

DAEYANG ELECTRIC

COMPANY PROFILE

www.daeyang.co.kr

DAEYANG

Technology developments and maximizing people's abilities are at the core of our philosophy and vision

We believe the purpose of company's existence is to support its members and society by producing continuous values with help of technology and human resources. Our employees are the best resources we can rely on, so we value the talented upbringing of our workers. Since the foundation of company we have implemented this philosophy and we will continue to put forth all our effort to achieve our goals through expanding technology and maximizing our employees' abilities.

History

1977

1977-05 DAEYANG Electric Co., Ltd. founded.

1977-12 Designated as manufacturer of marine electric equipment by Ministry of Commerce and Industry.

1980

1985-09 Selected as an "Excellent Exporting Company" by the Korea Development Bank.

1988-03 Established an affiliated company, DAEYANG Instrument Co.,Ltd.

1988-12 DAEYANG R&D center founded.

1989-01 Established an affiliated company, DAEYANG Electric Supply Co., Ltd.

2000

2000-07 Selected by "Small & Medium Business Administration" for "Venture Company".

2001-11 Awarded the "Bronze Tower Order" for contribution to Industry by Ministry of Commerce, Industry and Energy.

Awarded the "Export Tower" by Ministry of Commerce, Industry and Energy.

Awarded the "Leading Company" by Ministry of commerce, Industry and Energy.

2003-02 Selected as a "National Manufacture Research center" by Korean Ministry of Commerce, Industry and Energy.

2003-09 Completed the development of Goniometer.

2004-09 Completed the development WICS (Wireless Interior Communication System).

2004-12 Completed the development of NI-Rh electronic reflector.

2005

2005-05 Expanded & moved Noksan factory for Fan & Ventilation Division.

2006-06 Certified as "INNO-BIZ" company by SMBA (Small and Medium Business Administration).

2010

2010-11 Awarded 30 Million US Dollar Export tower at 47th National Export Day.

2011- 01 Registered on KHNP's Approved Vendor List for E272A (Incandescent, Sodium Lighting Fixtures & Lamps) and E272B (Fluorescent Lighting Fixtures & Lamps, Dimming Control System).

2011- 07 Flotation on the stock exchange. (Listed on KOSDAQ)

2012-01 Acquired KSB (Korea Special Battery).

2012-07 Completed development of MDV (Mine Disposal Vehicle) for Korea Navy.

2012-11 Expanded & moved R&D Center and Electric & Electronic factory to Noksan factory.

2015

2015-07 Selected as a World Class 300

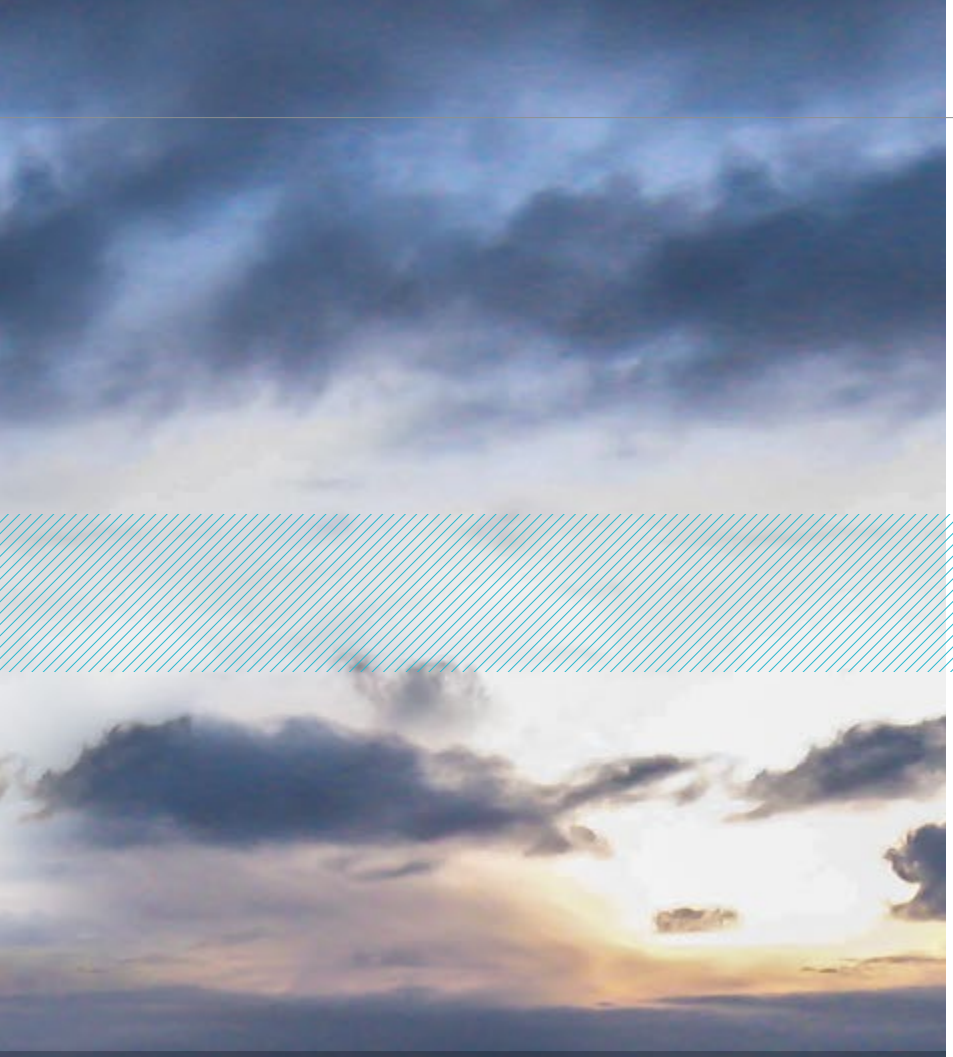
2015-08 KHNP(KOREA HYDRO & NUCLEAR POWER CO.,LTD) Approved Vendor (E208) (0210)

2015-12 Award '50 Million US Dollar Export Award' at 52th Export Day.

2016. 3 Awarded 'Exemplary Taxpayer' of Busan Metropolitan City

2016. 3 Expanded Sensor Division

2016.12 Expanded SI Division



1990

1990-11 Selected as a defense industry company by the Ministry of National Defense.

1992-03 Signed a technical license agreement with WITT & SOHN, Germany.

1995-08 Nominated as one of the most prominent medium-sized enterprises with advanced technologies by ministry of commerce and industry.

2006-11 Co-developed with KORDI an Unmanned Underwater Vehicle (UUV) for deep sea exploration at 6,000m depth in the ocean successfully.

2007-01 Established design research center for interior lighting equipments of cruise in Seoul.

2007-02 Developed of LED flat lighting equipments.

2008-07 Completed the Development of new explosion proof lighting equipments for land use.

2009-06 Developed LED lighting for indoor use.

2013-03 Awarded "Industrial Service Medal" on the 47th taxpayer's day.

2013-04 Expanded & moved DAEYANG Instrument Co.,Ltd to Noksan factory.

2014-10 Awarded "Industry development of LED & International competitiveness improvement by minister of ministry of Trade, Industry and Energy".

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Organization

Number of employee (2015) 450



Daeyang is an industrial leader in marine lightings, communication systems, power systems and nautical instruments. Based on over 40 years of experience in marine and shipbuilding industry, our superior products are acknowledged by various customers throughout the world.
Customer satisfaction is our first and only priority and we put endless effort to meet the highest standard. With heavy investment (10% of annual turnover) on research and development, our R&D center is one of the most famous research centers in the industry for its innovation and capability of product development.
We operate in various sites around Busan, Korea and have oversea liaison offices in Japan, North & South America, Europe, China, South Asia and Australia for immediate response to the customers' demands.



