands of transport information for over a decade.
Sans doute, we, Kyungbong, is your perfect partner in highly technology-intensive business of Transport Information system solution.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ☐ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Project of Traffic Violation Fix System in Almaty, Kazakhstan
- Pilot of Speed & Traffic Signal Control Equipment and Vehicle Mounted Vehicle Plate Number Recognition System in Turkmenistan

Others

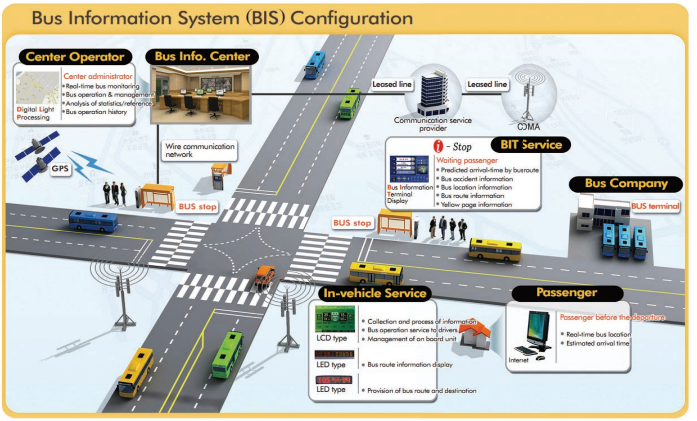
International exchange
- ISO 9001:2008
- CE

Patent
- Unmanned Vehicle Photographing Equipment
- Automatic Vehicle Number Recognition System
- Vehicle Speed Detection System
- Traffic Law Violation Enforcement System

ITS Product & Technologies

Technologies

Bus Information System (BIS), which actives public transportation with intelligent transportation system, recently has been promoting around the Metropolitan area. BIS provides related information such as route information, transit information, public transportation information and waiting period information to bus users during before and after transit period and helps passengers with effective transit decision. In addition through this system, a bus driver is able to precisely allocate the dispatching time and a passenger is able to safely and comfortably use public transportation.



General Information

Company Name : Kyungbong Co., Ltd.
Website : www.kyungbong.co.kr
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LG CNS

Company Overview

LG CNS is the global IT service company that enables digital innovation for customers through emerging IT technology.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (Smart Tolling, Air Traffic Control, Planning, Scheduling and Dispatching system)

2nd category

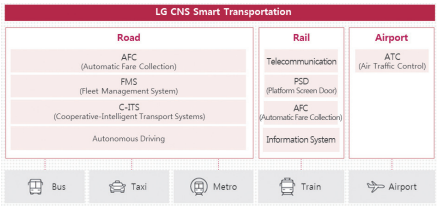
■ Hardware ■ Software ■ SI ■ Consulting ■ Others (Operation and Maintenance)

Ongoing ITS project or R&D-

- Hellas Smart Ticket Project in Athens, Greece
- AFC & FMS project in Bogota, Colombia
- MRT Feeder bus project in Kuala Lumpur, Malaysia
- RapidPenang bus project in Penang, Malaysia
- T-money
- Smart Tolling project in Korea
- Lusail LRT platform screen door project in Qatar

ITS Product & Technologies

Product Offerings



Technologies

1. AFC Solution

With proven expertise through major references in global cities, LG CNS provides end-to-end services and solutions for fare collection by integrating fare information and applications across the transportation types, transit and routes.
LG CNS's Smart Card Payment Solution helps transport operators to realize higher efficiency, profitability, and convenience with customer satisfaction by delivering passenger-oriented new "unified fare payment technology". As a turn-key solution provider, LG CNS provides a range of smart card related equipments, solutions and application services to ensure success in the future of public transit.

Our solution offerings :
- Holistic consulting services for system analysis & design
- Equipment supply & integration
- Back office application development & implementation
- System interface
- Data center implementation
- Operating & policy support system
- Post-hoc analysis and intelligence consulting

2. FMS Solution

The LG CNS FMS (Fleet Management System) provides planning & dispatching service from planning timetables to optimized disposition of vehicles and drivers. The solution also tracks the location of vehicles in real time for bus drivers and companies to maintain appropriate intervals among vehicles and optimize dispatch more efficiently.
It also improves passenger satisfaction, as they can receive information on estimated arrival time and bus routes via PIP (Passenger Information Panel) installed at bus stops and in vehicle; or through the Internet and mobile phones.
From route planning to statistics/ reporting, the solution automates and systemizes the entire process of public transit operation, which allows companies to flexibly and effectively adjust to changing demand.

3. ITS/C-ITS Solution

The Traffic Management System of LG CNS provides an integrated and systematic solution across the entire span of traffic management, including traffic information analysis, real-time traffic flow monitoring and incident management, advanced traffic signal control and traffic violation enforcement. LG CNS holds state-of-the-art V2X* Solution powered by LG core technologies of LG Electronics and LG Innotek.

General Information

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LOTTE Data Communications Company

Company Overview

LOTTE Data Communications Company (LDCC) is a subsidiary of LOTTE group which has provided customer-oriented services. LDCC is providing IT solution to Transportation, Health, Finance, Security and other fields. As service provider, LDCC generates a annual turnover of $ 543 Million ('16). Regarding Transportation service, LDCC implement and operate the system which are Electronic Payment, Auto Fare Collection, Electonic Toll Collection(including Multi-lane) for providing convenience of users.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Expressway ITS construction of the hinterland of Busan new port(Sin-Hang)
- Expressway ITS construction of Gyung-In Expressway line No.2
- System installation project of bus welfare card in Jeonbuk-city
- System installation project of bus fine imposition system in Changwon-city
- System installation and introduction project of tourist card in Jeonbuk-city

ITS Product & Technologies

Product Offerings

- Bus validator (terminal) and Main Controller Unit for Auto Fare Collection in bus, rail and other transportation method.
- Manufacturing prepaid card and related accessary equipment
- Main Controller Unit for single-lane and multi-lane road Electronic Toll Collection system

Technologies

- technology related to system integration of Auto Fare Collection System
- technology related to system integration of Electronic Toll Collection System
- technology related to system integration of Bus Information System and Bus Management System (Fleet Management System)

General Information

Company Name : LOTTE Data Communication company
Website : http://www.ldcc.co.kr/en/index.asp
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Contacts

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Phone (mobile) : 82-10-9831-1235
E-mail : dkchoi80@lotte.net

METABUILD Co., Ltd.

METABUILD CO., LTD.

Company Overview

MMETABUILD Co., Ltd. is a professional middleware solution company which has researched, designed and developed EAI and BPM product for business industries with plenty of experiences over 18 years since 1998. We are as one of the leading software development companies in South Korea, successfully deployed ITS solutions over 3000 organizations including government administrations such as the Ministry of Information and Communications (currently, the Ministry of Science, ICT and Future Planning), the Ministry of Defense and etc. We are expanding fast, firmly based on proven technologies and customer satisfaction, maintaining reputation of being the most recognized products and use of highly advanced technology. Our dedicated teams share a vision of creating truly superior technology.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

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■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Development of Cooperative Automated Driving Highway Systems.
- Cooperative ITS Project.
- Development and Verification of Signal Operation Algorithms in Local Intersection Network utilizing V2X Communication Infrastructure.

Others

Certification

- "A radar sensor based Realtime Incident Detection System" New Technology Certification
- ISO 9001 - INNO-BIZ (reword for Technological Innovation)
- Qualified as Software Development Leading Company of Venture Industry in Korea

Prize

- Steel Tower Industrial Medal was awarded by government in recognition of contribution to IT industry in 2016
- The leader of Software Development Industry in 2010
- The reward for Smart Highway Research in 2010
- The reward for Korean Intellectual Property Office System

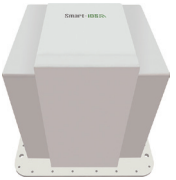
Patent

- Road monitoring method using RADAR and apparatus thereof. And so on.

ITS Product & Technologies

Product Offerings

Smart-IDS can be installed on highways, trunk roads and roads for preventing accidents and congestions. We install the system to bridges and tunnels for monitoring incidents and traffic flow. Smart-IDS provides long detection range to operate and easy to operate. Smart-IDS can improve safety and reduce accidents on the road in all-weather conditions. Also, it can reduce congestions by preventing accidents and reduce driver's travel time.



Technical Specifications

- Frequency: Ka-band
- Detection Range: Max. 1km
- Detection Velocity: Max. 200km/h
- Update Time: < 100ms
- 100Mbit Ethernet interface
- Supply Voltage: 12~32Volts
- Weight: 10kg

Function

- All weather operation
- Remote control function
- Detecting fixed/moving object on the road
- Automatic checking risk factors and providing the information
- Providing all statistical analysis information
- Sending detecting information to center

Technologies

Smart-IDS(Incident Detection System) is a radar based real-time incident detecting and monitoring system for preventing accidents and congestion on the road. It detects incidents such as stopped vehicle, wrong way driving, accident, fallen obstacle, and pedestrian on the road in all-weather. Also, it provides the current road information to administrator using GUI based S/W and notifies the information to drivers in advance to avoid accidents.

General Information

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MORU Industrial Systems Co., LTD.

Company Overview

MORU Industrial Systems is a typical ITS (Intelligent Transportation System) base solution provider in Korea.
MORU Industrial Systems developed a new Vehicle Detect Technology and provides related products ; Wireless Loop Detector etc.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
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- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (Parking Information System)

2nd category

■ Hardware ☐ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Wired Loop Detector (K-LOOP Series for Barrier Interlock&LPR Trigger) : Compact, Strong, Reliable

Others

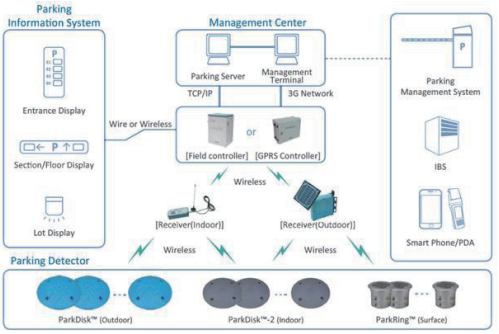
Certification
- ISO 9001:2008

Prize
- THE COMBINED LOOP TYPE AUTO-MOBILE SENSOR USING LOOP COIL AND PARKING INFORMATION SYSTEM THE SAME
- TRAFFIC INFORMATION DETECTION SYSTEM AND METHOD THEREOF

ITS Product & Technologies

Wireless Loop Detector (ParkDisk, ParkRing) for Parking Lot

- All-In-One type Wireless Loop Detector
- Micro Power Consumption Technology Based Wireless Parking Detector
- Wireless Data Communication (ISM Band, Sub 1GHz)
- Very Long Battery Life (10 Years)
- Easy Installation
- Automatic Compensation Algorithm for Temperature
- Waterproof & Heavy Duty Design for Outdoor Parking Lot



Wireless Inductive Loop Vehicle Detector for Intersection Traffic Signal

- Traffic Signal Control Purpose Optimized
- World First Wireless Inductive Loop Vehicle Detector
- 1st NexLoop Series Product

General Information

Company Name : MORU Industrial Systems Co., LTD.
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MQNIC Co,.Ltd.

Company Overview

MQNIC is the company which provides optimized IT solutions.
It consists of a staff with experience in the successful implementation of various projects.
Based on recognized technology, reliability and know-how in addition to the private / public sector and expand into overseas

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Name of Project	Name of Authority
Emergency Rescue Mobile linkage control system development	KMW
2016 addition and improvement projects Busan Bus Information Management System	Neighbor System
KOCED CMI integrated CI build system	Neighbor System
MOLIT Traffic Information Center SW Function Improvement Project	Neighbor System
2016 Microsoft Bing Map System Operating	SK Telecom
MOLIT Pyeongchang Winter Olympics ITS Deployment Planning Research	ITS KOREA

Others

- 2016. MQNIC ReverseGeocoding Engine
- 2016. MQNIC Geocoding Engine

ITS Product & Technologies

Technologies

1. Indoor / outdoor background map building / tiling

: Anyone can use the location of the various contents and attribute information existing in the ground and underground spaces, and perform Map produced to support efficiently, and can provide a variety of services based on the LBS based on this.

2. Road / Walk / Bike Network

For precise directions must ingest the road shape and properties of the ground. This can be a lot of experience and know-how to build a network data and LBS-based navigation services to the accumulation.

Building indoor/outdoor background map

English / Chinese building background map

3. POI / Adress(Lot number, new address)

Living geographical search based on a specific place on the map service and location-based service is a service that users most frequently utilized as a very useful function in the real world. Basic data to support such a search service will require a high accuracy and a POI address data.

Road / walking (pedestrian, traffic stands. hiking. etc.) / DB bike network building process

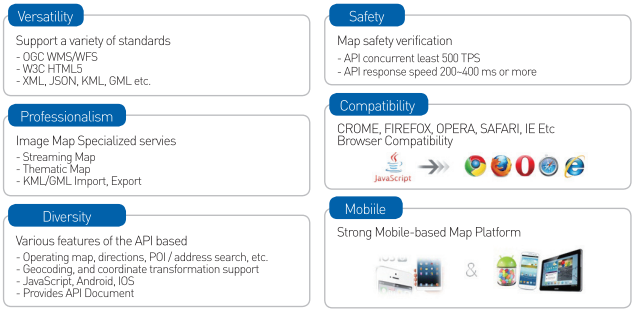
Based data collection	Build the basic shape	Inspection/complements	Network DB Construction
Background map, network DB	Buil car-only road combined Building pedestrian Building bike lanes	Fix roads and properties	Node, Link System Configuration
New address data	Intersection and rotation information, etc.	Crosswalks and pedestrian facilities	Node, Link Input properties
Standard node links	Crosswalks and pedestrian facilities	Built facility data	
Other materials	Built facility data	Other modifications and new building	

※ proceed with the ongoing maintenance to maintain freshness. (ASP can be applied)

MQNIC Co,.Ltd.

