

EMS
(ENERGY MANAGEMENT
SYSTEM)



INDUSTRIAL AUTOMATION
SYSTEM



WORLD SOLUTION COMPANY
**LIGHT SOLUTION
LEADER**

Adic Provides Perfect Light Control Systems

WE ARE DOING OUR BEST TO SATISFY CUSTOMERS THROUGH PROVIDING THE OPTIMUM **CONTROL SYSTEM** TO BECOME A **TECHNICAL LEADER IN THE FIELD OF INDUSTRY AUTOMATION**

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Adic Co., Ltd. is the R&D based company which develops devices about AGV (Autonomous Guided Vehicle) and LonWorks(ANSI/EIA 709.1 – the standard of open Control network) mainly.

Adic Co., Ltd. was established in 2000 and we have pursued R&D.

Specially, our LonWorks based power line communication device design technology (that achieved CE for the first time in Domestic & Europe), is applied in HA, BA, FA and TA.

We promotes element technology and quality of products based on our own Technology.



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HISTORY



2000's

Establishment of ADIC Corporation.
 Selected as New Technology Business Provider of TBI Business by the Ministry of Commerce, Industry and Energy. (No.2000-147)
 Registration as Venture Company. (No.200012-686)

2001's

Joined LonMark Partnership of International Certification Organization of LonWorks.
 Selected as Technology Transfer Company by the Small and Medium Business Administration-Development of Industrial Real Time Internet Web Server.

2002's

Acknowledgement of Affiliated Lab (No.20021576) : Korea Industrial Technology Association.

2003's

CE MARK Certification of Power Line Communication Module (APL) for the First Time in Korea/Europe.
 ISO 9001 & KSA 9001: 2000 Certification.

2005's

ECHOLON LID (LonWorks INDEPENDENT DEVELOPER) Certification.
 Relocation to New Office Building. (654-12, Bansong-ri, Eonyang-eup, Uiju-Koon, Ulsan)
 Selected as INNO-BIZ Company by Small and Medium Business Administration. (No.5021-0464)
 ADIC Factory Registration.

2006's

Partner Company Registration in KEPCO KDN. (Area: Automation Machinery, Other Service)
 Selected as Promising Export Firm (No. 06-51) : Busan / Ulsan Export Support Center.
 Confirmation of Software Company by Korea Software Industry Association.

2007's

Selected as Global Star Venture Company (No. 2007-3) : Ulsan City.

2008's

Establishment of Seoul / Kyonggi Branch of ADIC Corporation.
 Selected as Promising Export Company (No. 08Busan.Ulsan-129) : Busan / Ulsan Export Center.

2009's

Acquisition of Information Communication Business License. (No.520017) : Ulsan City.
 New Opening of Seoul/Kyonggi Branch Office of ADIC Corporation.

2010's

Achieved mechanical works license issued from Ulsan city. (Ulsan Uiju 2010-10-20)
 Selected as 2010 global star venture business.

2011's

Awarded excellence at the contest of LH Green Materials. (Energy saving electronic HID ballast)

2012's

Received Knowledge Economy Minister prize for contributing district software industry improvement. (No. 12560)

2013's

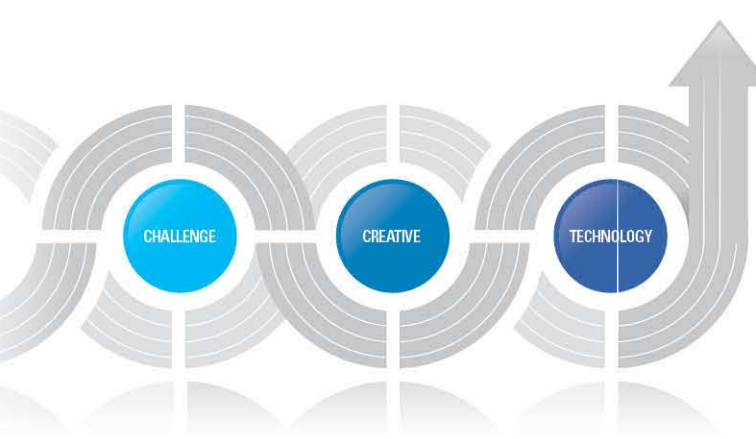
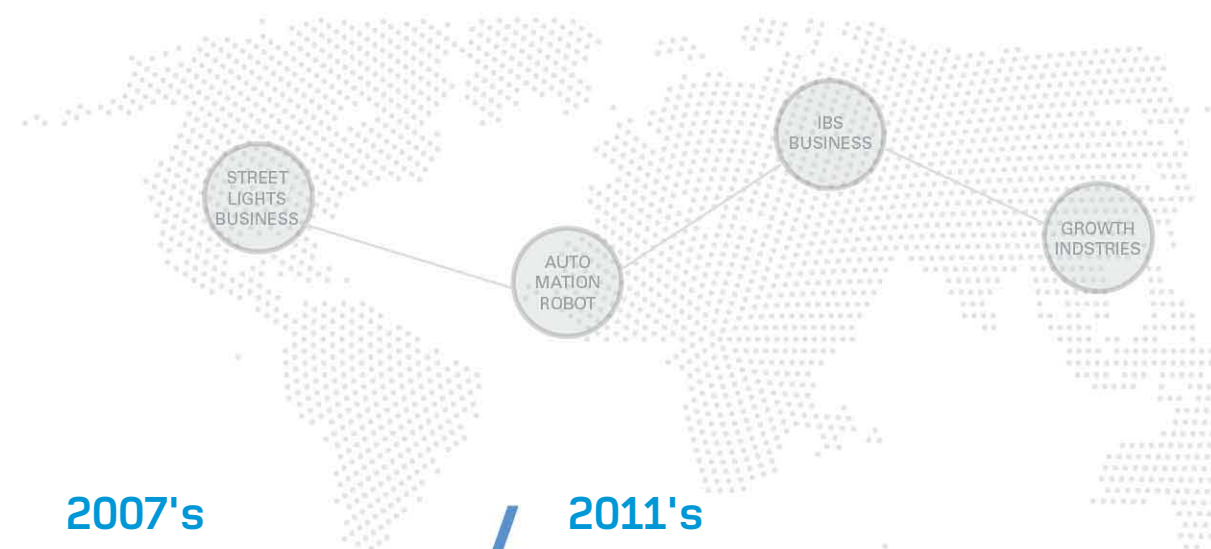
Designated as Ulsan global IP star business.
 Designated from Small & Medium Business Corporation as a core company for good workplace. (No. 2013-116)
 Certified as a 2013 shipbuilding & marine IT-combined renovation company.