SENSOR DIVISION Incheon, Korea



NOKSAN FACTORY Busan, Korea

Major Products



HEAD OFFICE
Busan, Korea

Lighting

Indoor Lighting
Outdoor Lighting
Navigation Light & Signal Light
LED Lighting
Hazardous Area Lighting
Receptacle & Switch
Reefer Container Receptacle
Lighting Architecture

Communication & Navigation

Integrated Communication System (ICS)
Refrigerated Container Monitoring System (RCMS)
Power Cable Transmission System
Integrated Navigation System (INS)
Electro-Magnetic Speed Logs (EM-LOG)
Degaussing/Deforming System
Ship Shore Communication Link System (SSCLS)

Panel & Switchboard

Main Switchboard
Emergency Switchboard
Power Distribution Panel
Engine Control Console
Bridge Control Console
Switchboard for Train

Underwater Vehicle

Remotely Operated Vehicle (ROV)
Autonomous Underwater Vehicle (AUV)
Deep Sea Unmanned Underwater Vehicle (UUV)
Mine Disposal Vehicle (MDV)

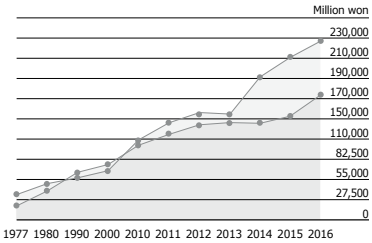
Nautical Instrument

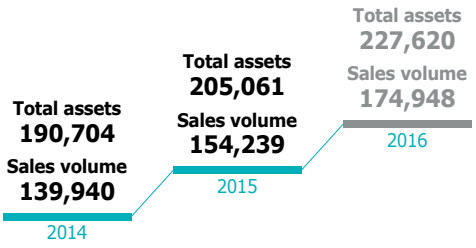
Anemometer & Anemoscope
Rudder Angle Indicator
Weather Information System (WIS)
Whistle

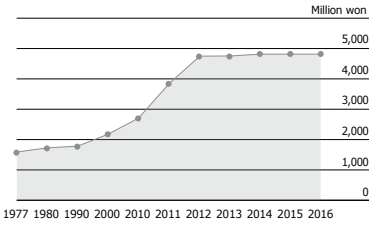
Sensor

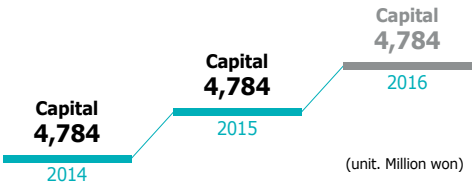
Temperature Sensor
Pressure Sensor
Weather sensor

Financial Status April, 2017









(unit. Million won)

Certificate

Quality Management

Daeyang Electric Co., Ltd. is a manufacturer of various equipment for marine and shipbuilding industry. To ensure our promises for best quality to customers, Daeyang has been certified with quality management system for production, inspection and service.



LRQA
ISO 9001:2008



DNV GL
AS 9100 Revision C



SMBA
Single PPM



KMAR
ISO/TS 16949:2009



Defense Agency for Technology and Quality
DQMS (KDS 0050-9000-2)



KGS IECEx
IECEx CoC Certificate Service Facility



HKMC
SQ
(Supplier quality)



KHNP (KOREA HYDRO & NUCLEAR POWER CO.,LTD)
E272A



TÜV Rheinland
ISO 26262:2011



KOLAS
ILAC -MRA
(International laboratory accreditation corporation)
(for Shock, Vibration, IP, Illuminance, etc.)

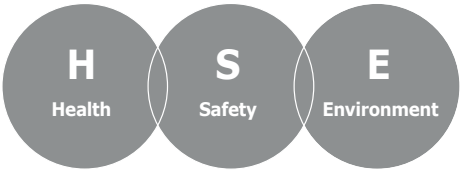


KEPIC
(Korea Electric Power Industry Code)
E208, J210
Renewal Registration of Duration



KHNP
(KOREA HYDRO & NUCLEAR POWER CO.,LTD)
E208, J210 Approved Vendor

HSE Management



Our company concerns the health(H), safety(S) and environment(E) as the most basic factors in our policy.



LRQA
OHSAS 18001:2007
(Occupational Health & Safety management system)



LRQA
ISO 14001:2004
(Environmental management system)

Assurance

Daeyang products have been guaranteed by cumulating the relevant certificates from various organization including CE, UL, IECEx bodies, ATEX, Classification Society all over the world, and so on.

Certification of Approval
1,600
certificates
(up to April 18th, 2017)

• Explosion Proof Certificate


CML (ATEX)


UL


Baseefa(ATEX)


LCIE(ATEX)



Sira (ATEX)


KGS


KOSHA


KRH



KTL

• Class Approval


RMRS



ABS


KR


LR


BV


SERCONS


NK


RINA


CCS



DNV



KS

Product

Lighting

We are continuously searching the lighting solution based on our cumulated experience and understanding for the lightings. As a result, we can provide the top-notch lighting solution including lighting architecture, lightings, controllers, switches, and plugs to our valuable customers from all industrial fields. For an optimized lighting solution, we are always considering both economic and technical aspects with strict quality control program which is certified for international standards.



NEW

Lighting Technology

We are endeavoring to lead the lightings industry through the sustained R&D effort in developing up to date lighting technologies. Based on our recent effort on the application of LED as a new lighting source in 2012, the world first full LED lighting ship was built with our LED lightings. We, surely, can supply all sort of LED lightings which could be replacements of traditional lightings including special lightings to meet customers' inquiry.



LED

Explosion Proof
LED Ceiling Light

▲▲▲ **EXLED-125/225ed**
▲▲ **EXLED-125/225edBu**
▼ **EXLED-125/225edG**





LED

LED Flood Light

▸ **PF125L-550UWCF**
▸▸ **PF250L-550UWCF**
▸▸▸ **PF400L-550UWCF**

LED

LED Flood Light

◂ **PF30L-550UWCF**
(Equivalent to 300W Halogen Flood Light)
▸ **PF50L-550UWCF**
(Equivalent to 500W Halogen Flood Light)

LED

Explosion Proof
LED Flood Light

◂ **EXLED-1BG-135A**
▸ **EXLED-1CG-200A**





LED

LED Search Light

▸ **PS60LL-550UWCEPJ**
(with Remote Control Panel)
◂ **PS60LL-550UWCF**
(Fixed Type)

LED



LED Navigation Light

Masthead	Port	Starboard	Towing Light
◂◂ **A2L-DM06H**	◂ **A2L-DP04H**	▸ **A2L-DT04H**	▸▸ **A2L-DY04H**

Indoor Lighting



Ceiling Light FL-WS-S



Surface Ceiling Light
FL-WS-TH



Recessed Dampa Ceiling Light
FL-NFD



LED Decorative Recessed Ceiling Light
LEB-NF



LED Decorative Recessed Ceiling Light
LEB-NL



LED Ceiling Light
LEB-WS



LED Surface Ceiling Light
LEB-NS



LED Down Light
LECO118NF-G / LECO118NF

Outdoor Lighting



Suez Canal Search Light PC-K



Surface Ceiling Light
FL-WS-U



Surface Ceiling Light
FL-WS-PC



High Pressure Sodium Flood Light
PF-42SI



Pendant Light
FPH



LED Dome Light
LECD09-U

Navigation Light & Signal Light



Double Lens A2-D



Warning Light
IW-01



Signal Light
IS-P/IS-B



Signal Light
IS-P



Morse Key
MK-S



Portable Daylight Signaling Light
DDS-84ABC

LED Navigation Light



Masthead
A2L-SM06H



Port
A2L-SP04H



Starboard
A2L-ST04H



Towing Light
A2L-SY04H

Hazardous Area Lighting



Explosion Proof Fluorescent Ceiling Light
FL-edg



Explosion Proof Fluorescent Ceiling Light
FL-220/240edgBu



Explosion Proof Recessed Ceiling Light
FL-220/240WFedg
FL-220/240WFedgBu



Explosion Proof Fluorescent Ceiling Light
FL-220/240edgG
FL-220/240edgBuG



Explosion Proof Ceiling Light
EXF-614



Explosion Proof LED Bulb Light
EXLED-1AG



Explosion Proof LED Down Light
EXLED-1AD



Explosion Proof LED Bulb Light
EXLED-1BG



Explosion Proof LED Down Light
EXLED-1BD



Extreme Low Temperature Light (500W Explosion Proof Halogen Flood Light)
PF50HnRT2BSI-226UWM2



