2023

Total Solutions for Railroad Signal Device

Railroad Signal System Specialist, SR

There is an SR in the Railroad

There is an SR in the Railroad

One of 3

Top in the domestic railroad signaling equipment industry

1st

The pioneer and sole producer and supplier of the innovative integrated modular impulse track circuit device in the railway industry

IoT

A leading provider of high-end electrical/electronic signaling products and an IoT Sensing Solution Provider

All in One

The only total solution company that offers integrated services from design, manufacturing, construction, to supervision for railway signaling system implementation

We will support the 10 principles of the UNGC and strive our best to firmly practice them

Human Rights

The 1st principle Business should support and respect internationally proclaimed human rights.
The 2nd principle Businesses should make active efforts to avoid complicity in human rights abuses.

Labor Standards

The 3rd principle Businesses should support the freedom of association and the effective recognition of the right to collective bargaining.
The 4th principle Businesses should eliminate all forms of forced labor.
The 5th principle Businesses should effectively abolish child labor.
The 6th principle Businesses should eliminate discrimination in employment and occupation.

Environment

The 7th principle Businesses should support a proactive approach to environmental issues,
The 8th principle Undertake measures to enhance environmental responsibility,
The 9th principle Promote the development and dissemination of environmentally friendly technologies.

Anti-Corruption

The 10th principle Businesses should oppose all forms of corruption, including extortion and bribery.

Furthermore, our company will constantly strive to fulfill the sustainable 17 Development Goals (SDGs) for corporate social responsibility (CSR).

* Corporate Social Responsibility

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01. Introduction and History of Company

Words of Thanks

Science for eco Revolution

We will make our best efforts for the day when the Earth and humanity become happier through **the development of environmentally friendly scientific technologies**.

Thank you for visiting our company, S.R. We deeply appreciate your presence.
Hello, everyone. I am Kang Chun-gi, the CEO of S.R. Corporation.
Since 2001, starting with the Seron E.N.G project, S.R. Corporation has been engaged in the railway signaling business in all places where railways exist.

With a focus on unity, diligence, creativity, and continuous improvement, we prioritize on-time delivery, quality enhancement, continuous improvement, and customer satisfaction in running together with the Korean railways. We hope to receive your attention and support for S.R. Corporation.
As a global company, SR is committed to exceeding legal compliance requirements to preserve the environment. All our employees uphold a strong sense of ethics and practice fair competition.

We adhere to the **10 principles of the United Nations Global Compact (UNGC)** and **respect the values advocated by ISO 26000**. We have embraced corporate social responsibility (CSR) in our business operations. Moreover, we strive to **implement international commitments regarding human rights and labor practices within our supply chain**.

To meet the growing expectations of our stakeholders, including customers and employees, we will continue to dedicate our efforts. We will develop safer and more beneficial new products and ensure impeccable quality. Additionally, we will further strengthen our commitment to sustainable management and social responsibility.

Thank you very much.

From all members of SR

01. Introduction and History of Company

Company Overview

Company name	SR Co., Ltd	CEO	Chun-gi Kang
Date of establishment	2008.05	Business	Manufacture of Railroad signal device
Website	www.sr.co.,kr	Employees	81
Address	SR Building, 50-8, Obongsandan 1-ro, Uiwang-si, Gyeonggi-do		

Management Philosophy

01. Customer satisfaction

A company that keeps its promise
to create the best quality and service

02. First class company

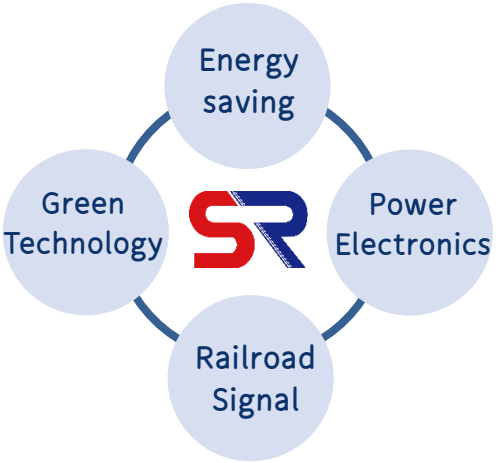
Talent-first principle "Company is people"
A company leading the future with constant innovation

03. A beloved company

The company you most want to work for
A company that fulfills its social responsibilities

Key Business

We develop and supply high-efficiency energy-saving products, contributing to the global environment and human well-being



We focus on enhancing energy efficiency and ensuring the stable supply of high-quality power

01. Introduction and History of Company

"SR, a comprehensive railroad signaling specialized company that has exclusively focused on the railroad signaling business."

01

20 years of Experience

Installing signaling systems at hundreds of domestic stations, participating in the project to connect the North and South Korean railways, supplying signaling equipment for the Gyeongui Line and Donghae Line in their entirety

02

Business Performances

An average annual revenue growth rate of 42.9%
An average annual operating profit growth rate of 77.7%
An operating profit margin of 24.0% (Recent five years, as of '2021)

03

Technological Capabilities

The only domestic producer and supplier of integrated modular impulse track circuit devices and power supply units for signaling purposes

As-is → Strategy → To-Be

Total Solutions for Railroad Signal Device

- Localization
- Digitalization
- Globalization

"Transforming into a specialized traffic signaling company"

01. Introduction and History of Company

Establishing business infrastructure

Establishment Phase (2001-2007)

2001 **Established SERON Electronic**, Public Procurement Service / Railroad Administration general competitive bidding registration

2002 Registered for general competitive bidding for Seoul Subway Corporation

2003 Company name change and company transfer to "Seron ENG"

2004 Supplied signal products to 6 stations for inter-Korean railway connection construction (Hyundai Asan Co., Ltd.)/ ISO9001 certification

2006 Registered patent for mechanism of power supply for train signal

Established an affiliated research institute, Registered as a venture business, lSO14001 certification

2007 Certified as a technologically innovative small and medium-sized business, (INNO BIZ)

Leading in the domestic railroad signaling sector

Growth Phase(2008-2018)

2008 **Established SR Co., Ltd.(conversion to a corporation)**
Confirmed as a company specializing in parts and materials (Ministry of Knowledge Economy) / Selected as a small business technology development support project (Housing Corporation)

2009 Registered patent for high-frequency rectifier for railway signal equipment

2018 **Automatic blockage control device (ABS) type approval (Ministry of Land, Infrastructure and Transport)**

Automatic blockage control device (ABS) manufacturer approval (Ministry of Land, Infrastructure and Transport)

Transformer, Acquired isolation CE certification

Global leap of railroad company

Leap phase (2019-Present)

2019 Technology evaluation (TCB) T-2 confirmation obtained

2020 **Supplied integrated modular impulse track circuit device (KORAIL)**

2021 **Establishment of railway signal communication for 15 stations in Mongolia (Byucksan Power Co., Ltd.)**

2022 ICT Technology Market Certification Technology Certification

02. Product Items Status

Product Items Status

Part	Product Name	Note
Dual-System Integrated Modular Impulse Track Circuit Device	1. Voltage Transmitter 2. Monitoring Receiver 3. Sub Rack 4. Track Relay (TR) 5. Transmit Impedance Bond (BT) 6. Receive Impedance Bond (BR) 7. Impedance Bond for 430A	1. Korean Railroad Corporation 2. Korea Rail Network Authority 3. Arex
Power Supply for Signal Device	1. Power Supply for Signal Device 2. Floating Rectifier for Signal(High Frequency) 3. Communication Rectifier 4. Uninterruptable Power Supply (UPS) 5. Battery (Ni-Cd)	1. Korean Railroad Corporation 2. Korea Rail Network Authority
ATC_AF	1. AF Track Relay 2. Mini Impedance Bond	
Non-insulated Audio Frequency (AF) Track Circuit Device	1. Power module (Rectifier) 2. Transmitter module 3. Receiver module 4. Transmission module 5. Tuning Unit (TU, ETU) 6. Impedance Bond (B2) 7. Non-polarized Line Relay	1. Korean Railroad Corporation 2. Korea Rail Network Authority
Automatic Block System (ABS) unit	1. Power module 2. Transmitter module 3. Receiver module	1. Korean Railroad Corporation 2. Korea Rail Network Authority
Adherence Detector (Single/Double)	1. Single aspect 2. Double aspect	1. Korean Railroad Corporation 2. Korea Rail Network Authority
Electric Point Machine	1. NS-AM Electric Point Machine 2. High reliable Point Machine 3. Circuit controller / Control relay	1. Korean Railroad Corporation 2. Korea Rail Network Authority 3. Seoul Metro
DC bias relay	1. DC bias relay (1.42V)	
ATS equipment cabinet	1. Automatic Train Stop equipment cabinet (Outdoor Distribution Cabinet)	
Crossing equipment	1. Crossing control unit 2. Control module for grade crossing control unit	
Communication rectifier	1. Communication rectifier	

03. New Product

Smart Switcher

Product Description

1. A smart integrated power supply device that provides stable power supply to the signal control room and on-site trackside signal equipment in the station of signaling.
2. It is equipped with dual redundancy using main power and backup power to ensure normal train operation even in the event of a power outage.
3. The digital integrated power supply device features a display device on the front panel, allowing real-time integrated monitoring of module information status, alarm status, etc., and data transmission through communication.

