Since1999 GROUND

1.602 ×10⁻¹⁹ eca3G

India

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GROUND Co., Ltd.

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GROUND Since1999

July.2023

eca3G

3rd Generation

Digital Lightning Protection Device

- Designated as an excellent product for government procurement and certified by the Ministry of Small and Medium-sized Venture Enterprises Product.
- Product Liability Insurance (PL, 500 million won) guarantees 100% damage protection with PGS (10 years of performance guarantee) 24 hours a day, 365 days a year Strategic (logistical) material registration,
- US Army RDECOM/GSTW registration U.S. and international patents, domestic patents,.
- CE certification, SIRIM, Q-Mark, ISO 9001:2015 ISO 14001:2015

Certificate of designation of Excellent Product	Excellent Performance Certification	US Patent	CE MARK	PL insurance ($500,000)
2018187	23-162	US 7,652,865 B2	N8 13 12 85780 001	PL18-000122

www.ground.co.kr, www.eca3g.com

Ground Co., Ltd. protects against natural disasters such as lightning, industrial accidents and serious disasters. We provide technologies and products that protect lives and prevent economic loss.

The customers of Ground Co., Ltd. are all countries and all citizens. Keeping in mind that electronic, electrical, information and communication facilities purchased and operated with taxpayers' money are valuable assets of customers, we will protect against lightning strikes and natural disasters · We will prevent major disasters.

- The world's first digital lightning protection device that get a US patent (2010)
- Technology, reliability, and stability of products proven as government procured excellent products and performance certified products.
- Lightning protection device that does not bury in the ground, lightning protection device that does not require a ground rod.

- It is the only lightning protection device in the world that can configure a common grounding and equipotential grounding system in a power system with an earth leakage breaker (ELB, ELCB)
- Product modularization for PGS 10-year performance maintenance service.

- Product durability guaranteed for 10 years.
- Maintained product liability insurance (PL insurance) for 18 years since 2006 Installed and delivered to approximately 6,600 domestic and foreign sites (2023.05).

GROUND History

2023 ~ 2021

2023. 00 : INADC(PT IKP),KBS, NMPNT, KOREATECH, ARISU, KCG, GOC
2022. 00 : KCG, Artillery Detection Radar, Korea Airports Corporation, CHA
2021. 00 : DOPCO, KHNP, KEPCO, SO Education, DGPS, Naval Operations Command

2020

2020. 00 : Gyeongbok Palace , local air defense radar, independent monitoring base
2020. 06 : 24 places including Seoul Metro Line 1~4 signal machine room
2020. 00 : KOREATECH(Firefighting), INDONESIA(IPON), KHNP, GWGS

2019

2019. 11 : Installed eca3G in 3 places including Seoul Metro Line
2019. 10 : Installation of TOD lightning protection devices for 13 divisions of Korea
2019. 10 : Installed eca3G in Lebanese contingent (Dongmyeong Unit)
2019. 07 : Gyeongbokgung Fire and Disaster Prevention Equipment eca3G installation
2019. 02 : Additional designation of excellent government procurement products
2019. 01 : Installation of eca3G at 35 tidal stations of the Korea Hydrographic and Oceanographic Agency
2019. 01 : Hyundai E&C Uruguay combined cycle power plant eca3G installation

2018

2018. 03 : ISO 9001:2015 / ISO 14001:2015 recertification
2018. 10 : Designated as an excellent government procurement product
2017. 03 : Thailand Navy's first on-site installation - RAYONG relay station
2017. 07 : First site installation in Turkey at Antalya Weather Radar Base in Turkey
2017. 08 : Acquired performance certification (EPC) No.23-162

2016

2016. 06 : Determination of eca3G as military strategic material by the DAPA
2014. 08 : Patent registration of TNC-P type lightning protection device
2014. 03 : Registered eca3G with US Army 'RDECOM/GSTW'
2013. 04 : Listing and registration of eca3G in Defense Standards Comprehensive
2013. 02 : Installed eca3G in Iraq and South Sudan

2010

2010. 01 : Registered US patent (US 7,652,865 B2)
2007. 05 : Designated as an excellent government procurement product
2007. 03 : Small Business Administration Performance Certification

2006

2006. 10 : Registered the establishment of a company affiliated research institute
2006. 08 : PCT international patent - grounding device without burying
2006. 08 : ISO 14001:2004 certification registration
2006. 07 : UL registration - PGS grounding device
2006. 07 : Patent - Earthing device that does not need to be buried in the ground
2005. 10 : Designated as a quality assurance company (acquisition of Q mark)
2005. 08 : Registered as a new technology (NT) venture company

2004

2004.12 : Registered ISO 9001:2000 certification
2004. 01 : Change of name - GROUND
2000. 12 : Registered as Energy & Ground Bank Corporation

1999

1999. 06 : Established GOON SYSTEM

Perfect Grounding System

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

Proven performances at Military, National Security sites : Over 6,600 sites+ for 25yrs,

Protection Success rate : 99.88%

Registered product at US Army Foreign Technology Database (GSTW)

Total Lightning Protection for PCB, Electronic components, Digital-IP Network-ICT devices from Lightning surge, Reverse surge, GPR

without adding grounding rods. Without making low earthing resistance

LM-Series

TNC-Series

eca3G

the 3rd Generation Digital Grounding Device for Perfect Lightning Surge Protection without burying in Ground

LP-Series

TM-Series

PGS on-line
Monitoring System

| US PATENT 7,652,865 B2 |

| SIRIM TEST : IEC 61643-1 |

| CE No. N8 15 07 85780 002 |

- 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, Korea)
- Product Liability Insurance for lightning surge damages in Korea
- Digital Grounding Device
  - Need not additional grounding rod
  - Need not low earthing resistance
  - Grounding without burying in ground
  - Protect from Reverse Surge, Indirect lightning, GPR
- Multi-Pulse lightning protection design
- Modular design for over 10years PGS Maintenance Service

TOTAL LIGHTNING PROTECTION SOLUTION eca3G

Perfect Protection for advanced networked electronic IT based systems

Since 1999, < GROUND Co.,> has implemented most successful lightning protection performances pursuing 100% perfect protection for 6,600+ sites of electronic digital systems under Military, National Security sites with US patented technology. PL insurance has been provided to the clients in Korea as repair cost guarantee if lightning damages occur under our protection services.

<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 lighting 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, Common Grounding become importan
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

There are no new IEC standards for above newly changed environment

<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.

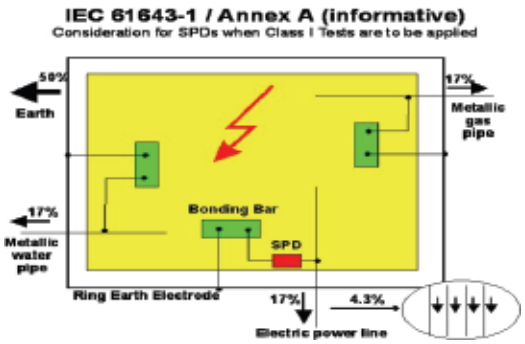
eca3G will provide perfect protection solution for following environment.

- 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.

Understanding Lightning

“ In Korea, an average of 145,000 lightning strikes have occurred annually over the past 10 years, and the trend is increasing. When the average temperature increases by 1 degree due to global warming, the frequency and intensity of lightning strikes increase by 13% ”

IEC 61643-1/Annex A



IEC 61643-1. Annex A. Fig A.1

Determining the current distribution through SPD in case of direct lightning to the structure equipped with an external lightning protection system,
17% of current is via power line which may be protected by SPD.

SPD' capacity is designed as below :
17% for power line surge,
each R.S.T.N line take 4.3% of 17% lightning current

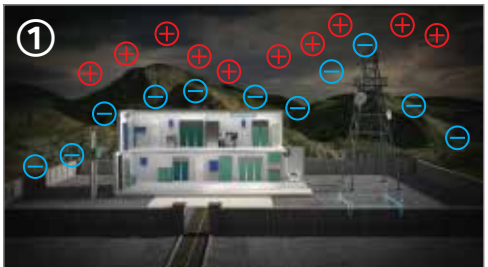
SPD has no coverage for the other surges via Gas & Water piping line Surges etc (33%) .

Lightning damage type

Types of damage caused by direct lightning strikes: buildings, lives, etc.

Types of damage caused by induced lightning strikes: electronic equipment, etc.

Lightning occurrence and path



Ground charge distribution during thundercloud movement

Lightning strike (discharge to ground)

Direct discharge to facilities (direct lightning strike)

Flow into the lightning surge facility by the potential difference (induced lightning)

Product Features

01 eca3G

Perfect lightning protection for PCB, IC-Chip, electronic devices, digital electronic communication equipment, sensors, etc.

