KYLAND

Industrializing the Ethernet Simplifying Industrial Communication

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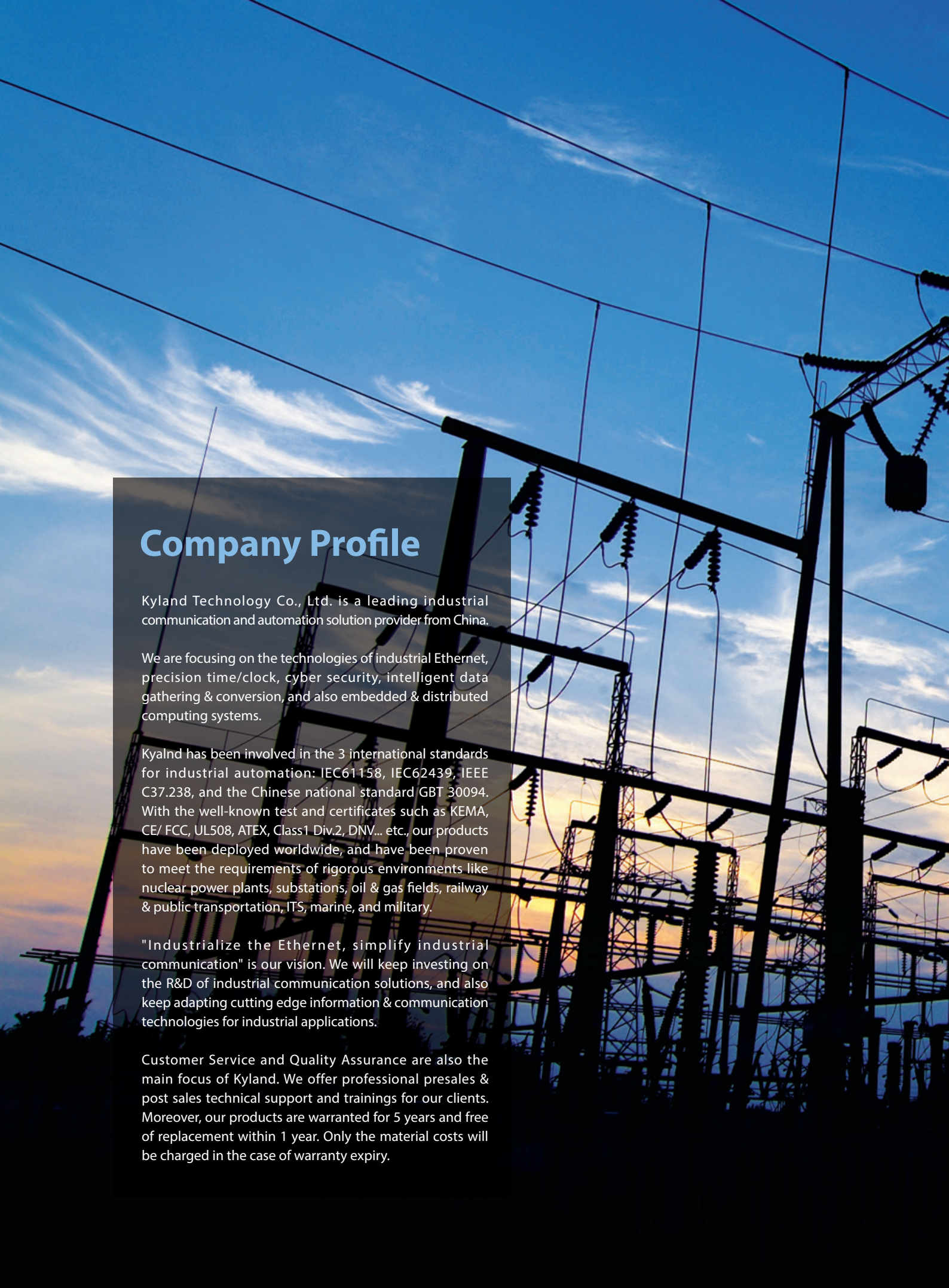
POWER AUTOMATION SOLUTIONS

KYLAND



Company Profile

Kyland Technology Co., Ltd. is a leading industrial communication and automation solution provider from China.

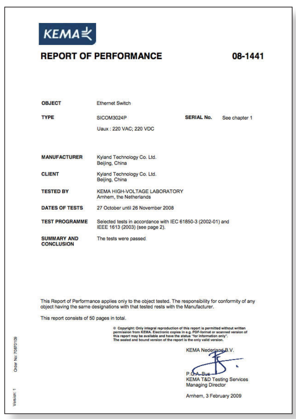
We are focusing on the technologies of industrial Ethernet, precision time/clock, cyber security, intelligent data gathering & conversion, and also embedded & distributed computing systems.