03. New Product

Smart Switcher

Product Configuration

AC Input Module

- Conversion of output power to DC by applying three-phase power input and rectifiers
- Improvement of issues such as automatic switching unit failure, momentary power outage, and operational risks due to live line conditions

AC, DC Power Output Section

: Installation of bypass breakers and development of modular inverters

- Decentralization of transformers and breakers for each facility, resolving maintenance issues caused by failures
- Improvement of power supply due to expansion of signal facilities

Energy Storage Device

- Development of an automatic battery management system for railway signals, addressing addressing the problem of insufficient monitoring system functionality and the need for regular maintenance

Integrated Monitoring Device

- Resolution of real-time monitoring issues caused by insufficient status information from existing power supply devices through the implementation of integrated monitoring devices for individual units

03. New Product

Smart Switcher

Significance

- Cost-saving effect due to the elimination of unnecessary rectifier (SMPS) devices caused by the use of DC power lines for railway signals.
- Real-time integrated monitoring system for self-monitoring
  ➔ Cost-saving effect resulting from reduced maintenance of railway infrastructure

Product Specification

◦ Rectifier Module

Category	Item	Characteristic	Note
Form	Rating	100% Continuous Use	
	Cooling Method	Forced Cooling Method	
	Constant	3⌀4W	
AC Input	Rated Voltage	AC 380[V]	
	Power Supply Allowable Variation Range	±15%(323[V]~437[V])	
	Frequency Range	50/60[Hz], ±5[%]	
	Power Factor	Above 0.85[LAG]	
DC Output	Rated Voltage	DC 384[V](120Cell)	Lithium-based
	Rated Current	78.1[A]	30kW Capacity Current
	Voltage Variation Range	DC 346[V]~DC 422[V]	Voltage Stability within ±1%
	Efficiency	Above 90[%]	At 100[%] load under rated input · output
	Noise	Below 65[dB]	Forward 1.5m
	Ripple Factor	Within ±1% of Rated Voltage RMS	Load Current From 10% to 100%
	Overload Capacity	125%, Over 10 minutes	After releasing current limitation
	Current Limitation	Within 110% to 115%	

03. New Product

Smart Switcher

◦ Inverter Module

Category	Item	Characteristic	Note
Form	Rating	100% Continuous Use	
	Adjustment Method	High-frequency synchronous control PWM method	
	Cooling Method	Forced Cooling Method	Semiconductor Section
	Used Components	Power semiconductor components	
DC Input · Output	DC Rated Voltage	DC 384[V]	
	Input(DC) Power Supply Allowable Variation Range	DC 346[V]~DC 422[V]	
	Constant	1-phase 2-wire system	
	Frequency Stability	60[Hz]±1[Hz]	
	Rated Capacity / Rated Voltage	1) 1K[VA]/AC60[V] 2) 1K[VA]/AC220[V] 3) 3K[VA]/AC110[V] 4) 5K[VA]/AC600[V] 5) 5K[VA]/AC220[V] 6) 10K[VA]/AC220[V]	
	Output (AC) Voltage Variation Rate	Within ±2[%]	
	Overvoltage Response Speed	Within 40[ms]	When returning within ±2%, load variable from 10% to 100% with 50% load
	Frequency Stability	Within±1[Hz]	
	Output Voltage Variable Range	Within ±10% of the Rated Voltage	
	Efficiency	Above 90[%]	At 100% load under rated input · output
	Noise	Below 65[dB]	Forward 1.5m
	Load Power Factor	Above 0.8	Operation verification
	Overload Capacity	125%, Over 10 minutes	After releasing current limitation
	Harmonic Distortion Rate	Within THD 3[%]	Under linear rated load
	Current Limitation	Within 110% to 115%	Drooping characteristic

03. New Product

Smart Switcher

◦ Converter Module

Category	Item	Characteristic	Note
Form	Rating	100% Continuous Use	
	Adjustment Method	High-frequency synchronous control PWM method	
	Cooling Method	Forced Cooling Method	Semiconductor Section
	Used Components	Power semiconductor components	
DC Input · Output	DC Rated Voltage	DC 384[V]	
	Input(DC) Power Supply Allowable Variation Range	DC 346[V]~DC 422[V]	
	Inrush current limitation	Within 30%	
	Rated Capacity / Rated Voltage	50[A]/DC24[V]	
	Output (DC) Voltage Variation Rate	Within ±1[%]	
	Overvoltage Response Speed	Within 100[ms]	
	Output Voltage Stability	Within±1[Hz]	
	Output Voltage Variable Range	20[V]~27[V]	
	Efficiency	Above 80[%]	At 100% load under rated input · output
	Noise	Below 65[dB]	Forward 1.5m
	Ripple Factor	Within 50mV	
	Overload Capacity	125%, Over 10 minutes	After releasing current limitation
	Current Limitation	Within 110% to 115%	Drooping characteristic

04. Product Introduction

Integrated Modular Impulse Track Circuit Device

Integrated Modular Rack

Voltage Transmitter

Monitoring Receiver

Track Relay(TR)

Sub Rack

Product Description

Dual-System Integrative Modular Impulse Track Circuit Device is a device that detects the presence of a train in a track circuit section, and it can also be used in non-rail sections by flowing traction return current of train line from double rail track circuit to substation through the rail and functioning as track circuit by blocking signal current from the impedance bond. In addition, it accurately outputs train detection signals, enables automatic transfer control and real-time function monitoring.

Improvements

1. Voltage Transmitter Automatic transfer function
2. ID setting on Monitoring Receiver
3. Display feature on each module
4. Track Circuit information communication functions
5. Convenient maintenance

04. Product Introduction

Integrated Modular Impulse Track Circuit Device

Voltage Transmitter

Voltage Transmitter

Voltage Transmitter Front

Product Description

The Voltage Transmitter is divided into three units:Power, Impulse, and Monitoring. The power unit the rectified ripple current voltage goes through the condenser to the impulse unit unit, Stabilizers voltage, which changes pulsating voltage into a regulated voltage. It controls the voltage within the regulated range, even when there is a load in output voltage or irregular changes in input voltage. Also, the Impulse unit works as an interval of 180pulses / ±3% mins, due to the digital pulse RC charges and discharge circuit actions, and through an impedance bond, it delivers asymmetric waveform, consist of positive impulse and negative impulse, to the track. MCU from Monitoring unit calculates values of voltage and current, shows results, such as Output Voltage, Impulse Voltage, Impulse current, Input Voltage, and etc, on the display screen, and send the information to monitoring unit.

Product Specification

Category	Standard
Rating input voltage	AC 220[V] (±15%)
Stabilizer(Pulse Charging voltage)	DC 580[V] (±10%)
Transmit Frequency	3㎐ (180 Pulse/min ±3%)
Transfer function	High Voltage, Low Voltage, Frequency
Self-monitoring function	AC Input, Stabilizer(Pulse Charging voltage) Main · Male pulse, Frequency, Average current
Size (mm)	73(W)*221.3(H)*320(L)

04. Product Introduction

Integrated Modular Impulse Track Circuit Device

Monitoring Receiver

Monitoring Receiver

Monitoring Receiver Front

Product Description

The Monitoring Receiver is composed of power, receiver and detection unit. Power unit allows detection unit to operate and its power is supplied externally. Receiver unit provides pulse value which gathered from receiver impedance bond to V2 and V1 rectifier through Receive Transformer. V2 and V1 are complementary to operate protective relay and are supplied to internal coil. Detection unit calculates measured data inputted by trans insulation partial pressure current, CT Insulation partial pressure current and OP AMP and denotes output voltage, impulse voltage, impulse current, input voltage and etc. It also receives information from Transmitter Module and transmits Monitoring Unit's information to external Host.

Product Specification

Category	Standard
Rating input voltage	AC 220[V] (±15%)
Receive Frequency	3㎐ (180 Pulse/min±3%)
Safety Functions	Receiver and Monitoring Insulation function
Self-monitoring function	- Voltage Transmitter main, Second Monitoring Information collect - Monitoring Receiver Monitoring Information collect - Voltage transmitter information, monitoring receiver information, Forward to mother device via RS-232
Track Circuit Monitoring	Relay Operation Status Monitoring Function
ID setting function	ID Setting function per Track Circuit (0~255)
Size (mm)	73(W)*221.3(H)*320(L)

04. Product Introduction

Integrated Modular Impulse Track Circuit Device

Sub Rack

Sub Rack

Product Description

1. The Sub Rack monitors the activities of low/high voltage and frequency from the Voltage Transmitter, it performs on Output relay under normal operation. However, when the malfunction occurs in the parts, it supports an automatic blocking system and a conveniently structured Integrated dual-module continuously provides stable detection of presence of the train.