Changes in the lightning protection environment in the digital age

70-80% of recent lightning strikes are multiple strikes	More and more IC chips are used in advanced digital systems	Operation of network, digital, electronic information and communication facilities	Damage to electronic equipment is indirect, not direct.	Potential difference between N-G affects the operation of advanced IC chips
3~4 lightning strikes per second along the same discharge path for a short moment	Electronic equipment 88.3% of unexplained failures Due to lightning surges	Reference potential (neutral wire), TN common ground important	Lightning damage is caused by reverse surges and ground potential rises. Not a direct hit	Signal, data distortion. semiconductor operation error, digital input signal error detection

"eca3G is a lightning protection specialized product that is perfect for various environmental changes"

02 Main Components

▲ EBDM

▲ NEQM

▲ Main board

▲ Neuter Module

▲ CGM

▲ SED

▲ EBDM

▲ HFDM

▲ SEQM

▲ M-LCM

▲ ECM

▲ M2M (Option)

▲ EBDM Drive Module

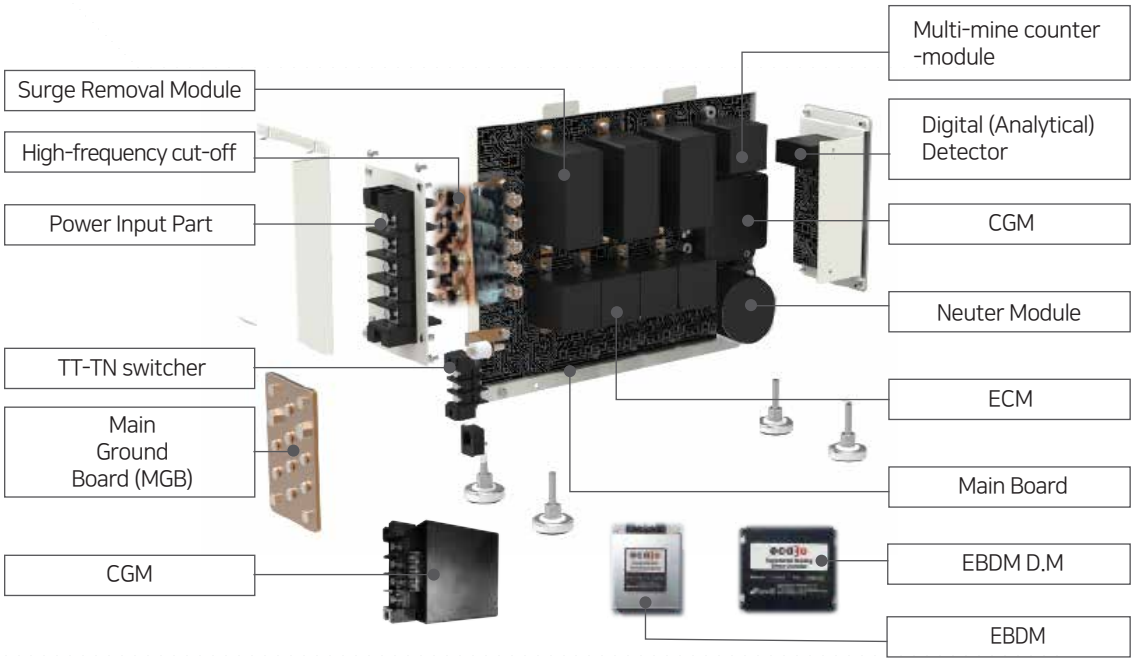
Product Features

Product modularization suitable for performance assurance maintenance services

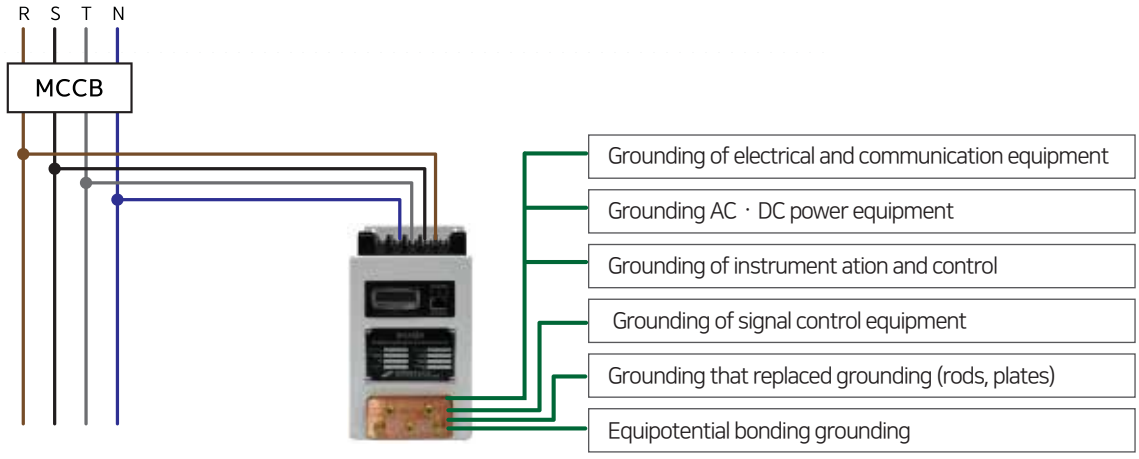
eca3G is a scientifically modular product.

It is highly economical because it can be interchangeable, replaced, and combined with parts, and it is a miniaturized, lightweight, and blocked, easy to install, withdraw, and move product, and it is a highly durable product.

03 Configuration Module Name



04 Installation Diagram



Product Features and Installation Location

eca3G TNC-M Series

| Feature |

Real-time lightning protection system configuration such as lightning surge inflow monitoring and self-diagnosis.
Detection of lightning surges in case of inflow and elimination by energy conversion.
Common ground/equipotential system configuration via equipotential Main Ground Board (MGB).

| Installation location |

Installed in parallel across the power distribution board

eca3G TNC-P / TNC-S Series

| Feature |

Constructed by converting the independent ground (TT) system into a common ground (TN) system.
Detection and energy conversion to remove lightning surges from inflow.
The potential difference between N-G is less than 0.05V to create a perfect equipotential environment.
P12 : Rail potential rise limite-Equipotential for limiting voltage and prevention of electric shock.

| Installation location |

Installation on the UPS side (The place where the UPS is not installed can be installed in the distribution board)

eca3G TNC-T Series

| Feature |

Detection and energy conversion to remove lightning surges
Removal of incoming lightning surges by installing in tactical communication vehicles and communication equipment racks

| Installation location |

Installed in a communication equipment rack or power distribution board

eca3G TNC-L Series

| Feature |

It is installed in small facilities and places to establish a common grounding environment, detect lightning surges in inflow, and convert energy to remove them

| Installation location |

Installed in power breakers such as CCTV enclosures, water level control alarm stations, and block systems

TNC-M Series

▲ CLARO SITE (RIO BONITO)
▲ BR-101, Rio Bonito

▲ A FUNDACAO OSWALD CRUZ
Avenida Brasil, 4365, Rio de Janeiro

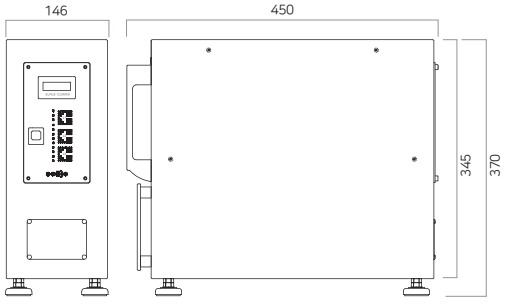
▲ Marine Fisheries
Administration

▲ Army Border Area Integrated
Situation Management System

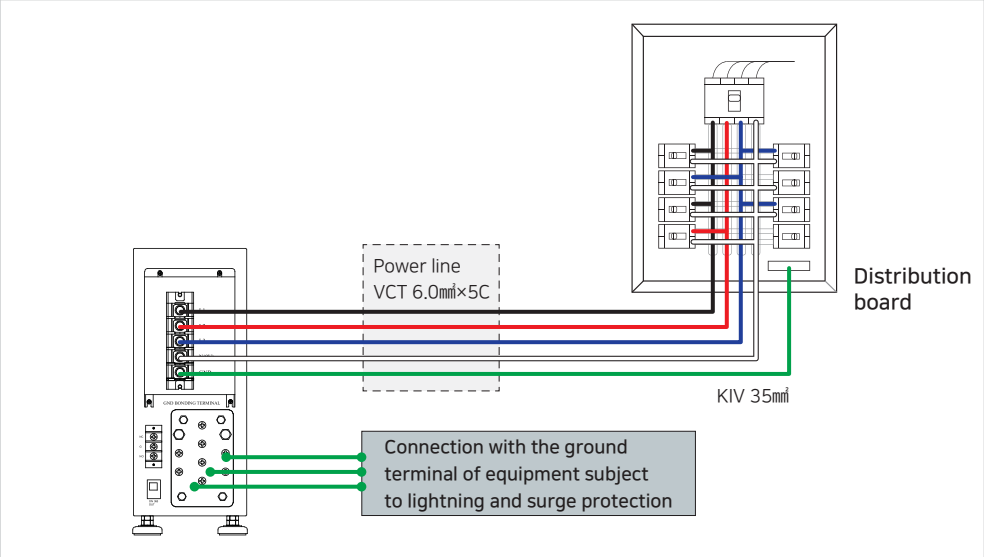
Product features and designations

① Lightning surge counter
② ON-365 port for remote monitoring
③ Operation indicator lamp
④ Power input terminal
⑤ Main Ground Board (MGB)