Extreme Low Temperature Light (400Wx2 Explosion Proof Sodium Flood Light)
PF42SnRT2BI-226UWM2W

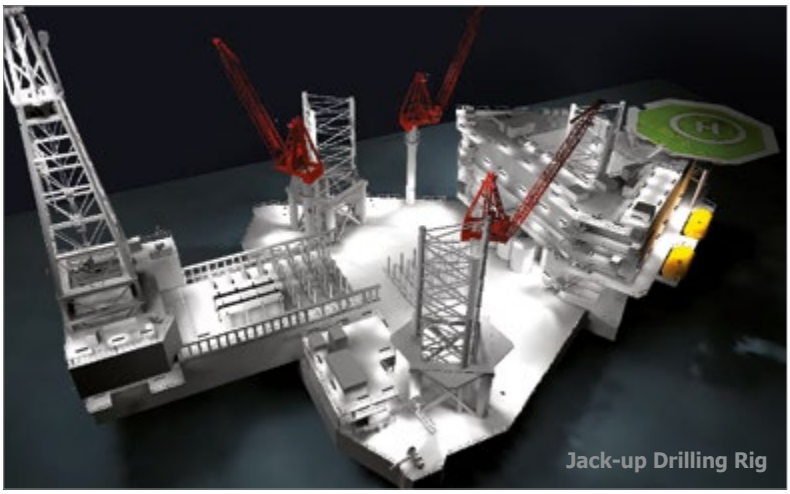


Explosion Proof Light
PF-40SBX2

Lighting Architecture

Daeyang is providing a total lighting solution including optimal lighting design and documentation for a number of complex offshore structures, such as Drillships, FPSOs constructed at all major shipbuilding yards.
All works on the lighting architecture for offshore structures are implemented on the basis of our cumulated experiences to meet the customers' requirement.

For designing adequate and relevant lighting architecture, we are performing lighting simulation to find the optimal arrangement of luminaires considering space, power consumption, economics, installation, and maintenance.
By a token of our total lighting solution, we can help customers to consider all lighting equipment from drawing level in any design stages, which surely can save time and money of our valuable customers.


Jack-up Drilling Rig

Human Factors Design

Human Factors involves the application of knowledge about human characteristics, capabilities, limitations, expectations, and needs to the design and development of equipment, products, plant and systems.

Standard

- Dining room : 300lx
- Lounges : 300lx
- TV Room/Cinema : 300lx
- Library : 500lx

Human factors

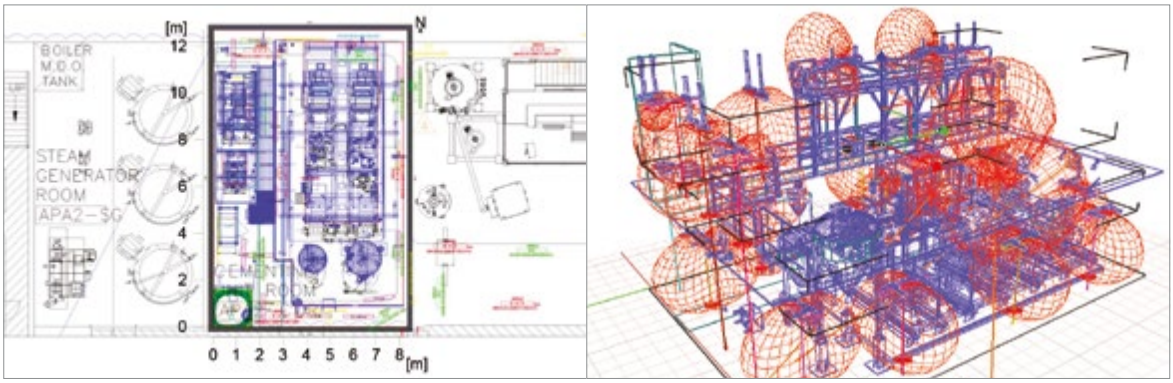
Design requirement

- Illumination of specific tasks
- Illumination for dark adaptation
- Glare from light sources
- Reflected glare
- Brightness ratios
- Lighting fixtures and controls
- Workstation illumination

Recommended lighting levels

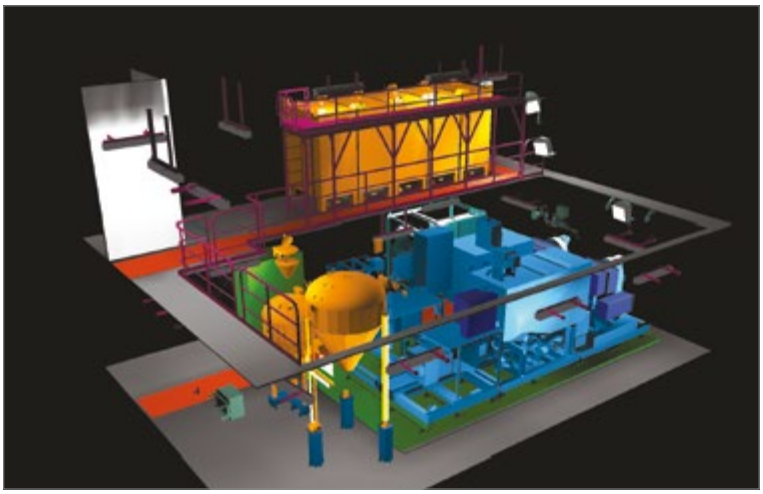
- Dining room : Adjustable range 150-400lx
- Lounges : Adjustable range 150-320lx
- TV Room/Cinema : Adjustable range 40-320lx
- Library : Adjustable range : 300-600lx

Illumination level study



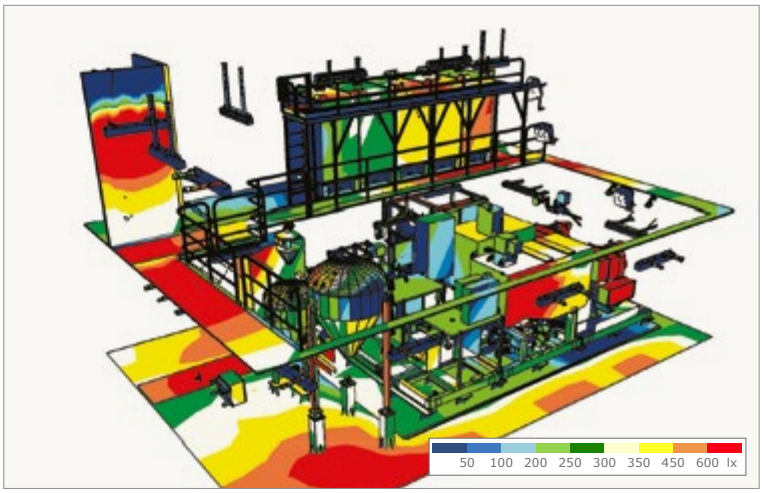
Space Composition & 3D Modeling

- 3D modeling works based on architectural drawings



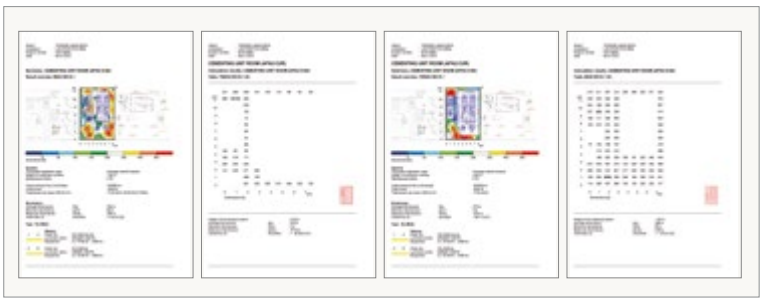
Illuminance Calculation Area Setting & Lighting Arrangement

- Illuminance arrangement & calculation area setting
- Illuminaire selection & illuminaire adjusting work



Simulation & Rendering

- Optimization & review
- Illuminance distribution simulation and review



Report

- Illuminance calculation data sheets
- Lighting arrangement drawings
- Illuminance data sheets
- Luminaires specification sheets
- Luminaires specification drawings

Lighting Control System

Daeyang offers consultants, system integrators and electrical installers for a comprehensive product range with DALI & KNX, in order to meet the challenges posed to complex lighting control system.