2. Transmission wire resistor is designed to be placed in the back of Sub Rack, effectively release emitting heat. If the resistance value is set in the initial installation, readjustment is not required although the voltage transmitter gets transferred from main and Redundancy.

Product Specification

Category	Standard
Rating input voltage	AC 220[V] (±15%)
Track Circuit	2 EA
Socket Quantity	- Voltage Transmitter 4EA - Monitoring Receiver 2EA
Size (mm)	482(W)*221.5(H)*331(L)

04. Product Introduction

Integrated Modular Impulse Track Circuit Device

Impulse Trak Relay(TR)

Product Description

1. A device that connects to a Receiver that supplies the DC Power required for operation and checks for pulses with Sufficient amplitude and accurate asymmetric waves.

2. A device that can check the presence or absence of trains in an Track circuit.

Impulse Track Relay (TR)

Product Specification

Wire winding resistance [Ω ±10%]		Action current [mA]		Drop way current [mA]		Drop way time (ms)	Contact number
V1	V2	V1	V2	V1	V2	500	4B4F
6,700	24,000	3.0	1.2	1.2	0.5		
		Less than	Less than	More than	More than	Less than	

Operation Contact		Drop Contact	
M1	T1	M2	R2
M3	T3	M4	R4
M5	T5	M6	R6
M7	T7	M8	R8

Impulse Track Relay Contact Operational status

Normal Operational status	Train operation Drop Contact
	

04. Product Introduction

Impedance Bond

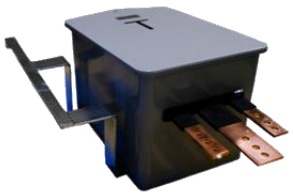
Transmit Impedance Bond(200A/BT)

Product Description

An instrument installed at the track circuit boundary point of the railway section to send the return current of the tram line to the next track circuit and the signal current to flow within only track circuit.

Product Specification

Category	Standard	Note
Return current usual	200A	
Return current peak	800A	
Size(mm)	308*224(554)	(554)Includes bus bar
Thickness(mm)	207	
Weight(kg)	35	
Water proof	Possibility (Mold type)	
Water tight	Possibility (Mold type)	



Transmit Impedance Bond(200A/BT)

Impedance Bond(200A/BR)

Product Description

An instrument installed at the track circuit boundary point of the railway section to send the return current of the tram line to the next track circuit and the signal current to flow within only track circuit.

Product Specification

Category	Standard	Note
Return current usual	200A	
Return current peak	800A	
Matching Condenser	630[V] More than, 5㎌ ±10%	
Size(mm)	308*224(554)	(554)Includes bus bar
Thickness(mm)	207	
Weight(kg)	35	
Water proof	Possibility (Mold type)	
Water tight	Possibility (Mold type)	

Impedance Bond (200A/BR)

Impedance Bond(for 430A)

Product Description

The Impedance Bond is a device that can allow the catenary line current to flow within the range of 430A or more during normal operation and 800A or more during peak operation.

Product Specification

Category	Standard	Note
Return current usual	430A	
Return current peak	800A	
Size(mm)	440*380	(554)Includes bus bar
Thickness(mm)	280	
Weight(kg)	40	

Impedance Bond (for 430A)

04. Product Introduction

High-Voltage Impulse Track Circuit Device

Impulse Rack

Product Description

- Standard 19inch Rack
- Impulse Track Circuit 8set can be fitted
  (Stabilizer, Transmitter, Receiver, Track Relay)

Impulse Rack

Product Specification

Category	Standard	Note
Return current usual	430A	
Return current peak	800A	
Size (mm)	440X380	Includes fixed bracket
Thickness (mm)	280	
Weight (kg)	40	

04. Product Introduction

High-Voltage Impulse Track Circuit Device

Impulse Rack

Track Relay

Voltage Stabilizer(VR)

Transmitter (TM)

Receiver (RE)

Product Description

Mainly used for AC 25,000[V] subway stations, the return current (electric vehicle current) of the tramway is returned to the substation through the rail the signal current is cut off from the Impedance Bond to perform the function of the orbital circuit. This High-Voltage Impulse Circuit Device has high insulation resistance of abnormal voltage in the track circuit due to the generation of cross wires and lightning, the signal facility protection is not only effective, but also endure well from disturbance during the operation of chopper, VVF vehicles. In addition, it uses impulses which provide little voltage drop due to the distance between transmission and reception, and the consumption of one track is relatively small as 50 to 60 VA, which can reduce energy saving and even in case of rain, the resistance of ballast leaks is small, so it makes more stable and easy to detect breakdowns or replace parts when obstacles occur. The High -Voltage Impulse Track Circuit Device consists of a voltage ballast, Transmitter, Receiver, Impedance Bond (Transmitter or Receiver) and track Relay.

04. Product Introduction

High-Voltage Impulse Track Circuit Device

Voltage Stabilizer(VR)

Product Description

A device for supplying rated AC power to the transmitter

Product Specification

Category	Standard
Input Power	AC 110[V] / 220[V], 60㎐
Output Voltage	40~60[V] / 400~600[V]

Voltage Stabilizer(VR)

Transmitter(TM)

Product Description

A device for transmitting impulse voltage to the transmitting Impedance Bond, consisting of a rectifier, control unit and transmitter, that transmits impulses (symmetrical waveforms consisting of pulses and pulses) through the Impedance Bond, which are generated at a certain interval (180pulses/min=5%)

Transmitter (TM)

Product Specification

Category	Standard
transmit frequency	3㎐ (180 pulses/min±5%)
Output Voltage	40~60[V] / 400~600[V]

Front measurement terminal

04. Product Introduction

High-Voltage Impulse Track Circuit Device

Receiver(RE)

Product Description

A device for receiving impulses transmitted through track circuit. Receiver generates and transmits the impulses of asymmetric waveforms received from the Impedance bond as a positive and a negative pulses, the appropriate ratios of waveforms to operate an Impulse Track Relay.

Receiver(RE)

Product Specification

Category	Standard
Input Voltage	AC 110 / 220 [V]
Output Voltage	V2 [Positive pulse] -40~60[V] V1 [Negative pulse] – 20~40[V]

Front measurement Terminal(TM)

Impulse Track Relay(TR)

Product Description

A device that connects to a Receiver that supplies the DC power required for operation and checks for pulses with sufficient amplitude and accurate asymmetric waves.

Impulse Track Relay(TR)

Product Specification

Wire winding resistance [Ω ±10%]		Action current [mA]		Drop way current [mA]		Drop way time (ms)	Contact number
V1	V2	V1	V2	V1	V2	500	4B4F
6,700	24,000	3.0	1.2	1.2	0.5		
		Less than	Less than	More than	More than	Less than	

04. Product Introduction

Power Supply for Signal Device

Power Supply for Signal Device

Product Description

The power supply for railway signals is referred to as the power supply unit for each purpose that supplies stable power according to the signal control facility.

Power Supply for Signal Device

Type

- EIS : Electronic Interlocking System
- RIS : Relay Interlocking System

Product Specification

- SYSTEM Size : W(660)*D(500)*H(2000) = 1SET 4EA
- Input Voltage : AC 220[V] (1Ø 60㎐)
- SYSTEM quantity of transformer

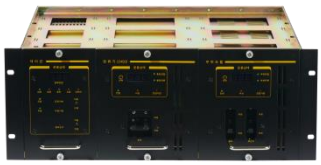
Input / Output power	For signal (STr)	For Switch Point (PTr)	For Track Circuit (TTr)	Local control Panel (ITr)	For route signal (RTr)	For remote control (ETr)	For ABS (BTr)	For crossing (LTr)
Input	220V	220V	220V	220V	220V	220V	220V	220V
Output	60V	110V/ 220V	110V/ 220V	110V/ 220V	110V/ 220V	110V/ 220V	600V	110V/ 220V

Component Introduction

Product Name	Component	Application and function
Panel 0	Floating Rectifier for Signal (High frequency 24V/50A) No1, No2 mounting	Free up space in the power room
Panel 1	Railway power(NET1), Kepco power(NET2) Power Switching Unit, Track circuit indicator	Supply of commercial and backup power, Remove unnecessary abnormal voltage, Equipment protection
Panel 2	Signal indicator point, track circuit indicator point, Work indicator point, UPS indicator point	Power supply for railway signal product
Panel 3	Rectifier automatic transfer point, DC power indicator point	Input AC220V to the rectifier to output DC voltage to the battery

04. Product Introduction

Floating Rectifier for signal (High Frequency)



Floating Rectifier for Signal (High Frequency 24V/50A)

Floating Rectifier for Signal (High Frequency 24V/100A)

Floating Rectifier for Signal Rack (High Frequency)

Product Description

- A device that receives input voltage AC110V/220V and rectifies to DC voltage
- It is a Rectifier that automatically performs floating and even charging or the battery

