

Global Network



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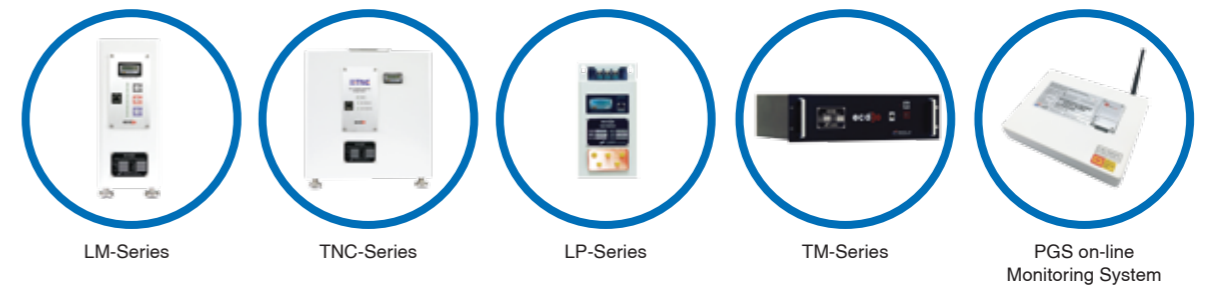
**eca3g Perfect Grounding System**

(US Patent No 7,652,865 B2 - Grounding Device which not need to be buried in Ground)

Proven performances at various national security sites :  
**Over 4,000 sites for 19yrs, Protection Success rate : 99.88%**  
Registered product at US Army Foreign Technology Database (GSTW)

Protect PCB, Electronic components, Digital-IP Network-ICT devices from lightning surge without adding grounding rods, without low earthing resistance

**eca3g** the 3rd Generation Digital Grounding Apparatus for Perfect Lightning Surge Protection without burying in Ground



- » Total Lightning Protection(Targeting 100% protection)
- » Provide Equi-potential, common grounding function (near zero N-G Potential difference assured - below 0.2V)
- » Patented technology(USA, PCT, Korea)
- » Product Liability Insurance Asia, South America
- » Digital Grounding Apparatus
  - Need not additional grounding rod
  - Need not low earthing resistance
  - Grounding without burying in ground
- » Multi-Pulse lightning protection design
- » Modular design for PGS Maintenance Service

## Protection for advanced networked electronic IT based systems

Since 1999, <GROUND Co.,> has provided total lightning protection solution pursuing 100% perfect protection, and has implemented remarkable successful performances with 99.88% protection rate for 19 years mostly for Military, National Security Facilities. PL insurance has been provided to the clients for further client satisfaction together with highly credible protection technology.



<eca3G> protects PCB , IC-Chip, Electronic component, Digital ICT devices from

### Changes of Lightning protection environment

1. Multi-pulse lightning become 70~80% of recent lightning
  - 3~4 strikes in a second at same lightning strike path
2. More IC Chips(Semi-conductors ) are applied for advanced Digital, Network systems
  - 88.3% of unknown failures of electronic equipment caused by surge
3. Networked electronic, digital, communication, IT equipment
  - Reference potential (neutral), TN grounding become important
4. Most damages of electronic equipment by indirect lightning
  - Most damages from Reverse surge, Ground Potential Rise, NOT by direct lightning,
5. N-G potential difference affect functions of advanced IC chips
  - MRI scanning image distortion. CNC Lathe signal error, Data input error at data center



< eca3G > is specially designed for perfect lightning protection under above environment

**eca3G** will provide ideal perfect lightning protection with integrated surge protection for your systems in the protection zone, common grounding, equi-potential function, surge elimination via energy conversion function, and does not require Secondary grounding rod and not require low earthing resistance, targeting perfect lightning surge protection for advanced networked systems.

**eca3G** will provide perfect protection solution for following environment.

- Networked, Automated, Data communication systems which require integrated lightning surge protection.
- Rocky mountain, Island area where could not get low earthing resistance for systems.
- Mobile Tactical vehicles which have difficulties to install grounding rod or could not get good earthing.
- Isolate, stand-alone systems in the field are easily exposed from GPR (Ground Potential Rise)
- Frequently surge damaged sites which could not find perfect protection solution
- National security facilities should be operated 365/24 under bad weather, frequent-lightning environment.





## eca3G - Total Integrated Lightning Surge Protection

- Free from Grounding Rod, free from securing low Earthing Resistance
- Perfect protection for Military electronic, communication, radar system, Vehicle/Shelter Systems.