4. Map Engine

Map Engine are available for utilization by using a variety of environments (Javascript, Android, iOS, etc.) and interface with the GIS Map Engine manufactured by Pure ActionScript 3.0 code. We have also ensured compatibility with the products available in the world to comply with international standards.

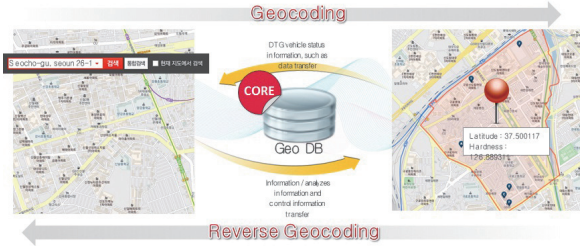


5. RP Engine

Developing intelligent route search solution that utilizes a high path search algorithms show you the best route and guides the reader to provide services and build roads each species. Also based on the RP also find customized solutions built road services to meet customers' Needs.

6. Geocoding ENGINE

This value is the address information to an API that converts geographic coordinates (latitude and longitude) can be expressed in many forms, and displayed on the map, or you can place. Mainly used as a feature in the map to visit the location with address search portal Conversely, it can provide the results to identify the map location address.



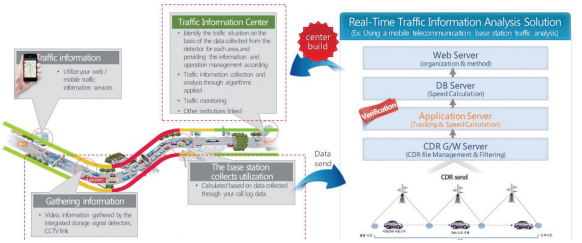
※ coordinate system support: KATECH, TM, latitude and longitude, UTMK etc. (can coordinate other support)

7. Build Platform

A build private / public Open Platform technology, and has the know-how and expertise in usability and Open Platform. It is also possible to build a variety of applications, such as building systems that meet customer-specific Platform Needs (ASP mode / self-build scheme) for planning, decision making and service activities.

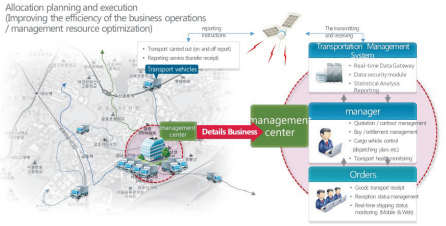
8. RTTI(Real Time Transport System) Solution

We collect data by utilizing mobile communication base station and collect various resources are being operated commercially in the world has been validated through the analysis of algorithms and other domestic projects.



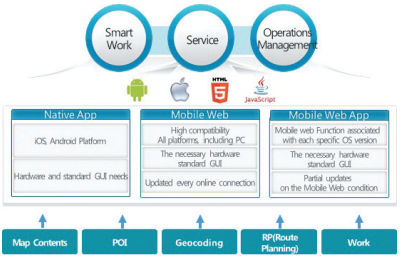
9. TMS Solution

To the various considerations form can, delivery process of the dispatch planning and operations in order to transport management system developed by real-time monitoring (control), results confirmed, freight settlement, than the transportation business through the optimization of operations Process and Resource Management reasonably it supports to perform.



10. Mobile Sernice

Depending on the paradigm shift to smart mobile ensure the global competitiveness of application services to Native apps as well as support the comprehensive development of Web standards such as HTML5 app development when the necessary information and infrastructure.



General Information

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NDS Corporation

Company Overview

NDS is IT service provider which has led informatization in various industrial fields including public works, manufacturing, distribution/logistics and development and operation of information system of Nongshim Group for last 30 years. NDS has a capability of global standard information service which provide customers with the best solution based on rich experience accumulated so far.
NDS is planning to be realized as 'Next Generation IT Service Provider' by enhancing capability of cloud service and ICT construction in preparation for the future, best to secure world class IT skills through continuous investment in R&D.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

□ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

□ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

- Song-Do U-City Construction Project
- Project for a Construction of BIS(Bus Information System) and BMS Link System
- C-ITS Project for a Korea Expressway Corporation
- CUPPS Project for a Incheon Internatinal Airport including a BRS(Baggage Reconciliation System)
- ATFMS(Air Traffic Flow Management System) Project
- GangNam Circuit Highway ITS Project for Seoul
- C-ITS Project for Pyeong-Chang

Others

Certification

- ISO 9001(quality management) - ISO 14001(eco-management) - ISO 20000(IT service management)
- ISO 27001(information security) - K-ISMS(protect information) - CMMI (international quality certificate)

Prize

- Patent related water quality estimating device : 2 application
- NFC-related patent : 1 application - Digital door-lock patent : 1 application

ITS Product & Technologies

WAVE OBU(NDS-EW001)

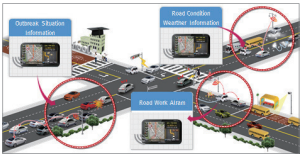
OBU	Main Board	RF Board
		

WAVE RSE(NDS-EWR01)

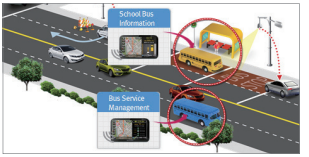
Antena		Main Control Unit			Support Unit
GPS Ant	Wave Ant	Closure	Control Unit	Comm Unit	
					

C-ITS

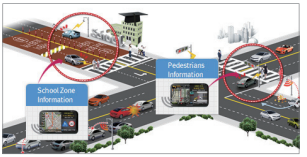
Support for a Safe Drive



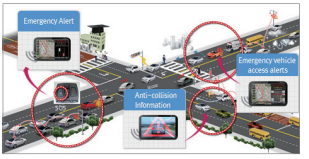
Support for Safe Public Transportation



Pedestrians Care



Inter-vehicle Accident Prevention



General Information

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NEIGHBOR SYSTEM

Company Overview

Neighbor System has had top class competitiveness in the IT industry by performing lots of various projects related to Intelligent Transport System (ITS). Neighbor System has an abundance of excellent employees who have a wide range of background and experiences on developing software, and has accumulated a variety of professional technologies of Multimedia / Mobile /LBS such as a technology to construct many kinds of Information Center connected with LBS /Telematics / Visualization System and develop solutions of its terminals, a technology of Visual Communications, applied technologies of GIS / GPS, and so on. Neighbor System has supplied quality technologies and services combined with ITS and has satisfied our clients very highly. Especially, Neighbor System has been providing self-developed softwares and construct systems for cutting-edge traffic infra construction business of Korean local governments and has been leading ITS business by cooperating with Korean major companies and developing technologies together. Neighbor System promises to provide hi-quality products and services based on its corporate culture: trust and responsibility.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

□ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

□ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

□ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

- Ulsan-metropolitan city' 2013 Bus Information System (BIS) expanding and advanced constructing
- Korea Expressway Corporation' 2013 National Traffic Information Center service improvements
- Korea Expressway Corporation' ITS operating software advanced services
- Busan-metropolitan city' Bus Digital Tachograph Management System (DTMS) construct services
- Gumi-city' 2013 Maintenance of Bus Information System (BIS) services
- High-Pass of Sujung-san Tunnel and Kwang-an main road S/W development
- Ulsan-metropolitan city' Maintenance of Intelligent Traffic System(ITS) and Bus Information System (BIS) services
- Electronic Toll Collection System (ETCS) of Ma-Chang bridge additional development

Others

Prize

- 2007 Prime Minister's Commendation (National Records Management)
- 2012 KICTEP (Korea Institute of Construction & Transportation Technology Evaluation and Planning) Chairman Commendation (Construction and transportation industry development)

Patent

- Method of providing Traffic information pursuant to accident data on drive way
- Video transfer system
- Camera Select System and method of selecting camera using dual multi frequency
- Camera Select System and method of Selecting Camera using telephone numbers

ITS Product & Technologies

Product Offerings

EasyMapX

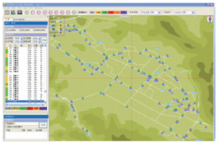
- As consisting of ActiveX component and Map server that help to develop GIS application, EasyMapX can apply to various fields including BIS, Traffic conditions control system, and so on.
- EasyMapX can provide the easy-to-use, effective map caches on the web as well as the basic functions requested by GIS application program such as display control, edit and thematic map.
- EasyMapX, easily possible to edit the user object through the API, can provide development environments appropriate to web application programs.
- Especially, EasyMapX can provide the optimized components for the bus stations and routes of BIS system.

NEIGHBOR SYSTEM

Application fields

- BIS/BMS, ITS (Facility Management, etc) Map Application Terminal
- Vehicle position control (Taxi, rental cars, vans, company cars, etc.)
- For communicating information expressed Traffic Display
- Control of the center of the display throughout the project

Bus Information System(BIS)



Bus route editing

Vehicle control

Traffic Display

Product Configuration

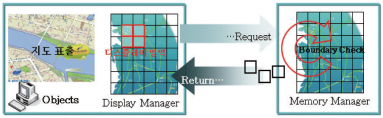
- EasyMapX Objects : Gis Viewer Client Engine of a C/S environment
- EasyMapX BrtEditor : Route and Bus stop editing Client Engine of a C/S environment
- EasyMapX Web : Gis Viewer Client Engine of a Web environment
- EasyMapX Manager : Gis Server Engine of a Web environment
- EasyMapX Editor : Spatial and Nominal Data editing

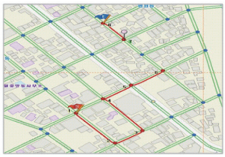
Product Description

- Client/Server, Supporting WEB-based environment and integration management
- Providing ActiveX component form in order to support development environments of various applied programs such as web, Visual Basic, Visual C++ and Delphi
- Providing theme changing service through the management of layer component

Key Features

- Upgrade speed of display through management of memory.



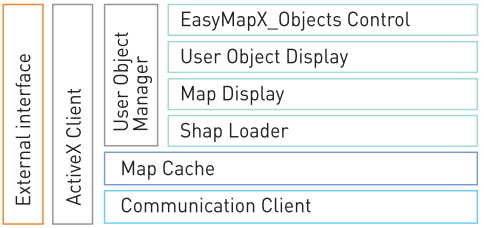


- Point continuous selection function, Automatic search function selectable link.
- Function through caching, version control and Off-Line Operation.
- Registered users of the object / Edit Bitmap express / Mouse Support.

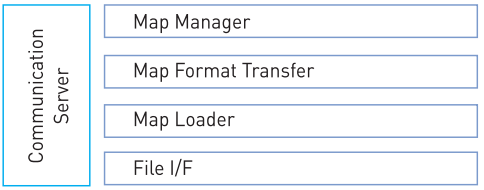
NEIGHBOR SYSTEM

System Configuration

Active Client Moodle Configuration



Map Server Moodle Configuration



General Information

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NOVACOS Co., Ltd.

Company Overview

June 2010 NOVACOS co., Ltd. was established in specialize in the field of road traffic and environmental technology, which is based on AVC(Automatic Vehicle Classification) and Radar, Loop VDS(Vehicle Detection System) and WIM(Weight In Motion) management system development, production and business sectors.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

KICT & Korea Expressway Corporation AVC Business, Radar VDS and an unexpected VDS project
Ansan-si Flitted CCTV design, Private Freeways VDS & AVC project, Dae-gu UTIS / ATMS VDS System

Others

Certification
- ISO 9001:2008
- ISO 14001:2004

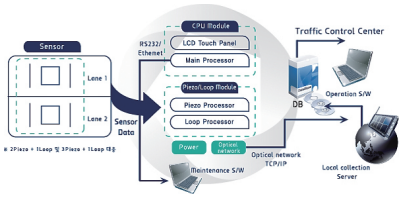
Patent

- Vehicle classification method
- Load sensor and the manufacturing method
- Driving vehicle automatic weight measurement system
- Piezo sensor manufacturing method

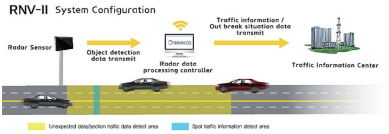
ITS Product & Technologies

Product Offerings

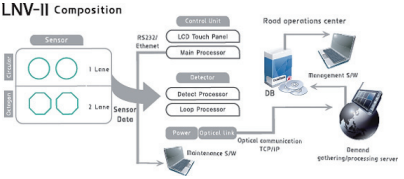
1. AVC(Automatic Vehicle Classification)



2. Radar VDS(Vehicle Detection System)



3. Loop VDS(Vehicle Detection System)



Technologies

An analysis for the traffic situation makes **AVC**, traffic volume, rate, share, such as the width of the vehicle, vehicle information, real-time leap detection and processing by the road system is sent to the operations center.

Radar VDS based on the Doppler-based motion detection technology, reliable traffic information(car selector speed, traffic volume, location, vehicle length, etc.)and the data surprises(sprinting, pedestrian stops, Accident State information, side street)to collect and transmit the data collected for traffic information center.

Loop VDS is a road traffic transportation vehicle sensor systems to provide the Center upon entry of the vehicle by vehicle — one of conductor inductance loop of interaction information for each car traffic(Volume), share(Occupancy), speed(Speed), and the collected data, such as classification schedule cycle makes much of the transport system.

General Information

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Penta Security Systems Inc.

Company Overview

Penta Security Systems Inc. is a leader in web, IoT, and data security solutions. Penta Security has overseen the implementation of its AutoCrypt®solution in numerous ITS projects across South Korea, including smart highway/roadway projects in the major cities of Daejeon, Sejong, and Yeoju, and K-City, one of the world's largest self-driving car test beds. Launched in 2007, AutoCrypt® is the world's first total security solution for all entities involved in smart transportation: drivers, pedestrians, devices, and infrastructure. The company's experience and extensive testing allows for AutoCrypt®to be adapted to other vehicular fields including EVs, EVSEs, smart ships, trains, and other applications.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (Cyber Security for C-ITS and Connected car)

2nd category

☐ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Designed the security and authentication system for C-ITS
Security solution for C-ITS Implementation Project – Korean Highway/Seoul city/Jeju Island

ITS Product & Technologies

Product Offerings

For Intelligent Transport Systems (C-ITS)

80% of cars will be connected by 2020. To help create a more convenient tomorrow, connected cars and IoT devices on the road will be engaging in constant communication with a wide range of entities, including unknown ones. This raises the issue of how to prevent untrustworthy communication from entering the traffic infrastructure.