Product Specification

Apparent Size

Type	Input Voltage(V)	Rated Output Voltage(V)	Rated Output current(V)	Type	Width	Length	Height
S2450	220	24	50	S2450	482	424	177
S24100	220	24	100	S24100	482	445	266
S24200	220	24	200	S24200	482	445	445

Classification

Product name	Unit	Quantity	Application and function
Rectification self	EA	1	Rectifier, Control Panel, Load module
Rectifier	EA	1	24[V] / 50A, 100A, 200A
Control Panel	EA	1	Rectifier control, Status display, an alarm signal
Load module	EA	1	Load voltage current control

04. Product Introduction

Matching Transformer (MT)

Matching Transformer(MT)-SL1

Matching Transformer(MT)-SL2

Product Description

Transformer to match the impedance of the antenna and the supply wire

Product Specification

Category	MT-SL1	MT-SL2
Insulation resistance	DC 500V 100㏁	DC 500V 100㏁
Internal voltage	50/60Hz 3.0KV 1minute	50/60Hz 3.0KV 1minute
Wet proof	Over temperature 40℃, humidity 90%, 6 hours later, when removed dew condensation, insulation resistance is over 10MΩ	Over temperature 40℃, humidity 90%, 6 hours later, when removed dew condensation, insulation resistance is over 10MΩ
Internal heat	At 80℃, 5 hours later, insulation resistance is over 20MΩ	At 80℃, 5 later, insulation Resistance is over 20MΩ
Operational attenuation amount	When measured at 2.5KHz~22KHz output 1V-Within 1.5dB±0.5dB	
Impedance measurement	(1-2)At 2.5KHz 1V, 880Ω ±25% (1-2)At 2.2KHz 1V, 880Ω ±25%	

04. Product Introduction

AF Track Relay

ATC-AF Track Relay

Product Description

1. An instrument that opens or closes an electrical circuit according to various input signals. Such as voltage, current, power, frequency, etc.

2. The operation of the AF Track Relay can be visually verified.

ATC-AF Track Relay

Product Specification

Number of contacts	Rating(20℃)		Operation Voltage	Drop way Voltage	Action (ms)	Recovery (ms)
	Voltage	Coil resistance				
Normal and Reverse 6set (3FB3FB)	10V	400 Ω	6V below	2V	150~450 below	10~80 below

04. Product Introduction

Non-insulated Audio Frequency(AF) Track Circuit Device

Non-insulated Audio Frequency (AF) Track Circuit Device

Power Module

Transmitter Module

Receiver Module

Transmission Module

Turning Unit (TU,ETU)

Impedance Bond(B2-500)

Product Description

Non-insulated Audio Frequency (AF) Track Circuit is a device that uses audible frequencies (16 - 20,000Hz) that people can hear. This track circuit is a digital information transmission system that enables safe operation by sending not only train detection, but also the interval between the preceding trains, the speed instruction of the trains, and the information of vehicle operation. The main components are Tuning Unit (TU), Coupling Unit (CU), Matching Transformer(MT) and AP Impedance Bond.

04. Product Introduction

Non-insulated Audio Frequency(AF) Track Circuit Device

Power Module

Product Description

A device used for Audio, End and block and supplies stable power to the system

Product Specification

- Input voltage : AC 220[V], 60㎐, Single-Phase
- Input voltage Allowable Range : AC 176~264[V]
- Output Voltage : DC 24[V] / 8A
- Output stability of input voltage : ±2% of the set output voltage
- Stability of the output load : ±2% of the set output voltage
- Ripple Factor and noise voltage : Rating less than 2[V] (between the highest and lowest levels)
- Adjustment Range of Output Voltage : -10% ~ +15%
- Indicating Light and Power Switch: DC Output Indicator – DC 24[V], Green
- Fault indicator lamp : FAIL, Red
- Insulation resistance : 100㏁ (DC 1,000[V] Insulation- resistance tester)
- Insulation strength : Primary side– AC 2,000[V] –1 minute (Leakage Current : Less than 0.5㎃)
- Size(mm) : 73(W)*300(L)*177(H)

Power Module

Transmitter Module

Product Description

The transmitter module used in the stations and for Audio and block generates a stable track detection signal and sends it to the rail through the tuning unit.

Product Specification

- Rating Voltage : DC 24[V]
- Operating voltage : DC 22.5~30.5[V]
- Consumption current : Less than 2.2A
- Alternation Speed : 174㎳~260㎳(4.8㎐)
- Insulation resistance : DC 500 [V]/ More than 50㏁
- Size (mm) : 73(W)*300(L)*177(H)
- Type : A(1,699㎐), B(2,296㎐), C(1,996㎐), D(2,593㎐)

Transmitter Module

04. Product Introduction

Non-insulated Audio Frequency(AF) Track Circuit Device

Receiver Module

Product Description

Receiving module used in stations and for Audio and block receives the track circuit signal output from the transmitting module, and generates a voltage of the track relay when a normal signal is input to operate the track relay. The operation indicator on the front side of the receiving module can be used to check the abnormality of the module. In addition, it has a built-in monitoring device for collecting monitoring of operation status inside the receiving module.

Product Specification

- Rating Voltage : DC 24[V]
- consumption current : Less than 1A
- Operating voltage : DC 22.5~30.5[V]
- Relay Output Voltage : Operating voltage DC 19.2~31.2[V]
- Communication : RS-232 Communication
- Relay Operating Power appearance delay time: Energized (2sec±0.5 sec) Demagnetized (Less than 1ms)
- Size (mm) : 73(W)*300(L)*177(H)
- Type : A(1,699Hz), B(2,296Hz), C(1,996Hz), D(2,593Hz)

Receiver Module

Transmission Module

Product Description

The blocking transmission module shall display the DC24V, transmission voltage, receiving current, relay operating voltage value received from the receiving module on the front side and be able to assign each unique address. In addition, it is compatible with the same structure of units for in-stations and block

Product Specification

- Rating Voltage : DC 24[V]
- Communication : RS-232 Communication
- Type : Units for in-stations and block are same (Classified by internal [HOST] dip switch)
- Use : Installed in block device box (Send transmission /reception information, rail track Occupied state, signal state information, etc. to the machine room)
- Size (mm) : 73(W)*300(L)*177(H)

Transmission Module

04. Product Introduction

Non-insulated Audio Frequency(AF) Track Circuit Device

Turning Unit(TU)

Product Description

The tuning unit is used to generate the electrical isolation joint of the AF track circuit. The tuning unit is divided into A, B, C and D according to the operating frequency. For the design of the tuning unit, only passive components are used, and when installed from the side of the track, no separate power supply is required for the tuning unit.

Product Specification

- Type : A(1,699Hz), B(2,296Hz), C(1,996Hz), D(2,593Hz)
- Size (mm) : 390.5(W)*365(L)*100(H)

Turning Unit (TU)

End Turning Unit(ETU)

Product Description

The end tuning unit is used to connect the signal to the Rail track where the tuning zone is absent, which is accomplished by emulating the characteristics of the tuning zone. This device is usually used for the central supply system and the circuit not adjacent to the AF track, and the track circuit adjacent to it. The type is divided into A, B, C and D according to the frequency.

Product Specification

- Type : A(1,699Hz), B(2,296Hz), C(1,996Hz), D(2,593Hz)
- Size(mm) : 390.5(W)*365(L)*100(H)

End Turning Unit (ETU)

Impedance Bond(B2)

Product Description

A device used to return the electric wire return current to the 25KV 60Hz train section

Impedance Bond(B2)

04. Product Introduction

Non-insulated Audio Frequency(AF) Track Circuit Device

Sub Rack (for automatic blocking device)

Product Description

A device that can be installed in the inside of the Automatic Block System(ABS) of the blocking section

Sub Rack (for automatic blocking device)

Product Configuration

Type	Unit	Quantity	Application and function
Sub Rack	SET	1	Module (power, transmission, reception, transmission) Equipped
Power module	EA	1	For supply of power to transmitter and receiver
Transmitter module	EA	1	track Detector Carrier wave Receive
Receiver module	EA	1	Receiving track detection carrier wave and monitoring of operational status
Transmission module	EA	1	Display and transfer data

Nonpolar Line Relay

Product Description

The track relay of the AF track circuit accepts the output voltage of the sending module from the receiving module, and if the input signal exceeds a certain value, the relay output voltage is generated to operate the relay. In addition, if the input signal is smaller than a certain value, the relay output voltage is not generated and the relay is not driven. The track circuit relay is based on the railway standard KRS SG 0005 (non-polar line relay)

Nonpolar Line Relay

Product Specification

- Nonpolar Line Relay Contact : NR4, N4, R2

04. Product Introduction

Automatic Block System (ABS) unit

Automatic Block System(ABS)unit

Transmit Card(Front)

Transmit Card

Receive Card(Front)

Receive Card

Product Description

Equipment for automatic block control that controls signals and train automatic stop devices by track circuit in block sections.