### Provide maximum field operation efficiency with total integrated lightning protection

- No need to install additional secondary grounding rods.
- No need to acquire low earthing resistance, but secure equi-potential common grounding.
- Provide neutral-ground potential difference within 0.2 volt which is important for advanced electronic systems.
- No need to install grounding rod for mobile military vehicle/shelter system for communication, Radar, C4i tactical

### Perfect total lightning protection for

- Military Communication, Radar, Broadcasting systems
- Rocky, mountain area where could not get low earthing resistance
- Mobile radar / Communication vehicles without Grounding Rod
- Frequently surge damaged sites which could not find perfect protection solution yet.
- Airport Instrument landing guide system
- Border surveillance, coastal radar system
- IP CCTV network system



<Navy Communication system>



<Army - Ammunition Depot Surveillance>



<Remote controlled automated water treatment plant>



Low-Altitude Surveillance Radar  
[http://www.lignex1.com:8001/en\\_US/product/product\\_detail.jsp?pid=19&scode1=&scode2=&scode3=&skey](http://www.lignex1.com:8001/en_US/product/product_detail.jsp?pid=19&scode1=&scode2=&scode3=&skey)



<Mobile communication vehicle >



<Mobile communication vehicle >

### Countries using eca3G Product

- Korea : 19 years, mostly for National Security about 4000 sites
  - Navy, border surveillance, digital TV, Mobile radar vehicle
- Malaysia for 7 years for Police, Telecom Malaysia, Army PABX, Air force radar, Airport ILS, Police relay station
- Thailand for 5 years for Satellite station, Army ammunition depot, Border surveillance, Army video network
- India for 4 year for Glide path of airport, Military engineering, Police communication, Satellite Research Institute, Telecom
- Brazil for 2 year for telecommunication (TIM, CLARO), Army communication. Vaccine lab, Water Plant
- Turkey for 1 year : Meteorological radar station
- Indonesia for 1 year : Airport ILS, Police communication station

## Brief Technology Information

**eca3e** can detect surge, convert surge electrical energy, neutralize, eliminate surge which may enter into the systems via power line, data line and conductive structures (such as water & gas piping lines, hydrant, steel structures), also from reverse surge(GPR etc.)

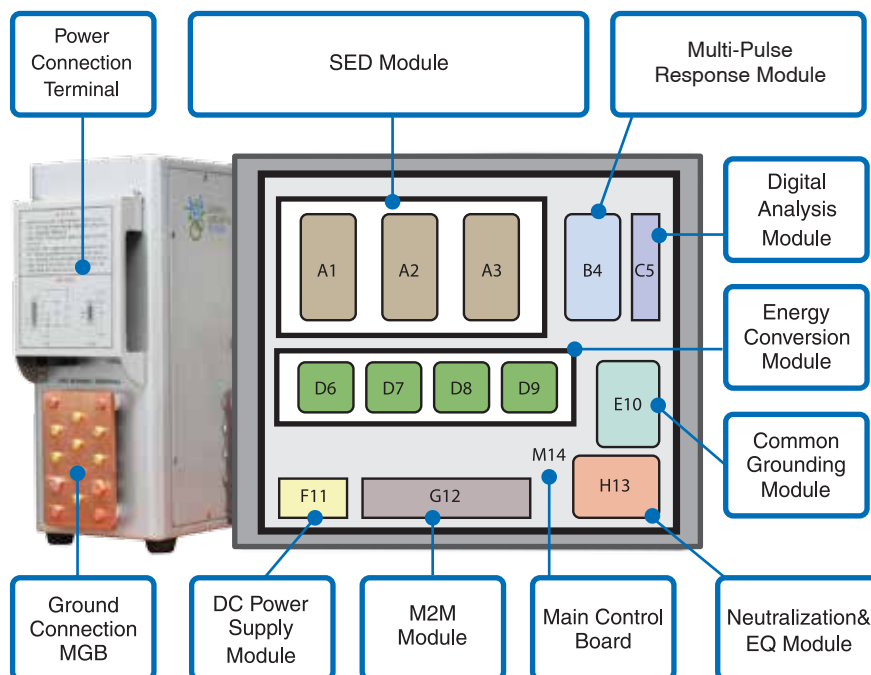
**eca3e** has energy conversion and neutralization function to convert electric characteristics of surge into arc, heat, neutralization, and eliminate the surges.