Secure communication can be achieved with mutual authentication, which prevents the introduction of fraudulent or malicious traffic information that could endanger lives on the road. In the case of intelligent transport systems (ITS), trusted communication can be established via the implementation of a security credential management system (SCMS).

AutoCrypt V2X and **AutoCrypt PKI** provide the core security components required to protect communications in ITS.

For Connected car (In-Vehicle Security)

Unlike smart phones, connected vehicles are smart devices that people travel in, rather than with. This means cyber mishaps can instantly become life-threatening. Upon gaining access to a vehicle's internal network, malicious actors may install new firmware for executing custom commands and take over controls remotely.

From the OBD-II port to the vehicle's wireless connection, the attack vectors for hackers are plenty and aren't easy to secure. Cars are not just becoming connected, but also autonomous and therefore architecturally extremely complex. All this data being exchanged within the vehicle needs to be monitored for signs of abnormal activity that could indicate network intrusions or attacks.

AutoCrypt AFW and **AutoCrypt KMS** protect the internal systems of vehicles by detecting malicious or abnormal traffic and securely managing encryption keys used within internal networks.

Technologies

AutoCrypt PKI

AutoCrypt PKI is a public key infrastructure (PKI) system that complements AutoCrypt V2X by providing certificate management used to authenticate end entities such as cars and traffic lights in an ITS.

- Enrolls new end entities into the system, provisions identification and pseudonym certificates, and revokes certificates based on reported misbehavior.
- Designed to comply with the CAMP Security Credential Management System (SCMS), with solutions also available for the European Cooperative (C-ITS) Credential Management System (CCMS).

AutoCrypt V2X

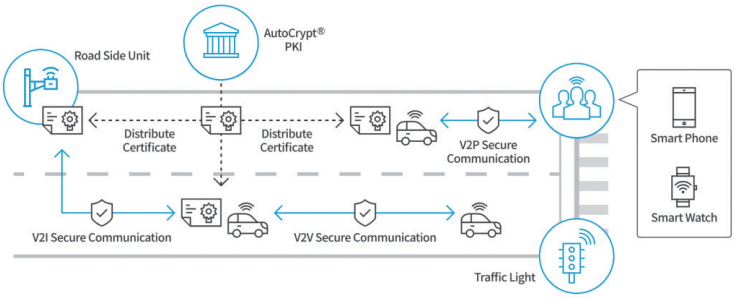
AutoCrypt V2X is an authentication/encryption system for vehicle-to-everything (V2X) communications, including vehicle-to-vehicle (V2V), vehicle-to-infrastructure (V2I), vehicle-to-pedestrian (V2P).

- Secures broadcast and receipt of basic safety messages (BSM) and other data between surrounding vehicle on-board units (OBU) and roadside units (RSU).
- Designed according to the IEEE 1609.2 communication standard for Wireless Access in Vehicular Environments (WAVE).

Penta Security Systems Inc.

- AutoCrypt LCM is a local certificate manager (LCM) that is installed in the OBU to manage certificates from AutoCrypt PKI.

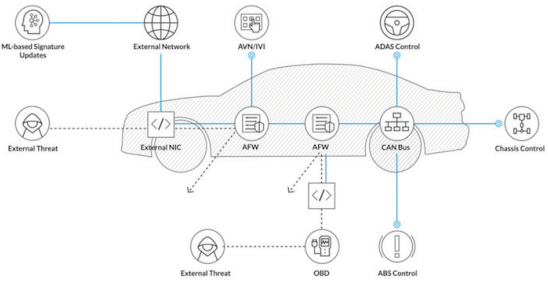
IEEE1609.2: Wireless Access in Vehicular Environments--Security Services for Applications and Management Messages
CAMP SCMS: Crash Avoidance Metrics Partnership –Security Credential Management System



AutoCrypt AFW

AutoCrypt AFW offers both a firewall (F/W) and an intrusion detection system (IDS) for in-vehicle networks. It controls and analyzes the network packets in the CAN or Ethernet to protect the network from malicious packets or other abnormal activities.

- Implements both positive and negative security models to manage access to in-vehicle systems.
- Uses an internal AFW and an external AFW with different security policies.
- Uses machine learning (ML) to analyze malicious traffic and provide signature updates to AutoCrypt AFW.

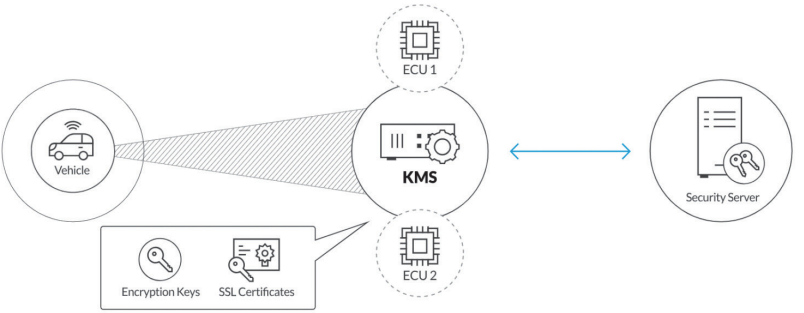


Penta SECURITY
enterprise · iot · blockchain

AutoCrypt KMS

AutoCrypt KMS is an in-vehicle key management system (KMS) that manages keys used for encrypting data transmitted between the vehicle and external entities, or between electronic control units (ECU), as well as keys used for authenticating users and entities.

- Manages the encryption key life cycle process which includes generation, storage, and revocation.
- Integrates with external key management systems and hardware security modules (HSM).



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POSCO ICT

Company Overview

POSCO ICT delivers a comprehensive ICT service, from diagnosis and design of government or enterprise info systems, development of software applications and establishment of hardware and network solutions to operation and maintenance of info systems. Our service scope includes national defense, transportation and manufacture, and se offer systems, top of the line. We build the right system optimized for the business environment and needs; existing systems are integrated into the new one.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

□ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

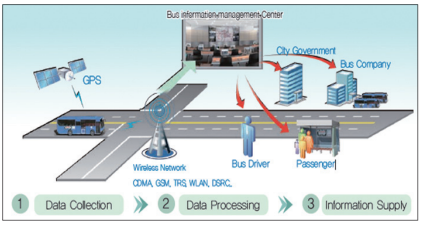
Ongoing ITS project or R&D

- ETCS,TCS / Construction project of Changwon ~ Busan private freeways.
- U-traffic System / Construction project of Chung-ju city.
- Tunnel ITS / Facility management project of San-sung private freeways Tunnel in Busan
- ETCS / Korea Expressway Corporation : hi-pass system maintenance
- Survey of DSRC traffic information on the ITS section
- F.S. / Project of Russia ITS feasibility Study
- Proposal of India Hyderabad city ITS Project.
- Proposal of Brunei ITS project.

ITS Product & Technologies

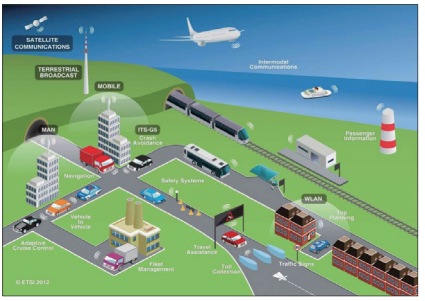
ETCS (Electronic Toll Collection System) & (Multi-Lane Free Flow)
TCS (Toll Collection System)
C-ITS (Cooperative-ITS)
ATMS (Advanced Transportation Management System)
BIS (Bus Information System for BRT)
FMS (Fleet Management System)

1. BIS (Bus Information System for BRT)



2. ETCS & Multi-Lane Free Flow

3. C –ITS (Cooperative – ITS)



General Information

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RANIX

Company Overview

RANIX is a company that is perpetually challenging in research and development to provide the best system semiconductors and solutions, confronted with the convergence and integration era between industries changing rapidly.
We are committed to developing core technologies of autonomous vehicles and Internet of Things(IoT), which are national strategy projects to lead the future of a nation.
Particularly, we are the only company in Korea that has V2X total solutions, essential solution for completing the autonomous vehicle.
On the other hand, we are initiatively developing the security and authentication chip solutions to protect various hacking attacks that must be solved for the growth of the IoT industry.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

WAVE
- Total Solutions and Modem ASIC
- Software Stack and Application Development / Support include video transfer

Security
- IEEE1609.2,3,4 for WAVE
- Dedicated Chips for Automotive and IoT

Others

- AEC-Q100
- INNO-BIZ
- Awarded the Grand Prize at the 'IoT Innovation Award(Smart Traffic Sector)'

ITS Product & Technologies

Product Offerings & Technologies

1. G-WAVE

G-WAVE is baseband ASIC optimized for vehicle-to-vehicle and vehicle-to-infrastructure communication and has developed for safety, convenience, and commercial applications in vehicular environment.
G-WAVE will serve cooperative road safety and traffic efficiency with low latency and fast data rate under harsh automotive mobile condition.
RANiX's V2X technology will integrate crypto engine for advanced security, RF transceiver, high speed application processor as well as modem device to provide the lowest cost for new ITS solution worldwide.

Feature
- US/EU ITS
- Integrated Anti-fast fading
  [Enhance fading performance]
- Support Dual Channel
- Support Diversity
- 10MHz Ch. Bandwidth

Security
- IEEE1609.2 H/W Engine (2016v)(~1.2K signature processing/1s)
- ECDSA-224/256
- ECIES, SHA 224/256
- AES CCM

S/W
- US/EU ITS
- OS : Linux
- Tx/Rx Driver, Security Driver
- 1609.x Stack

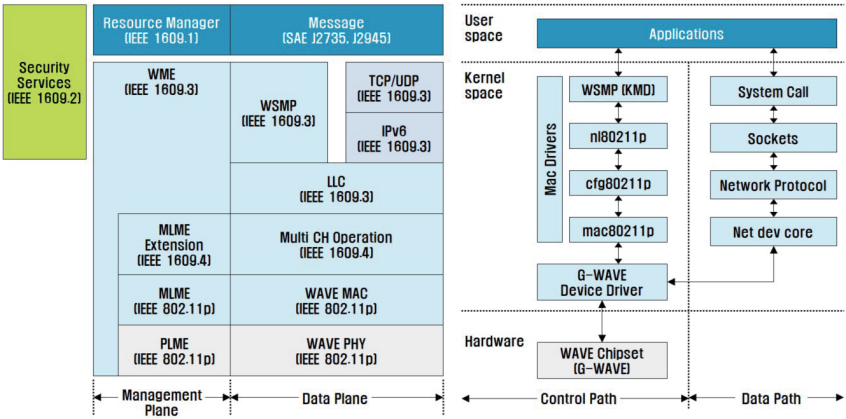
SDK Available

Transceiver
- AD9364

CPU (External)
- Freescale I.MX6 Dual Lite Cortex-A9 (800MHz)

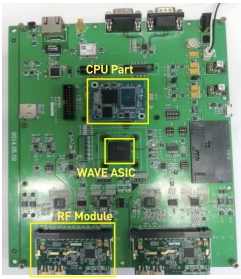
RANIX

S/W Implementation



SDK, EVM & OBU

Software Development Kit	
Platform	V.1) Linux 2.6 / V.2) Linux 3.14
Cross Compiler	ARM Tool Chain
Software	U-BOOT, Linux Kernel Source, Root File System, 802.11p MAC, IEEE 1609.3 (IPV6, WSMP), IEEE 1609.4(Multi-Ch Operation) IEEE 1609.2 Driver Source



Evaluation Module	
Processor	V.1) ARM926EJ (Samsung S3C2450 533Mhz) V.2) Cortex-A9 (Freescale I.MX6 Dual Lite 800Mhz)
Operating Memory	V.1) Mobile DDR RAM(64MB) SLC NAND Flash(256MB) V.2) DDR3 RAM(2GB), SLC NAND Flash(16GB)
SD	SD/MMC Port (SD Boot)
UART	UART1 (Debug) UART3 (GPS)
Ethernet	SMSC LAN9220 10/100Mbps
Expansion Connector	EBI (G-WAVE Register Interface)
Radio Modes	IEEE 802.11p PHY
Wireless Modes	WAVE
Transceiver	V.1) MAX2829 / V.2) AD9364

RANiX

OBU		
Shape	 <Out Side>	 <Inner Board>
Interface	SD/MMC Port (SD Boot) UART Ethernet : SMSC LAN9220 10/100Mbps Transceiver : 2CH Communication : Between OBU and OBUs or EVMs Radio Modes : IEEE 802.11p PHY	

2. MaaT Ⅳ

MaaT-Ⅳ is the best optimized DSRC baseband SoC for various ITS services, such as ETCS, BIS and ATMS.Through ARM Cortex-M3, system peripherals and H/W DSRC transceiver, it provides the most cost-effective solution for DSRC based applications.
The proprietary DSRC transceiver makes robust communication possible due to outstanding TX/RX performance and auto frequency scan function.
MaaT-Ⅳ can be easily certified by Korea Expressway ETCS, TTA DSRC and automotive AEC-Q100 with its features.
Built-in smart card buffer, regulator and serial flash controller are versatile for a small and low price product.