(Unit : mm)



Installation Diagram



Specifications

Model Name	Specification	Weight(kg)	Size(W×H×D/mm)
LM-1P	1Φ2w/220V/160KA	13.5 ~ 14.5	146×370×450
	1Φ3w/220V/320KA		
LM-3P	3Φ4w/220V/480KA		
	3Φ4w/380V/480KA		

Main Function

- Main switchboard LV (low voltage) panel, wiring circuit breaker (MCCB) panel
- Product quality warranty 2 years, durable 10 years.
- Lightning Surge Protection, Multiple Lightning & Induced Lightning Protection.
- Eco-friendly/grounding device that does not bury in the ground.
- Easy and quick installation/removal.
- Common / equipotential grounding provided.
- Built-in lightning surge counter
- Induced lightning surge &, ground potential rise (GPR) protection
- 24-hour uninterrupted equipment operation.

ecaBG TNC-S Series

Brazil 4G Biosite, Copacabana Beach, Rio de Janeiro in Brazil

▲ Tol Gate One-Tolling System

▲ TRS Mobile Relay Station

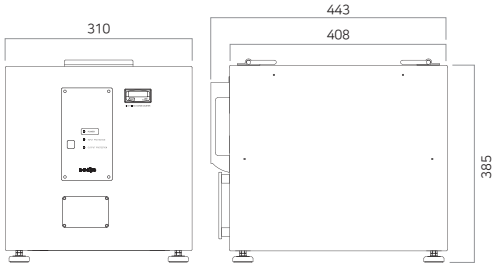
▲ Water purification plant automation control system

▲ Water Resources Corporation Block System

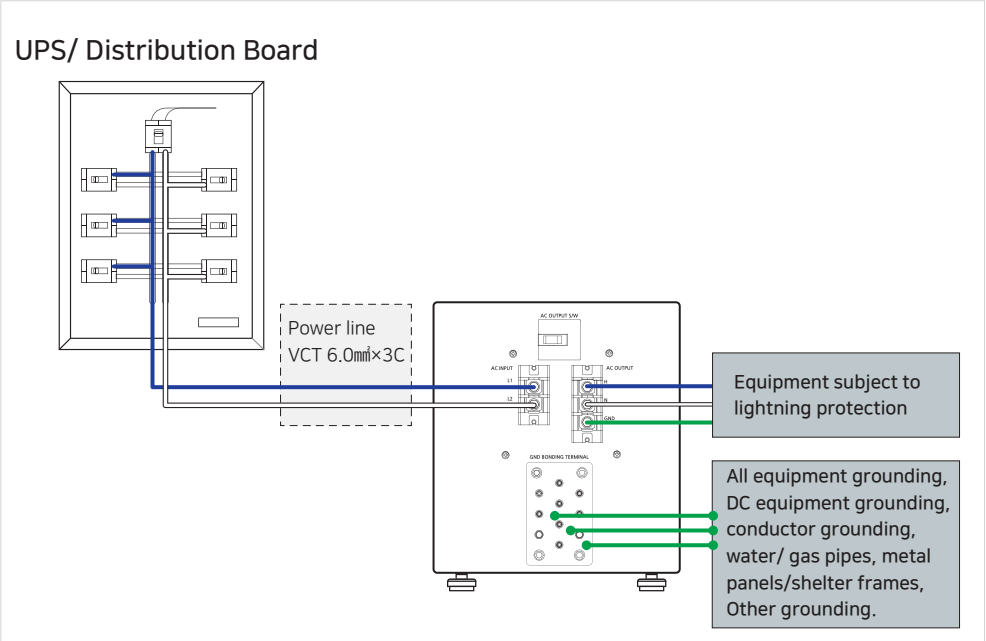
Product features and designations

(Unit : mm)

① Lightning surge counter
② Operation indicator lamp
③ ON-365 port for remote monitoring
④ Power circuit breaker
⑤ Power input terminal
⑥ Main Ground Board (MGB)



Installation Diagram



Specifications

Model Name	Specification	Weight(kg)	Size(W×H×D/mm)
eca3G TNC-0.3k	1Φ2w/220V/480KA/0.3kVA	9.6	310×385×443
eca3G TNC-0.5k	1Φ2w/220V/480KA/0.5kVA	15	
eca3G TNC-1k	1Φ2w/220V/480KA/1kVA	32	
eca3G TNC-2k	1Φ2w/220V/480KA/2kVA	35	390×385×443
eca3G TNC-3k	1Φ2w/220V/480KA/3kVA	43	
eca3G TNC-5k	1Φ2w/220V/480KA/5kVA	59	

※ The site where UPS (lottery type) and AVR are installed is designed with eca3G TNC-P1 and P3 types, regardless of capacity.

Main Function

- **Single-phase, UPS second-side output stage installation**
- Single-phase voltage installation without neutral wire
- Product quality guarantee 2 years, durable 10 years
- Lightning Surge Protection, Multiple Lightning & Induced Lightning Protection.
- Eco-friendly and no need to bury the land
- Easy and quick installation/removal
- Provides common/equipotential grounding - N- G:0.5V or less configuration
- Built-in lightning surge counter
- Protection against induced lightning strikes, direct strike surges, and ground potential rise (GPR)
- 24-hour uninterrupted operation

TNC-P Series

▲ Gyeongbokgung Palace Fire and Disaster Prevention

▲ Water purification plant facilities (Bupyeong, Incheon)

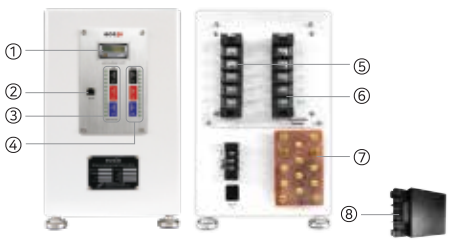
▲ Jeonbuk Transportation Broadcasting (Palgongsan Mountain, Jeollabuk-do)

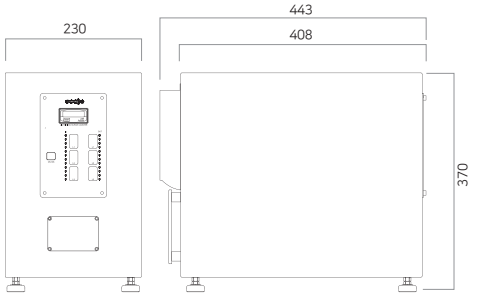
▲ Sejong the Great Historic Site Management Office

Product features and designations

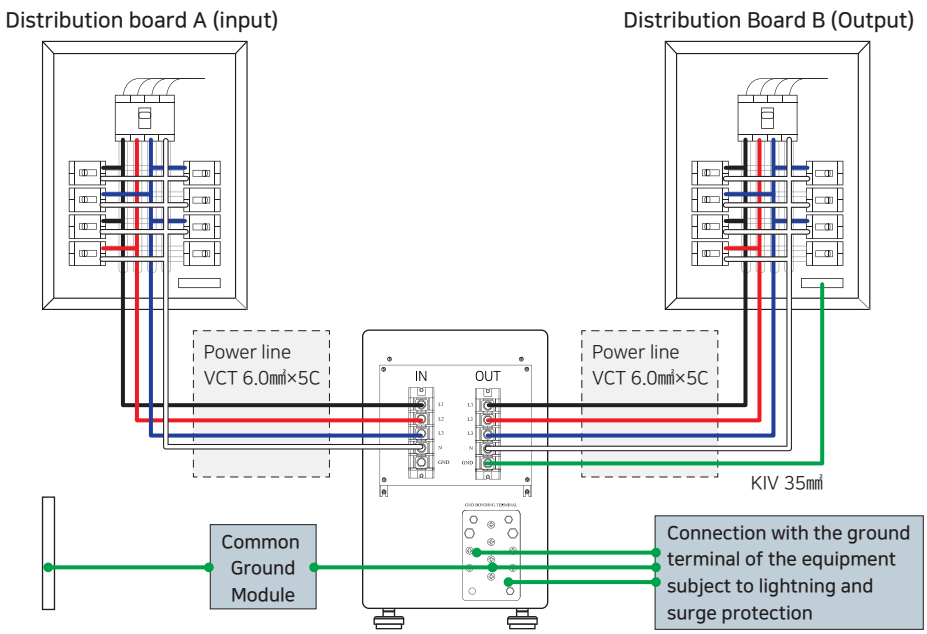
(Unit : mm)