**eca3e** makes EQUI-POTENTIAL environment of all the equipment and conductive parts in protecting zone, which improve earthing resistance also.

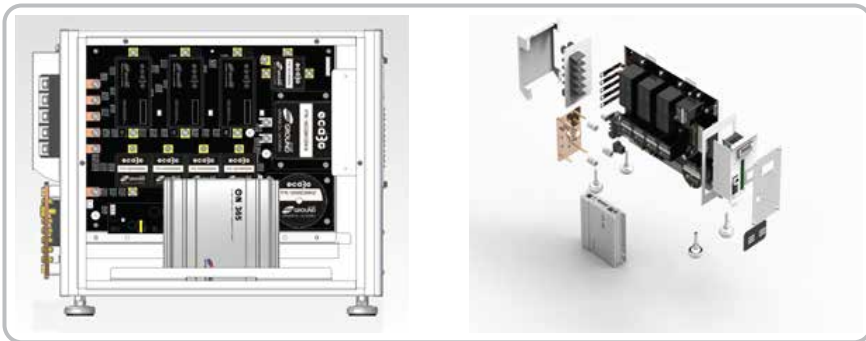
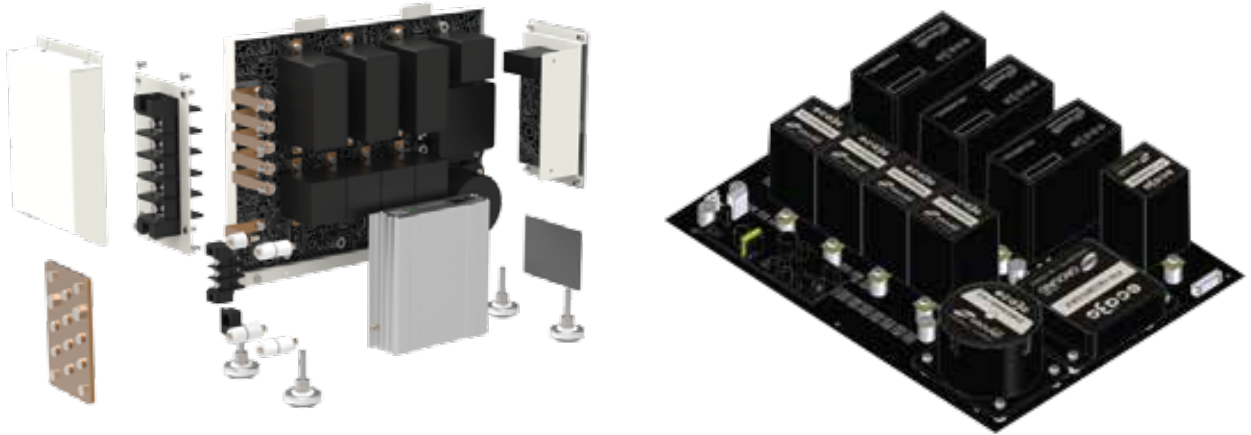
**eca3e** provide INTEGRATED SURGE PROTECTION to be able to connect max 20 ground points in the protection zone (LM model).