Product Features

1. Minimized contact failure by using a small, non-polar relay that is stable in structure.
2. It is modularized for each application and easy to maintain.
3. 1:1 replacement with existing equipment is possible.
4. The control relay of the system and the power of the transmission / reception card are composed of two relays so that the reliability is improved.

04. Product Introduction

Automatic Block System (ABS) unit

Transmit Card

Product Description

The Receiving Module is operated separately by function with DC10 [V] power, receives the reception frequency through the communication security device and line transformer to operate the control relay.

Product Specification

Category	Standard
Relay Operating Voltage	DC 24[V]
Relay Contact Number	2F2B
Current Consumption	Less than 110㎃
Module Input voltage	DC 10[V] ±1[V]
Frequency Domain	0.625㎑~2.625㎑(250㎐ Interval) f1~f9 2.625㎑~7.125㎑(500㎐ Interval) f10~f18
Minimum Transit Voltage Level	40~70㎷, Standard Operating Point : 100㎷ (Track Resistance from 600Ω, Receiving Module at the input site)

Transmit Card

Receive Card

Product Description

The Sending Module is divided into functions and operated by DC10 [V], receives the transmission control information condition, and transmits the transmission frequency through the line transformer and the communication security device.

Product Specification

Category	Standard
Relay Operating Voltage	DC 24[V] ±3[V]
Relay Contact Number	2F2B
Current Consumption	Less than 35㎃
Module Input voltage	DC 10[V] ±1[V]
Frequency Domain	0.625㎑~2.625㎑(250㎐ Interval)f1~f9 2.625㎑~7.125㎑(500㎐ Interval)f10~f18
Minimum Transit Voltage Level	700~900㎷, (Track Resistance 600Ω) (Level adjustment required at field installation)

Receive Card

04. Product Introduction

Automatic Block System (ABS) unit

Power Module

Power Module

Product Description

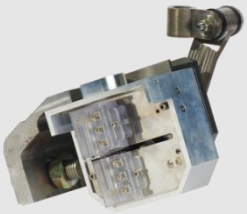
The power module is configured as a standby dual circuit and operates by receiving the Redundancy side power supply (AC220V±10%,60Hz) of the isolation transformer, and the output is DC24 [V], DC10 [V]

Product Specification

Category	Standard
Rating Input voltage	AC 220[V], 60㎐, Single-phase
Input voltage Allowable Range	AC 176[V] ~ 264 [V]
Rated Output Voltage and Current	DC 24[V] / 2A, DC 10[V] / 2A
Stability for Input Voltage	Within 0.2% of the set output voltage
Output Stability against Output Load	Within 0.2% of the set output voltage
Ripple Factor and noise voltage	Normal Voltage/Normal Load Less than 100㎷
Adjustment Range of Output Voltage	DC 24[V] (+2V, -1V)/ DC 10[V](+2V,-1V)
Efficiency	More than 80%
Over-Current protective Circuit	operating Electric Current 110~120% movement
Over Voltage protective Circuit	DC 27[V]~30[V], DC15[V]~18[V] movement

04. Product Introduction

Adherence Detector (Single System/ Double System)

Single System	 
Double System	  

Product Description

A device for detecting the snug tight of basic rails and tongue rails.

Product Specification

1. It uses micro-switches, sensors that remove mechanical contact points and detect objects with no contact, and it is currently using proximity sensors in national railroads.

2. When a metal object approaches a high frequency magnetic field combined with LC, a tachycardia flows through the metal as a result of electro-flow phenomena, and this current I and specific resistance R caused energy loss. As a result, it is not possible to maintain the oscillation state by changing the impedance of the detector spiral coil, resulting in a reduction of the oscillation stop or oscillation amplitude. This method is applied to the principle of generating the output signal by detecting the amount of variation in the oscillation energy.

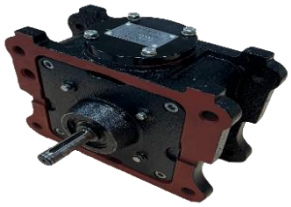
04. Product Introduction

Electric Point Machine

NS-AM Electric Point Machine

Switch Circuit Controller

Control Relay



Electronic Clutch

Product Description

The device that enables branching or switching from one track to another track on a single track

Product Features

1. Easy maintenance with control unit insertion method
2. Appliance of magnetic clutch
3. Enhanced security with forced position locking in both directions

Product Specification

Movement(MM)		Rated Voltage(V)		Railroad switch Movement(MM)
Operating Position	Locked Position	Switching	Control	130~185
185	130~185	AC 110/220V Single phase 60㎐	DC 24V	

04. Product Introduction

Electric Point Machine

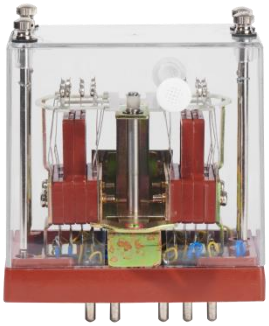
Switch Circuit Controller

Product Description

When the switch and lock system operated, it is mechanically checked that the track switch is fully switched to a certain position. It is a contact point constructed from the complete switch, which disconnects the power of the motor and transmits the operational direction of the track switch to the signal room.

Product Specification

- Contact Pressure : More than 70g
- Contact Resistance : 0.05Ω 이하
- Contact Interval : Spacing between fixed and operational parts more than 1.5mm Spacing with other contacts–more than 0.8mm
- Insulation Resistance : More than DC 500V 10㏁
- Dielectric Strength : AC 1,000V 10mA 1Minute
- Size(mm) : (W)90*(L)150*(H)149



Switch Circuit Controller

Control Relay

Product Description

A polarized 2nd-class magnetic holding relay, called WR on the control relay diagram, that is responsible for transmitting AC power toe the motor and for determining the direction of the switchover by inserting the controller(W) inside the track switch point.

Product Specification

- Coil Resistance : 200Ω ±5%
- Contact Resistance : 0.05Ω
- minimum operating current : 72~96mA
- Contact Pressure : electric motor - more than 70g indication circuit - more than 50g
- Contact Interval : Fixed to movable – more than 1.5mm Spacing with other contacts – more than 0.8mm
- Insulation Resistance : more than DC 500V 10㏁
- Dielectric Strength : AC 1,000V 10mA 1minute
- Size(mm) : (W)90*(L)150*(H)156

Control Relay

04. Product Introduction

Electric Point Machine

Electronic Clutch

Product Description

It utilizes electrical power to control the compression and separation of friction surfaces, preventing excessive load on the electric motor

Electronic Clutch

Product Specification

- Rated slip torque (N·m): 4.22 or higher
- Minimum slip torque (N·m): 2.06 or higher
- Friction torque (N·m): 0.29 or lower
- Air gap (mm): 0.6~1.2

04. Product Introduction

Electric Point Machine

DC Track Circuit Device

Product Specification

- Operating voltage: 1.42V or higher
- Operating current: 65.5mA or lower
- Operating time (20±5℃): 10 ~ 15ms
- Coil resistance: 17.9Ω±10%
- Number of contacts: 2F1B

DC Track Circuit Device

Transmitter

Product Specification

- Transformer : Input 110~220V, Output: 3~24V
- Rectifier Circuit : Bridge Diode
- Transmitter Current Device : Resistance 1.3Ω±10%, 15W, Transmitter 60Ω at 60Hz
- Protection Device : T200

Transmitter

Receiver

Product Specification

- Receiver Current Device(Resistance:4.1Ω±10%, 600Ω at 60Hz)
- Protection Device T200

Receiver

04. Product Introduction

Railroad Crossing Control Unit

Crossing Control Unit
Equipment box

Product Specification

- Cabinet: STS Special No.1 (Heat-dissipating type)
- Rectifier: 24V 50A
- Input voltage: 110/220V, Single-phase, 60Hz
- Rated output voltage: DC 24V
- Rated output current: 50A
- Equalization charging voltage: 2.4 (V/CELL)
- Float charging voltage: 2.17 (V/CELL)
- Flashing frequency of the warning light: 50times per minute ± 10

Fault alarm module

24V/30A rectifier

Non-polarized Line Relay

Product Description

The crossing control unit (insertion type) controls alarm lights, horn speakers and obstacles through relays. It also controls detectors and other devices.