2014's

Registered as strategic partner for Hanwha S&C.
 Designated as export prospective company. (No. 14Busan-Ulsan-105)

2015's

Designated again as small hidden champion from Employment and Labor Ministry.
 Signed MOU with Ulsan Creative Economy Center.
 Registered as cooperative company for Hyosung Group.
 Registered Seoul branch office as a factory



World Solution Company
Control System Leader

BUSINESS AREA

Industrial Automation Provides Solutions to the core of Control System Leaders



EMS (Energy Management System)

Street light control system

■ LED street light control system.

It controls through power line communication, LED lights (street lights, security lights and tunnel lights) using the CMS and DLC(outdoor lighting controller). The system has capability of dimming control, status monitoring and electrical data measuring.

■ HID street light control system.

It controls through power line communication, HID street lights using our CMS (central management software), electronic smart ballast, line controller. Especially, the electronic smart ballast, an innovative product, provides significant energy saving through power factor correction circuit, dimming control function, LonWorks PLC circuit, etc.



Demand control system

It is an automatic energy control system that reduces power rates and energy consumption through power peak control, and is a maximum power demand control system not to exceed contracted power or the target power use. (An effective system that controls major target loads such as lighting, air conditioning, through direct control by distributed control system based on LonWorks)

Intelligent Building System

We have developed and manufactured LonWorks platform control devices and systems for building automation which manage the equipment and facility efficiently since our foundation. It supplies the comfortable environment and energy saving for building users. We are offering a wide range of solution from device development to design, system installation and commissioning and maintenance for IBS.



INDUSTRIAL AUTOMATION SYSTEM

Robot Control System

■ AWS (Automatic Welding Solution)

It is a robot control system for auto welding applied to the construction of oil carrying pipe lines, and it is adopted and operated in many construction sites in the world since it reduces work fatigability in manpower and makes working period shorter, and improves welding quality.

■ AGV (Autonomous Guided Vehicle System)

It is a key control system to harbor automation to improve distribution system according to the increase of harbor traffic, and it has various functions such as location recognition of autonomous guided vehicle, optimal path planning, running, collision avoidance, and it can be applied in many industries.

■ ROV (Remote Operation Valve System)

It is a system to operate balancing valves installed at the bottom of a ship in the deck remotely and it provides efficient and economic effects in construction and maintenance since it consists of LonWorks PLC communication.

Safety System

■ Crane Collision Avoidance System

Crane collision avoidance system is to prevent crane collision accident between the cranes which can occur in shipbuilding and construction industry. The system consists of precision DGPS, wire-wireless network integrated control system and console devices for users.

■ u-Safety

Disaster prevention management system is to prevent industrial disasters in advance by collecting and analyzing the factors causing disasters such as fire, explosion, suffocation and fall which can occur in general industries of shipbuilding, chemistry, construction and other industries through wire-wireless sensor network and integrated control system.



LED Street Light Luminaires

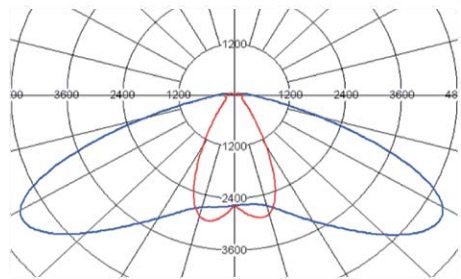
Features

- Uses suitable lens for streetlight.
- Enhances light dispersion and distribution by improving light straightness.
- Easy installation due to the same width as existing sodium luminaires.
- Applies aerodynamic design.
- Improves heat dissipation using individual heat sink.
- Saves energy by applying high efficiency power LED.
- Eco-friendly product applying LED light source.
- Guaranties 50,000 hours of life time due to perfect heat dissipation.
- Designed to meet IP65.