## eca3e Component Modules



**eca3g** Component Modules - Modular Design for Performance Based Maintenance Service



► eca3G LM model

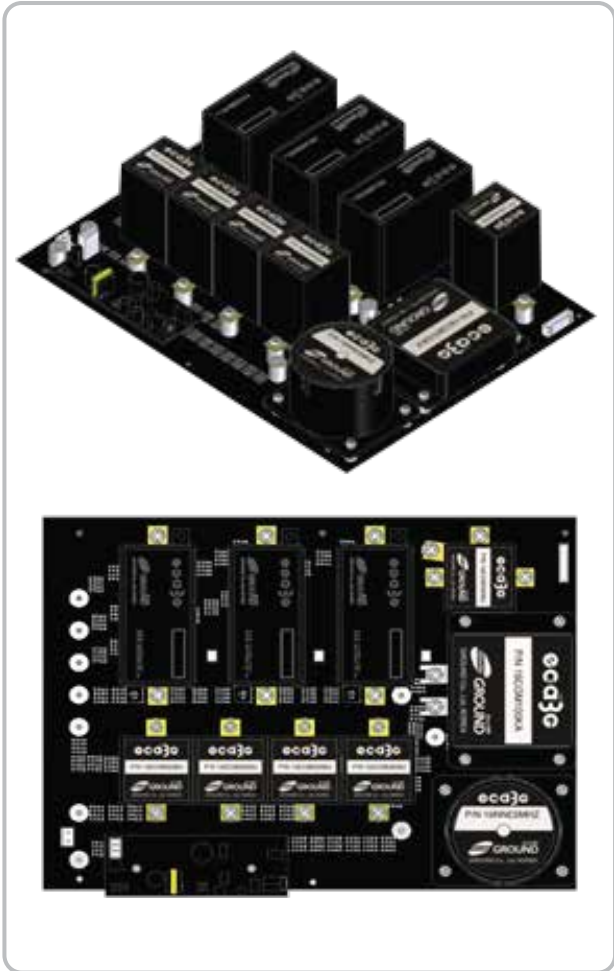


► eca3G TNC model



► eca3G TM model

## Modular Design for Performance Based Maintenance Service



▲ Module composition



▲ Main control board



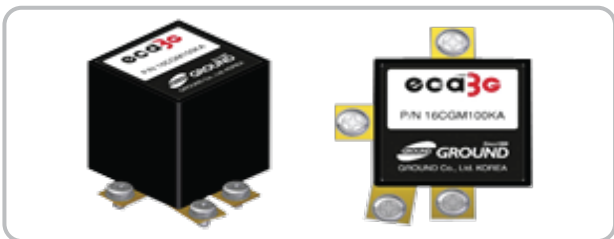
▲ SED module



▲ Neutralization & EQ Module



▲ Common Grounding Module



▲ Multi-Pulse lightning Response Module

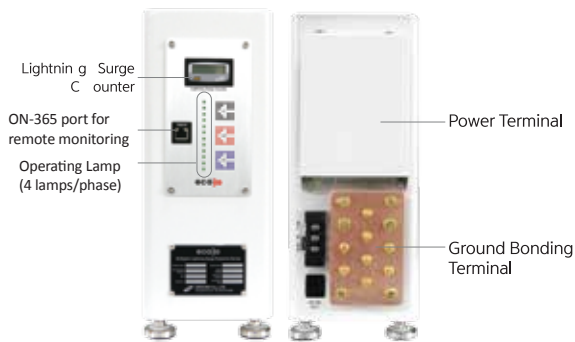


▲ Energy Conversion Module



▲ M2M Module

## eca3G-LM Series



Model	Specification	Dimension (WxHxD/mm)	Weight (Kg)
LM-1P	1Φ2w/220V/160KA	150×360×450	13
	1Φ3w/220V/320KA		
LM-3P	3Φ4w/220V/480KA		
	3Φ4w/380V/480KA		

### Application

Main Distribution Board (MDB) for Communication system, Computing system, Broadcasting system, Automation, control system, Signaling system, Firefighting system, PLC ( protection zone : abt 10m x 10m, max 20 grounding points )

## eca3G-TM Series

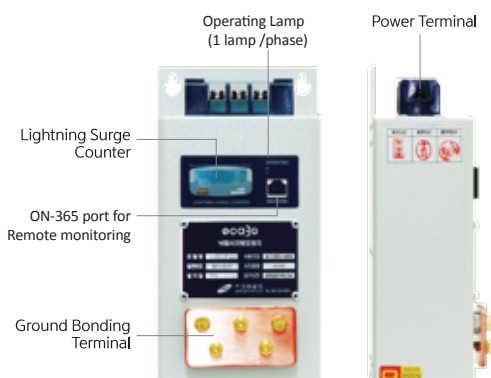


Model	Specification	Dimension (WxHxD/mm)	Weight (Kg)
TM-1P	1Φ2w/220V/160KA	482×132×460	13
	1Φ3w/220V/320KA		
TM-3P	3Φ4w/220V/480KA		
	3Φ4w/380V/480KA		

### Application

Model for 19 inch standard Rack installation (suitable for mobile tactical vehicle, shelter system)

## eca3G-LP Series



Model	Specification	Dimension (WxHxD/mm)	Weight (Kg)
LP-1P	1Φ2w/220V/80KA	120×233×87	2.3
	1Φ3w/220V/160KA		
LP-3P	3Φ4w/220V/240KA		
	3Φ4w/380V/240KA		

### Application

Communication system, CCTV, DVR, PLC, Computing system (Protection zone : abt 5m x 5m , suitable for sub-DB , street cabinet)