Scene 1
Dining Mode



Group 1, 2, 3, 4 : 100%
Group 5 : ON
Group 6 : ON

Scene 2
Dining Preparation Mode



Group 1 : 70%
Group 2 : 100%
Group 3 : 0%
Group 4 : 50%
Group 5 : ON
Group 6 : OFF

Scene 3
Tea Time Mode



Group 1 : 70%
Group 2 : 70%
Group 3 : 100%
Group 4 : 100%
Group 5 : ON
Group 6 : OFF

Scene 4
Night Mode



Group 1 : 0%
Group 2 : 0%
Group 3 : 100%
Group 4 : 100%
Group 5 : ON
Group 6 : OFF

Product

Communication & Navigation System

Communication systems and navigation systems
for naval ships and commercial vessels.

Communication systems
for naval vessels ;

ADICS-21
DICS-32
WIRAS-III

Navigation systems
for naval vessels ;

EM-LOG
DRT

Electronic systems
for commercial ships;

SSCLS
RCMS
STC
ECDIS





Thruster control systems for both inland navigation and on board all types of sea going vessels.

- Deck-mounted azimuth propulsion units
- Well-mounted azimuth propulsion units
- Retractable azimuth thrusters
- 360 degree steerable Shallow Draught Thrusters
- Tunnel thrusters

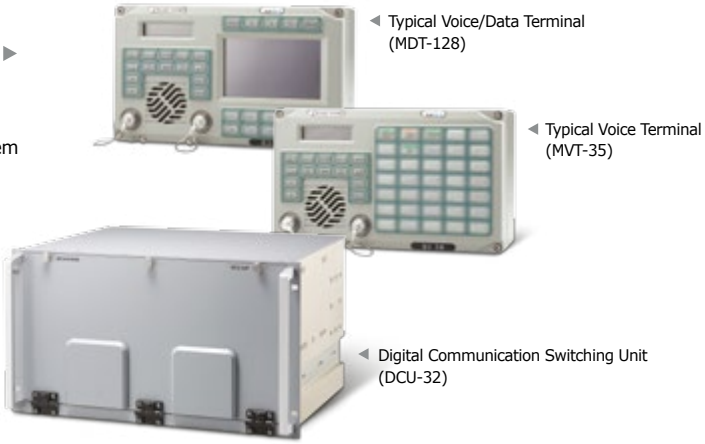
ADICS-21

Advanced Digital Integrated Communication System

ADICS-21 consists of an Internal Communication System, an External Communication System, an Announcing System, a Wireless Interior Communication System, and a Data Link System applied to any type of medium or large naval ship or submarine. The high speed optical network of ADICS-21 has high reliability and survivability as the ring structure including the dual redundancy routes, and serve gigabit Ethernet network.
As a tactical voice/audio network, the time-division multiplexing technology through 155Mbps(STM-1 standard) optical network provides a maximum of 2048 user channels simultaneously for voice or data transmission by using a non-blocking network switching technology.
In addition, ADICS-21 provides a high speed optical ethernet as an option, a variety of applicable data communications, and flexible interoperability for various demands of communication system and requirements of naval ships and submarines. More than 30 optical network systems have been delivered to naval ships and submarines.

ADICS-21 integrated communication system contains the following subsystems by customer selection.

- Internal Communication System
- Radio Communication System
- Public Address System
- Wireless Communication System
- Telephone System
- CCTV Network System
- Weather Information System
- Navigation Information System
- VoIP System
- Message Handling System
- Data Distribution Network
- Data Link Interfacing



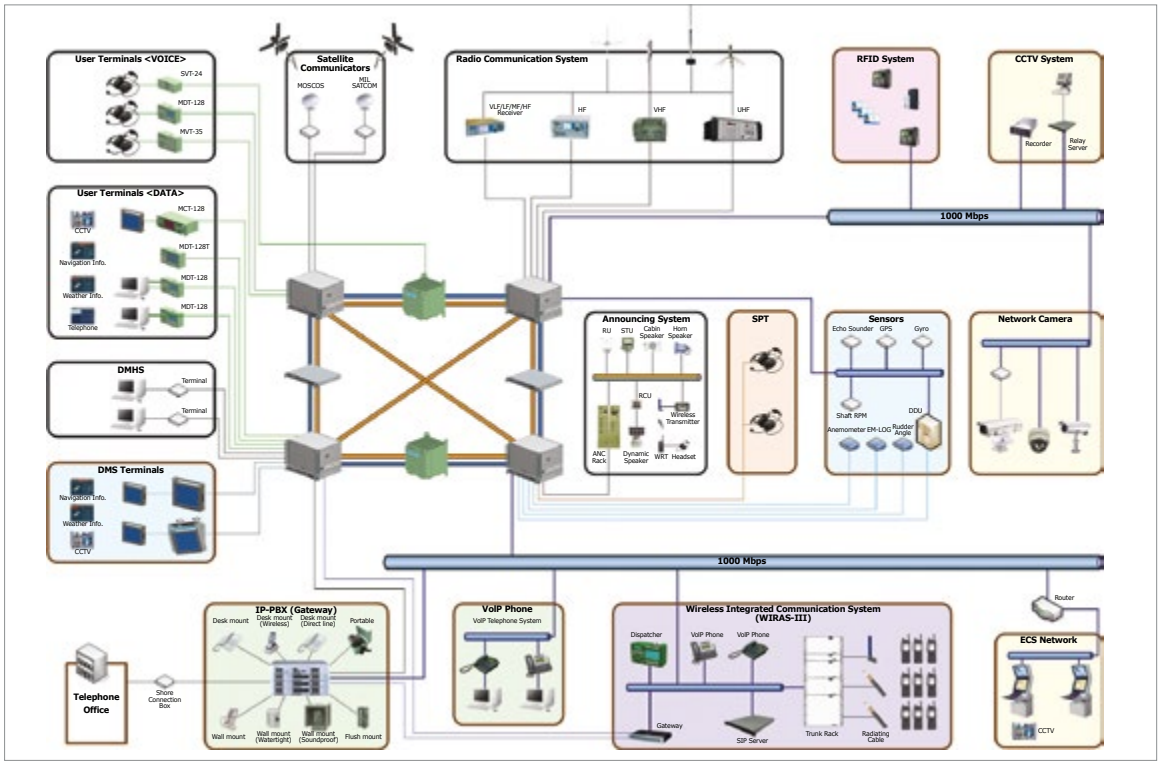
Typical Voice/Data Terminal (MDT-128)

Typical Voice Terminal (MVT-35)

Digital Communication Switching Unit (DCU-32)

System Introduction

ADICS-21 is a state-of-the-art digitalized Integrated Communication System (ICS) based on an optical communication network for newest naval ships or submarines in order to provide integrated communication environment involving naval tactical operations by using a variety of data and voice communications as below.



EM-LOG
Electro-Magnetic Speed Log

EM-LOG for the measurement of ship's speed.
This equipment indicates the speed of naval ships and voyage distance using the signal from a sensor reflected from ships to water surface.