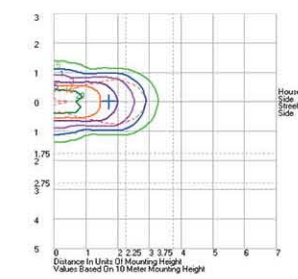
Distribution Profile

Luminance Intensity Distribution

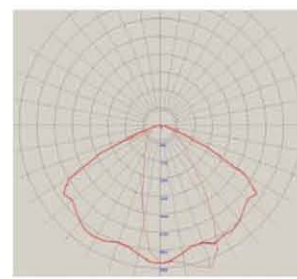


STREET LIGHT TYPE

Isolux Diagram



Distribution Curve



SECURITY LIGHT TYPE

Specifications

| Model | ASL-150L | ASL-120L | ASL-100L | ASL-75L, ASC-75L | ASC-40L |
|---------------------|---------------------|---------------------|-------------|---------------------|-------------|
| Power | 150W | 120W | 100W | 75W | 40W |
| Luminous Efficiency | >110 lm / W | >110 lm / W | >110 lm / W | >110 lm / W | >120 lm / W |
| Luminous Flux | >15,000lm | >12,000lm | >10,000lm | >7,500lm | >4,200lm |
| Color Temperature | 5700K | | | | |
| Color Rendering | >75 | | | | |
| IP | 65 | | | | |
| Life Time | 50,000 hrs | | | | |
| Dimension | 928 x 326 x 167(mm) | 780 x 275 x 155(mm) | | 507 x 238 x 108(mm) | |

LED Tunnel Light Luminaires

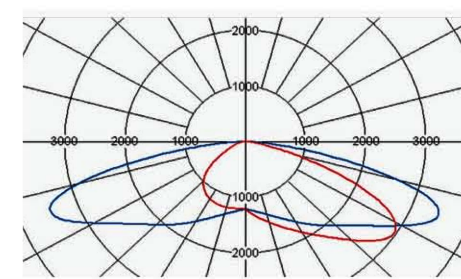
Features

- Designed for tunnels, underground passes, etc.
- Easy maintenance. (Separate spaces for the LED Modules and SMPS / OLC)
- Improves heat dissipation with individual LED module heat sink.
- Energy saving by applying high efficiency power LED.
- Eco-friendly product applying LED light source.
- Guaranties 50,000 hours of life time due to perfect heat dissipation.
- Designed to meet IP65.
- Built-in LED protection filter.

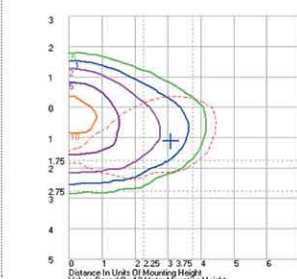


Distribution Profile & Simulation

Luminance Intensity Distribution



Isolux Diagram



Specifications

| Model | ATL-200L | ATL-150L | ATL-125 | ATL-100L | ATL-75L |
|---------------------|---------------------|------------|------------|------------|------------|
| Power | 200W | 150W | 125W | 100W | 75W |
| Luminous Efficiency | >110lm / W | >110lm / W | >110lm / W | >110lm / W | >110lm / W |
| Luminous Flux | >22,000lm | >15,000lm | >12,000lm | >10,000lm | >7,500lm |
| Color Temperature | 5700K | | | | |
| Color Rendering | >75 | | | | |
| IP | 65 | | | | |
| Life Time | 50,000 hrs | | | | |
| Dimension | 492 x 384 x 161(mm) | | | | |

LED Street Light SMPS

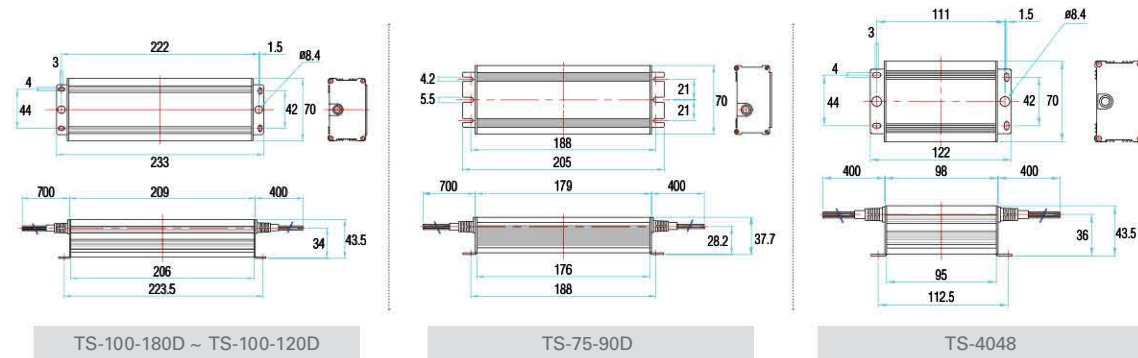
[For Series connected LED's]

Features

- Universal AC input (90VAC up to 305VAC) / Full range.
- Short circuit / Overload / Over voltage / Over temperature Protection.
- Built-in constant current limiting circuit with adjustable OCP (Over Current Protection) level.
- Built-in active PFC function.
- IP 67 design for indoor or outdoor installations.
- Isolated Input - Output.
- Cooling by free air convection.
- Non- electrolytic Capacitor.
- Long life time over 100,000 Hrs.
- Applicable for Dimming system. (0 ~ 10 : Optional)
- Built-in surge protection circuit.



Dimensions



Specifications

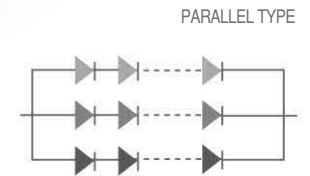
| Model | TS-150-180D | TS-120-150D | TS-100-120D | TS-75-90D | TS-4048 |
|---------------------------------|---------------------|-------------|---------------------|-----------|---------------------|
| Input Voltage | 90 ~ 305VAC | | | | |
| Wattage | 150W | 120W | 100W | 75W | 40W |
| Power Factor (at 220VAC) | ≥ 0.99 | ≥ 0.98 | ≥ 0.97 | ≥ 0.95 | ≥ 0.96 |
| Output Current | 740mA | 700mA | 700mA | 700mA | 800mA |
| Output Voltage | 180V | 150V | 120V | 90V | 48V |
| Dimming Signal | 0 ~ 10V | | | | |
| Efficiency | ≥ 94% | ≥ 93% | ≥ 92% | ≥ 89% | ≥ 89% |
| Life Time | 100,000hrs | | | | |
| Operating Temperature | -40°C ~ 50°C | | | | |
| Size | 233 x 70 x 43.5(mm) | | 205 x 70 x 37.7(mm) | | 122 x 70 x 43.5(mm) |
| Weight | 970g | | 690g | | 430g |