Feature

CPU
- Embedded ARM Cortex-M3 Core, 80 MHz
- Non-maskable Interrupt (NMI) + 1 to 240 Physical

Interrupts
- SDRAM (Main Memory, 8MB)

Modem
- TTAS.KO-06.0025/R1
- DSRC RX Data FIFO
- Frequency Scan Function
- Support SPI RF Interface

Peripherals
- ISO 7816-3 Compliant Smart Card Interface (SCI)for ETCS
- USB Full-speed
- Serial Flash Interface
- I2S (with WAVPACK)
- UART/Timer/SPI/I2C/WDT
- 32 General Purpose I/O Ports

IPs
- Main/SC LDO, PLL

Process
- 0.18㎛ CMOS Standard Cell Library
- 100pin LGA (14mmx14mm, 0.5mm Pitch)

RANIX

3. MaaT-V

MaaT-V is developed for system optimization including memory, peripheral devices and circuits of Maat-IV. Ultimately, user can be best of design circuit and cost effectively.
Of course, MaaT-V is including all functions of MaaT-IV.

Feature

Enhanced
- ESD/EMI
- GPIO : Design POC(Power On Control)/Open Drain Output(3EA)
- Audio Codec : SDRAM Bypass Mode for Fast Boot

Include Internal from MaaT-IV
- Serial Flash : 8MB
- Reset IC : POR(Power On Reset)
- Oscillator : Can use Crystal direct
- USB Oscillator : 48MHz

CPU
- Embedded ARM Cortex-M3 Core, 80 MHz
- Non-maskable Interrupt (NMI) + 1 to 240 Physical

RAM
- SDRAM (Main Memory, 8MB)

Modem
- TTAS.KO-06.0025/R1
- DSRC RX Data FIFO
- Frequency Scan Function
- Support SPI RF Interface

Peripherals
- ISO 7816-3 Compliant Smart Card Interface (SCI)for ETCS
- USB Full-speed
- Serial Flash Interface
- I2S (with WAVPACK)
- UART/Timer/SPI/I2C/WDT
- 32 General Purpose I/O Ports

IPs
- Main/SC LDO, PLL

Process
- 0.18㎛ CMOS Standard Cell Library
- 100pin LGA (14mmx14mm, 0.5mm Pitch)

4. THoTH

速龙(THoTH) integrates a number of key components in one package to support various features and application required by the car.
速龙(THoTH) are composed with CPU, Peripherals, DSRC modem, SDRAM, LDO, Smart Card Interface, CAN and USB etc., and provides the most cost-effective solution for DSRC based applications.
速龙(THoTH) supports China Standard GB/T 20851.

RANiX

Feature

CPU
- Embedded ARM Cortex-M3, 80MHz
- Non-maskable Interrupt (NMI) + 1 to 240 Physical

Interrupts
- SDRAM (Main Memory, 8MB)

Modem
- GB/T-20851.x
- DSRC RX Data FIFO
- Multi RF Interface (SPI & Dedicated Control)

Process
- 0.18㎛ CMOS Standard Cell Library
- 100pin LGA (14mmx14mm, 0.5mm Pitch)

Peripherals
- ISO 7816-3 Compliant Smart Card Interface(SCI) for ETCS
- USB Full-speed
- CAN 2.0B (with FD)
- Serial Flash Interface (with Fast Boot Mode)
- I2S (with WAVPACK, SDRAM Bypass Mode)
- UART/Timer/SPI/I2C/WDT
- Detecting the Forced Detachment, Using Secondary

Battery [Patent]
- 65 General Purpose I/O Ports

IPs
- Main/SC LDO, PLL, PoR, XTAL
- ADC (6bit, 1KSPS, 2ch)

Developpment of Core Technologies of Autonous Driving

Expertise	Product Portfolio	Technical Overview
Automotive Communication	DSRC Modem SoC for Korean ETC	• TTA Standard • 5.8GHz RF ASK • ETC(Hi-pass) Communication Protocol
	DSRC Modem SoC for Chinese ETC	• Chinese Standard(GB/T 20851.X) • 5.8GHz RF ASK • ETC Communication Protocol
	V2X(WAVE) Modem Chip	• IEEE STD 802.11P, 1609 • 5.9GHz RF OFDM • Core Tech. of Safety & Autonomous Driving

General Information

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RexGen Co.,Ltd

Company Overview

REXGEN was founded in 2002 after lots of experience of several projects, which resulted in, the highest video processing application technology to provide customers with integrated video processing services.
REXGEN has developed image processing and license plate recognition system by its own technology, and applied in various field of ITS (Intelligent Transport System), and provides core algorithm and technologies to a lot of customers in domestic and overseas market. The main products are RexWatch Road(ANPR), RexWatch Speed(Overspeed Enforcement System), RexWatch Parking(Parking Management System) and RexWatch PES(Parking Enforcement System).

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

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- Pedestrian/Disabled Support System

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- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Others

Certification
- ISO 9001:2008, ISO1400
- CE,
- FCC
- Obtained the designation letter as a PQ company of Public Procurement Service

Patent(63)
- Vehicle Monitoring System and Method using the same
- Device for monitoring image, monitoring system using the device and the method of control
- Illegal parking regulation device, regulation system and the method of control

ITS Product & Technologies

Automatic Number Plate Recognition system (RexWatch Road)

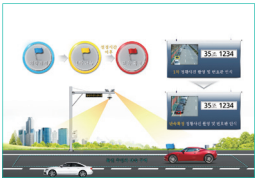

Installation Image


Sample Image(Day)


Sample Image(Night)

- Speed check function (able to search by speed)
- Automatic recognition of old and new plate
- Registration/alarm function of wanted or specified vehicles
- Providing the various search condition such as date, time, place and vehicle type.
- Provides the search of wrong way driving vehicles
- Search the cargo of vehicles using 3 frames images
- IR LED light that has over 10 million times life cycle.
- Provides the vehicle image printing preview and various statistics.
- Real time connection with the National Police Agent database

Parking Enforcement System (RexWatch Parking Enforcement)


System diagram

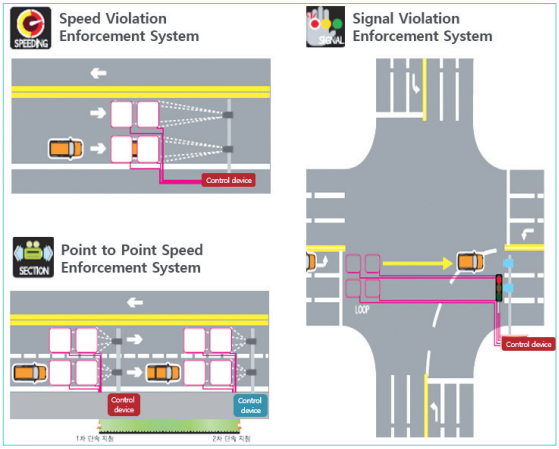

Sample Image


Sample Image

-Automatic/semi-automatic regulation
-Provides real-time image and regulation information
-Automatic prevention of overlapped regulation
-Function of detecting and tracing vehicles

RexGen Co.,Ltd

Overspeed Enforcement System (RexWatch Speed)



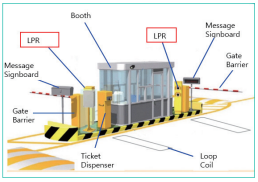
System diagram

Installation Image

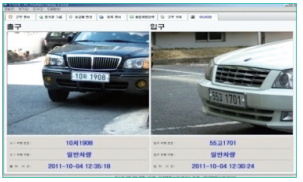
- Using high-resolution cameras, the clear image of the driver, vehicle plate etc can be obtained
- Trucks and general vehicles can be separately regulated on the highway
- Besides speed regulation, regulations of bus-only lanes and shoulder violation can also be conducted
- Selectable between laid-type (loop method) and non-contact type (laser method)
- General exclusive line method is used for data communication
- High recognition ratio (90%)
- Provides various search conditions (weather, time, location, vehicle type, etc)
- Uses IR LED lighting with a durability of 10 million actions or more

Rex Gen

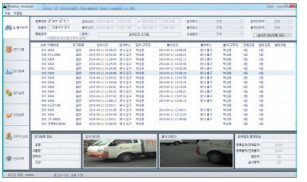
Parking Management System (RexWatch Parking)



System diagram



Booth operation S/W



Center management operation S/W

- Using high-resolution cameras, the clear image of the driver, vehicle plate etc can be obtained
- High recognition ratio (99.8%)
- Continuous upgrading is available as the system uses an independently-developed engine
- Plate is recognized automatically when the vehicle enters/exits, and the information is immediately linked with the management DB
- Improved parking control efficiency using a control system
- Statistics can be calculated as preferred by using the vehicle search function for each condition
- Information related to the control can be displayed on the electronic display

General Information

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ROADKOREA Inc.

RK RoadKorea Inc.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

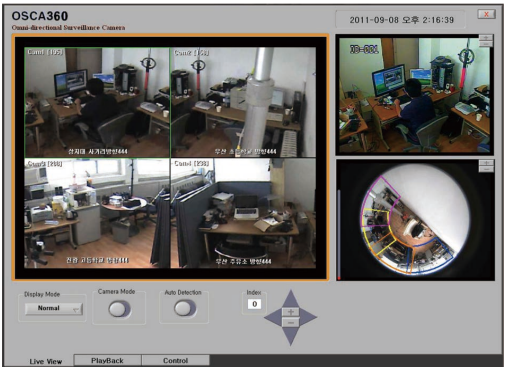
Ongoing ITS project or R&D

National Project
- SMART-I -> Automatic Tracking CCTV System Research and Development
- KICTEP (Korea Institute of Construction & Transportation technology Evaluation and Planning. -> SMART Highway Project

ITS Product & Technologies

OSCA : Omnidirectional Surveillance Camera

- 360 degree Surveillance with one lens (about 100~140M)
- Automatic Object Tracking
- Divided Screens (up to 4 Screens)



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SAMWON FA Co., Ltd.

SAMWON FA

Company Overview

Making the future together, SAMWON FA

Founded in 1979 in southern port city of Busan, Korea, SAMWON FA has become a leading player to serve customer needs across diverse industries with its state-of-the-art ITS solutions and technologies. SAMWON FA developed RFID-based Electronic Toll Collection System in 1998 for the first time in the world. The firm has since solidified its presence in the smart transportation market developing and supplying cutting-edge automatic fare collection systems for buses and urban rail transit. SAMWON FA also is renowned for its technical prowess in electronic payment solutions for various retailers and parking lots.

Business Area

1st category

■ Traffic Management
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□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

- Implementing Automatic Fare Collection System for buses in Busan City
- Implementing Automatic Fare Collection System for buses in Ulsan City
- Implementing Automatic Fare Collection System for buses in Jeollabuk-do
- Implementing Bus Information System across Busan – Geoje
- Implementing Advanced Traffic Management System in Busan City
- Implementing Automatic Fare Collection System for Ui-Sinseol Light Rapid Transit (LRT)

Others

Patent

No.	Category	Reg No.	Name of Patent
1	Patent	1020110062486	RFID Tag embeded inlay, Card comprising the inlay and method for fabricating the inlay thereof
2	Patent	1020110061948	System and method for processing subway tickets
3	Patent	1010386530000	Method for fabricating RF-ID tags
4	Patent	1020100008490	Method for fabricating a pattern structure
5	Patent	1020050002687	Master of Electro-forming
6	Patent	1009802170000	Master of Electro-forming
9	Patent	1006882590000	Method for managing street parking lot
11	Patent	1005433910000	An observation system of giving an injection of Ringer's solution
13	Utility model	2003408890000	Parking Fare Collection System
14	Utility model	2003436020000	Credit card settlement vending machine for selling for biddened items according to years
15	Utility model	2004108600000	System for making a call of condolence remotely using Internet

Certification

1) Wirelwss device for wireless data communication-KCC
2) Ticket Gate-KCC
3) Wide Ticket Gate-KCC
4) Portable Ticket Gate, Ticket Gate for KSPO-KCC
5) Bus card reader-KCC
6) Self Service Charger-KCC
7) Automatic Ticket Vending Machine-KCC
8) Automatic fare adjustment machine-KCC
9) Central Ticket Issuing Machine-KCC
10) Toll road unmanned card reader-KCC
11) Wireless device for RFID/USN - KCC
12) US Taxi (Electronic Payment System)-FCC
13) ISO 9001 : 2009 / ISO 9001 : 2008 certified

*** KSPO** - Korea Sport Promotion Foundation *** KCC** - Korea Communications Commission
*** FCC** - Federal Communications Commission

ITS Product & Technologies

Product Offerings

1.All-in-One Bus Fare Collection & Management System

A state-of-the-art on-bus system that collects fares from passengers, manages bus operation for drivers and provides bus-related data to operators, transport information centers, bus card issuers and drivers enabled by location-based services such as GPS, LTE and WLAN to expand convenience for every user.

SAMWON FA Co., Ltd.

2. Bus Information Terminal (BIT)

It is installed at bus stops to provide passengers with bus location and estimated arrival time.

3. Ticket Vending and Card Reload Machine

It allows passengers to purchase tickets or recharge their pre-paid transportation cards.

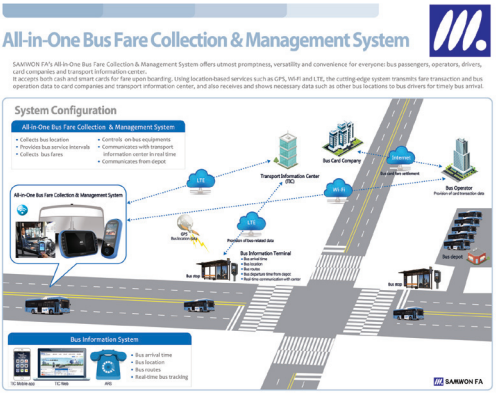
4. Automatic Gate Machine (AGM)

It is designed to perform access control between unpaid area and paid area by allowing passengers to enter or exit through the gate after checking the validity of their tickets or transportation cards.