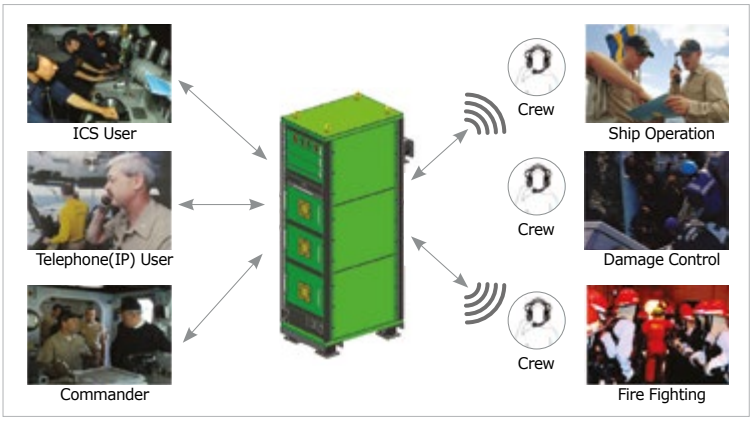
WIRAS-III
Wireless Interior Radio Communication System

WIRAS-III is based on the digital TETRA and VoIP technology. And the central management system is normally installed in 19" standard rack. It consists of 1 to 4 transceivers for 3 to 15 user channels and VoIP telephone channels.

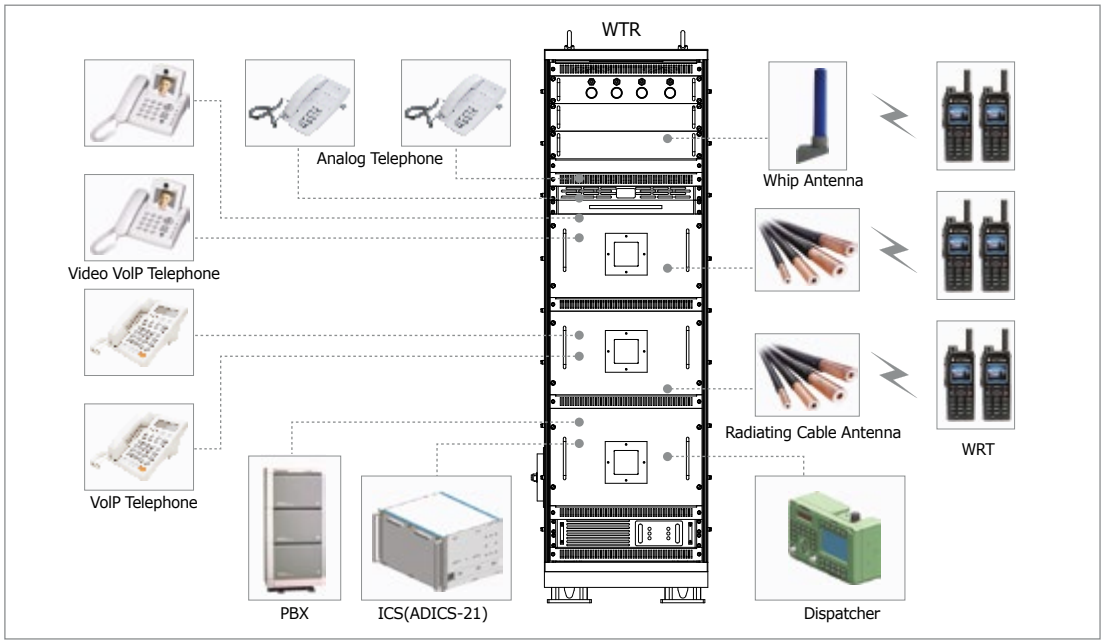
This system has various functions as follows ;
- Sending and receiving SMS
- Individual call and Group call
- Communicate with ICS
- Communicate with PBX through gateway
- VoIP communication through SIP protocol
- Seven user channels simultaneously
- 0.5 to 8 hours long time backup UPS (Option)

This system consists of the following devices ;
- Trunk Rack (WTR)
- Dispatcher (WDT)
- Radio Transceiver (WRT)
- Mobile Terminal (WMT)
- Network Manager (WNMS)
- VoIP Telephone (WTP)

WIRAS-III System Operation Example



Typical System Configuration of WIRAS-III



SSCLS
Ship Shore Communication Link System

1 | Perfect Compatibility

2 | Distributed Control System

Several independent function controllers are connected by CAN interfaced network.

- Overall system reliability is intact even when some components are faulty during operation.
- Modular design for facilitation in future system expansion.
- Applying functional redundancy.

3 | Easy User Interface

Easy to operate and to control system with intuitive touch LCDs.

- Provide three touch LCDs.
- If one touch LCD is faulty, user can use other LCDs as a replacement.
- Slave LCD can be used in separately main cabinet.

4 | Auto Wiring

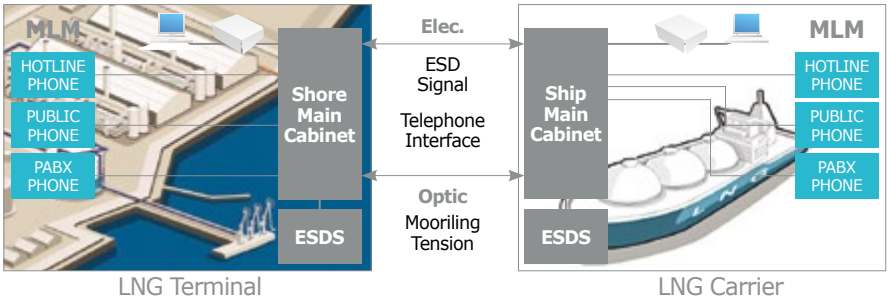
Electrical pin connections are automatically selected by simple choosing of port/terminal name.

5 | Self-Diagnostics

Intrinsic self-diagnostic function for each component with controllers.



SSCLS System



LNG Terminal LNG Carrier

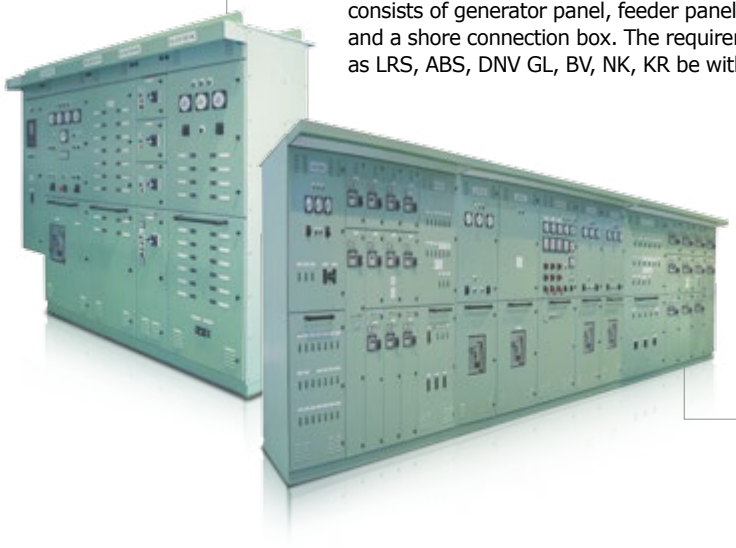
Product

Electrical Switchboard & Console

for special vessels including naval ships

The Emergency Switchboard

The Emergency switchboard is used for automatic start of emergency generator when power supply is the main switchboard fails. The panel consists of generator panel, feeder panel, emergency group starter panels and a shore connection box. The requirements of classification societies such as LRS, ABS, DNV GL, BV, NK, KR be with the emergency switchboard.



Main Switchboard

The main switchboard is newly designed for commercial marine application.
It has many advantages in design and is manufactured with compactness and ruggedness. The main switchboard meets the requirements of classification societies complied with IEC 439-1(Option).

Group Starter

The group starter is a newly designed and manufactured for easy installation, space saving with high reliability and safety. Especially the layout of components and units provides easy operation and maintenance, and simultaneously compacts design provides less weight and requires less space for installation. The group starter meets the requirements of classification societies and complies with international standard(IEC).



Engine Control Console

The engine control console is continuously developed in design of hardware and software, and has several features with easy operation, monitoring and maintenance.

Product

Nautical Instrument

We keep taking advantage of boundless uses of sensor.
We developed all kinds of sensors including thermometer, anemometer, smell sensor and environmental purity sensor for our daily life use.