LED Street Light SMPS

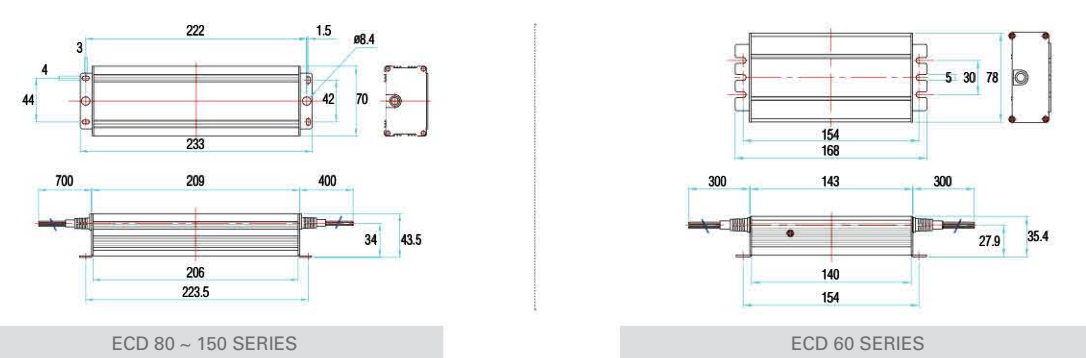
[For Parallel connected LED's]

Features

- Universal AC input (90VAC up to 305VAC) / Full range.
- Short circuit / Overload / Over voltage / Over temperature Protection.
- Built-in constant current limiting circuit with adjustable OCP (Over Current Protection) level.
- Built-in active PFC function.
- IP 67 design for indoor or outdoor installations.
- Isolated Input - Output.
- Cooling by free air convection.
- Non- electrolytic Capacitor.
- Long life time over 100,000 Hrs.
- Applicable for Dimming system. (0 ~ 10 : Optional)
- Built-in surge protection circuit.



Dimensions



Specifications

| Model | ECD 150 Series | ECD 100 Series | ECD 60 Series |
|------------------------------|---|-------------------|---------------------|
| Input Voltage | 90 ~ 305VAC | | |
| Wattage | 150W (130W ~ 150W) | 100W (80W ~ 120W) | 60W (50W ~ 70W) |
| Power Factor | PF ≥ 0.98 / 115VAC, PF ≥ 0.98 / 220VAC, PF ≥ 0.95 / 277VAC at full load | | |
| Output Current | 4.5 ~ 2.4A | 3.8 ~ 1.6A | 2.2 ~ 1.0A |
| Output Voltage | 30 ~ 56V | 24 ~ 56V | 24 ~ 56V |
| Dimming Signal | 0 ~ 10V | | |
| Efficiency | 92% | 91% | 90% |
| Life Time | 100,000hrs | | |
| Operating Temperature | -40°C ~ 50°C | | |
| Size | 233 x 70 x 43.5(mm) | | 168 x 78 x 35.4(mm) |
| Weight | 970g | | 590g |

ADSLC II OLC

[OLC(Outdoor Lighting Controller)]

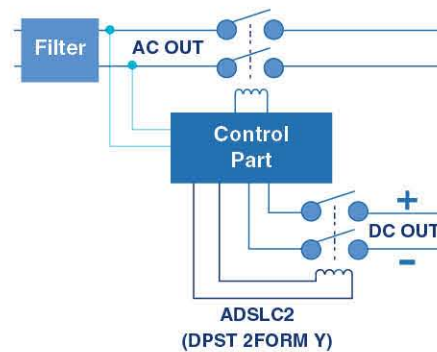
Dimming and Energy Consumption Monitoring Capabilities through Power Line Communication Based on LonWorks.

ADSLC II, a streetlight controller, builds streetlight control network with power line communication, and can be accessed through the iLon SmartServer by Internet or mobile wireless network in order to manage and control streetlights.



Features

- Enables dimming control and lamp on / off through dimming signal. (0~10V dc)
- Has metering function measuring electrical data such as current, voltage, power, etc.
- Is equipped with the function to detect leakage current.
- Complies with LonMark standards.
- Can build streetlight network through power line communication.
- Applies DPST 2FORM Y type relay to remove residual light of LED that protects lamp from surge during daytime and prevents energy loss by leakage current.



Specifications

| | | | |
|--|----------------------|---|-------------------|
| Input / Output Voltage | 100VAC ~ 250VAC | Dimming Signal Voltage and Current | 0 ~ 10VDC |
| Input / Output Max Current | Max 1A (at 250 Volt) | Use Temperature | -40°C ~ 50°C |
| Leakage Current Measuring Range | Max 100mA | Storage Temperature | -50°C ~ 90°C |
| Input / Output max Power | Max 250W | Size | 208 x 68 x 37(mm) |
| Communication | Processor | PL 3120 Smart Transceiver (ANSI-709.2) | |
| | Channel / Speed | PL-20C, 5.4 Kbit / Sec | |
| | Protocol | Enhanced LonTalk® Proxy protocol | |
| | Function block | NodeObject (SFPTnodeObject, Index: 1) | |
| | PLC Regulation | Lamp (SFPToutdoorLuminairController, Index: 96) | |
| FCC, Industry Canada, Japan MPT, European CENELEC EN 50065-1 | | | |