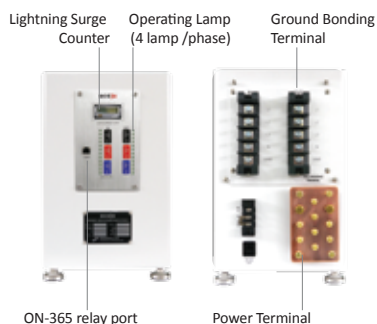
# eca3G Product Information

## eca3G-TNC-S Series



Model	Specification	Wt(kg)	Size(W×H×D/mm)
TNC	1Φ2w/220V/240KA/0.3kVA	25	146×196×290
	1Φ2w/220V/240KA/1kVA	33	230×345×408
	1Φ2w/220V/240KA/2kVA	39	250×345×408
	1Φ2w/220V/240KA/3kVA	47	270×345×408
	1Φ3w/220V/240KA/5kVA	55	320×345×408
TNC-P-1P	1Φ2w/250V/480KA/100kVA	20	180×290×315
TNC-P-3P	3Φ4w/500V/960KA/300kVA		180×290×315

## eca3G-TNC-P Series



### TNC-S Application

Total lightning protection for

- a) Single phase of Delta power supply,
- b) Power supply without ground or not clear ground,
- c) Power supply with TT ground,
- d) Power line without neutral line
- e) power line which cannot be ground

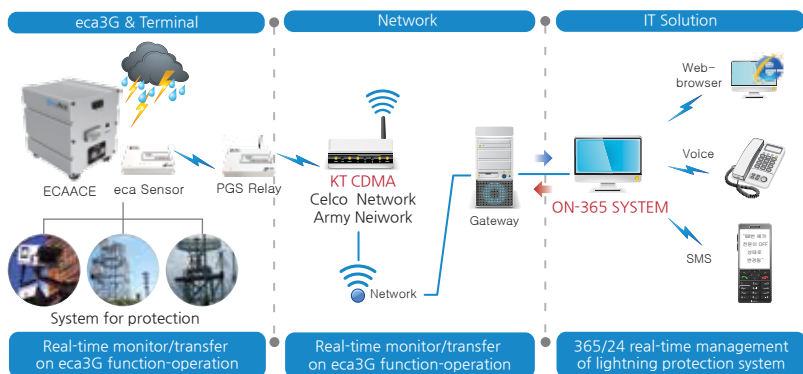
### TNC-P Application

TNC function with larger capacity of Power Supply Unit of 1P or 3P (UPS, AVR etc)

\*Product information for DC systems, various SPDs can be provided upon request.

## ON-365 SYSTEM : Operational Concept

ON-365 system is the real-time monitoring system for eca3G functions at client site with this service, we can provide further Performance Guarantee Maintenance Service



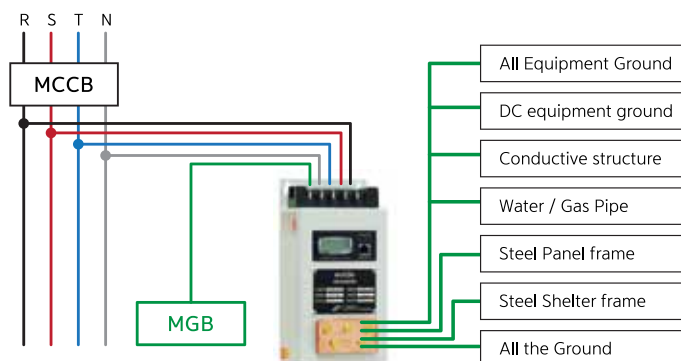
Model	Specification
ON-36-PC-PR1	Monitoring Program
ON-36-RL-WE1	Internet Terminal
ON-36-RL-RS1	Internet Terminal
M2M Modem	WCDMA Terminal



eca3G is not SPD or TVSS or Surge Arrestor, but total surge protection device with Ground, equi-potential element