① Lightning surge counter
② ON-365 port for remote monitoring
③ Display of input operation function
④ Display output operation function
⑤ Input power connection
⑥ Output power connection
⑦ Main Ground Board (MGB)
⑧ Common ground module





Installation Diagram



Specifications

Model Name	Specification	Weight(kg)	Size(W×H×D/mm)
eca3G TNC-P-1P	1Φ2w/250V/480KA/100kVA	19	230×370×443
eca3G TNC-P24	AC/240kA A,DC 24V / 80kVA	19	
eca3G TNC-P-3P	3Φ4w/500V/960KA/300kVA	20	
eca3G TNC-P48	AC/480kA,DCV48/80KA	20	
eca3G TNC-P12	DCV12/DCA90/280KA	10	280×560×130

Main Function

- Main switchboard LV (low voltage) power supply input and output stage installed
- TNC-M model 2 sets equivalent performance
- Product quality guarantee 2 years, durable 10 years
- Lightning Surge Protection, Multiple Lightning & Induced Lightning Protection.
- Eco-friendly and no need to bury the land
- Easy and quick installation/removal
- Provides common/equipotential grounding - N- G:0.5V or less configuration
- Built-in lightning surge counter
- Protection against induced lightning strikes, direct strike surges, and ground potential rise (GPR)
- 24-hour uninterrupted operation
- P12, P24, P48 PSD models: Common ground that constitutes PSD DC system, equipotential and limiting voltage. Equipotential module configuration

TNC-T Series


▲ Estacion Meteorologica AWS

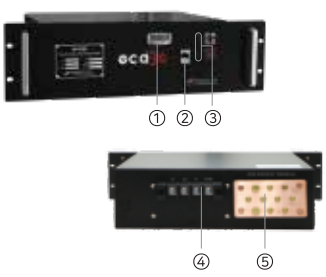

▲ India Airforce


▲ Military tactical vehicle radio equipment

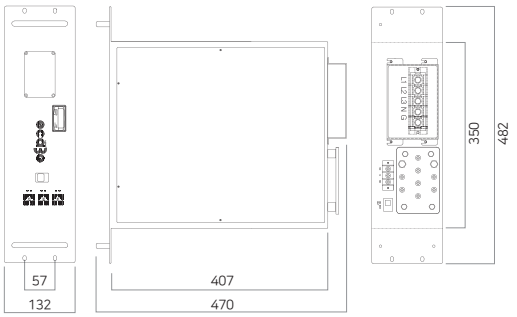

▲ Community Center Computer Equipment

Product features and designations

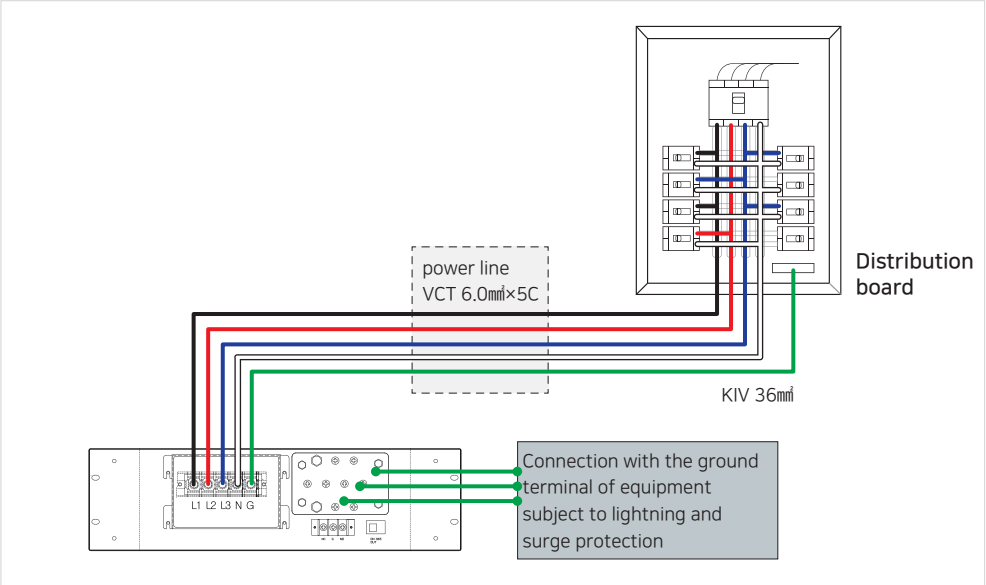
① Lightning surge counter
② ON-365 port for remote monitoring
③ Operation indicator lamp
④ Power input terminal
⑤ Main Ground Board (MGB)



(Unit : mm)



Installation Diagram



Specifications

Model Name	Specification	Weight(kg)	Size(W×H×D/mm)
eca3G TM-1P	1Φ2w/220V/160KA	13	482×132×470
	1Φ3w/220V/320KA		
eca3G TM-3P	3Φ4w/220V/480KA		
	3Φ4w/380V/480KA		

주요 기능

- Equipped with a 19-inch rack, suitable for mobile tactical vehicles / shelter vehicles
- Product quality guarantee 2 years, durable 10 years
- Lightning Surge Protection, Multiple Lightning & Induced Lightning Protection.
- Eco-friendly and no need to bury the land
- Easy and quick installation/removal
- Provides common/equipotential grounding
- Built-in lightning surge counter
- Protection against induced lightning strikes, direct lightning surges, and ground potential rise (GPR)
- 24-hour uninterrupted operation

ecaBG TNC-L Series

▲ Brazil Vila Miiltar

▲ FIOCRUZ_Vaccine_Lab

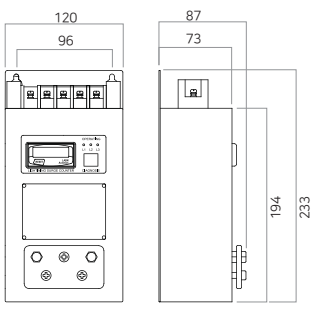
▲ MBC Relay Station

▲ Water purification plant flow meter

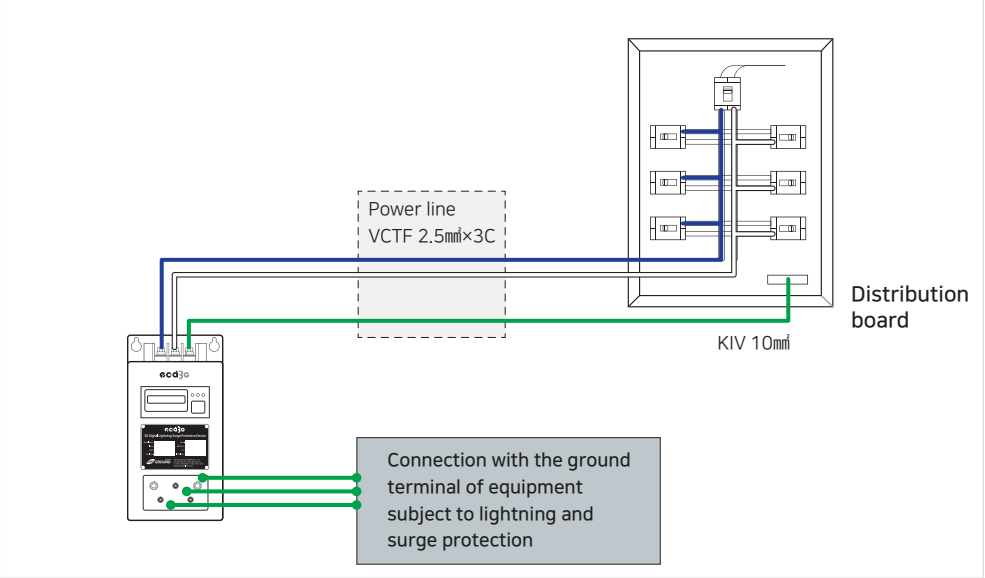
Product features and designations

① Lightning surge counter
② ON-365 port for remote monitoring
③ Operation indicator lamp
④ Power input terminal
⑤ Main Ground Board (MGB)

(단위 : Unit)



Installation Diagram



Specifications

Model Name	Specification	Weight(kg)	Size(W×H×D/mm)
eca3G LP-1P	1Φ2w/220V/80KA	2 ~ 2.3	120×233×87
	1Φ3w/220V/160KA		
eca3G LP-3P	3Φ4w/220V/240KA		
	3Φ4w/380V/240KA		