04. Product Introduction

Railroad Crossing Control Unit

Fault alarm module

Product Specification

- Voltage: DC24V
- Detection Type: continuous alarm detection, non-alarm detection, low voltage detection, uninterrupted power detection, power failure detection, bell failure detection

Fault alarm module

Non-polarized Line Relay

Product Specification

- Type: SL24600
- Main use: ABS general control
- Voltage: DC 24V
- Coil resistance: 600 Ω
- Contact formation: NR4N4R2

Non-polarized Line Relay

Rectifier

Product Specification

- Rated input: Single-phase AC 220V Output: DC 24V/30A
- Overall efficiency: 60% or more
- Pulsation and noise: Within 360mV (RMS)
- Voltage variable range: 19V~34V
- Power outage alarm: Buzzer sound

Rectifier

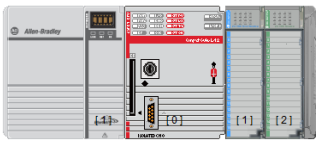
04. Product Introduction

Railroad Crossing Control Unit

PLC Crossing Control Unit Equipment box

Product Specification

- Cabinet: STS Special No.1 (Heat-dissipating type)
- Rectifier: 24V 50A
- Input voltage: 110/220V, Single-phase, 60Hz
- Rated output voltage: DC 24V
- Rated output current: 50A
- Equalization charging voltage: 2.4 (V/CELL)
- Float charging voltage: 2.17 (V/CELL)
- Flashing frequency of the warning light: 50times per minute ± 10



Control module

Fault alarm module

24V/30A rectifier

Product Description

The crossing control unit controls the alarm light, horn speaker and obstacle detection device

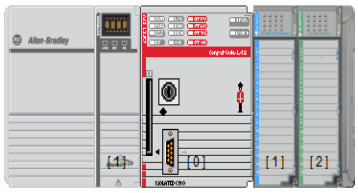
04. Product Introduction

Railroad Crossing Control Unit

Control Module

Product Specification

- Voltage range: 18 ~ 32V DC SELV/PEIV (MOD power supply)
- Maximum current: 950 mA
- Safety memory: 0.5MB
- Local I/O modules: 8 I/O modules
- Communication port: 1 Type B 2.0 Full-Speed USB and 2 Ethernet/IP ports
- Communication speed, Ethernet: 10Mbps/100Mbps/1Gbps
- Axis of motion: 256 motion
- SIL rating: SIL 3



Control module

Fault alarm module

Product Specification

- Voltage: DC24V
- Detection Type: continuous alarm detection, non-alarm detection, low voltage detection, power outrage detection, bell or horn failure detection

Fault alarm module

Rectifier

Product Specification

- Rated input: Single-phase AC 220V Output: DC 24V/30A
- Overall efficiency: 60% or more
- Pulsation and noise: Within 360mV (RMS)
- Voltage variable range: 19V~34V
- Power outage alarm: Buzzer sound

Rectifier

04. Product Introduction

Railroad Crossing Control Unit

Product Specification

- Horn or horn speaker

1) Horn
- Nominal input rating: 20W
- Replay frequency band: 400Hz ~ 4,000Hz
- Output level: 95 dB or more at 690 Hz to 750 Hz

2) Bell
- Rated voltage: DC24V ± 20%
- Number of bell rings: 70 to 100 times

- Alarm light

- Rated voltage: 24V
- Rated current: 0.3A±10% or less
- Sighting distance: More than 100m forward when using 80% of the rated voltage

- Electric circuit breaker

- Blocking Range: 6m~9m
- Maximum rotation angle: 90˚
- Rise time: 5sec
- Fall time: 7.5sec
- Motor: DC 24V motor (automatic and manual cont
  (Easy to change blocking angle and effective lengt
  block free fall crossing in case of power outage)

04. Product Introduction

Railroad Crossing Control Unit

Laser-type crossing obstacle detection device

◦ Laser-type crossing product specifications

- Sensing distance: up to 50 meters
- Cycle time: 40ms
- Power consumption: 10W
- Harmless laser usage: 200ns

◦ Traffic signal specifications

- Light emitting element lifespan: at least 50,000 hours
- Detection Type: continuous alarm detection, non-alarm detection,
- Number of traffic light turns: 60±5 per minute
- Input power: DC 24V+25%-10%

(Signal gun hanger range: 800 meters (including day and night))

04. Product Introduction

Communication Rectifier

400A

100A

50A

Product Description

A communication rectifier is a device that provides power to various communication equipment. It eliminates power failures such as commercial power outages, momentary power outages, voltage drops, and input power fluctuations to ensure reliable and stable operation of communication equipment. The rectifier module is a compact and lightweight product with an efficiency of over 90%. It is designed for easy maintenance, allowing hot-plugging of modules in case of rectifier module failure. The device also enhances operational stability by employing dual power supply in the rack.

Product Specification

	Category	400A	100A	50A
AC Input	Input voltage	AC 1Φ 220V ± 10%		
	Frequency fluctuation range	50Hz ± 5%이내		
	Input power factor	More than 90%		
DC Output	Rated voltage	-53V		
	Voltage fluctuation range	Rated voltage ± 10%		
	Operating voltage	-46V ~ -58V (Adjustment)		
	Output voltage stability	Within ± 1% of the set voltage		
	Cooling method	Forced air cooling		
	Output current	400A(50A*8EA)	100A(50A*2EA)	50A(50A*1EA)
	Load burden deviation	Less than 10% (load: 30% to 100%)		
	Current limit	Over 105% to 120% of rated current		
	Efficiency	Above 80%		
	Acoustic noise	Below 65㏈		

05. Major Performance Status

Status of delivery performance by major accounts

Category	Product Name
Korea Railroad Corporation	• Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device • Non-insulated Audio Frequency(AF) Track Circuit Device • Automatic Block System unit(ABS) • Impedance Bond
Korea Rail Network Authority	• Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device • Non-insulated Audio Frequency(AF) Track Circuit Device • Automatic Block System (ABS) unit • Electric Point Machine
Airport Railroad Corporation	• Airport Railway Vehicle Depot • Power Supply for Signal Device • High-Voltage Impulse Track Circuit Device
Seoul Metro	• Non-insulated Audio Frequency(AF) Track Circuit Device
Seoul Metropolitan Rapid Transit Corporation	• Power Supply for Signal Device
Yookyung Control (Inc)	• Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device
(Ltd) Innovation Project	• Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device
POSCO Engineering (Ltd) Daewoo E.N.G)	• Matching Transformer • Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device
(Ltd) Kumho Electric Power	• Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device
DAEA TI	• Power Supply for Signal Device • Floating Rectifier for Signal (High Frequency) • High-Voltage Impulse Track Circuit Device

05. Major Performance Status

Annual Business Performance Status

Year	Project
2001	Participation in the project of supply and installation railway signal products for Gaya `s vehicle base Gyeongbu line (Railroad Authority)
2002	Participation in the project of supply and installation of 28 station railway signals between Gyeongbu and Honam Lines (Railroad Authority)
2003	Participation in the project of supply and installation of 38 station railway signals between the Central and Honam Lines (Railroad Authority)
2004	Participation in the National project for the installation of 7 Station Power Supply Systems for the Signaling of the South-North Korean railway connection (Railroad Authority/Hyundai Asan)
	Participation in the 13 station railway signal projects between Gyeongwon and Gyeongbu Lines (Railroad Authority)
2005	Participation in the 11 station railway signal project between the central and the Gyeongbu Lines (Korea Railroad/Korea rail network Authority)
	Participation in the railway signal project at Dongmyo Station on subway Line1
2006	Participation in two station railway signal projects for extension of subway Line3 (Seoul Metro)
2007	Participation in the railway signal project at the Gomo Maintenance Base on the Gyeongbu Line (Korea rail network Authority)
2008	Participation in the project of 13 stations on the Gyeongui and the central Lines (Korea railroad / Korea rail network authority)
	Participation in the railway signal project at Jonggak Station on Subway Line1 (Seoul Metro)
2009	Participation in the railway signal project at cheongnyangni Station (Seoul Metro)
	Participation in the 2nd station Railway Signal Project (Seoul Metro)
	Participation in the railway signal project of 10 stations on the Gyeonbu-Gyeongjeon Line (Korea railroad/Korea rail network authority)
2010	Participation in the 11 station railway signal projects on Line2 (Seoul Metro)
	Participation in the railway signal project at Changdong Vehicle Base on Line4 (Seoul Metro)
	Participation in the seven station sign-up project between the central line and Busan New Port (Korea rail network authority)

05. Major Performance Status

Annual Business Performance Status

Year	Project
2010	Participation in the railroad signal project of the Migeum Station in new Bundang Line(Korea railroad)
	Power Supply for signals(EIS) 5 Station Contracts (Korea railroad)
2011	Power Supply for signals(RIS) 5 Station Contracts (Korea railroad)
2012	9 Color light signals Contracts (Korea railroad)
	Contract for Purchase of Automatic Block System(ABS) of South Container in Busan New Port (Korea rail network authority)
	Installation of Power Supply for Signal device for the south Container in Busan New Port (Korea rail network authority)
	Contract for Purchase of Audio Frequency(AF) Track Circuit device (Seoul Metro)
	Contract for Purchase of Auto Block System(ABS) unit (Korea railroad)
	Supply and Installation of railway signal products In Gyeongseon Line (Korea railroad)
2013	Secondary Contract for Purchase of Audio Frequency(AF) Track Circuit device (Seoul Metro)
	Participation in railway signal product project at 20 station on the Gyeonbu Line (Korea railroad)
2014	Contract for purchase of Power Supply for Signals device at 56 station (Korea railroad)
2015	Contract for Audio Frequency(AF) Track Circuit device (Korea railroad)
	Unit price contract for High-Voltage Impulse Track Circuit device (Korea railroad)
	Contract for purchase of Audio Frequency(AF) Track Circuit device between Chengnyangni and Dokso for Pyeongchang Olympics (Korea rail network authority)
	Participation in the railway signal Product project at 9 station between Seongnam and Yeoju stations (Korea rail network authority)
	Participation in a gross railway signal product contract for Power Supply for Signal device at 43 station (Korea railroad)
	Unit price contract for High-Voltage Impulse Track Circuit device (Korea railroad)