Item	Description				Remark
MODEL	eca3G - LM	eca3G - TM	eca3G - LP	eca3G - TNC	Other small models available for Special purpose (traffic light control, CCTV etc)
Major Application	Main incoming DB	Vehicle, Shelter 19" Rack Type	Sub / small DB	Delta power, TT ground	
Major functions	Total protection for electronic, communication, IT systems from lightning, induced surge, Ground Potential Rise  Common ground, equi-potential function, N-G:below 0.2V				USA Patent, PCT, Korea Patent
Product assurance	5 years warranty, Product Liability Insurance (in Korean territory), (optional: 10 years warranty program with ON-365 service)				G-50 model
ON-365 Service	On-line, real-time monitoring on the performance, operation status, health, surge intrusion counting of eca3G <sup>®</sup> by M2M base (machine-to-machine)				10 years warranty program with Modular, Block designed model
Power consumption	Below 5w				adopt surge current for operation
Uc	275V (maximum continuous operating voltage)				
Maximum Discharge Current/Imax	160kA~480kA/	160kA~480kA/	80kA~240kA/	240kA~960kA/	IEC 61643-1 Class II SIRIM/ KERI Test Report
Voltage Protection Level / Up	2.5KV	1.0~2.5KV	1.5KV	0.9KV	
Weight(kg)	13	13	2.3	25 ~ 55	
Size(W×H×D/mm)	150×360×450	485×135×450	130×205×96	270×345×408 (3kv)	Can be changed upon design improvement
Operation Voltage	100ACV ~ 440ACV				Low Voltage below 600V
Operation Temp	- 40°C ~ +80°C				
Installed Location	Power Distribution Board, UPS, AVR, TRANSFORMER				Parallel connection to power line (except TNC model)
Others	Multi-pulse lightning protection(patent), built-in surge counter, Main Ground Bar for common grounding  Enable for centralized total real-time maintenance support by ON-365 via M2M				

## Installation configuration



# Performances

## Performances in Asia

Country	Project Name	Site Location	Project Owner	Year
Malaysia	MPOC <BUG F321>	Glenmarie, Shah Alam, Selangor	Telekom Malaysia Berhad	2010. May
	MPOC <KLJ F401>	Petaling Jaya, Selangor	Telekom Malaysia Berhad	2011. Feb
	MPOC < KLJ F031>	Petaling Jaya, Selangor	Telekom Malaysia Berhad	2011. May
	MPOC < KLJ R8040>	Petaling Jaya, Selangor	Telekom Malaysia Berhad	2011. Mar
	MPOC < KLJ-R8040 >	Petaling Jaya, Selangor	Telekom Malaysia Berhad	2011. Mar
	Bilik MDF-F909 eca3G installation	Subang, Selangor	Telekom Malaysia Berhad	2011. Oct
	CIMB ATM , Petronas gas station	Subang, Selangor	Telekom Malaysia Berhad	2011. Oct
	Balai Polis Setapak	Setapak, Kuala Lumpur	Royal Malaysia Police	2012. Mar
	Balai Polis Trafik KL	Kuala Lumpur	Royal Malaysia Police	2012. Mar
	Balai Polis Sungei Besi	Sungei Besi, Selangor	Royal Malaysia Police	2012. Mar
	Balai Polis Sri Permaisuri	Sri Permaisuri, Selangor	Royal Malaysia Police	2012. Apr
	Cawangan Pengangkutan	Sungei Besi, Selangor	Royal Malaysia Police	2012. May
	PULAPOL - Cawangan Kem Komandan	Jalan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. May
	PULAPOL - Cawangan Sekolah	Jalan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. May
	Narcotic Crime Investigation Dept	Jalan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. May
	MPOC <KIN-F003>	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
	MPOC <KIN-F081>	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
	MPOC <KIN-F039>	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
	MPOC <KIN-080>	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
	MPOC <KIN-F052>	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. June
	MPOC <KIN-027>	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. June
	Special Operation Department	Jalan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. July
	PLKP (Agricultural Engineering Training Centre)	UPM Campus, Serdang, Selangor	Telekom Malaysia Berhad	2013. Apr
	CIMB ATM , Shell Gas Station	Seri Kembangan, Selangor	Telekom Malaysia Berhad	2013. Apr
	Ebor North Toll gate	Subang, Selangor	PLUS ( Highway Corporation)	2013. Apr
	MPOC <BG-F010>	Batu Gajah, Perak	Telekom Malaysia Berhad	2014. May
	MPOC <BG-F311>	Batu Gajah, Perak	Telekom Malaysia Berhad	2014. May
	MPOC <SIR_F007>	Seri Iskandar, Perak	Telekom Malaysia Berhad	2014. May
	MPOC <BG-F013>	Seri Iskandar, Perak	Telekom Malaysia Berhad	2014. May
	MPOC <BG-F301>	Seri Iskandar, Perak	Telekom Malaysia Berhad	2014. May
Army PABX station	Sungei Besi, Selangor	Royal Malaysia Army	2014. July	
Flight Information Region (FIR)	26 Sites	TUDM, Telekom Malaysia	2016	
Thailand	KHC-5 Camp Ammunition Depot surveillance system	Nakorn Rachaseema	Royal Thai Army	2012. May
	Post Engineering building	Minburi, Bangkok	Post engineering	2012. Sept
	Cosmo Skymed rack	Amphoe Siracha, Chonburi	THEOS Ground Station of GISTDA	2012. Sept
	BAMBOO RESORT	LOPBURI	Bamboo Resort	2012. Nov
	Quartermaster terminal surveillance system	Tha Sai Nonthaburi	Royal Thai Army	2013. Nov
	L Solar 1 Solar Farm (8.7MW)	Kabinburi , Prachin Buri	Loxey Co	2014. May
	Border Camera Sites	Preah Vihear	Royal Thai Army	2014. Oct
	Southern region inspection post	Hatyai	SINGHA Communication	2014. Nov
India	Calicut airport-Glide Slope Shelter	Malappuram, Kerala	Airport Authority India	2014. Jan
	Navi Mumbai Police	New Mumbai	New Mumbai Police	2014. Apr
	Farida shoe pattern printing system	Chennai	Farida Shoe Manufacturing	2014. May
	UFLEX Printing Dater center	New Delhi	UFLEX Printing co.,	2014. July
	Military Engineering Service, Bareilly office	Bareilly	Military Engineering Service	2014. July
	Liquid Propulsion Systems Centre (LPSC)	Trivandrum, Kerala	India Satellite Research Organization	2014. Aug
Brazil	Bhopal Police communication station	Bhopal	Bhopal Police	2014. Aug
	TIM Biosite No. 08219	SAO CONRADO Beach, RIO	TIM Celco	2016. Mar
	Claro Biosite No. BR-101, Rio Bonito	Rio Bonito	Claro Celco	2016. Aug