Main Function

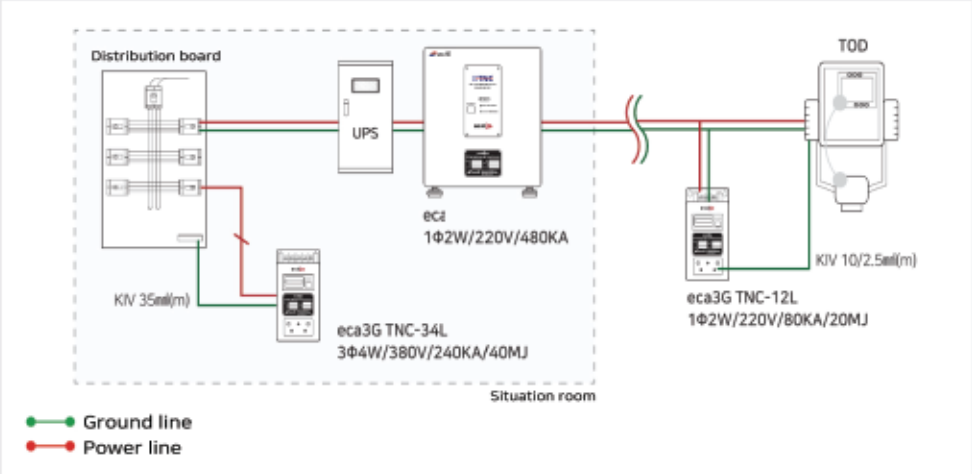
- Local DB, CCTV panel, small venue
- Product quality guarantee 2 years, durable 10 years
- Lightning Surge Protection, Multiple Lightning & Induced Lightning Protection.
- Eco-friendly and no need to bury the land
- Easy and quick installation/removal
- Provides common/equipotential grounding
- Built-in lightning surge counter
- Protection against induced lightning strikes, direct lightning surges, and ground potential rise (GPR)
- 24-hour uninterrupted operation

Key Performance and Effects

① Even in bad weather and thunderstorm warnings, the power is not turned off and continuous monitoring operations are guaranteed.

② Stable power supply improves equipment operation efficiency

Installation Diagram



Product configuration and function by installation location

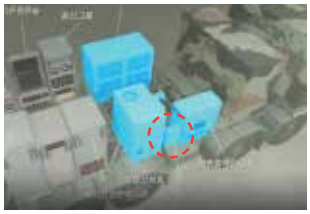
location	Situation Room (Distribution Board)	TOD camera (power breaker)	Remote control device(UPS)
Models	eca3G TNC-34L	eca3G TNC-12L	eca3G TNC-3K
Product photos			
Function	Entering the control room Lightning surges such as induced lightning Remove by converting energy	Inside the thermal imaging camera Removal of incoming lightning surge	Protective facility Equipotential configuration / power supply

Key Performance and Effects

- Even if lightning strikes occur, the power supply (Main) is never turned off.
  (Operation Instructions)
- Even if lightning strikes, the equipment is operated normally as in normal times.
  (Operation Instructions)
- Never disconnect the ground wire during lightning strikes or in peacetime.
  (Operation Instructions)
- The lightning protection device (eca3G) is a common ground (TN),
  and the additional equipment is also a common ground (TN) method.

TNC-LEMP

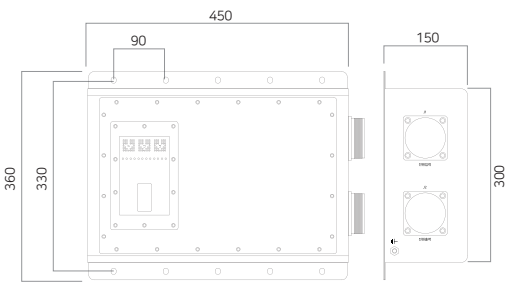

[사진출처:https://www.lignex1.com/view/pr/nex1NewsView]

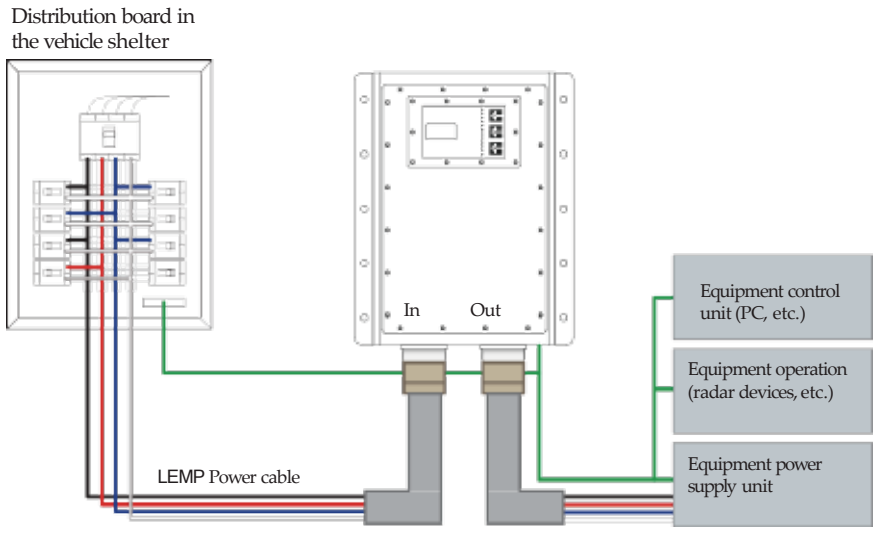
Product features and designations

① Power input
② Power output part
③ Ground terminal

(Unit : mm)



설치 구성도



Anti-artillery radar vehicle shelter

Specifications

	Model name	Specification	Weigh(kg)	Size(W×H×D/mm)
LEMP-1P	LEMP-12-20-60M	1Φ2w/220V/160KA	12~15	150×360×450
	LEMP-13-20-60M	1Φ3w/220V/320KA		
LEMP-3P	LEMP-34-38-90M	3Φ4w/380V/480KA		

Main Function

- **Protection of LEMP and electronic communication and C4I equipment from lightning and surges**
- Product quality guarantee 2 years, durable 10 years
- Lightning Surge Protection, Multiple Lightning & Induced Lightning Protection.
- Eco-friendly and no need to bury the land
- Easy and quick installation/removal
- Common / equipotential grounding provided
- Built-in lightning surge counter
- Protection against induced lightning strikes, direct lightning surges, and ground potential rise (GPR)
- 24-hour uninterrupted operation
- Includes eca3G product self-protection design from LEMP

SPD

Models

▲ G-RS232

▲ G-VIDEO-A

▲ G-RS422-A

▲ G-8P6V

▲ G-LAN-A

▲ G-RF:N-J/P

Specifications

	Model Name	Protcol	Application	Weigh(g)	Size(W×H×D/mm)
SPD	G-RS232-S	RS232	RS(9port), RJ(10 pin) IDU, ODU	163	107×80×23
	G-RS232-A	RS232	RS(9port), RS 232, POE IP CCTV	150	107×80×23
	G-MDI-A	RJ/10 pin	POE #5,6 : DC 48V, RJ-10 pin IDU, ODU	140	100×80×23
	G-8P6V-A	RS232, 422, 485	6 pin Parallel Type/RS-232, 422, 485	125	108×80×23
	G-LAN-A	RJ 45	POE, IP CCTV , DATA COMUNNICATION	77	72×30×30
	G-RS485-A	RS485	Wired/wireless TCP/IP communication and serial data communication	47	68×30×30
	G-RS422-A	RS422		60	80×30×30
	G-VIDEO-A	BNC/RG59	CCTV (camera) video signal (RG 59 cable)	60	68×25×25
	LS-1P110AC	1P2W	For power supply of railway traffic light controller	240	112×46×60
	G-ECA-80	DC/G-AC/G	DC ground and AC ground connection, equipotential maintenance device For SMPS and AC and DC electromagnetic equipment	156	150×80×23
	G-RF:N-J/P	RF	RF-N communication lines	117	68×28×25

Main Function

- Surge protector (SPD) that interlocks with and assists eca3G products to expand the range of lightning protection on communication lines and data lines and blocks/removes surges through communication lines, data lines, and signal lines.
- Surge protector (SPD) that blocks surges in communication, signal, and data lines of electro -nic communication and informatization facilities *Applicable facilities: Scientific boundary system, wired and wireless communication facilities, information communication facilities, disaster prevention facilities, CCTV facilities, instrumentation and control facilities, data devi -ces, signal devices, measurement devices
- Installation location: TM/TC, RTU, communication RACK, CCTV, security equipment, etc., signal, data, measurement Parallel (7P) and series (3P, 5P) connection to the line/signal system, and connection of the ground wire to the ground terminal of eca3G

ON-365 System M2M Module (Optional)