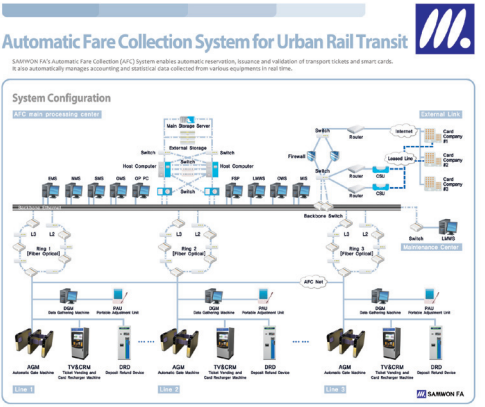
SAMWON FA

Technologies

1. All-in-One Bus Fare Collection & Management System



2. Automatic Fare Collection System for Urban Rail Transit



General Information

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SANE Co., Ltd.

Company Overview

SANE Co., Ltd. is the Korean company specialized in smart-City part. It was established in July 1997. We have developed and produced both hardware and software to build a smart city. We have produced necessary hardware devices and systems in order to design and build a smart city specially transportation, security system and energy saving lighting. We are capable of providing solutions helping communications between devices and people such as ITS, BIS, Security, Disaster Prevention System, Ubiquitous Service, Environment System, and so on.
We are developing the overseas/domestic traffic system and participating in the national project for ITS technologies development through a variety of experience and technology.
And we are providing the pleasant and safety transportation condition.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
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☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Name of Project	Name of Authority	Project Period
Urban Traffic Information System(UTIS) Work in Daejeon-Sejong	Daejeon Metropolitan City	15.06.08~16.10.31
3-step ITS construction work in Incheon airport	Incheon International Airport Corporation	15.06.12~17.09.30
Bus Information System(BIS) construction work in Cheongju-Jeungpyeong-Jincheon	Cheongju-si	15.11.19~16.07.17
Wireless Traffic Signal control System construction work in Uiwang	Uiwang-si	15.12.28~16.05.26
Advanced Traffic Management System(ATMS) construction work in Pyeongtaek	Pyeongtaek-si	15.12.28~16.08.24
Traffic Signal System Maintenance work in Traffic Information Center, Gwangju	Gwangju Metropolitan City	15.12.31~16.12.31
A real-time Traffic signal control system(COSMOS)	Namyangju-si	16.02.19~16.12.31
Traffic Signal Control System operation & Maintenance work in Hwaseong	Hwaseong-si	16.02.15~16.12.20
Bus Information System construction work in Uiwang	Uiwang-si	16.04.08~16.08.04
BIT construction work for Bus Platform Change	Gunpo-si	16.06.23~16.07.15
Bus Information Terminal install work	Seoul	16.07.19~16.12.31

Name of R&D	Name of Authority	R&D Period
International Collaborative R&BD Project for System Semiconductor	Korea Electronics Technology Institute	11.12.01~16.09.30
Practical development of wireless low floor tram system	Road Traffic Authority	13.08.01~16.07.31
Development of Cooperative Automated Driving Highway Systems	Korea Expressway Corporation	15.07.28~20.07.27
Development and Verification of Signal Operation Algorithms in Local Intersection Network utilizing V2X Communication Infrastructure	The Korea Transport Institute	15.10.30~18.08.29

Others

Certification

- KS Q ISO-9001:2009
- KS I ISO-14001:2009

Patents

Name of Project	Name of Authority	Project Period
Method of measuring queued vehicles at an intersection	10-0284596	2000.12.20
Traffic signal control apparatus for correction real time of standard time and method for correction of standard time	10-0330460	2002.03.15
TRAFFIC SIGNAL CONTROL SYSTEM AND METHOD USING CDMA WIRELESS COMMUNICATION NETWORK	10-0345637	2002.07.10
ADVANCED ELECTRONIC TRAFFIC SIGNAL CONTROLLER	10-0392265	2003.07.09
Method for processing the detecting signal from moving object Detector	10-0413049	2003.12.19
Method for installing the loop detector for vehicles and Device for detecting the vehicle using loop detector	10-0413053	2003.12.15

SANE Co., Ltd.

Method and apparatus for detecting traffic jams on the road	10-0435003	2004.05.28
Remote traffic signal control system	10-0435228	2004.05.31
Intersection signal planning method	10-0457599	2004.11.08
History control and traffic facilities system of traffic signal controller	10-0458718	2004.11.17
Method for collecting real time traffic data using wireless communication in traffic signal control system	10-0586839	2006.05.29
Method for acquiring three-dimensional image information using single camera and video traffic monitoring method using the same	10-0631082	2006.09.26
Traffic signal control system that implements Power Line Communication through power line of specific traffic light	10-0771463	2007.10.24
Apparatus for announcement in a bus using text-to-speech conversion	10-0948644	2010.03.12
Method for identifying pedestrians and computing density of pedestrians	10-0965129	2010.06.14
Apparatus for forecasting traffic information with multi-detection and method for operating the same	10-0979724	2010.08.27
Method of image vehicle detection using feature of moving object	10-0979726	2010.08.27
Method for detecting vehicle of lanes	10-0990404	2010.10.21
System for roadway information and method for operating the same	10-1067746	2011.09.20
Method for determining position of mobile device	10-1242973	2013.03.06
Traffic signal controller and signal driving unit mounted on traffic signal controller	10-1276935	2013.06.13
Apparatus for trace of wanted criminal and missing person using image recognition and method thereof	10-1337554	2013.11.29
Apparatus for illumination controlling of black box using car and method thereof	10-1344066	2013.12.16
Black box for vehicle, surveillance camera apparatus and method for processing traffic accident video using network of the same	10-1358756	2014.01.28
Apparatus for image exploration of black box using car and method thereof	10-1403035	2016.05.27

ITS Product & Technologies

Bus Information Terminal

- 26inch TFT-LCD(Wide type)
- The tempered glass and anti-reflection for LCD protection
- CCTV
- User search key, voice information
- Slim cabinet for dustproof, dampproof and view

- Display the bus position and voice guidance
- Identification of Bus position: GPS
- Communication network: LTE Model
- A variety of information such as video, voice
- Easy to set by IR remote control

SANE

Controller
(Automation of split)

Operation
(real-time control)

Vehicle detect
(Volume, occupancy, etc.)

Features and Functions

- Traffic information detect by Loop detector(Max.32 channels)
- Accept the video/ultrasonics wave/very high frequency detector
- Provideing the interface using the Graphic display(MMI)
- Real-time communication by embedded communication model
- Revising the time of controller by GPS-Unit
- Wire/wireless linkage with exist controller

Specifications

- CPU: 32bit Processor, Frequency 25MHz
- Memory: 1M Byte SRAM, 1M Byte ROM
- Modem: 2,400 bps
- MMI: Diplay-8x24 Graphic LCE Module

• **Technologies/Product Load-map**

Core Technology	Embedded System Technology	Wireless application Technology	Video processing Technology	Telematics Technology
Elementary Technology	Process control/processing	DSRC	Video detect	Integration Terminal
	H/W, F/W, S/W Design	RFID/USN	Video Recognition	Automonile electrical
	Network Management	WLAN(UTIS)		Intelligent Terminal
	Electric power control	WAVE		Infra(V2I)
Elementary Technology	SCADA Product (power, communication)		VDS	
	BIT (based on Cloud, Android)			Intergrated OBE (except BIT)
	Wireless Interface Signal control systems for Dynamic and Optimum Management (Center + Site equipment)			

Holding Technologies

General Information

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SAT (System and Application Technology) Co., Ltd.

Company Overview

SAT (System and Application Technology) Co.,Ltd. is a manufacturer and supplier of Low Speed WIM System, High Speed WIM System, Automatic Traffic Classification System, Static Weighbridge System, Software relevant to traffic system and Maintenance & Calibration Service for traffic control and management systems. SAT has the biggest market share for LS-WIM System in Korea more than 99% and has stepped into worldwide markets.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Development of Smart WIM Controller
- Load Condition Surveillance System
- Automatic Overloading Enforcement System with High Speed WIM

Others

Certification
- ISO 9001:2008
- ISO 17025:2005

Patent
26 patents for WIM system

ITS Product & Technologies

Product Offerings

WAVE modem has developed for safety, convenience, and commercial applications in vehicular environment.

LS-WIM : ± 5% accuracy at 0 ~10km/h
HS-WIM : ± 5% accuracy at 30 ~ 250kmkm/h
Automatic Vehicle Classification System : More than 95% accuracy in vehicle classification for Vehicle classification
Weighbridge System : 3 to 7 platforms, ±1% weighing accuracy

Technologies

Multi rows of weighing sensor using Bending Plate, Quartz Sensor, Piezo Sensors, Load cell to increase the accuracy of WIM system.

General Information

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SA Tech Co.,Ltd.

Company Overview

SATEC Corp. have an ITS Total Solution of ITS Consulting design, construction, deployment, operation, and maintenance.
In addition, SATEC Corp. are continuing to try to go to open the Smart Traffic World.
And SATEC Corp. implementing a sustainable transportation system through excellent technology and the best professional and technical personnel.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

R&D
Korea Agency for Infrastructure Technology Advancement
<Improvrment of assistive technology for mobile convenience the elderly>

Others

Certification

- ISO 9001:2008
- ISO 14001:2004

ITS Product & Technologies

ITS (Intelligent Transports system) :

- intelligent traffic control system with leading edge technologies of electronics, communications and control supervises traffic participants and elements I.e. road, vehicle, freights etc.
- ITS covers real-time traffic data gathering, data mining and providing optimal traffic condition.
- ITS reduces fuel consumption and achieves eco-friendly traffic environments.

1. Traffic signal controller :

- Local traffic controller equipped with MIcroprocessor is installed on road cross to control Traffic signal lamps. LTC collects traffic Volume, Speed and Occupancy, controls optimal traffic signal after data analysis.
- Standard LTC monitors traffic volume of each direction via vehicle detector, builds traffic signal plan and controls signal pattern to make optimal traffic flow. Whereas previous LTC runs only predefined signal pattern on the basis of time-of-day, day-of week and special day plan without considering traffic condition changes.

Features - Real-time traffic signal control using vehicle detectors
- Powerful microprocessor provides numerous functions for best suited traffic signal control
- Built-in large scale memory for stable operation
- Database synchronization by periodic data exchange
- Endurable structure for harsh environment

2. Loop Detector

- Basic sensor for real-time traffic condition data collection of vehicle detection system
- Reliable, maintainable, endurable inductive loop
- data from inductive loop detector is conveyed to VDS server after processing at Central Processing Unit

Features - Reliable sensor immune to weather and light condition
- Low installation cost
- Sensitivity tuning as to pavement condition
- Erroneous data purging algorithm embedded

3. BIS(Bus Information System) : It's a system that provides to peoples about bus information through Identifying real-time position of the bus from the bus using GPS and analysis and processing

Features – It can predict the destination arrival time and it can make sure peoples can ride the bus a few minutes real-time updates by Internet, BIT.

General Information

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SDsystem

Company Overview

SDsystem is an specialist in transportation systems in Korea as well as contributing to the development of this area

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

■ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

1. Jeju Island C-ITS (SW platform)
2. Pangyo Zero City Autonomous Driving Demonstration Complex Construction Project
3. Seoul Smart Parking System

Others

Certification

- ISO 14001
- ISO 9001
- CE Certification

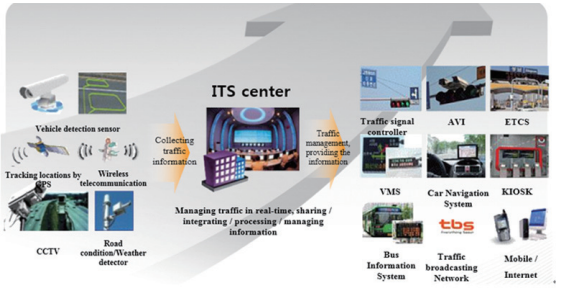
Patent

- Toll Collection
- Vehicle classification for toll collection
- Number plate recognition
- Smart Parking system

ITS Product & Technologies

Product Offerings

SDsystem has the core technology and production capacity to perform from research/development to manufacture, installation and maintenance of the equipment



Technologies

ETCS(Electronic Toll Collection System)

The system allows automatic toll payment without the need to stop the car through the on-board device (OBU) that automatically charges the payment with wireless network.

PMS(Parking Management System)

The system integrates equipment for the management of entrance and exit of vehicles as well as detecting the empty spots in the facilities and informing the user for a fast and convenient parking management

BIMS(Bus Information & Management System)

This system collects location/status info from the on-board device and sends it to the center, through the wireless network where it will be analyzed to provide information such as arrival time and bus information to the user through various media (displays in the stop, web server, mobile phone) Bus Information & Management System

General Information

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SeoulTech co., LTD

SEOUL TECH CO., LTD

Company Overview

Our company specializes in LED electronic boards, which was founded in 1999 with the belief that the customer is myself. the best quality to customer, We are registering technologies such as patents, procurement excellence, and performance certification every year. On this basis we are recording the steady growth.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (LED, LCD display solution, ITS(BIS,VMS,CCTV))

2nd category

■ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Build large media façade -
- Bus information system solution
- Development of an electronic board controller

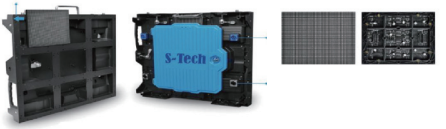
Others

- An electronic board with inspection and error detection method
- Light safety vest with high resolution LED light source
- High-definition luminance adjustment system - All-in-one train navigation system
- Integrated modular bus information system
- LED Module Dichotomous Dynamic Drive
- the Method and Equipment of LED Color Using Symmetric PWM Pulse Distribution

ITS Product & Technologies

Product Offerings

A technique to control the overall PWM was developed to achieve a clean color, and a dichotomous drive to increase the color level to achieve detailed images.