05. Major Performance Status

Annual Business Performance Status

Year	Project
2016	Contract for Purchase of one business other than double subway in Seongnam and Yeoju (Korea National Railway)
	Participation in a gross contract for Non-insulated Audio Frequency(AF) Track Circuit device of local authority (Korea railroad)
	Participation in the railway signal product project at 6 station on the Daegu Line (Korea National Railway)
	A gross contract for Power Supply for Signals device at 38 station (Korea railroad)
	Participation in the railway signal product project at 9 station between Wonju and Gangneung (Korea railroad)
	Unit price contract for High-Voltage Impulse Track Circuit device (Korea railroad)
2017	A gross contract for Power Supply for Signal device at 32 station (Korea railroad)
	Contract for Purchase of Audio Frequency(AF) Track Circuit device at Double subway in Wonju and Jecheon (Korea rail network authority)
	Supply and Installation of Audio Frequency(AF) Track Circuit device Between Gwangju-songjeong and Gomakwon stations at High Speed Railway (Korea rail network authority)
2018	A gross contract for Power Supply for Signal device at 15 stations (Korea railroad)
	Participation in Unit price contract for Impedance Bond (Korea railroad)
	Participation in Unit price contract for High-Voltage Impulse Track Circuit device(Korea railroad)
	Participation in the 12 station railway signal product project between the central Line and Donghae Line (Korea rail network authority)
2019	Signed a total contract for the supply of 15 signal power supply devices for stations (Korea Railroad)
	Participated in the phase contract for the manufacturing and procurement of high voltage impulse track circuit devices (Korea Railroad)
	Signed a contract for the manufacturing and procurement of non-insulated audible frequency(AF) track circuit devices for the Yeongcheon-Singyeongju double-track railway project and one other project. (Korea rail network authority)
	Signed a contract for the manufacturing and procurement of non-insulated AF track circuit devices for the Iksan-Daejeon double-track railway project and one other project. (Korea rail network authority)
	Signed a contract for the production and purchase of track circuit PCBs for the Daegu Subway Line1 (Daegu Metropolitan Transit Corporation)
	Signed a total contract for AF track circuit devices for the Gimcheon-Daeshin railway Project (Korea Railroad)

05. Major Performance Status

Annual Business Performance Status

Year	Project
2020	Signed a total contract for AF track circuit device modules, unit price contracts (Korea railroad)
	Signed a unit price contract for rectifier diodes for DC track circuits (Korea railroad)
	Signed a contract for the purchase of impulse impedance bonds (transmitting and receiving) (Korea railroad)
	Signed a contract for the manufacturing and purchase of impedance bonds (AF1) for AF track circuits (Seoul Metro)
	Signed a comprehensive contract for a total of 24 stations for integrated modular impulse track circuit devices (Korea railroad)
2021	Signed a contract for the manufacturing and purchase of Electric Line Changer(NS-AM) (Seoul Metro)
	Signed a contract for the manufacturing and purchase of Electric Line Changer(NS-AM) (Hu Metro Busan)
	Signed a contract for the supply of signal power supply devices for a total of 13 stations (Korea railroad)
	Signed a total contract for the Integrated Modular Impulse Track Circuit Devices for 57stations
	Participated in the improvement project of electronic interlocking devices between Bumgye and Daegongwon. (Korea national railway)
	Participated in the improvement project of electronic interlocking devices between Suseo and Ori (Korea national railway)
	Participated in the electronic interlocking device project between Hongseong and 106 Stations (Korea national railway)
	Participated in the Impulse impedance bond project (Korail)
	Participated in the signal and communication construction project for 15 stations between Mongolian Tavantolgoi and Junbayan (Mongolyn Tömör Zam)
2022	Signed a contract for the manufacturing and purchase of NS-AM (Electric Line Changer) device for the Chungju to Mungyeong section. (Korea national railway)
	Signed for the procurement of Insulated AF Track Circuit Devices between Chungju and Mungyeong (Korea national railway)
	Signed a contract for the supply of integrated modular impulse track circuit devices for a total of 23 stations (Korea railroad)
	Signed a contract total contract for integrated modular impulse track circuit devices for a total of 9 stations (Korea railroad)
	Signed a contractfor Impedance Bond (Korea railroad)
	Signed a contract for Insulated AF Module

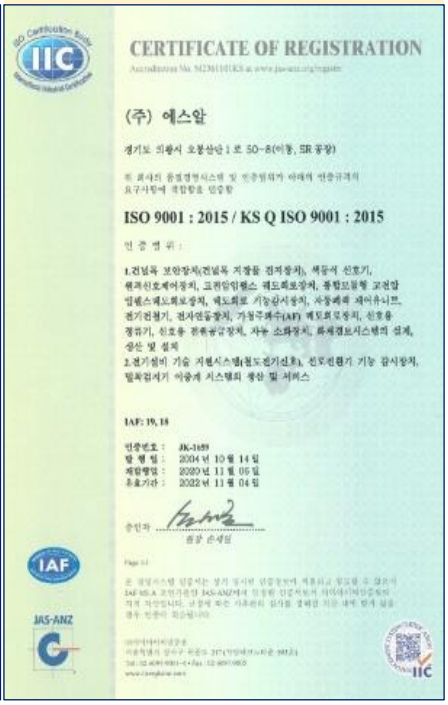
05. Major Performance Status

Annual Business Performance Status

Year	Project
2022	Signed a contract for the establishment of business development plan for Seoul Subway Line 2 extension to Cheongna
	Signed a contract for the feasibility assessment and basic planning of Goyang to Eunpyeong Line Rapid Transit
	Signed a contract for the implementation design services for the construction of ATO Single Signaling System on Line 2
2023	Participation in the temporary track railway signaling project between Taoyuan Pusin Station and Inge Station, Taiwan.
	Participation in the electrified metro project for 12 stations in Dhaka, Bangladesh, funded by ADB.
	Signed a contract for NS-AM type track circuit changer on the Janghang Line, Sinchang to Hongseong section.
	Signed a contract for NS-AM type track circuit changer for one project outside the Munsan Rolling Stock Depot on the general railway.