Product features and designations

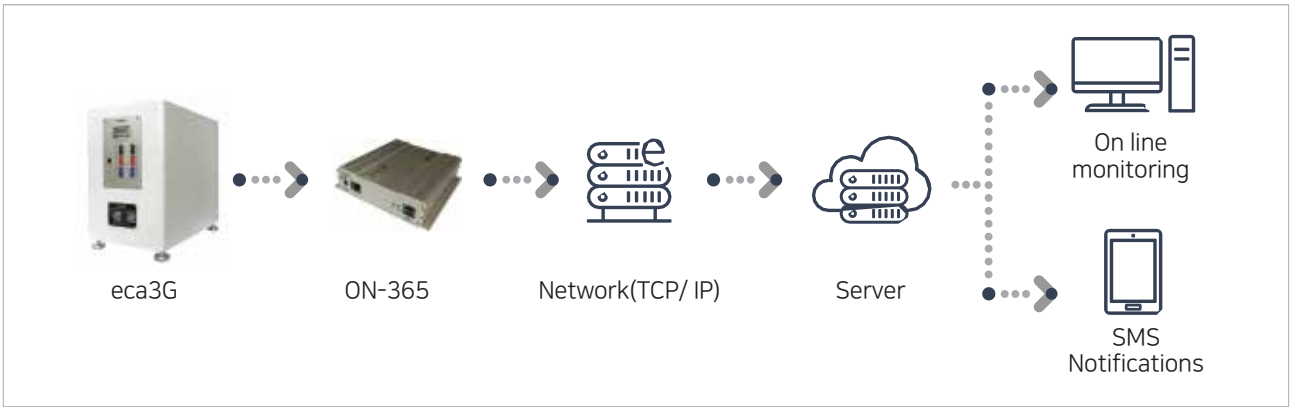
① DC adapter
② LAN port
③ ON365 operation status LED
④ eca3G connection port

In order to secure the viability of advanced electronic communication information technology facilities in the 21st century from lightning strikes, we check the performance and operation status of eca3G in real time and maintain normal functions at all times, thereby completely protecting electronic and communication information facilities. In particular, since it is possible to monitor the equipotential state or the TNC method (common ground) in real time, it is possible to maintain the quality of the lightning protection system at the time of the completion inspection, so that the best lightning damage prevention can be continued.
It is a 'real-time lightning protection integrated management system' that enables equipment operation, vigilance, and mission execution without turning off the power even in the event of a lightning strike.

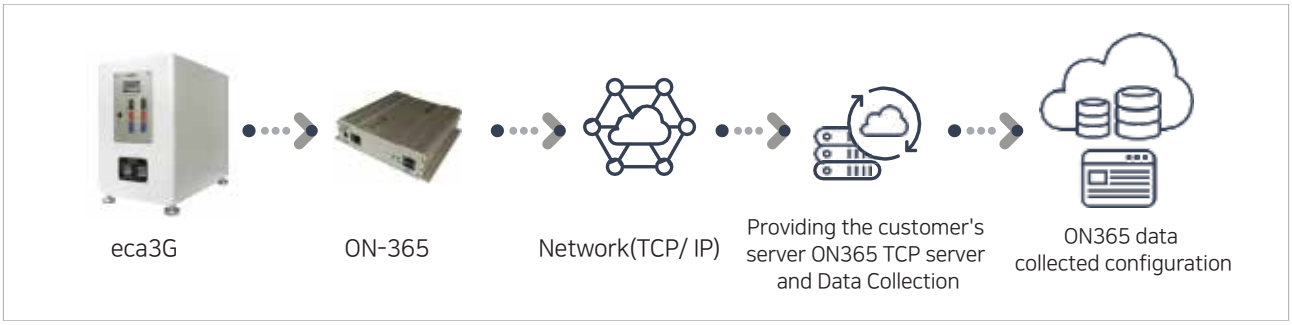
Features and effects

- Real-time monitoring, notification, and management function of lightning protection device, equipotential and TNC method (common ground)
- Monitoring, notifying, and transmitting the inflow of lightning surges in real time to check the operation status of lightning protection devices and manage their lifespan Remotely check equipment status to save time and resources for maintenance

ON-365 System Real-time Monitoring Configuration Diagram



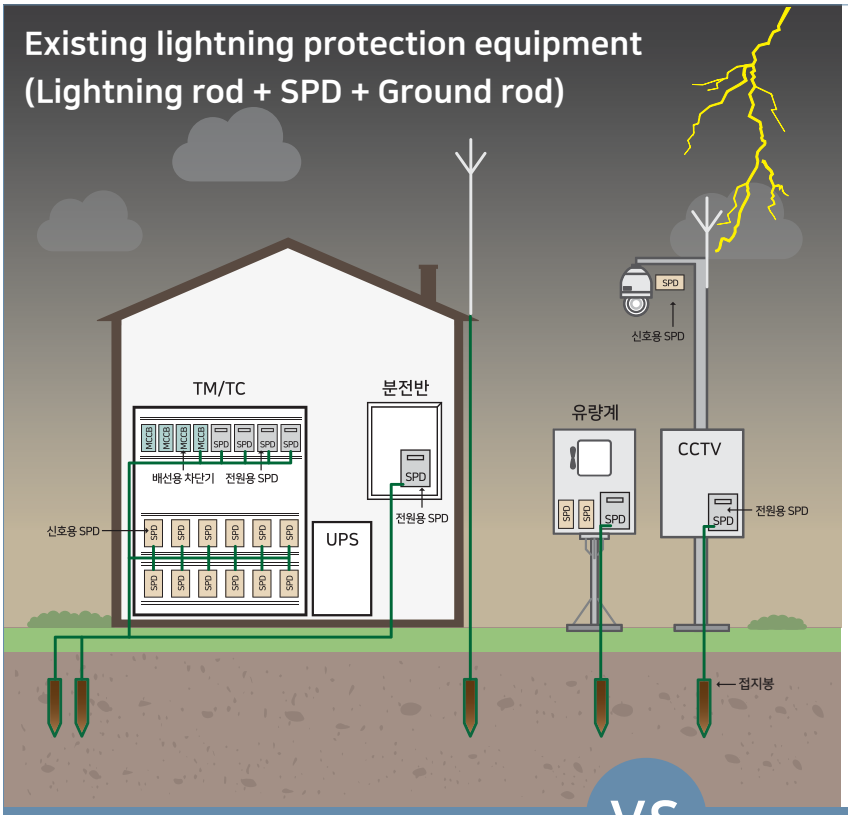
[Figure-1] Real-time lightning protection monitoring service configuration diagram



[Figure-2] Real-time lightning protection monitoring service configuration diagram for customers using independent networks

Comparison of installations (water intake stations)

Comparison of installations (water intake stations)



- How to install

Grounding rods, reducing materials, and lightning rods are installed in various places, and power, communication, signal, and bypass SPDs are installed independe -ntly

- Construction period

Long-term construction period (20 days) by installing trench, ground rod, reducing material, SPD, and lightning rod
Heavy machinery, boring equipment, and other external work

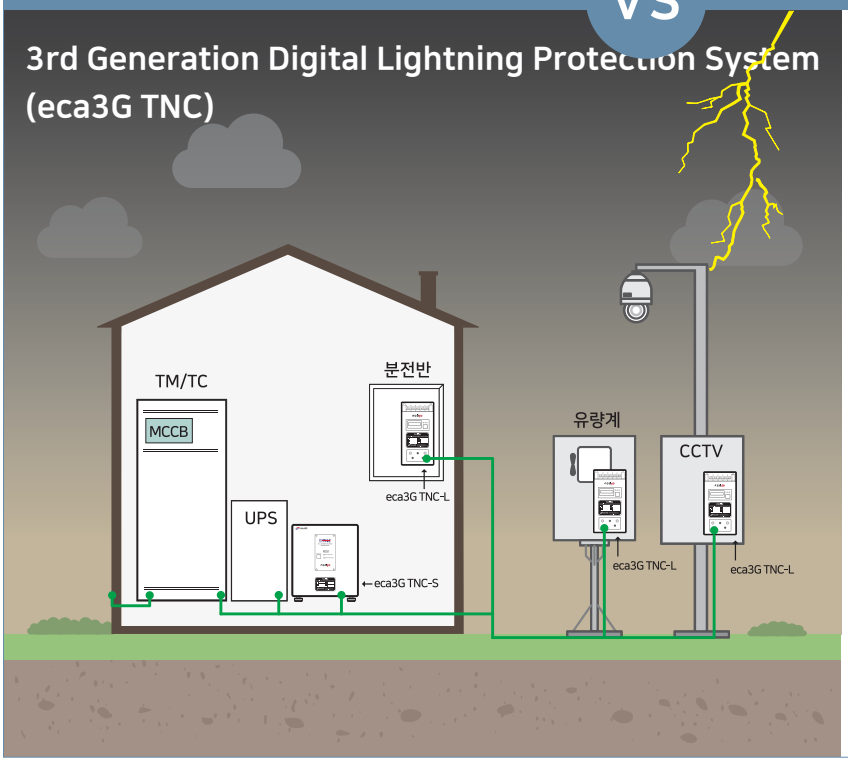
- Maintenance

It is fixed in the ground and cannot be maintained, and it is difficult to check the functional status.

- Indemnity

No liability in the event of lightning damage.
No PL insurance contracts.