Ultrasonic Type Wind Sensor

The ultrasonic Type Anemometer is a compact, self-contained, automatic station with no moving parts. The weather sensors and data acquisition computer are all contained in a single unit that is easy to install. Anemometer is ideal for severe and harsh environments aboard marine vessels. Anemometer offers the convenience of requiring no calibration or periodic maintenance.



Propeller Type Wind Sensor

Propeller Type Anemometer measures wind velocity and direction in real-time by rotation of transmitter. We can supply two kinds indicator-separated type or combined type.



3-Cup Type Wind Sensor & Indicator

The 3-Cup Type Wind Tracker, wind speed and wind direction indicator offers big performance in a compact display. Wind speed is displayed in your choice of units: KNOTS, M/S. Maximum wind speed is saved on the display until reset by the operator. Wind direction information is clearly displayed on a circular compass pattern of LEDs. Multicolored segments give a quick visual indication of current direction and direction variability. Front panel brightness control allows adjustment for best viewing in any light.



Pressure Transmitter

MCP-1 series Pressure Transmitter is designed to operate in hostile environments and yet give the outstanding sensitivity, linearity, and hysteresis of a silicon. Applications are process control system and biomedical instruments as well as ship.



Temperature Sensor

The temperature resistance characteristic of platinum wire is internationally utilized for measuring temperatures in the range of -200°C to 600°C. Platinum thermal resistance bulbs are known to be most suitable when used as temperature sensors which require extreme accuracy and stability.



Air Horn

Whistle

Air Horn

The air horn is a diaphragm sound transmitter operating on compressed air. The signal is released by an electromagnet or manually using a hand pull-rope.

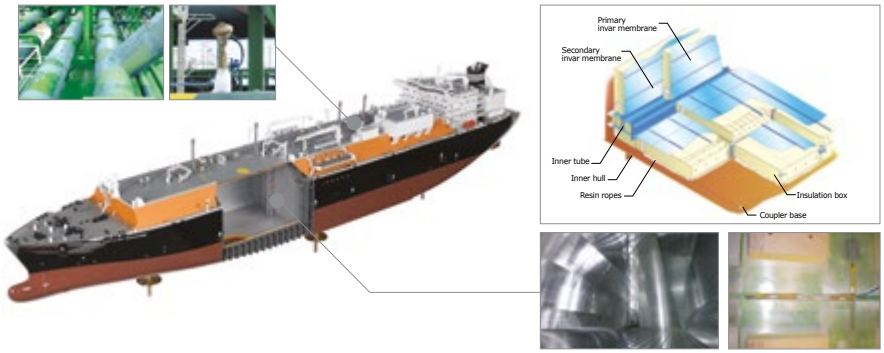
Electric Horn

The electric horn is driven by an AC 3phase motor. An essential component is the piston inside the cylinder driven by an AC3phase motor via connecting rod, crankshaft and gearwheels.

Temperature Sensor for LNGC

Temperature Sensor for GTT NO 96

NO 96 Membrane System is a cryogenic liner directly supported by the ship's inner hull. This liner includes two identical metallic membranes and two independent insulation layers.



Model



Application

1) IS/IBS/Liquid Dome Temperature
2) BHD/Trunk/Sec. Space Temperature
3) LNG Liquid Temperature
4) LNG Vapor Temperature
5) Glycol Water Temperature
6) Spray Inlet Temperature
7) Atmospheric Temperature

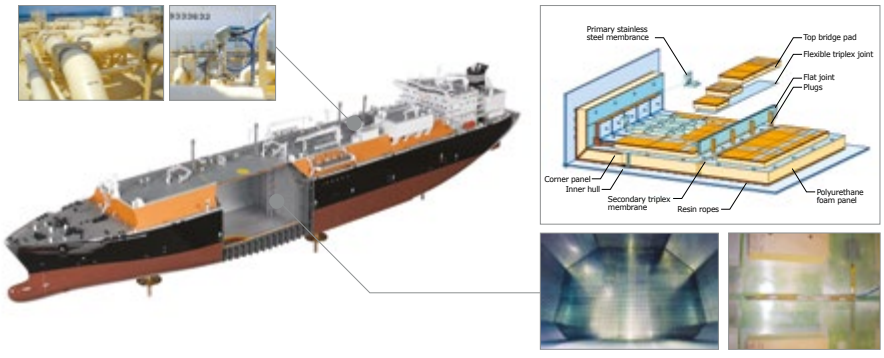
Specification

- Sensor type : RTD(Pt100Ω)
- According to IEC 60751
- R100/R0 = 1.3851
- R0 : Resistance value at 0 °C
- R100 : Resistance value at 100 °C
- t : Measuring temperature

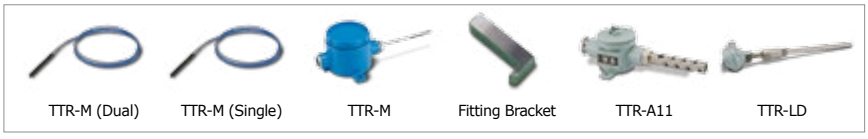
Operating Temperature	Class	Tolerance(°C)
-200 ~ 100°C	A	±(0.15 + 0.002 | t |)

Temperature Sensor for GTT Mark III

MARK III Membrane System is a cryogenic liner directly supported by the ship's inner hull. This liner is composed of a primary metallic membrane positioned on top of a prefabricated insulation panel including a complete secondary membrane.



Model



Application

1) IS/IBS/Liquid Dome Temperature
2) BHD/Trunk Temperature
3) LNG Liquid Temperature
4) LNG Vapor Temperature
5) Glycol Water Temperature
6) Spray Inlet Temperature
7) Atmospheric Temperature

Specification

- Sensor type : RTD(Pt100Ω)
- According to IEC 60751
- R100/R0 = 1.3851
- R0 : Resistance value at 0 °C
- R100 : Resistance value at 100 °C
- t : Measuring temperature

Operating Temperature	Class	Tolerance(°C)
-200 ~ 100°C	A	±(0.15 + 0.002 | t |)

WIS-200

Weather Information System

Weather Information System measures Wind speed and direction, Air temperature, and Barometric pressure, Humidity, Rainfall(Option).



Performance

- Wind speed
- Wind direction
- Temperature
- Barometric pressure
- Relative humidity
- Rainfall(Option)



Outputs RS422/RS232

Output rate	1sec
Units	m/s
Serial output format	Daeyang protocol
Serial output baud rate	2400,4800,9600,19200 or 38400 (Default : 9600)

Power

Power requirements	24Vdc (±20%) 4A

Environmental

Operating temperature range	-40 ~ 70°C
Storage temperature range	-50 ~ 80°C

Specification

Wind speed range	0 ~ 75m/s
Wind speed accuracy	±3%
Wind direction range	0 ~ 360°
Wind direction accuracy	±3°
Temperature range	-40 ~ 60°C
Temperature accuracy	0.3°C
Barometric pressure range	600 ~ 1100hP
Barometric pressure accuracy	±0.5hP
Relative humidity range	0 ~ 100%RH
Relative humidity accuracy	±3%RH
Rainfall range (Option)	0 ~ 250mm/h
Rainfall accuracy	±5%

*** Weather Information System Protocol**
$DEWMS,xxx.xx,R,xx.xx,M,A,H,xxx.x,T,
sxxx.x,B,xxxx.x*[CS] <CR><LF>

*** Rainfall Protocol**
$RAINxxx.xMM*[CS]<CR><LF>

Product

Sensor

Daeyang supplies various types of sensors measuring temperature / pressure / humidity / ultrasonic flow as a module and as a system, which have been developed and manufactured on our own.
We have developed all the core technologies for the sensors such as MEMS(Micro Electro Mechanical System), SoC design, simulation and reliability test, etc.
Recently, we developed the pressure sensors for ESC(Electric Stability Control) system for the automobile, and since 2014 we started to supply these sensors to HKMC and SYMC.