Street Light Smart Control Box



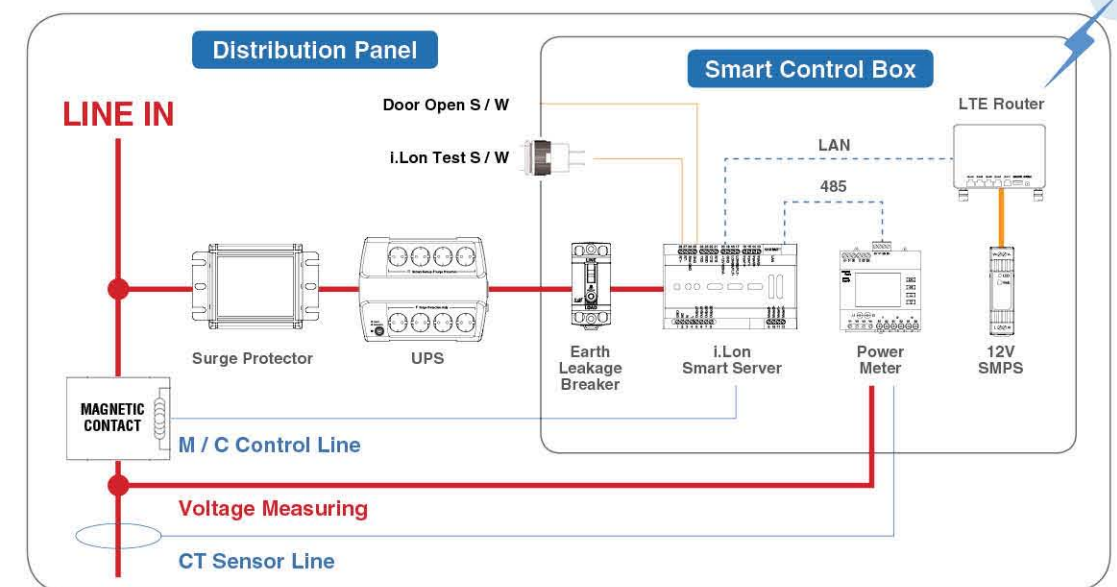
Composition

- ▶ i.Lon SmartServer PL
- ▶ Switching Supply
- ▶ Power Meter
- ▶ LTE Router
- ▶ UPS
- ▶ Earth Leakage Breaker
- ▶ Surge Protector

Features

- Enables real time monitoring and controlling using various devices. (PC, smart phone, tablet, etc)
- Monitors the status of lamps on / off, dimming level, failures, line voltage / current / power.
- Controls lamp on/off, dimming level.
- Supports access to the system through mobile devices. (iOS, Android)
- Supports power line communication.
- Supports LTE (Band1, Band3, Band5, category3) and WCDMA(Band1), GSM.
- Protects the devices inside the box using 10kA rated breaking current breaker.
- Optimized compact size. (280mm * 235mm * 94.6mm)

Block Diagram



LTE
GSM
3G

Advanced Streetlight Management Software

System Overview

This Advanced Streetlight Management System is a real time control system based on GIS that monitors and controls street lights remotely.

- Able to run up to 1,000 SmartServers and 100,000 light points
- Easy access and convenience of use through GIS (Map) service
- Able to use the system without installing client system through HTML5 web based service and to access the system with PC's, tablets and smart phones.
- Cost Reduction through building dynamic IP based network. (DDNS, static IP not used)



Features

Real Time Control

- Monitors in real time lamps on / off, dimming levels and electrical data etc.
- Schedule and program-based automatic control through stable local network.
- Able to control remotely through individual and group control.
- Reduces maintenance cost through detecting old lamps, abnormal state etc.

Energy Saving

- Realizes energy savings through sunrise sunset based dimming control.
- Reduces running costs and CO₂ emission.

Efficient Management of Street Light

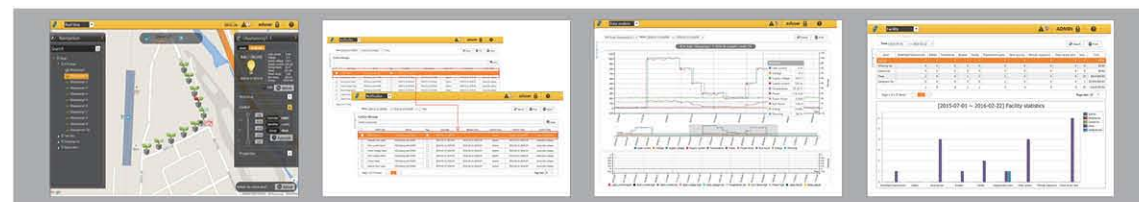
- Builds GIS (Map) based facility management system.
- Traces the data of facility management and maintenance history.
- Efficient management through statistical analysis.

Detecting Failures / Alarming in Real Time

- Detects panel door open, outage, overvoltage, overcurrent, communication failure etc in real time and gives alarms.
- Informs users in real time through e-mail / SMS.
- Minimizes nighttime patrol and reduces civil complaints through immediate onsite actions.
- Efficient facility management.

Optimum Installation and Trial Run

- Integrated management from preliminary investigation to installation and trial run.
- Conducts preliminary investigation and builds management area through our registration apps.
- Collects installation information using the apps. (pole numbers, NID's, GPS positions etc)
- Automatic commissioning and onsite test through the installing software.