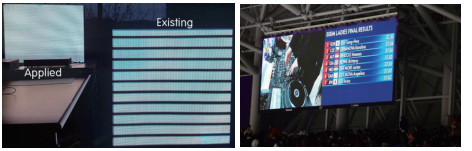
Technologies

PWM symmetric signal technology

Extract the signal from the PWM signal. Then reverse the order so that the entire section is distributed symmetrically. By implementing LED colors, color interference between color bands will be prevented, allowing dark areas to be presented in detail

Dichotomy drive

This technology improves the re-presence rate by varying the order of drive rather than the position continuous



General Information

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Signtelecom Co., Ltd.

Company Overview

Signtelecom is a leading manufacturer of LED media board and ITS solutions who has 28 years' of experience based on high-quality and innovative technology know-how. Signtelecom has been maintaining its market leadership including the VMS category and other ITS related items. Signtelecom is striving to expand its market dominance to the global range, with its proven technical stability and superiority to other competitors in the market.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

■ Others (LED display solution (Media board and other applications), ITS (BIS, VMS, PIDS, CCTV solutions), LED Lighting Solutions)

2nd category

■ Hardware ■ Software ■ SI ■ Consulting

■ Others (We provide integrated traffic management systems (H/W + S/W) depending on specific end-user's needs, Every solution is customizable through professional analysis)

Ongoing ITS project or R&D

We are also concentrating some of our R&D resources on development of integrated traffic management system utilizing CCTV solutions.

Others

Signtelecom has gained the national NEP (New Excellent Product) certificate due to technology of which display board with embedded SoC (System On Chip) that can detect the defective symptoms on the surface of the display module and track the historical records by remote access on a real-time basis. (NEP is certified for the innovative new technology with great economic and technical impact on the relevant industry in order to promote the product and support the development)

ITS Product & Technologies

Sub-categories of ITS business category

1. Bus Information System

2. Variable Message System

Signtelecom Co., Ltd.

3. Passenger Information System

4. CCTV solution

General Information

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SK Holdings Co., Ltd

Company Overview

As the holdings company of Korea's "SK" group, SK Holdings aims to reinforce corporate value with global tier portfolio management and drive growth through ICT technology to lead the industry in digital transformation. SK Holdings has been recognized globally, ranking 57th in the 2015 Fortune Global 500. With over 20 years of ITS experience SK Holdings will leverage its capabilities and knowledge to utilize new digital technologies from Artificial Intelligence, Cloud, and Big Data, to continuously create better value for customers.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
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■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

■ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Watz Eye ITS (www.watzeye.com)

- Watz Eye is the versatile solution developed by SK with intelligent event-driven operations, powerful features and functions, and top-notch customer support.
- Watz Eye supports clients' everyday operations for Smart Cities, Security, and Intelligent Transportation Systems
- Watz Eye's integrated control system and subsystems such as LPR and VMS can support ITS operations achieve maximum efficiency with its superb detection capability and user friendly design

SK Holdings Co., Ltd

Others

Awards and Certifications

- 2016/17 Dow Jones Sustainability Indices IT Sector Leader (7 Consecutive Years)
- Quality Innovation Award (Sustainability Management Sector)
- E-daily Entrepreneur Angel Index 2016 (Grand Prize)
- Accompanied Growth Index Assessment (Grand Prize)
- The Most Loved Companies in Korea Award
- ISO 9001, ISO 20000, ISO14001, ISO 27991, CMMI Level 3,

ITS Product & Technologies

Product Offerings

- SK Holdings offers over 60 ITS products including:
- Traffic Signal Controller/Vehicle Detection System/Automatic Vehicle Identification/CCTV/Variable Message Signs/Automatic License Plate Recognition/Vehicle Enforcement System/Traffic Signal Lights/Fog Protection System/Electronic Toll Collection & Automated Fare Collection
- SK Holdings' very own Watz Eye Platform enables greater efficiencies for device integration, traffic control and monitoring, and surveillance

SK Holdings ITS Products

Watz Eye ITS

Watz Eye Big Data

Watz Eye ALPR

BMS/AFC

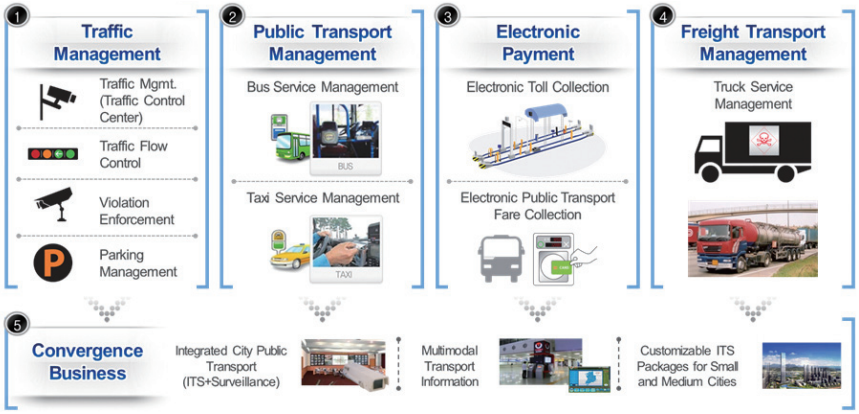
Technologies

SK Holdings offers 12 services in all 5 core ITS business areas and have served clients world wide with top quality systems.

1. Traffic Management (Control Center, Traffic Flow Control, Violation Enforcement, Parking)
2. Public Transport Management (Bus/Taxi Management)
3. Electronic Payment (Electronic Toll Collection, Electronic Public Transport Fare Collection)
4. Freight Transport Management (Truck Management)
5. Convergence Business (Smart Cities, Multi-modal Transport Info., Customized ITS Packages)

SK holdings

SK Holdings Business Areas and Services



References

- SK Holdings provides comprehensive ITS services for clients and have successfully completed over 33 projects globally.
  - · Hanoi·Haiphong Expressway, Vietnam (USD 35M)
  - · Baku, Azerbaijan (USD 138M)
  - · Ulaanbaatar, Mongolia (USD 12M)
- 40% of Korean ITS enabled cities currently utilize SK's system including Seoul and Jeju Island.

General Information

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Songam Syscom Co., Ltd.

Company Overview

Songam Syscom is specialized in the power grid ICT and ITS. Since established 1991, 23 years has focused on building multimedia infrastructure.
We delivers high quality, reliable and cost-effective ICT & ITS products by constantly exploring and implementing innovative and inteligent solutions that drive long-term value to customers.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
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☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

- Bus Information System Maintenance - Urban Traffic Information System Maintenance
- Surveillance System Setup & Installation (CCTV) - Development of Intelligent Video System

Others

Certification
- ISO14001, ISO9001
- CERTIFICATE OF SINGLE PPM QUALITY
- CE

Patent

- RING TYPE OPTICAL MODEM DEVICE, AND COMMUNICATION METHOD USING THE SAME
- System and method for management of measuringinstrument based on RFID
- Corporate body for cable using equipment of communication
- wire and wireless communication system for watching a state of the power distribution pole having a changing function using an induced current of the power wire
- The apparatus and system for managing the utility pole and method for managing the utility pole

ITS Product & Technologies

Product Offerings

1. Industrial Optical Switch (L2)
- Line speed : 1.25 Gbps ± 20ppm
- Line symbol : Scrambled NRZ
- Optical source : Single mode LD
- Peak wavelength : 1310nm
- Connection type : SC/PC
- Optical type : 2 Core
- Transmittal distance : 20Km or 40Km
- Specification : Meeting ITU-T G.957, G.958

2. Multi controller for CCTV & VDS
- HD/Full HD, H.264
- Stored for more than 24 hours
- Backup function
- Always store, Event video storag

Technologies

1. This industrial L2 switch equipment L2 switches 1000Base-T Ethernet signal, coverts to 100Mbps or 1Gbps optical signal and transmits. When it is optically linked, various networking is available, such as Ring, Star or Line, provides various interface such as RS- 232, 10/100Base-T or 1000Base-T, and monitoring and control of external sensor are available through Telemetry Port(DI/DO).
   This device can be installed and operated stably in industrial environment including power plant, substation or factory, and can be applied in various area including ITS.

2. CCTV controller and VDS controller is combined to one device and additional smart functions applied.
- CCTV controller Improves
- CCTV controller and VDS controller is combined to one device
- Incident Detection and Alarm function

General Information

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sTraffic

Company Overview

Based on the best professional team with outstanding technological capabilities and many years of experience, s-Traffic provides transportation solutions that considers people and environment beyond the creation of safe transportation infrastructure.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
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- Traffic Information Integration - Traffic Information Center Traffic Data Management

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- Pre/On-Trip Traveler Information Service - Telematics Service

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- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

□ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

□ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting □ Others ( )

Ongoing ITS project or R&D

1. Implementation of Toll Collection System for Korea Expressway Corp. in 2013
2. Development and supply of Unmanned Toll Collection System for Korea Expressway Corp.
3. Supply of Vehicle Classification System for Korea Expressway Corp. in 2013
4. Implementation of Electronic Toll System for Sujung tunnel in Busan
5. Implementation of Toll Collection System for Bukhang bridge in Busan
6. Implementation of Electronic Payment System for Gwangan bridge in Busan
7. Implementation of Toll Collection System and Traffic Management System for Guri-Pocheon expressway
8. Improvement of Toll System and Expressway Toll System for Misiryeong Corp. in 2014
9. ETCS Feasibility Study for Mongolia in 2015
10. A study on the improvement of Hipass image recognition and communication quality for Korea Expressway Corp Research Institute in 2015
11. Establishment of New Transportation Card System for Seoul Metro (Line 1-8) in 2016
12. Implementation of Smart Tolling System for Korea Expressway Corp. in 2016
13. Implementation of Vertical Platform Screen Door(VPSD) for pilot business of SNCF in France

14. Implementation of Vertical Platform Screen Door(VPSD) for pilot business of TNB in Spain
15. Implementation of Electronic Toll Collection System for pilot business of CMNP in Indonesia
16. Implementation of Automatic Fare Collection System spare-part for TVM in India
17. Implementation of Smart Tolling System for pilot business of Namhae Expressway
18. Implementation of Electronic Toll Collection System in Azerbaijan
19. Implementation of Electronic Toll Collection System for expressway in Incheon International Airport

Others

Certification

- ISO 9001:2008 - CE

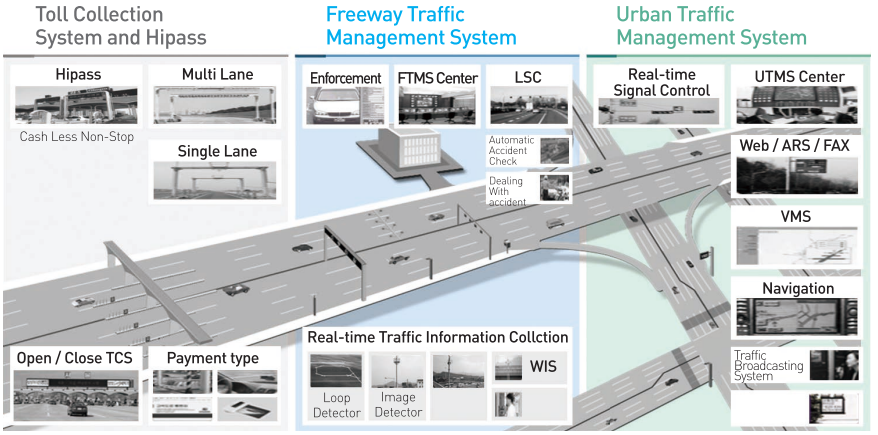
Patent

- Unmanned Vehicle Photographing Equipment
- Automatic Vehicle Number Recognition System
- Vehicle Speed Detection System
- Traffic Law Violation Enforcement System

ITS Product & Technologies

Product Offerings

sTraffic provides Toll Collection System and Hipass, Freeway Traffic Management System, and Urban Traffic Management System for the creation of safe and speedy transportation infrastructure.



sTraffic

Technologies

MLFF(Multi-Lane Free Flow Tolling System)

MLFF is Multi-Lane Free Flow toll collection system using DSRC or RFID technologies. MLFF provides safety of driving and improves the traffic flow because it does not need to change a lane or decrease speed for paying a toll while driving. And it does not have a complicated structure like an old toll gate. Also, MLFF can reduces amount of fuel consumption and carbon oxide emission around a toll gate so that it helps to make comfortable environment for a city. MLFF is the latest toll collection system developed by sTraffic which have been a leading company of tolling market for 20 years in South Korea. MLFF will make safe and environment-friendly expressways for future.

General Information

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Website : www.straffic.co.kr
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Gyonggi-do, Korea. 463-400

Contacts

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Department : Global Business Division
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THINKWARE CO., LTD.

THINKWARE

Company Overview

THINKWARE Systems Corporation develops, manufactures, licenses and supports a range of LBS solutions and products, including scalable intelligence map and navigation systems, in-vehicle infotainment systems, mobile applications, road network information data and statistical analyzing engine technologies. THINKWARE is now well positioned to provide total LBS solutions to worldwide markets with having number one spot in the Korea LBS industry.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

■ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

■ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ■ Others (GIS, GPS, DR, LBS)

Ongoing ITS project or R&D

Automotive AVN system projects - In-vehicle audio video navigation S/W and solutions
- Intelligent Map S/W solution business – Air 3D / real 3D (web, app.)
- Customer Experience Navigation Cloud R&D, projects – Cloud navigation solutions(Web, Mobile) for every stage of the customer journey with Data-driven experiencesExpressway Corp Research institute in 2015

Others

Certification
- ISO 9001:2008 (Q347012) certified

Patent (1000-odd worldwide)

THINKWARE CO., LTD.