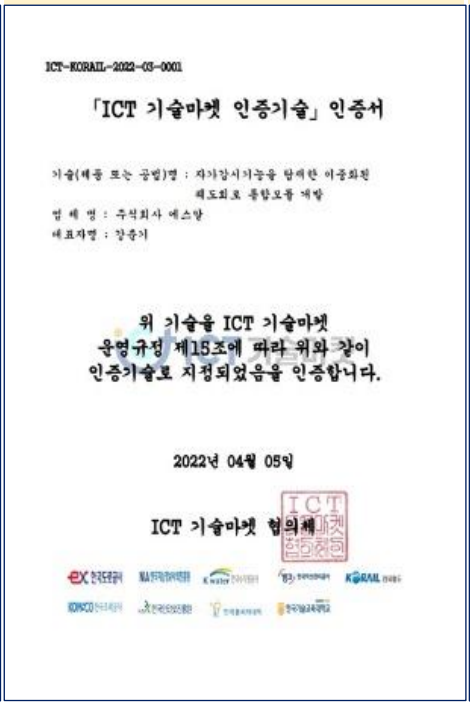
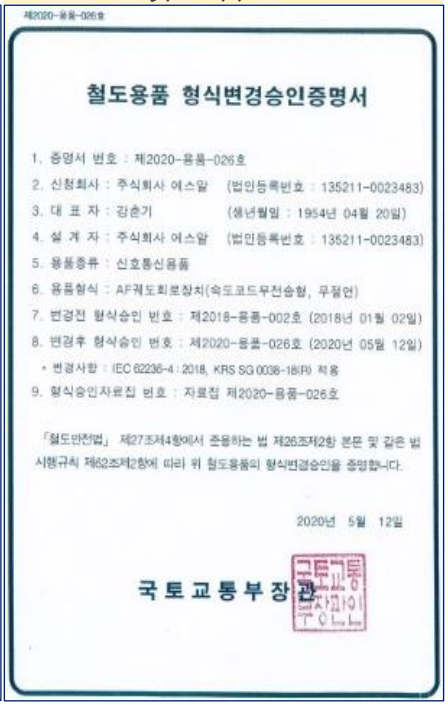
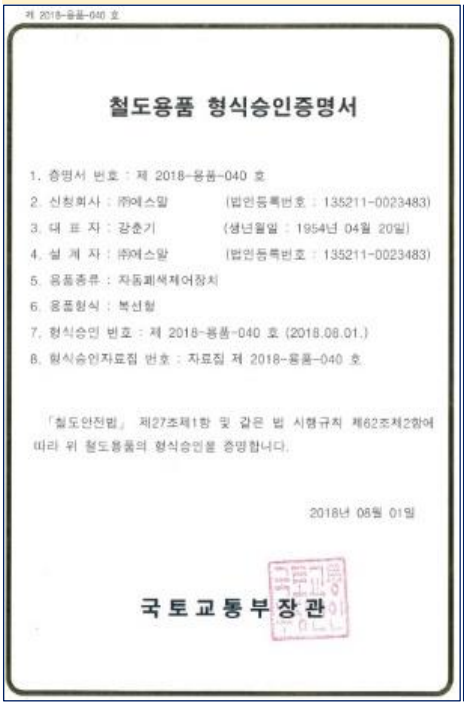
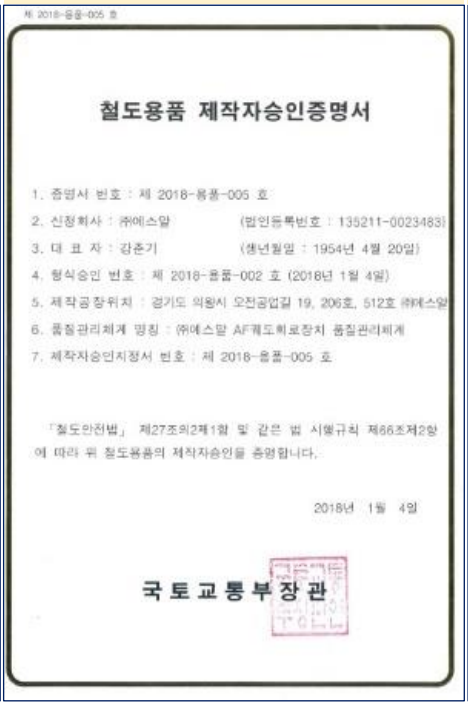
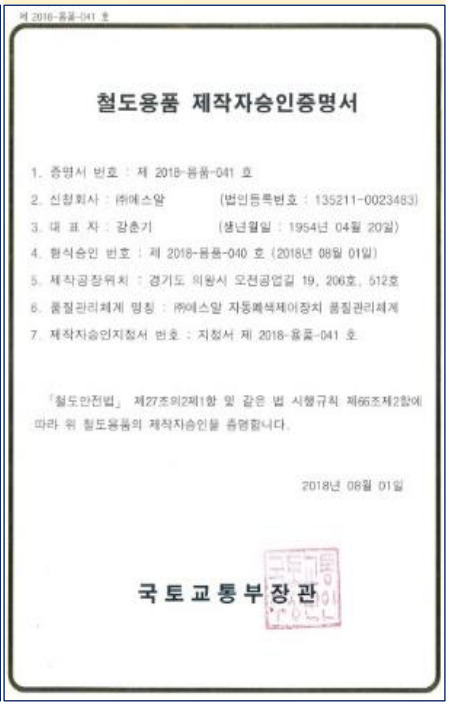
06. Certification Status

Certificate

Corporate Research Institute	ISO 14001	ISO 9001
		
Technology Innovative Inno-Biz	**Small and Medium Enterprise**	**Venture Enterprise**
		

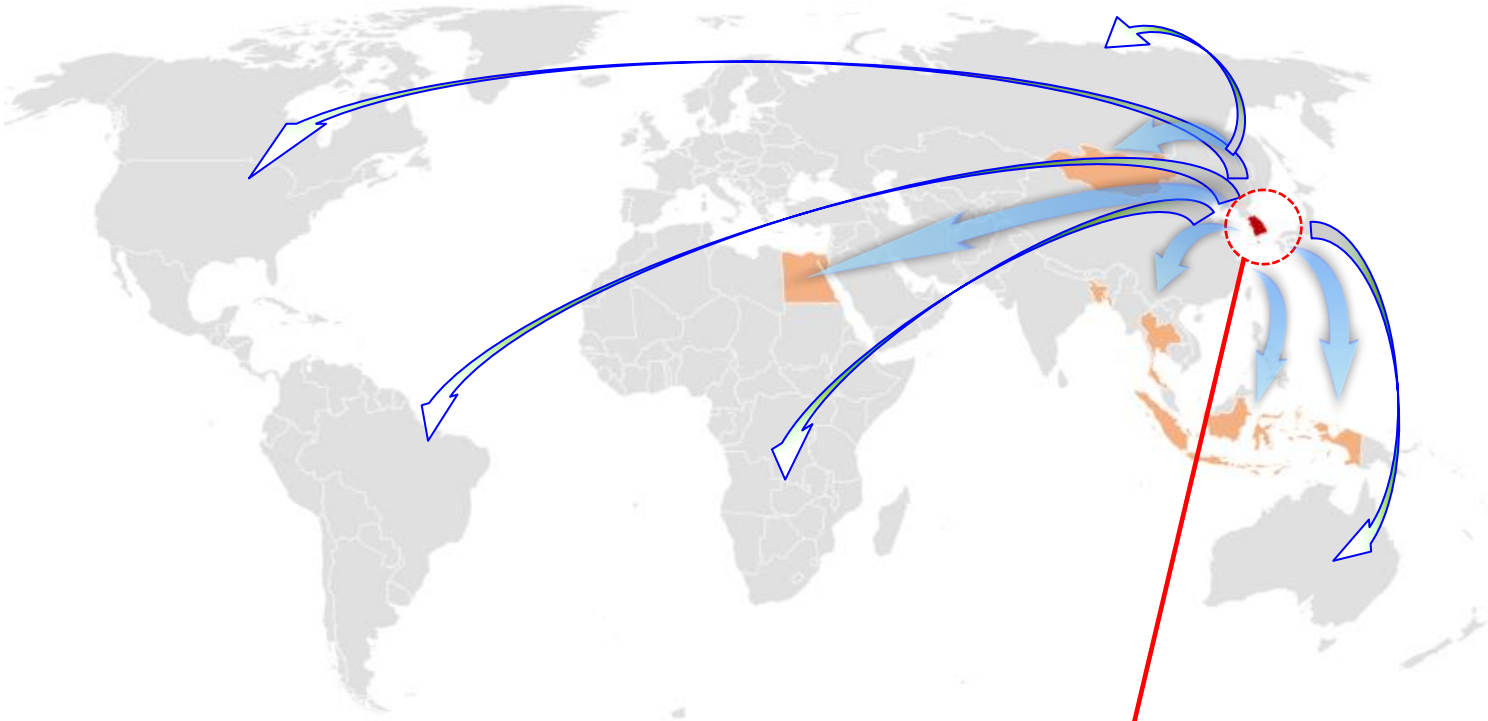
06. Certification Status

Certificate

CE Certification	ICT Technology Market	Railway Equipment Type Approval
		
Railway Equipment Type Approval	**Railway Equipment Manufacture Approval**	**Railway Equipment Manufacture Approval**
		

07. Global Business Partner

Installation Status



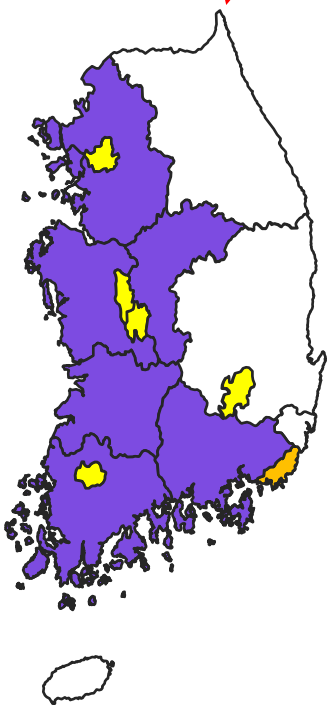
■ Installation Status of Integrated Modular Systems

☐ Total account of Installation

Station	Track	Note
Total of 112 station	Total of 4,014 tracks	2020.12-2022.12

☐ Detailed installation (Division)

HQ	Station	Track
Seoul HQ	12	443
Metropolitan Area HQ	13	644
East Area HQ	24	786
Daejeon Chungcheong HQ	10	326
Chungbuk Management Service	2	100
Daegu Management Service	5	253
Daegu Gyeongbuk HQ	1	31
Busan Gyeongnam HQ	22	786
Gwangju Jeonnam HQ	8	252
Jeonbuk HQ	11	288
Gwangju area Management Service	4	105



06. Directions

Directions to SR

Address
(16079) 50-8, Obongsandan 1-ro, Uiwang-si, Gyeonggi-do (SR Building)

T. 031-459-3995
F. 031-459-3996

If you are coming by car

At the Bugok IC intersection, turn right at the first intersection in the direction of Uiwang City Hall

If you are coming by public transportation

Exit 2 of Uiwang Station, take regular bus 1-2 (blue), 5, or 5-2 in the direction of Bugok Gas Station and get off at Changmal

WEBSITE

Science for eco Revolution