Integrated LED Streetlight Controller

All-in-one LED smart driver that performs multiple tasks of LED lamp brightness adjustment and read/report of electrical data such as power consumption, current, voltage and etc, by combining power supply function and communication function



Features

- LED LAMP ON/OFF & Dimming control. (20%~100%)
- Various protection functions embedded. (lamp overcurrent / overvoltage monitoring and automatic output cutoff, etc)
- Gathers / reports input voltage, current, power consumption.
- Gathers / reports lamp run hours, energy use.
- With the power line communication modem (PLC-33) built in, it controls the lamp without extra communication lines.



Specifications

| Items | Specifications | Remarks |
|---------------------------|---------------------------|---------------------|
| Input Voltage | 180Vac ~ 250Vac (50/60Hz) | |
| Input Current | 0.65A@180Vac | |
| Power Factor | >0.93 | full load condition |
| Rated Output | 100W | |
| Efficiency | 92% Max | full load condition |
| Output Voltage | 144Vdc | |
| Output Current | 700mA(max) | |
| Dimming Range | 20W ~ 100W | |
| Output Control Method | Constant Power Control | |
| Operating Temperature | -40°C ~ 45°C | |
| Case Temperature Max (Tc) | 80°C | |

LCM Series Lighting Control Module

The intelligent building system requires interoperable, reliable and efficient lighting facility more and more. The LCM is an Lonworks based lighting controller that provide 4 latch relay output for lighting application.

This lighting control module assures seamless integration into Lonworks, thus enabling more effective building operation and energy saving. It is designed to efficiently control and add value to the building industry.

Specially, LCM supports the function that is able to manage the communication traffic in lighting control network to improve the reliability of control network through using appropriate configuration property and detecting the error and retrying communication by comparing the control command and the status of latched relay.



ALCL-H4BM



ALCL-D4CS

Features

- 4 independent latch relay outputs.
- User friendly, customer based Plug-In.
- Provide a wide range of lighting control strategies.
- LED indication for each relay status.
- Easy installation and maintenance.

Specifications

| Model | ALCL-D4CS | ALCL-H4BM |
|-----------------|---|--------------------|
| Processor | Neuron FT5000 | |
| Transceiver | FT - X3, 78Kbps | |
| Processor Clock | 10Mhz | |
| Memory | 32K Flash Memory, 2K EEPROM | |
| Comm. Media | TP (Twisted Pair Line) | |
| Power | 24VAC, 50mA, 50 / 60Hz | |
| Protocol | ANSI / EIA / CEA 709.1 Lon Talk Protocol, ANSI / EIA / CEA 709.3 TP | |
| Comm. Type | Standard | Message |
| Dimension | 123 x 105 x 85(mm) | 123 x 105 x 67(mm) |
| Operating Temp. | 0°C ~ 50°C | |
| Mounting | Wall mount type or Din rail base plate type | |

LPS Series Lighting Programmable Switch

The LPS product series are the LonMark programmable switches for the open protocol lighting control applications. It can be used with any other Lonworks interoperable devices.

Bar type, square type and metal cover type are available. Each type has 1, 2, 3, 4 and 8-circuit switches.

These devices have a protection coupling circuit to avoid potential damage from misuse or misapplication especially when the Linked Power Line becomes short circuit. Moreover, Users can use both the 4-Wire FTT-10 Lonworks application and 2-Wire linked power LonWorks application without extra setting.



BAR TYPE BUTTON SWITCH



SQUARE TYPE BUTTON SWITCH



METAL COVER TYPE SWITCH

Features

- FTT-10 and LPT-10 compatible system.
- Lonworks "Open System" architecture, topology free, polarity free.
- Interoperable and LonMark 3.2 compliant.
- LED indication of the relay status.
- Easy installation and maintenance.
- Linked power application compatible.

Specifications

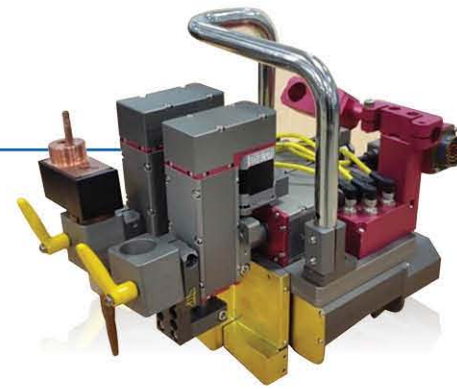
| Model | LPS 1, 2, 3, 4, 8 |
|-----------------|---|
| Processor | Neuron FT5000 |
| Transceiver | FT - X3, 78Kbps |
| Processor Clock | 10Mhz |
| Memory | 32K Flash Memory, 2K EEPROM |
| Comm. Media | TP (Twisted Pair Line) |
| Power | 4 - Wire FTT-10 Network Application 2 - Wire Link Power Network Application MAX 42VDC |
| Protocol | ANSI / EIA / CEA 709.1 Lon Talk Protocol, ANSI / EIA / CEA 709,3 Twisted Pair Line |
| Comm. Type | Standard / Message |
| Dimension | 1~4CCT : 70mm x 120mm(W x H) / 8CCT : 118mm x 116mm(W x H) |
| Operating Temp. | 0°C ~ 50°C |