VS



- How to install

Lightning protection devices are installed in the power supply system (distribution board), and lightning protection is easily solved by connecting the ground terminals of all prote -cted equipment

- Construction period

It can be built in a short period of time by installing it on a ground distribution board.
Easy internal installation

- Maintenance

It is easy to maintain by installing it in a distribution board, and remote monitoring of lightning protection status is possible (ON-365 system)

- Indemnity

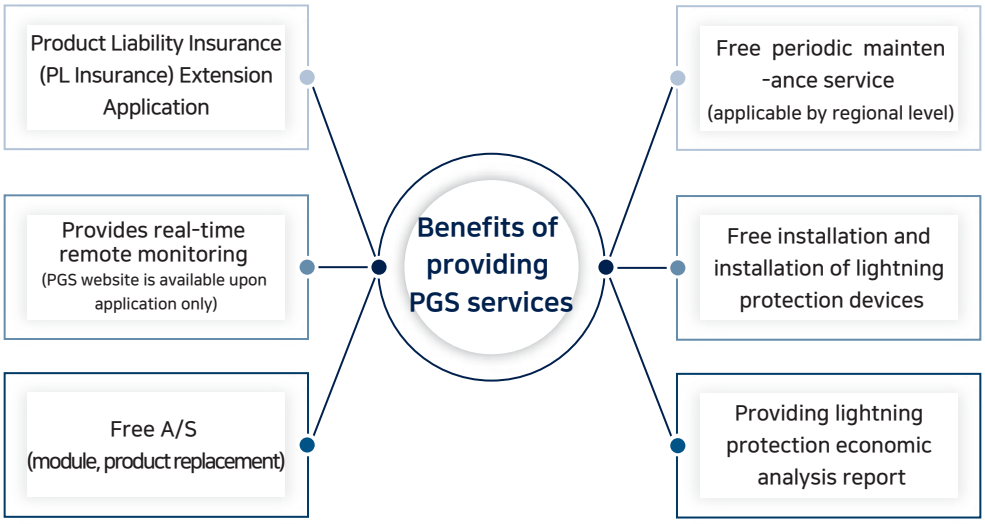
100% liability in the event of lightning damage.
PL Insurance 500 million won
(Hyundai Maritime)

Lightning protection performance maintenance service

PGS (Performance Guarantee Service)

The industry's first customer-only maintenance web service operation "pgs.kr"
'ONE-STOP lightning protection system support'

PGS Benefit



PARTICIPATION - International Defence Exhibitions with local partners

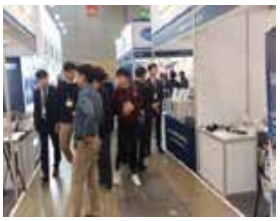

<DEFEXP0 2020-Feb. Lucknow, India>

<Defense & Security 2019 - Nov, Bangkok>

<DSEI 2019 - Sept. ExCeL, London , UK>


<SITDEF 2019 - May. LIMA, PERU>

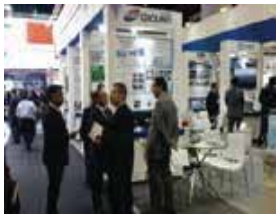

<AUSA 2019 - Oct, Washington DC, USA>

<MADEX 2019 - Oct. Busan, Korea>

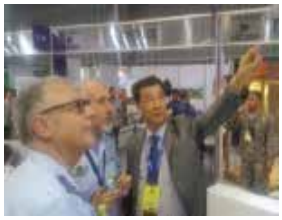
<IDEF 2019 - May. Istanbul, Turkey>

<ADAS 2018 - Sept. Manila, Philippines>

<AUSA 2019 - Oct, Washington DC, USA>

<INDO-DEFENSE 2018 - Nov, Jakarta, Indonesia>



<FIDAE 2018 - Apr, Santiago, Chile>


<LIMA 2017 - Mar, Langkawi, Malaysia>

Performance certification

3rd generation digital lightning protection system

- ✓ 3rd generation digital lightning protection system
  Designated as an excellent product by the government and certified by the Ministry of Small and Medium-sized Venture Enterprises (SMEs)
- ✓ U.S. and international patents, domestic patents, CE certification, SIRIM
- ✓ ISO 9001:2015 / ISO 14001:2015

Certificate of Excellence in Government Procurement

Performance Certificate

Patent No. US 7,652,865 82

CE : LM + TNC

CE : LP

CE

ISO 9001 certificate

ISO 14001 Certificate


SIRIM

TEST REPORT : MIL-STD-810G

Product Liability (PL) Securities


Certificate of Insurance (Hyundai Maritime)

Performance (~2019)

India

India ARMY	AAI-Airport Authority India	BSNL Telecom	ARMY Signal Command	DRDO-Defense R&D Org	Tamil Nadu State Police
India Air Force	Central Public Work Department	BEL-Bharat Electronics	Military Engineer Service	India Statellite Research Org	UFLEX packaging group
AP Police	amdocs LLC	Delhi Metro Rail Corporation	Indian Railways	Prasar Bharti	All India Radio

Thailand

Royal Thai ARMY	Military Inteligent	Singa Comm	Royal Thai NAVY	Armed Forces HQ	Gulf Energy Group(GED)
Royal Thai Police	GISTDA Satellite Station	Loxley Group	Post Engineering	GUNNO System	Chankesam Group

Brazil

TIM Mobile	Brazil NAVY	Embratel Telecom	SCCRIT Critical Comm Service
CLARO Mobile	Brazil ARMY	FIOCRUZ Vaccine Lab	TV Bandeirantes

Indonesia

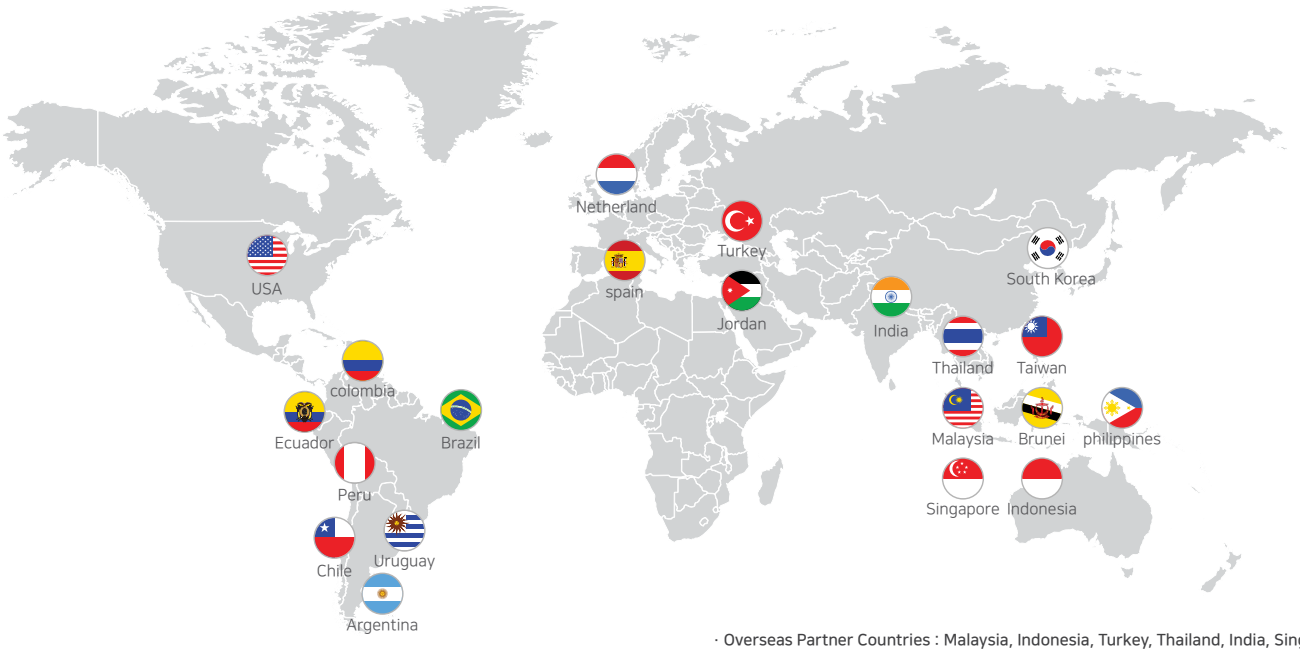
National Disaster Management Authority	Air Force	Police	NAVY

Peru& Ecuador

Ecuador Civil Aviation	Ecuador COMACO	PlusPetrol PERU	Turkey Meteorology

Performance (~2019)

✓ India, Malaysia, Brazil...
Exported more than $2 million to 13 countries in South America, Europe, and Southeast Asia.