TheSEN

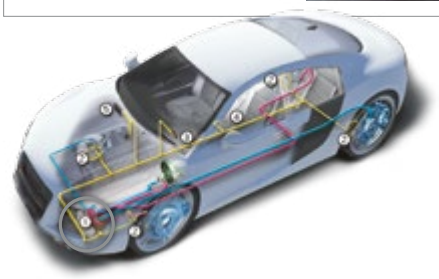
Pressure Sensor for Automobile

The pressure sensor modules ESC(Electronic Stability Control) is designed to provide optimal operation to control the brake power of wheels independently under the condition where the steering system does not work.



ESC System





Electronic Stability Control

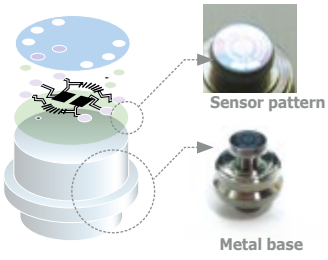
Component of the Electronic Stability Control
1. ESC-Hydraulic unit with integrated ECU
2. Wheel speed sensors
3. Steering angle sensor
4. Yaw rate sensor with integrated acceleration sensor
5. Engine-management ECU for communication

Application area ▶

ESC, ABS, TCS, TPMS and etc.

Metal Thin Film Pressure Sensor

We developed pressure sensor for high temperature and high pressure area by using metal thin films, deposited by the sputtering system. This kind sensor has the excellent performances like linearity, reliability and safety for harsh environments.





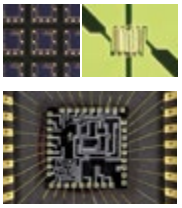
Package and Module

Application area ▶

Pressure transducer and transmitter, industrial automation, ventilation system, automobiles, aircrafts, hydraulic system, compressor, medical instruments

MEMS Pressure Sensor

Daeyang's MEMS(Micro Electro Mechanical Systems) pressure sensor has excellent properties just because of using advantages of Si semiconductor with high sensitivity and the metal structure with high safety. Because of these characteristics, the operation range is wide from 1 bar to 1,500 bar and moreover.







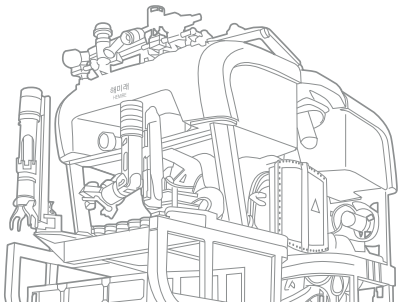
Application area ▶

Pressure transducer and transmitter, industrial automation, ventilation system, automobiles, Aircrafts, hydraulic system, compressor, medical instruments

Product

Underwater Vehicle

Daeyang have been developing the unmanned underwater vehicle (UUV) since 1990; 400m depth semi-autonomous underwater vehicle (SAUV) on 2003, 6000m depth UUV on 2006, which is the fourth of the world, has been successfully developed. Currently, our underwater vehicles are being supplied to marine industry and to underwater research centers.



Haemirae (UUV 6000)

- Underwater station to support ROV & AUV
- Heading keeping control
- Deep towed camera function
- Localization with USBL system







UUV A 100

- Development of technology for automatic control
- Design and application of hybrid navigation algorithm
- Development of technology for precise control of communication system

UUV R 100

- Underwater camera, sonar, environmental senor
- Automatic dynamic control
- Underwater hybrid navigation algorithm
- Communication system via tether cable



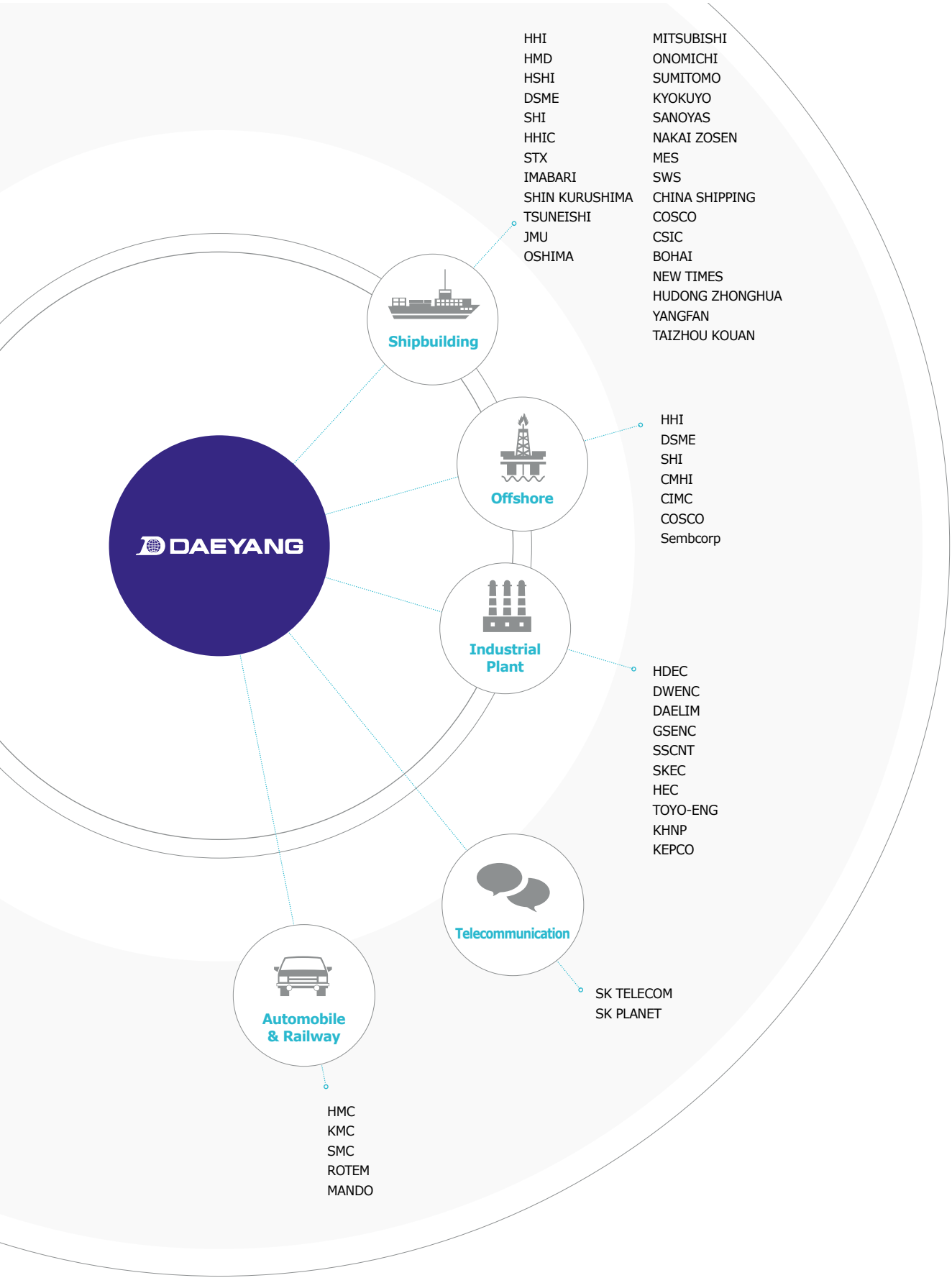
H-ROV

- 6-DOF motion control
- Heading keeping control (Heading, Depth, Altitude)
- Precise control through fiber optic telemetry
- Localization with USBL system
- Ship hull & infrastructure inspection
- Port & harbor security
- Mine countermeasures (MCM)
- Scientific research