- Method and system for providing analysis index associated with drive section based on road and traffic conditions
- APPARATUS AND METHOD FOR PROVIDING REAL-TIME INFORMATION USING ANALYSIS FACTOR BASED ON ROAD AND TRAFFIC CONDITIONS
- APPRATUS AND METHOD FOR CONTROLLING VIDEO RECORDING IN BLOCKBOX FOR VEHICLE
- SERVER, NAVIGATION SYSTEM, VEHICLE NAVIGATION SYTEM, AND METHOD FOR PROVIDING IMAGES OF VEHICLE NAVIGATION SYSTEM
- SAFETY PHOTO SERVICE PROVIDING METHOD AND SYSTEM
- METHOD FOR SENSING COVERING STATE ACCORDING TO VELOCITY AND SYSTEM FOR PROVIDING TRAFFIC INFORMATION USING THE SAME METHOD, etc.,

ITS Product & Technologies

Product Offerings

GPS :
- Map software (European and Asia map solutions, supporting GPS devices and mobiles)
- PND (Navigation devices, No.1 market share)
- iNAVI, ThinkNAVI
- In-Dash

Car DVR(Dash-Cam) : Time, Speed, 2Ch(Full HD), Surveillance, Drive assistance,
Tablet PC : Dual/Quad Core, 10.1"/8.9"/8", Android Jelly bean, PLS LCD, GPS, Wifi
In-Vehicle Infotainment system : Android AVN platform
LBS : LBS system integration and software solution

General Information

Company Name : THINKWARE CO., LTD.
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TmaxData Co., Ltd..

TmaxData

Company Overview

DBMS vendor that provides the best database software in Korea TmaxData Co., Ltd. (hereafter TmaxData) is a DBMS vendor that researches and develops data-related core technologies and data-based technologies. In 2003, TmaxData successfully launched its own DBMS product 'Tibero' to commercialize the large DBMS in Korea, and has become one of the leading companies in the domestic DBMS market. In 2008, TmaxData developed 'Tibero Active Cluster (TAC),' which is a shared DB cluster technology. It was the first time in Korea, and the second in the world. TAC exhibits stability and high performance enough to replace DBMS products of other global companies.
In October 2011, TmaxData strengthened its product competitiveness by launching a new DBMS product 'Tibero 5' which had been designed to be used as the core system of a large business system. The product can be applied to not only a unit business system but also a core business system or an enterprise system. Gradually upgrading technology, TmaxData now leads the domestic DBMS market with its competitive products that display outstanding performance, stability, and distinctive technical support.
TmaxData has made efforts and passion in developing new database technology and products to meet the needs of the market and customers. As the result, TmaxData has grown as Korea's leading DB service company with high quality products and original technology which can compete with foreign products.

Business Area

1st category

■ Traffic Management
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- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

☐ Hardware ■ Software ☐ SI ☐ Consulting ☐ Others ( )

TmaxData Co., Ltd.

Ongoing ITS project or R&D

- Seoul Transportation Operation & Information Service - Integrated traffic management and analysis system building
- Cheongju City Hall - Advanced Traffic Management System (ATMS) building
- Namyangju City Hall - Bus Information System (BIS) building for Namyanju-Gapyeong-Chuncheon
- International Airport Corporation - U-Signage replacement and installation business
- Gimhae/Changwon/Yangsan/Uijeongbu/Uiwang/Namyangju/Gunpo/Gyeonggi-do Gwangju City Hall - Urban Traffic Information System (UTIS) building
- Daegu Metropolitan Transit Corporation - System building for the line no. 3
- Gumi City Hall - BIS building
- Busan-Gimhae Light Rail Transit Corporation - Automated Fare Collection (AFC) system building
- Gwangju Metropolitan City Hall - BIS building
- Korea Institute of Construction Technology - 5th Transport Advice on GOing anywhere (TAGO) system building
- Metropolitan Transport Association - Intelligent Transport System (ITS) building for Seoul-Hanam as part of the Bus Rapid Transit (BRT) pilot project Ministry of Land, Transport and Maritime Affairs - BIS building for the southeastern part of the capital area Yongin/Busan Metropolitan City Hall - ITS building Korea Express Corporation - TCS server adoption for business/branch offices Tongyeong City Hall - Bus Management System (BMS) building

Others

Certification

Tibero proved its stability and performance by gaining GS certificate from Telecommunication Technology Association (TTA) and gained 'Open GIS' certificate, the international GIS standards, from OGC (Open Geospatial Consortium) for the first time in the domestic DBMS market.

GS (Good Software) Certificate Statue

- Tibero 4 Certificate (Code : 09-0208, November of 2009)
- Tibero 5 Certificate (Code : 13-0029, February of 2013)

Open Geospatial Consortium Certificate Statue

- Spec. : OpenGIS® Simple Features Specification for SQL, Revision 1.1, Types and Functions Alternative

Major Awards

- Oct. 2010 Award of DB Solution Innovator
- Dec. 2008 Korea Software Technology Excellence Award
- Nov. 2008 New technology·Excellent IT product Presentation selected by public Institutions Won the best product Award

ITS Product & Technologies

Product Offerings

TIBERO DataBase

- Maximizes performance of processing increasing multiple users with a multi-process and multi-thread based architecture and the latest methodology for efficient resource management.
- Offers a compatible development environment by complying with ANSI SQL standards and supporting data access standard APIs, tbPSM (Tibero's Persistent Stored Modules), and embedded SQL.
- Maximizes business continuity by offering an environment for convenient and stable operation with high availability, database structure modification, and various backup/recovery functions.

TmaxData

Technologies

Stability

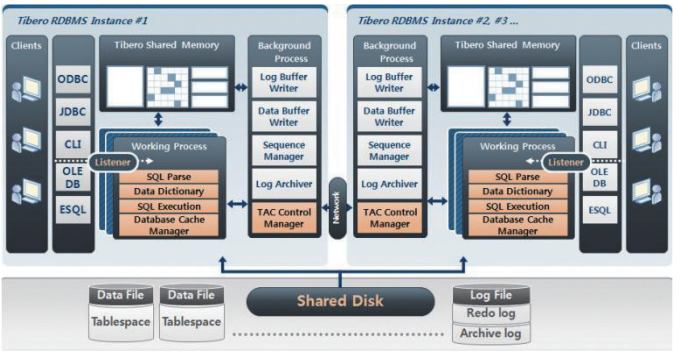
In order to protect a database against various types of failures, Tibero offers a variety of logical/physical backup methods and provides the RMGR (Recovery Manager) utility that implements flexible recovery depending on each failure situation.

- Backup: Nonstop service through online backup, and rapid backup through offline backup and incremental backup

Recovery

- Crash Recovery: Automatically performed while Tibero is restarted after abnormal termination.
- Media Recovery:
  - Complete recovery: Restores all lost data in the event of data loss.
  - Incomplete recovery: Restores the database to a particular point of time.
- High Availability

  Tibero supports Tibero Active Cluster (TAC), which corresponds to Oracle RAC, for its high availability. TAC guarantees stable system operation and convenient scalability with cluster-related functions including the failover function.



- Compatibility

  Tibero supports standardized SQL and interfaces to integrate with various applications, is fully compatible with almost all components of Oracle, and thus it enables rapid and easy DB migration.
- Compliance with Global Standards
  - Supports the standardized SQL (SQL-92 and SQL-99), a variety of character sets, and XA interface which compiles with X/Open standards.
  - Supports various standard interfaces: JDBC, ODBC, OLE DB, and CLI (Call Level Interface)
  - DB Link (Sybase, Oracle, DB2, MS SQL)
- Compatibility with Oracle
  - Supports non-standardized SQL (Complete support of Oracle-modified SQL).
  - Application compatibility: Compatible with Oracle's stored procedures (PL/SQL) and embedded SQL
  - Data type: Supports CHAR, VARCHAR, NUMBER, DATE, TIMESTAMP, BLOB, CLOB, LONG, RAW, ROWID, NVARCHAR, and NCLOB.
- High Performance

  Tibero ensures the best performance in mass transaction system via various mechanisms for high performance processing.

TmaxData Co., Ltd.

- Multi Process - Multi Thread: Creates required threads beforehand and makes them stand by to respond to user access requests immediately, and uses the minimum system resources.
- Row-level Locking: Minimizes loads by reducing a lockable range and avoiding lock escalation.
- MVCC (Multi Version Concurrency Control): Processes multiple users at once, and offers a structure in which blocking does not occur between read and write processes.
- Parallel DML: Realizes quick response time as multiple threads execute a single query in parallel, and automatically forms operation groups, which can be executed independently, to process them in parallel.
- Parallel Data Loading: Uses the tbLoader utility which loads mass text data to a database, and enhances loading speed as multiple threads within the utility are operating concurrently.
- Partitioning: Supports various partition types such as Range, Hash, List, and Composite partition, and also provides global index and local index.
- Function/Convenience

Tibero offers various utilities for developers and administrators in order to develop and manage a database more efficiently.

- tbAdmin
  - Input, modification, and execution of SQL statements, and DML SQL statements' execution plan view
  - Partial Data Fetch for performance improvement, Open File, and Save As... functions
  - Describe Object (table, view, synonym) function, and various monitoring functions
- tbMigrator: Supports tbExport, which is a tool that exports some or all of the data and schema objects in a database to a file, and tbImport, which can import this file back into a database.
  - Migrates data and application from another DBMS to Tibero without modification.
  - Migration target: All schema objects such as table, index, view and synonym, constraints, privileges, and roles
  - Parallel migration processing enables speedy data migration.
- tbLoader: Loads massive data files to a database at high speed.

General Information

Company Name : TmaxData Co., Ltd.
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TOPES Co., LTD.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Project : ITS project for Angola, Rwanda, Turkmenistan

Others

ISO
- ISO 9001 : 2009 / ISO 9001 : 2008 - ISO 14001 : 2009 / ISO 14001 : 2004

CE
- CR200 (TOPCAM200C) - Vehicle Enforcement System (#K1651/L07)
- CR200 (TOPCAM200C) - Vehicle Enforcement System (#K1652/E07)
- Surge Portection Equipment (#N8 07 04 63165 001)

Prize
- Korea Expressway Corporation.
  : Appreciation Award for ITS Project in 2010. (#10-231)
- Chief of the Ulaanbaatar City / Traffic Control Center
  : Appreciation Award Of Honor for Ulaanbaatar City ITS Project in 2010.

TOPES Co., LTD.

ITS Product & Technologies

Vehicle Enforcement System (TOPCAM 2012)

- Speed Enforcement System (TOPCAM 2000)
- Red-Light Enforcement System (TOPCAM 2001)
- Point to Point Speed Enforcement System(Average Speed Enforcement system) (TOPCAM 2002)

Traffic information system

- Automatic Vehicle Identification System(Image detection) (IMAGEPRO 8000)
- Automatic Vehicle Identification System(Sensor detection) (IMAGEPRO 6100)
- Vehicle Detection System (IMAGEPRO 1000)

Road Security System

- Crime Prevention & Prevalence System (IMAGEPRO 5000)
- Roadway Surveillance System (IMAGEPRO 6000)
- Intelligent CCTV System for Safety Improvement in the Protection Area (IMAGEPRO 7000)

CCTV System

- CCTV for Traffic Monitoring System (IMAGEPRO 4000)
- I-TV (Industrial CCTV)

General Information

Company Name : TOPES Co., Ltd.
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E-mail : sungwonlee@topes.com

TRACOM Co. Ltd.

TRACOM

Company Overview

TRACOM, established in November 2004 as a ITS service company. Leads the revolution of service with its software and hardware solution, integrated ICT and Traffic-infra Businesses. For 10 years, We have been working with companies, cities and communities around the world to build ITS and constantly making efforts for creating value through the continuous R&D

Business Area

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☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Overseas Project
- Intelligent Transportation Systems for Metro Manila Public Transport(Consulting)
- Detail Engineering Design work for Bus Rapid Transit Line-3 Corridor in Dhaka(intelligent transport system Consulting)
- The Establishment of Advanced Traffic Management System (ATMS) in Asuncion, Paraguay
- The Master Plan for public transportation system in Lima and Callao, Peru (Technical support to Automatic Fare Collection and ITS)
- Paraguay Asunción City Child Traffic Education Park revitalization project(CSR)

Domestic Project
- Traffic Information System project in Jamsil Seoul
- Design porject for Wonju ITS

TRACOM Co. Ltd.

- TOPIS Management & Maintenance in Seoul City
- Suwon Public Bike System Consulting

R&D

- A Development of Integrated Platform for Commercial Vehicles
- Development of a maintenance platform based on asset management for underground structure of plants and large-scale utilites(focusing on energy production and supply plants)

Others

Certification

- ISO 9001:2008 - CE

Patent

- Technical Patent Registration: Navigation System using RFID Tag. (2011)

Certificate of Software Quality

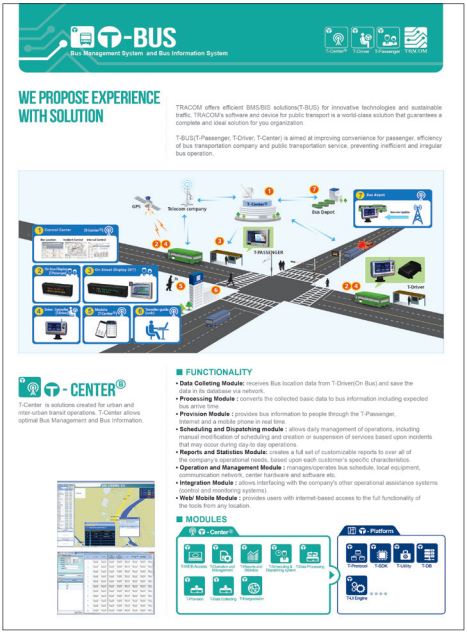
- BIT for ITS/BIS AYBIT2013

ETC

- S/W registration : 10 programs (2005 ~ 2011)
- Winning a 4th Korea Internet Award 2010 (Special Mention Award)
- Confirmation of Innovational Technology Small Business(INNO_BIZ)

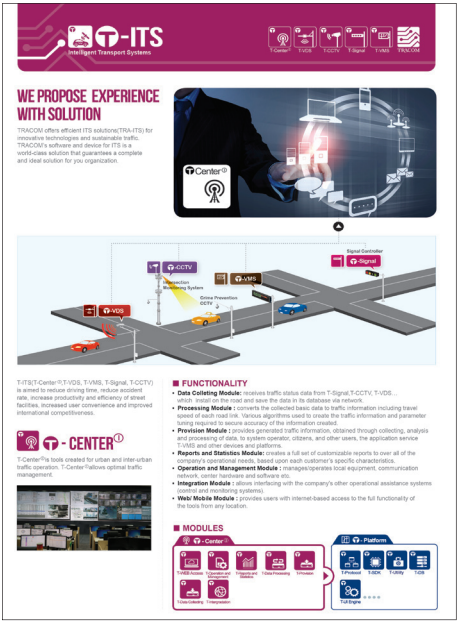
ITS Product & Technologies

Product Offerings



TRACOM

Product Offerings



TRACOM Co. Ltd.