## Major Clients in Korea









 Presidential Security Service	 ROK NAVY	 ROK MARINE	 ROK AIRFORCE	 ROK ARMY	 Defense Comm Command
 Korea Combat Training Center	 Army Logistics Command	 Agency for Defense Development	 Capital Garrison Command	 National Emergency Management Agency	 Korea Forest Service
 Ministry of Ocean and Fisheries	 Meteorological Agency	 Fishery Information Communication	 Hydrological Survey Center	 Korea Environment Corporation	 Korea Water Resource Corp
 Korea Broadcasting System - DTVR	 Buddhism Broadcasting System	 MunHwa Broadcasting Corp	 Traffic Broadcasting System	 KTF - Korea Telecom Mobile	 SK Telecom
 Korea Gas Corporation	 Chungbu City Gas	 DaeHan Oil Pipe line Corp	 Korea Rural Community Corp	 Construction Management Admin	 Korea Cancer Center Hospital
 Wolsong Nuclear Power Plant	 Kori Nuclear Power Plant	 Boryung Thermal Power Plant	 Seoul Metropolitan Rapid Transit	 Daegu Metropolitan Rapid Transit	 MyongJi Hospital
 Korea Testing Laboratory	 Seoul city Waterworks Office	 ChunCheon City	 Changwon City	 Gwangyang city	 KRTnet Corporation
 Cultural Heritage Administration	 Korea Electric KDN	 Korea Hydrographic, Oceanographic Admin	 Central Radio Management Office	 Baekseok University	 Hanyang University

# Performances

## Major Clients in Malaysia

	
Royal Malaysia Air Force	Telekom Malaysia
	
Royal Malaysia NAVY	KUANTAN PORT
	
Royal Malaysia Army	North-South Highway Corp
	
Royal Malaysia Police	Defense Comm Command

## Major Clients in Thailand

	
Royal Thai Army	Military Intelligent
	
Royal Thai NAVY	Armed Forces HQ
	
Royal Thai Police	GISTDA Satellite Station
	
Quarter Master Oil terminal	Gulf Energy Group (GED)

## Major Clients in India

	
India ARMY	AAI - Airport Authority India
	
India Air Force	Central Public Work Department
	
Army Signal Command	DRDO-Defense R & D Org
	
Military Engineer Service	India Satellite Research Org

## Major Clients in Korea

			
Brazil Vaccine Lab	Airports Authority of India Glide Path	Malaysia Airforce Radar Station	Telekom Malaysia Station
			
Brazil 4G Biosite	India BSNL Repeater station	Malaysia Police Microwave	Thailand Army Wireless IP Link
			
Indonesia Critical Communication	India Police wireless site	Malaysia Police NOC	Thailand Navy Satellite Station
			