Our Valuable Customer



Worldwide Service Network

National	Company	Website
Argentina	Turbogen	http://www.turbogen.com/
Australia	AMI Group	http://www.amigroup.co/
	Read's Electric Company PTY. Ltd	http://www.readselectric.com/
Belgium	Maintenance Partners NV	https://maintenancepartners.com/
Brazil	Metalock Brasil	http://www.metalock.com.br/
Canada	Oasis Marine Services, LTD.	http://www.oasismarine.ca/home.htm
China	CETCME	http://www.cetcme.com/
	Huludao Haitong electric equipment manufacturing Co., Ltd.	http://www.hldht.cn/
	Jiangsu Hiscaler Electric Co., Ltd	http://www.hiscaler.com/
	Saiernico Electric & Automation Ltd	http://www.saiernico.com/
	Seven Seas Electronic Co., Ltd	http://www.sevenseas-electronic.com/
	Shanghai Marine Diesel Engine Research Institute	http://www.csic-711.com/
	Shanghai NSE Co. Ltd.	http://www.nse.net.cn/
	Zhejiang Xin Ya Electric Development Co. Ltd.	http://www.xy-cd.com/
Colombia	Electronica Maritima ITEC SAS	http://www.iteccolombia.com/
	Servicios Portuarios S.A.	http://www.serport.co/
Cyprus	Totottheo	http://www.totottheo.com/
France	MACOR (Amarix Group)	http://www.macor.fr/
Germany	Ing.-Buero Querin GmbH	www.querin.com
	Karle & Fuhrmann	http://www.karle-fuhrmann.de/
	Veinland GmbH	http://www.veinland.net/
Gibraltar	Sandvik Marine Group	http://www.sandvikservice.com/
Greece	SRH Marine Electronics S.A.	http://srhmar/
India	Adrie Marine Electronics Solution Pvt.Ltd.	http://www.adriemarine.in/
	Favourite Marine Services	http://www.favouritemarine.com/
Italy	A. Santamaria Spa	http://a-santamaria.it/
	S.I.R.M. spa	http://www.sirmspa.it/
Japan	Bemac Uzushio Electric Company Ltd	http://www.bemac-uzushio.com/
Lithuania	RSB Novikontas Ltdd	http://www.novikontas.eu/
Mexico	Marine Radio Surveyors	http://www.marineradiosurveyors.com/
Ne	Navico	http://navico.com/
Nigeria	Radial Circle Telecommunications Ltd	https://radialcircle.com/
Panama	Electromar Services SA	http://www.electromarpanama.com/
	Hi-Tek Marine S.A	http://www.hitekmarine.com/
	Intermaritime Group	https://intermaritime.org/
	Talleres Industriales SA	http://www.talleresindustriales.com/
Poland	Enamor	http://www.enamor.com.pl/
	EPA Marine sp. z o.o	http://epamarine.pl/
Romania	Navtron SRL	http://www.navtron.ro/
Singapore	Cyclect Electrical Engineering PTE Ltd	https://www.cyclect.com.sg/cyclect/
	Jason Electronics Pte. Ltd.	http://www.jason.com.sg/
	New Funnels (s) Pte Ltd	http://newfunnels.com.sg/home.php
South Africa	SMD Telecommunications Pty (Ltd)	http://www.smd-marine.com/
Spain	AAGE Hempel	http://www.aagehempel.com/
	Alconza Berango S.L.	http://www.alconza.com/
	Crosscomar S.L.	http://crosscomar.com/
	Hermanos Alfaro	http://www.halfaro.com/
Sweden	Laholm Marine & Industry Services AB	http://www.lmis.se/
Turkey	Polar Marine Group of Companies	http://www2.polarmarine.com/
United Kingdom	S.I.R.M. UK	http://www.sirmspa.it/en/
U.S.A	Belfor Holdings Inc.	http://www.belfor.com/
	Koffler Electrical Mechanical Apparatus Repair	http://www.koffler.com/index.html
	Rice Electronics	http://www.riceelectronics.com/
	Seaboard Controls INC	http://www.seaboardcontrols.com/
Venezuela	Radio Marina de Venezuela	http://www.radiomarinagroup.com/web/

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Riverwood NSW 2210, Australia
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13th floor Botafogo, Rio de Janeiro,
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Fax. 55 21 2518 5587

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5956, 86 21 6404 6912 (ext 8036)

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KWT INDUSTRIAL CONTROL TECHNIC
Licang College Road, No.280, Buildng 14
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GERMANY

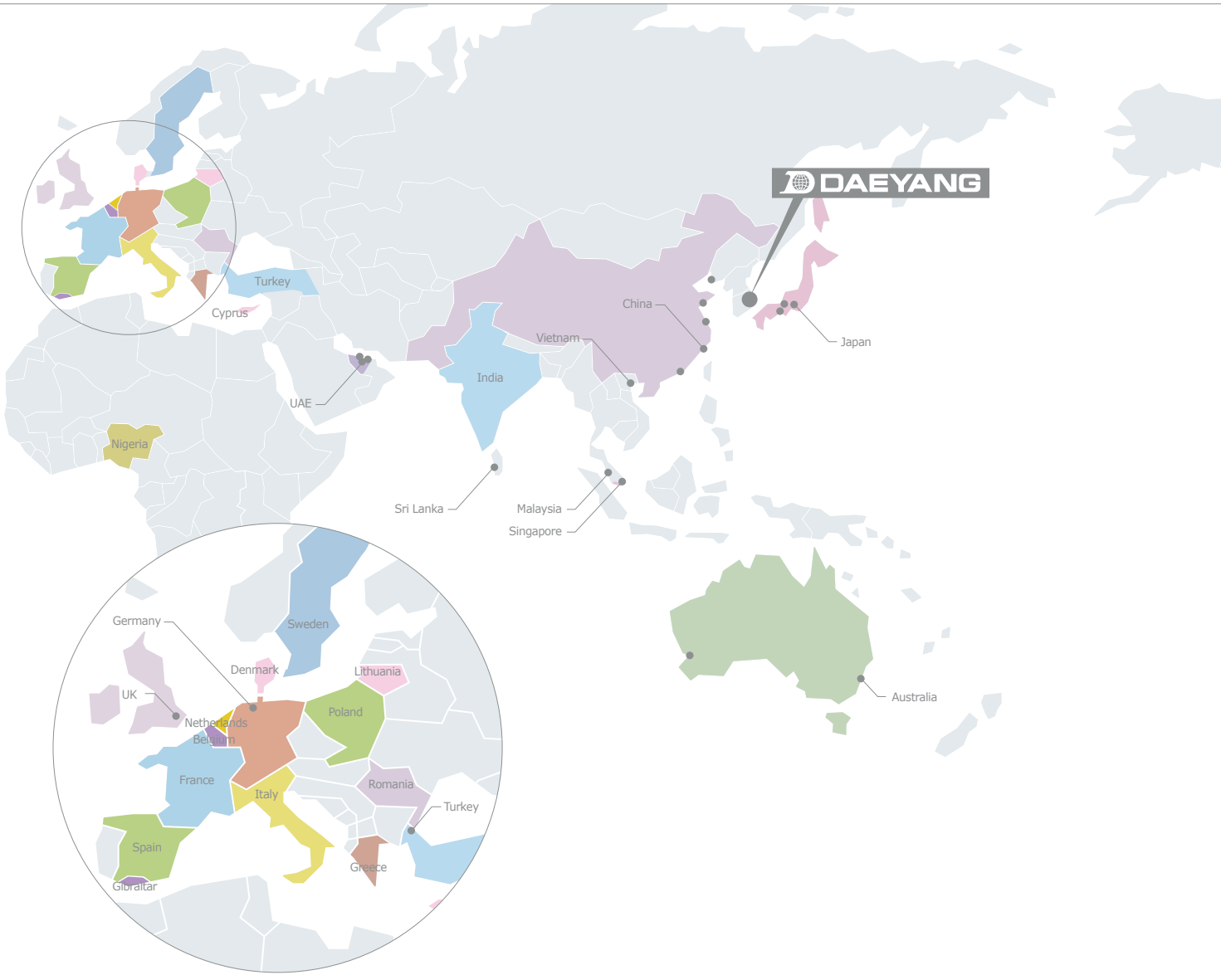
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Fax. 49 40 311598

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Fax. 81 898 41 6999

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Fax. 81 6 6584 0566

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Tel. 1 847 412 4600
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DAEYANG

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