· Overseas Partner Countries : Malaysia, Indonesia, Turkey, Thailand, India, Singapore, Brazil, Jordan, Philippines, Peru, Ecuador

· Countries under the KOTRA Convention : United States, United Kingdom, Spain, Chile, Peru, Ecuador

eca3G - Overseas Performances


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

Ground eca3G Private Limited
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Fax: +91-1-4902-9061
E-mail: info@groundeca3g.com / web: www.groundeca3g.com

Project Name	Site Location	Project Owner	Year
Pattern Making System	Chennai	Farda Shoes	2014
Test Lab Equipments	Site-1	Defence Research & Dev Org	2014
Test Lab Equipments	Trivandrum	Indian Space Research Org (ISRO)	2014
Server Room Protection	Pune	Muncipal Corporation	2015
Dopler Wather Radar	Bhubaneshwar	CPWD-Indian Metrological Dpt	2015
Cell Repeater	Utharakhand	Bharat Sanchar Nigam Ltd (BSNL)	2015
Communication equipment	Site-4	Indian Airforce	2015
CNS Equipments	Lucknow	Airports Authority of India	2015
Process & Automation	Site-5	Defence Research & Dev Org (IRDE)	2015
Process & Automation	Trivandrum	Indian Space Research Org (ISRO)	2015
Communication equipment	Site-7	Indian Airforce	2016
Signal Communication	Site-8	Indian Army	2016
Medical Equipment	Haryana	Fortis	2016
Test Lab Equipments	Noida, UP	Samsung India	2016
Wireless Repeaters	Chennai	Tamil Nadu State Police	2017
CNS Equipments	Srinagar	Airports Authority of India	2017
Singnal communications	Site-11	Indian Army	2017
Command Control Post	Hyderabad	AP State Police	2018
Test Lab Equipments	Trivandrum	Indian Space Research Org (ISRO)	2018
Research Lab Equipments	Nainital UP	ARIES	2018
Singnal communications	Site-14	Indian Army	2018
Mob. Communication	Site-16	Indian Airforce	2018
Software Dev Centre	Pune	Amsdoc LLC	2018
Research Lab Equipments	Ghaziabad UP	Dabour India Ltd	2019
Bio-Med Eqp. Manufring	Pune	S.H Pitkar Orthotools Pvt.Ltd	2019
CNS Equipments	Chennai	Airports Authority of India	2019
Test Lab Equipments	Trivandrum	Indian Space Research Org (ISRO)	2019
Signal Communication	Chennai	Indian Railways	2019
Test Lab Equipments	Delhi	Delhi Metro Rail Corporation	2019
Test Lab Equipments	Trivandrum	Indian Space Research Org (ISRO)	2019
Equipment Protection	New Delhi	Prasar Bharti & All India Radio	2019
CNS Equipments	Kolkota	Airports Authority of India	2020
Mob. Communication	Site-26	Indian Airforce	2020
Signal Communication	Site-27	Indian Airforce	2020
Server Room Protection	Mumbai	Mahrashtra State Electricity Board	2020
Communication systems	Site 07	Indian Airforce	2021
Communication systems	Site 22	Indian Navy	2021
Equipment roon	Site 75	Indian Airforce	2021
Mobile communicatiom	Bangalore	IBharat Electronics Ltd	2021
Communication systems	Hyderabad	Defence Reaserch & Development Org	2022
Control & Navigation Systems	Akadappa	Airports Authority of India	2022
Communication systems	Chennai	Airports Authority of India	2022
Radar systems	Site 07	Indian Airforce	2022
Test Lab	Hyderabad	Defence Reaserch & Development Org	2023
Mobile Equipment Shelter	Site 009	Indian Airforce	2023
Communication facility	Site 102	Indian Army	2023
CNS Equipments	Raipur	Airports Authority of India	2023

Performance

Malaysia

1SPKFDU /aNF	4iUF -PDaUiPn	1SPKFDU 0XnFS	:FaS
MP0C BU('321	(lenmarie, Shah Alam, Selangor	Telekom Malaysia Berhad	2010. May
MP0C KL+ ' 01	Petaling +aya, Selangor	Telekom Malaysia Berhad	2011. 'ed
MP0C KL+ '031	Petaling +aya, Selangor	Telekom Malaysia Berhad	2011. May
MP0C KL+ R 0 0	Petaling +aya, Selangor	Telekom Malaysia Berhad	2011. Mar
MP0C KL+ R 0 0	Petaling +aya, Selangor	Telekom Malaysia Berhad	2011. Mar
Bilik MD'-' 0 eca3(installation	SuCang, Selangor	Telekom Malaysia Berhad	2011. 0ct
C*MB ATM , Petronas gas station	SuCang, Selangor	Telekom Malaysia Berhad	2011. 0ct
Balai Polis Setapak	Setapak, Kuala Lumpur	Royal Malaysia Police	2012. Mar
Balai Polis TraGik 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
CaXangan Pengangkutan	Sungei Besi, Selangor	Royal Malaysia Police	2012. May
PULAP0L mCaXangan Kem Komandan	+alan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. May
PULAP0L mCaXangan Sekolah	+alan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. May
Narcotic Crime *nvestigation Dept	+alan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. May
MP0C K*N-'003	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
MP0C K*N-'0 1	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
MP0C K*N-'03	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
MP0C K*N-'0 0	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. May
MP0C K*N-'052	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. +une
MP0C K*N-'02	Bukit Kinrara, Selangor	Telekom Malaysia Berhad	2012. +une
Special 0peration Department	+alan Semarak, Kuala Lumpur	Royal Malaysia Police	2012. +uly
PLKP (Agricultural Engineering Training Centre)	UPM Campus, Serdang, Selangor	Telekom Malaysia Berhad	2013. Apr
C*MB ATM , Shell (as Station	Seri KemCangan, Selangor	Telekom Malaysia Berhad	2013. Apr
ECor North Toll gate	SuCang, Selangor	PLUS (HighXay Corporation)	2013. Apr
MP0C B(-'010	Batu (aKah, Perak	Telekom Malaysia Berhad	201 . May
MP0C B(-'311	Batu (aKah, Perak	Telekom Malaysia Berhad	201 . May
MP0C B(-'00	Seri *skandar, Perak	Telekom Malaysia Berhad	201 . May
MP0C B(-'013	Seri *skandar, Perak	Telekom Malaysia Berhad	201 . May
MP0C B(-'301	Seri *skandar, Perak	Telekom Malaysia Berhad	201 . May
Army PAB9 station	Sungei Besi, Selangor	Royal Malaysia Army	201 . May
'light *nGormation Region ('*R)	2 Sites	TUDM, Telekom Malaysia	201

Thailand

1SPKFDU /aNF	4iUF -PDaUiPn	1SPKFDU 0XnFS	:FaS
KHC-5 Camp Ammunition Depot surveillance system	Nakorn Rachaseema	Royal Thai Army	2012. May
Post Engineering Cuilding	MinCuri, BangKok	Post engineering	2012. Sept
Cosmo Skymed rack	Amphoe Siracha, ChonCuri	THE0S (round Station oG (*STDA	2012. Sept
BAMB00 RES0RT	L0PBUR*	BamCoo Resort	2012. Nov
2uartermaster terminal surveilance system	Tha Sai NonthaCuri	Royal Thai Army	2013. Nov
L Solar 1 Solar 'arm (. M8)	KaCinCuri , Prachin Buri	LoYey Co	201 . May
Border Camera Sites	Preah 7ihear	Royal Thai Army	201 . 0ct
Southern region inspection post	Hatyai	S*N(HA Communication	201 . Nov

eca3G Specification

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 (economic model)	Delta power, TT ground	
Major Gunctions	Total protection for electronic , communication, IT systems from ightning, induced surge, Ground Potential Rise				USA Patent, PCT , Korea Patent
	Common ground, equi-potential function, N-G : below 0.2V				
Product assurance	5 years warranty(LP: 2years), 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" 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	160A~480A/	160A~480A/	80A~240A/	240A~960A/	IEC 61643-11 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(WxHxD/mm)	150x360x450	485x135x450	130x205x96	270x345x408	Can be changed upon design improvement
Operation Voltage	100VAC ~ 440VAC				
Operation Temp	- 40C ~ +80C				
Installed Location	Power Distribution Board, UPS, AVR, TRANSFORMER				Parallel connection to power line (except TNC-S model)
Others	Multi-pulse lightning protection(patent), built-in surge counter, Ground Bonding Terminal for common grounding				
	Enable for centralized total real-time maintenance support by ON-365 via M2M				

Global Network

India

Ground eca3G Private Limited
C-74.F/F, DDA Sheds, Okhla Indl. Area Phase -1, New Delhi-110020, India
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E-mail: info@groundeca3g.com / web: www.groundeca3g.com

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Moblie: +91-981-0050116 / E-mail: sunil@unexindia.com

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E-mail : precision@pretech.com.sg / www.pretech.com.sg

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Quito, Ecuador
Tel : 593-2-243-0373
E-mail : juan_jaramillo@digitec.com.ec / www.digitec.com.ec