Turkey Meteorological Radar Station	Malaysia Airforce Localizer station	Malaysia Airforce FIR	Thailand border surveillance



< CE certificate >



< SIRIM Test - IEC 61643-1 >



< ISO 9001 certificate >



< ISO 14001 Certificate >



< Testimonial Letter (Malaysia) >



< Testimonial Letter (India) >



< P/L Insurance Policy >

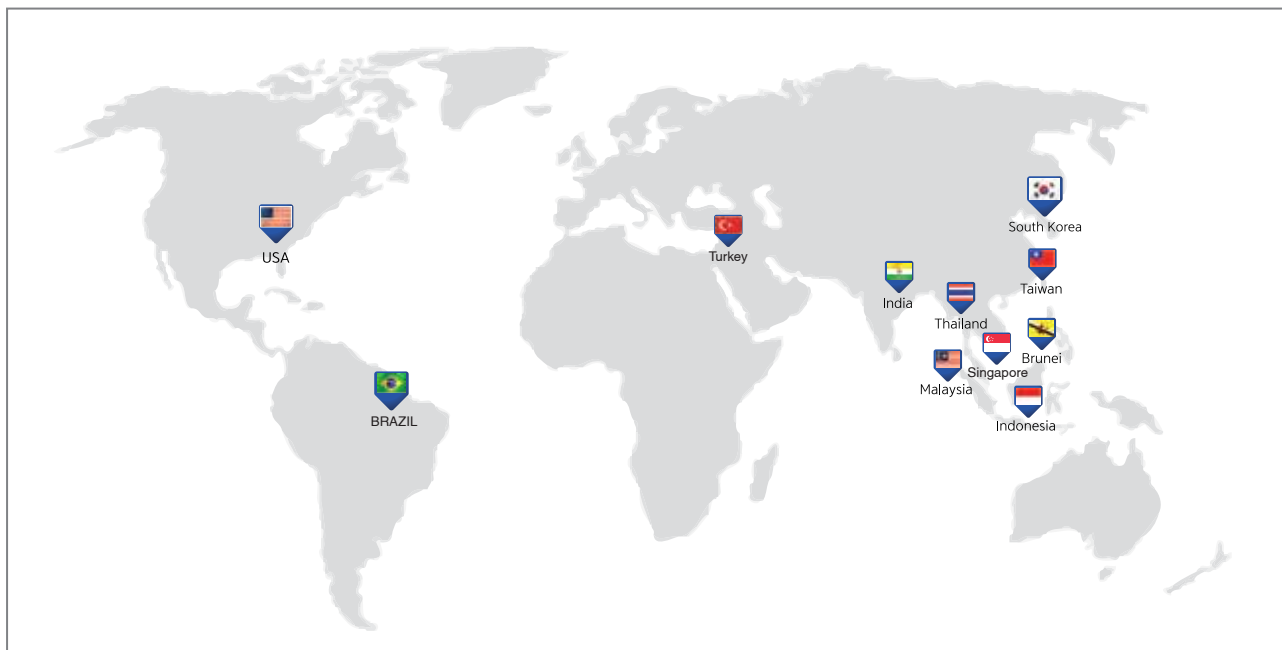


< MIL Test report >



< Testimonial Letter (Korea) >

# Global Network



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## MAJOR CLIENTS/USERS

eca3G has been extensively installed in South Korea for Navy, Army, Air Force, Special Government Departments, National Institutions, Water Service Management Agencies, Railways, Subways, Road Construction Sites, Sewage Treatment Plants, Drinking Water Treatment Plants, Broadcasting Stations, Telecom Base Stations, Universities, Hospitals, Research Institutes, Factories, Golf Clubs, Gas Corporations, Hydro-Nuclear Power Corporations, Mobile Communication Service Providers, Mobile Shelters and etc.

## Certificates



USA Patent



CE MARK



Certificate of Korean patent



Certificate for Good product approved by public Procurement Service



Certificate of INNO-BIZ



ISO 14001



Certificate of Performance  
The head of small and medium business administration



Certificate of enterprise research laboratory



International Patent



Certificate of Product Liability Insurance



US Patent



INNOBIZ  
Enterprise



Korea  
Patent



Q mark  
Quality  
Assurance



CE MARK



ISO9001:2008  
ISO4001:2004



Superior Defense  
SME Goods



R&D Venture  
Enterprise



PL insurance  
1bil Won



SIRIM  
QAS

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