Automatic Welding Solution

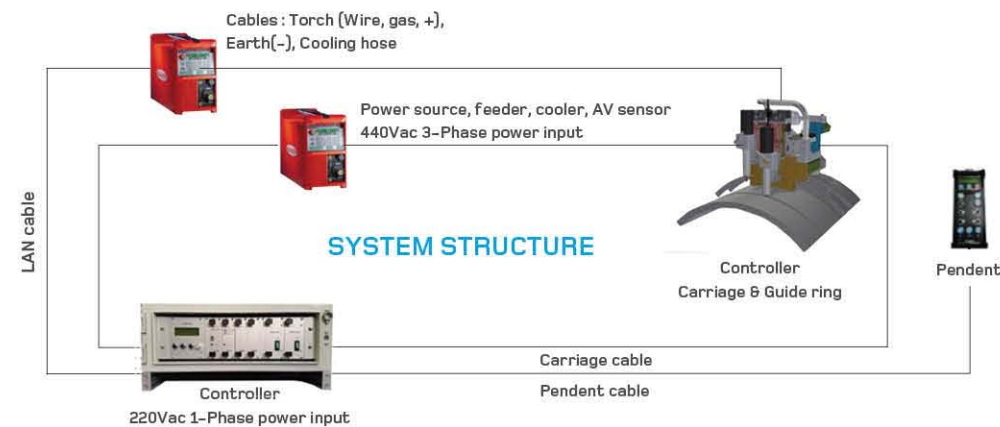
Offshore Pipeline Automatic Welding System (Dual Torches)

Used for undersea pipeline welding installed on a cable ship

- Welding technique : FCAW or GMAW
- Welding Type : Root, Hot pass + Fill, Cap pass
- Seam tracking : Torch weaving center auto tracking
- Light guide ring able to cope with various pipe sizes
- Modularized carriage structure : easy maintenance
- Automatic change in welding condition based on welding postures(5G)
- Single carriage with dual torches
- Simultaneous welding with two carriages divided into port and starboard
- Auto voltage(current) control : Torch height auto tracking



DUAL TORCH CARRIAGE



Actual Applications

- 2004 ▶ Provided HHI (Hyundai Heavy Industry) Barge-2500 with the welding system (10 sets of the controllers and spare parts) and supplied technical support.
 - ▶ Provided HHI Barge HD-60 with the welding system(10 sets of the controllers and spare parts) and supplied technical support.
- 2004 ~ 2012 ▶ HHI and other companies conducted more than 20 projects using the system with Adic technical assistance.
- 2010 ▶ Provided Geumseong GTC with the system(10 sets of the controllers and spare parts) and supplied technical support.
- 2011 ▶ Provided Inwoo Engineering with the System (18 sets of the controllers and spare parts) and supplied technical support.
- 2012 ▶ Automatic welding system upgrade for J-Lay Pipeline.

Automatic Welding Solution

All-posture Light Fillet Carriage

Automatic welding carriage used for butt welding, vertical welding, horizontal welding, flat position welding, etc.

- Light design : 5.7kg
- Weaving functions : width, speed, L / R stop time setting
- Torch center movement function : able to move during welding
- Able to set continuous /sporadic welding mode
- Able to change the design of torch driving part according to welding method
- Provides welder control interface (voltage, current, inching, gas check)
- Applied small / light rail of detachable magnetic type
- Constant speed control algorithm : Speed setting screen available



FILLET CARRIAGE



PIPE FACING MACHINE



INTERNAL LINE-UP CLAMP

Automatic Track Welding System (Single Torch)



Equipment used for site customized welding pipes.

- Is used for oil / gas pipes welding, marine/overland plant, etc.
- Able to connect with various brands of welders.
 - Lincoln (CAN, DeviceNet), Miller (485, Modbus)
 - Fronius. (LAN, Modbus UDP)
- Uses various types of guide rings like fixed or assembled type.
- Torch motion control with high degree of freedom.
 - Tracking, weaving, height, tilt
- Extension of feeding wire. (push-pull type, option)
- Failure detection, remote welding control and monitoring.
- Able to apply to pipes bigger than 12 inches and up to horizontal welding.

Smart Welding Information System



Efficient welding process control.

- Real time welding data collection.
 - Welding length, time, current, voltage, wire, gas and power consumption.
- Builds wire / wireless communication system in yard unit.
- Builds real time welding data server.
 - Welding speed, running rate, current wave, welded volume, etc.

Crane Anti-collision System

Features

Crane position recognition and automatic control system

- Automatic stop control interconnected to the crane PLC
- User interface device

Linear algorithm/Anti-collision control algorithm

- Detail information coming from 3D Modeling and linear algorithm
- Interoperable to GIS-based industrial site information

Stable communication network

- Wireless mesh network communication

Real time detection of cranes in operation

- High precision RTK DGPS, tilt angle sensor

Wire / wireless network technology to transmit collision / sensor information

- Builds high performance mesh network, RF network
- Wire communication of the sensor information (GPS, tilt angle, etc) within the crane
- Applied standard communication control technology Industrial Field BUS LonWorks (ANSI EIA 709.1)



INTEGRATED MANAGEMENT SOFTWARE



CRANE OPERATOR PROGRAM

Management Software

| Integrated Management Software | Crane Operator Program |
|---|--|
| <ul style="list-style-type: none"> • All cranes running status monitor | <ul style="list-style-type: none"> • Gives an alarm when neighboring cranes approach within the hazard distance |
| <ul style="list-style-type: none"> • Distance information among the cranes | <ul style="list-style-type: none"> • Displays the distances from neighboring cranes |
| <ul style="list-style-type: none"> • Crane position information | <ul style="list-style-type: none"> • Supports observation from front, side and top based on 3D |
| <ul style="list-style-type: none"> • Built-in crane anti-collision algorithm | <ul style="list-style-type: none"> • Provides various information of individual crane |
| <ul style="list-style-type: none"> • Individual crane information display (Crane PLC data, wind speed and direction) | <ul style="list-style-type: none"> • Supports observation in detail through zoom-in / zoom-out |
| <ul style="list-style-type: none"> • Supports monitoring from 3D-based various angles | |

i.Node Series

[LonWorks general purpose I/O Module]

i.Node product series are direct digital controllers that adopt LonWorks open and distributed control network standards (ANSI/EIA/CEA 709.1). These are used widely in HA, BA and FA with capability of two way, multi-target and multi-control.