Product Offerings

General Information

Company Name : TRACOM. Co. Ltd.
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UNISECU INC

www.unisecu.kr

Company Overview

UNISECU develops AI based ITS system that values human safety the most.
Smart crosswalk, its representative system, has been selected as 'excellent product' by Korean government. And it has been chosen for smart crosswalk pilot-project implemented by Korean government so that has been installed in front of 'presidential archives' in Sejong-city. It has also been chosen for pilot-project product by LH(Korea Land and Housing Corporation) so that it will be installed in 18 developing new towns in Korea.
UNISECU is making a rapid achievement as a pioneer in 4th industry.

Business Area

1st category

■ Traffic Management
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☐ Others ( )

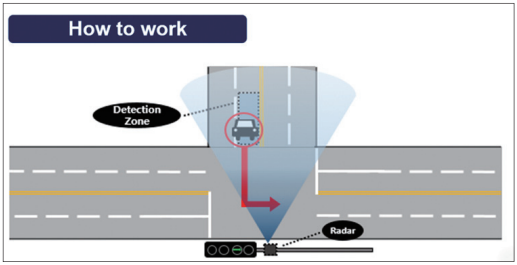
2nd category

■ Hardware ■ Software ■ SI ☐ Consulting ☐ Others ( )

Ongoing ITS project or R&D

* Smart City : Smart Intersection System(Smart City solution) using high resolution 4D/UHD(Ultra High Definition) and multi-tracking radar which analyzes moving direction / detects speed of objects.
* Smart Left-turn : Turns on left-turn lights when a left-turning car comes into detection zone. When there is no left-turning car, green lights always on.

UNISECU INC



- Pre-set detection zone
- Detects left-turning car in the detection zone
- Turns on left-turn lights

Others

Patents

- Intelligent Type of Apparatus for Guarding Crosswalk Pedestrian and Guard System with the same
- Convergence detector and traffic enforcement system therewith
- Integrated System for Monitoring Vehicles Using Radar Sensor on Spot

Certificate

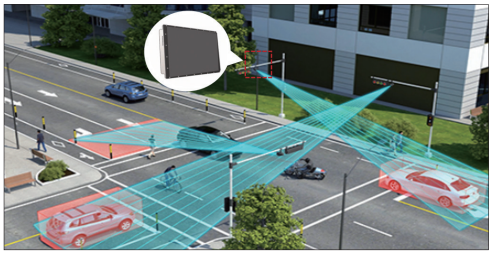
- ISO 9001 : 2005
- 'Excellent Product' by Korean Gov.
- Promotion of Technology Innovation [INNO-BIZ]
- Certificate of Venture Business
- Registration of Broadcasting and Communication Equipment

ITS Product & Technologies

Smart Speed/Red-light Enforcement

Radar Technology

- 2M to 340M range
- Detects cars running over speed limit
- Detects cars passing through intersection on red light

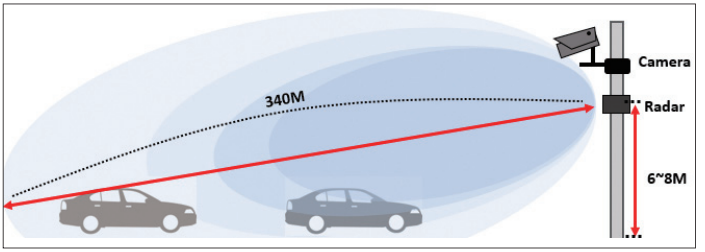


Enforcement Scenario

a. When a vehicle passes scanning zone, radar sensor detects the speed of the vehicle (Doppler's effect)
b. When a vehicle exceeds speed limit, the radar sensor outputs a signal to the camera
c. When the camera gets the signal, it takes a picture of the vehicle at a designated point

UNISECU
www.unisecu.kr

How to work



a. Radar sensor detects speeding cars
b. Radar sensor outputs signal to camera
c. Camera takes picture of the car's plate

Deployed site

Smart Crosswalk System
Consists of 3 functional parts

- Automated Crosswalk
- Broadcasting system
- Button Crosswalk

Automate Crosswalk

- **Behavior Analysis** : Analyzes pedestrians' intention whether to cross or pass-by
- Light Change : Changes lights for pedestrians not for passers-by
- Recognition Rate (official test certificate)
- **100%** : day/night, under good/bad weather conditions, 750 times per each(1,500 times)

UNISECU INC

Broadcasting System

- When people nearing road or attempting j-walking
  "It is dangerous, please get back to sidewalk"
- When pedestrians come into the scanning zone
  "Please wait for a moment, it will turn to green light"
- When green lights turn on
  "Please cross on the next light"

Button Crosswalk

- Lights turn to green when a pedestrian pushes button
- Still functional even when under maintenance (no need to J-walk or detour)
- LED backlight makes it easier for pedestrians to use (esp. for hearing impaired, disabled)

Optional Function

Centralized Control

- Current light-color, broadcasting test, temperature check
- Check the number of nearing road or j-walk attempt
- Sound test, Rebooting

Scheduler

- On/Off timer
  Ex) School zone : deactivated at commuting time
  Populated zone : activated 00:00 ~ 05:00
  Lowly populated zone : activated 24/7

General Information

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VITZROSYS Co., Ltd.

Company Overview

Vitzrosys is strengthening its foothold as the ITS, SI leading company in 'Consult, Design, Products, Construct' at this whole progress. We have technology in the field of ITS like ATMS, UTIS, BIS, etc. as well as long experience and R&D records of DCS, SCADA. The company, in order to become the leader in the future high technology society, is expanding its business into advanced ITS like CCTV, signal controller; and also certificate and product line.

Business Area

1st category

■ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

■ Public Transportation
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- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

■ Traffic Information Integration/Management
- Traffic Information Integration - Traffic Information Center Traffic Data Management

☐ Traveler Information
- Pre/On-Trip Traveler Information Service - Telematics Service

☐ Advanced Vehicle/Road
- Safe-driving Vehicle & Road - Autonomous Driving - Drive Assistant System

☐ Commercial Vehicle Operation
- Fleet Management System - Hazardous Freight Management - Logistics

☐ Others ( )

2nd category

■ Hardware ■ Software ■ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Project
- Construction of UTIS(Urban Traffic Information System), City of Geoje, Pohang, Kimhae, Changwon
- Construction of ATMS(Advanced Transportation Managesystem), City of Paju
- Construction of u-City(Ubiquitous City), Songsan GREEN city, Magok u-City
- Construction of BIS(Bus Information System), Expanding BIT of Seoul, Yongin-Seongnam, Mokpo-Muan

R&D
- SITMS Transport information center(design and implement)
- Development of 3rd dimensional landfill management system
- Development high precision power metering SOP for Smartgrid; Home energy platform
- Development of hybrid remote processor

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Others

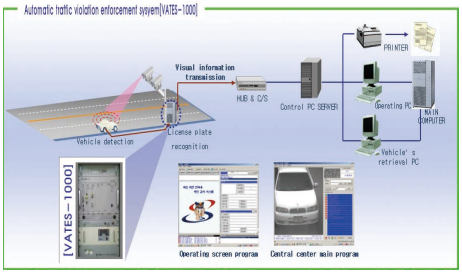
Certification

- Verification of manufacturer (VMS, Signal Control Unit, DCS)
- GS-certification, ISO 9001 / 14001, Inno-Biz, EN-241, and etc

Patent and utility model

- Discharge-lamp tracking system through the image recognition
- Index finger auto configuration for panning, tilting, zooming conversion
- Surveilance, tracking system and the method of lane violation on the road
- Traffic signal control system at the division of area, the method and image recognition system
- Surveilance and tracking system and the method for the cars which do an illegal U-turn
- Information indicator for the parking-lot and the method
- Blind information indicator of the crosswalk
- Signal control system used of the laser sensor
- Tracking system of a traffic offense through the image fusion
- Remote controller for the traffic signal

ITS Product & Technologies



1. Violation Enforcement System

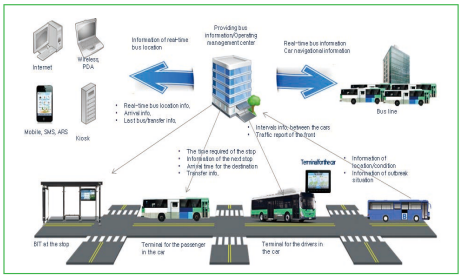
Collection and management system for the efficient cotrol of the road/preventing from the traffic accident through the car information committed speed, lane, traffic signal violence

Solution

Tracking enforcement system for speeding, illegal stopping and parking, traffic signal/bus driveway / crashing the line violation

Performance

On-going maintenance and implement more than 500 systems all over the country



2. Bus Information System

Information system for providing the route/arrival information to the bus manager and user through collecting the bus(in-service) data in real-time

Solution

Integrated solution of field equipment and centers for bus information to collect /manufacture / provide itself

Performance

Implement of Seoul / Gyeonggi province BIS, etc.

VITZRO SYS

3. Signal control system

Collected data based on the detecting device established near the intersection will calculate the optical variables in the center, regional controller. It is the control system which manages traffic condition in real-time and period system of ITS as well

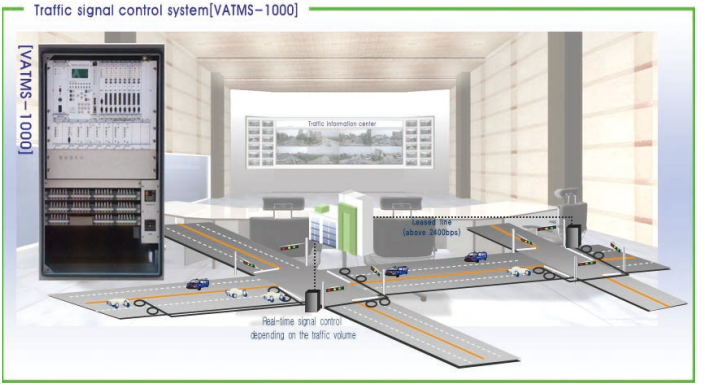
Solution

Traffic-actuated control, Left-turn actuated control, On-line remote control, On/off control, Manual control

Performance

Signal control system implement in City of Cheonan, Jeonju, Changwon, Choongju, Yeosu, Goonsan

Traffic signal control system[VATMS-1000]



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Wayties Inc.

Company Overview

Wayties is a startup company working in the automotive and connected car areas.
We offer the test & analysis system and test consulting for V2X/C-ITS to Car OEMs and research institutes with our comprehensive experience including Web, Mobile, Graphics, V2X and Automotive platform.

Business Area

1st category

☐ Traffic Management
- Traffic Signal/Control - Incident Management - Traffic Information - Safe-driving Support
- Traffic Enforcement - Parking Management

☐ Public Transportation
- Bus Information/ Management System - Public Transportation Information/Management
- Multi Modal Information/Management - Bus Rapid Transit System/Solution
- Pedestrian/Disabled Support System

☐ Electronic Payment
- Electronic Toll Collection - Electronic Parking Payment - Electronic Fare Payment

☐ Traffic Information Integration/Management
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2nd category

☐ Hardware ■ Software ☐ SI ■ Consulting ☐ Others ( )

Ongoing ITS project or R&D

Development of test solutions for V2X and C-ITS services
- Evaluating the performance of V2X system and its application
- Providing validation and verification test for C-ITS services

Open-source projects for developing V2X service platform

ITS Product & Technologies

V2X Analysis System (VAS)

V2X & C-ITS test scenario management based on standards

V2X data collection

- Easy of V2X test log management
- Real-time data logging & Analysis based on Vehicle-to-Cloud Technology

V2X data analysis

- N:N analysis for communication performance, positioning and application service

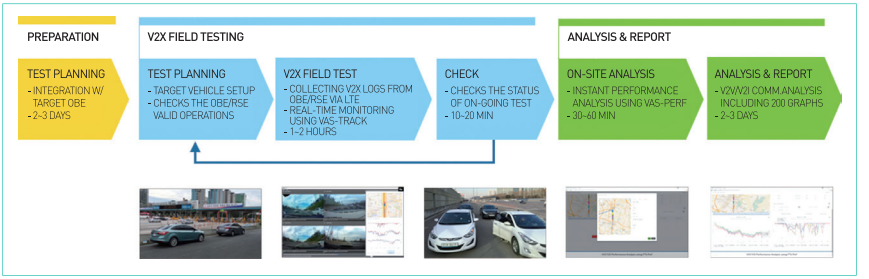
Fast customization based on Web-UI

- Easy of data gathering & performance analysis using web based UI/UX

Use case of V2X testing & performance evaluation using VAS

- PER & RSSI analysis according to vehicle mobility, communication parameters, location etc.
- Provides the day report & full report efficiently

Products		Description
VAS-Center		DB & Web-server for V2X test management & data collection
VAS-Logger		Data logging from V2X OBE
Analysis	VAS-Track	Providing the real-time tracking for the on-going V2X testing
	VAS-Perf	Analysis of V2X communication performance
	VAS-Safety Application	Analysis of V2X Vehicle safety applications (VSA)



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