The series provide various models that are equipped with up to 8 digital /analog input /output channels.

- ▶ DI4DO4
- ▶ DI4AI4
- ▶ AI8
- ▶ DO8
- ▶ DC4DO4
- ▶ DI8
- ▶ FB i.Node
- ▶ AO4



Features

- Provides LNS Plug-In program. (various I/O setting)
- Easy maintenance. (wiring disconnection not necessary when it is replaced)
- Specialized iNode series available for AHU, fan and pump control. (DI4DO4)
- Able to simplify control logic through making site-customized function block.
- Provides 2 LonWorks TP communication port channels. (easy wiring)

Specifications

| | | |
|-------------------|--|--|
| Processor Type | FT5000 | |
| Transceiver Type | FT - X3 | |
| Processor Clock | 10MHz | |
| Memory | 32K Flash Memory, 2K EEPROM | |
| Comm. Media | TP (Twisted Pair Line) | |
| POWER | 15 ~ 30 VAC / VDC | |
| Protocol | ANSI / EIA / CEA 709.1 Lon Talk Protocol | ANSI / EIA / CEA 709,3 Twisted Pair Line |
| Digital Input | Dry - contact | |
| Digital Output | Relay (MAX 1A) | |
| Analog Input | Resistor (0~50kΩ) / Current (4~20mA) / Voltage (0~10V) | |
| Analog Output | Current (4~20mA) / Voltage (0~10V) | |
| Dimension | 92(W) x 96(H) x 82(D) mm | |
| Operating / Temp. | -10°C ~ 50°C | |
| Mounting | Wall mount or Din Rail mount | |

PLC-SIP Module

LonWorks PL3120 SIP – Hybrid IC

Features

- Core Module for LonWorks Power Line Communication.
- Supports PL3120 Full I / O.
- Built in Crystal.
- Applied standard 1.27mm Pitch 29 pin.



PLC-33

Specifications

| | |
|-----------------------------------|---|
| CPU | PL3120, 10MHz, |
| I / O | 12 Pin Full I / O port support |
| Comm. Media | LonWorks : Power Line |
| Protocol | LonTalk Protocol (ANSI/EIA 709.2) |
| Power | 5VDC, 12VDC INPUT |
| Operation Temp. / Humidity | -40°C to +85°C operating and non-operating 20 to 95% RH @ 50°C |
| Dimension | 32mm x 20mm x 3mm (W x H x D) |

APC Series

LonWorks Power Line Communication Coupler

Features

- Supports signal coupling between the different phases in PLC network.
- 3-wiring type and 4-wiring type available.



Specifications

| | |
|----------------------------------|--|
| PLC Coupling loss | - 6dB |
| Maximum operation voltage | 250VAC |
| Band width | 100KHz ~ 140KHz |
| Withstand voltage | For one minute at 1,800V DC between line to line. 300MΩ minimum at 500V DC between line to case |

Blocking Filter Series

Signal protect filter for LonWork PLC

Features

- Blocks the packet transferred from other local networks.
- Reduces entire network communication traffic.
- Guarantees a stability of LonWorks power line communication in such a traffic problem.
- Supports signal coupling function between three phases for power line communication.



Specifications

| Model | ABL 104NE | ABL 100E | ABL 050E | ABL 050SE |
|------------------------------------|--|---------------------------------|-----------------------------------|----------------------------------|
| Rated Voltage | Three Phase 4wire type 380 / 220VAC 100A | Single Phase 200 / 110VAC | Single Phase 220 / 110 VAC | Single Phase 220 / 110 VAC |
| Rated Current (A) | 100A | | 50A | 50A |
| Temperature Operating Range | -10°C ~ +40°C | | | |
| Attenuation [dB] | > -45dB | | | |
| Blocking Bandwidth | 110KHz ~ 140KHz | | | |
| Size | 140 x 60 x 175 mm (W x H x D) | 66 x 165 x 60 mm (W x H x D) | 69 x 115 x 42.2 mm (W x H x D) | 39 x 130 x 41.7mm (W x H x D) |
| weight | 2,000g | 1,600g | 600g | 600g |

Surge Protector

- Protects LED converters from surges and lightning strikes.
- Series setup and built-in fuse help prevent fire caused by overheating / overcurrent, by blocking unwanted voltages above the safe threshold.



| | |
|-----------------------------------|-------------------------------|
| Rated voltage | Single Phase 220Vac |
| Max operating voltage | 250Vac (250Vac fuse built-in) |
| Operation starting voltage | 820V (L-N), 1800V (L-G / N-G) |
| Protection mode | 3Mode (L-N,L-G,N-G) |
| Surge capacity | 13kA / Mode |
| IP Rating | IP67 (asphalt potted) |
| Operating temperature | -40°C ~ 60°C |
| Weight | 150g |

Signal protect filter for LonWork PLC

- The signal attenuation, noises and Signal distortion are protected by AFLP-20.



| | |
|---------------------------|---|
| Rated Voltage | Single Phase 220 / 110 VAC, 2A |
| impedance | 50ohm (115 ~ 132 KHz Band, within ±10%) |
| Blocking Bandwidth | 110KHz ~ 140KHz |



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