Kyalnd has been involved in the 3 international standards for industrial automation: IEC61158, IEC62439, IEEE C37.238, and the Chinese national standard GBT 30094. With the well-known test and certificates such as KEMA, CE/ FCC, UL508, ATEX, Class1 Div.2, DNV... etc., our products have been deployed worldwide, and have been proven to meet the requirements of rigorous environments like nuclear power plants, substations, oil & gas fields, railway & public transportation, ITS, marine, and military.

"Industrialize the Ethernet, simplify industrial communication" is our vision. We will keep investing on the R&D of industrial communication solutions, and also keep adapting cutting edge information & communication technologies for industrial applications.

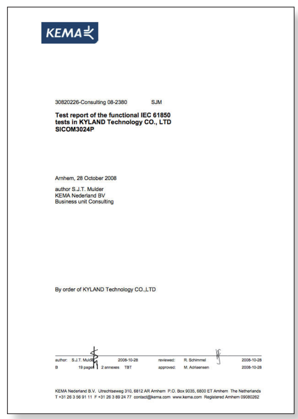
Customer Service and Quality Assurance are also the main focus of Kyland. We offer professional presales & post sales technical support and trainings for our clients. Moreover, our products are warranted for 5 years and free of replacement within 1 year. Only the material costs will be charged in the case of warranty expiry.

Quality Assurance



KEMA

REPORT OF PERFORMANCE 08-1441

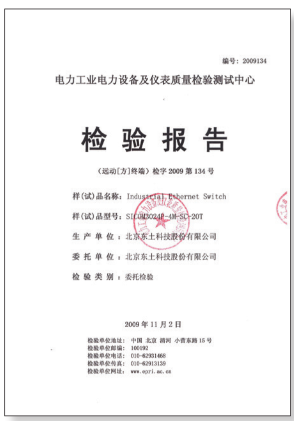


KEMA

Test report of the functional IEC 61850 tests in KYLAND Technology CO., LTD SICOM3024P

AREVA

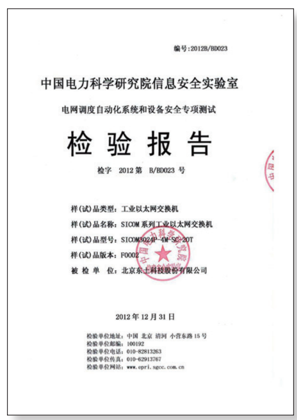
TO: Whom it may concern



编号：2009134

电力工业电力设备及仪表质量检验测试中心

检 验 报 告



编号：2012B/BD023

中国电力科学研究院信息安全实验室

电网调度自动化系统和设备安全专项测试

检 验 报 告

POWER AUTOMATION

SOLUTIONS

CONTENT

KYLAND

Introduction

Distribution Automation is an important component of the Smart Grid and is essential to enhance grid operational efficiency and system reliability, reduce frequency and duration of outages, improve restoration time and cut operational costs, asset utilization & protection.

System Requirements

- Distribution automation devices work outdoors ask for rugged operating temperature, moisture-proof, dust-proof, and strong EMC/EMI required in power utilities.
- Distribution automation communication system is a large network ask core and backbone network built up by Layer 3 industrial Ethernet switches.
- Fast recovery from link or device failure and fault isolation.
- Cyber security protect system from illegal attacks.
- Optional serial connection for legacy devices.
- Easy network extension without stopping or influencing existing network structure.
- Integrated Management system for easy maintenance.

Why Kyland

- Complete network solution with Lay 2 and Lay 3 industrial Ethernet switch, system integrated with intelligent gateway and FTU.
- DRP with fast recovery time within 20ms for reliable redundancy, VLAN based DRP supported to build multiple redundant networks with different uplinks.
- DHP protocol with flexible redundant chain scheme for extension in access network.
- Security features of SSH, SSL, SNMP v3, IEEE802.3x, TACACS+, Radius, ACL are ready to protect.
- Both Ethernet ports and serial ports(RS232/RS485/RS422) supported on SICOM3005A, 24VDC, 48VDC, 110VDC and 220VAC/DC power input optional.
- Kyvision network management software able to manage the large network for easy troubleshooting and visualization.
- Industrial proven -40~85℃ operation temperature, IP40, conformal coating available with EMC level 4.
- DG-P8/16 support multiple protocol conversion (IEC61850/DNP 3.0/Modbus/IEC60870-5-101/104).
- DG-P8/16 integrated with large storage capacity component.
- DG-P8/16 support long distance communication by fiber ports.
- DG-D60 fit for all types of pole-mounted breaker, load switch, isolating breaker and ring-network interconnection switch applications.
- DG-D60 support IEC60870-5-101/104 and DNP3.0.
- DG-D60 can be remote maintained and configured by GPRS, optical fiber and wireless communication.

Recommended Products

SICOM3028GPT-L3G/SICOM3028GPT-L3
Layer 3 modular switch up to 28 gigabit ports or 4G+24 fiber or copper ports, 1U
Support OSPF/RIP/VRRP
Security features supported
EMC level 4, IP40

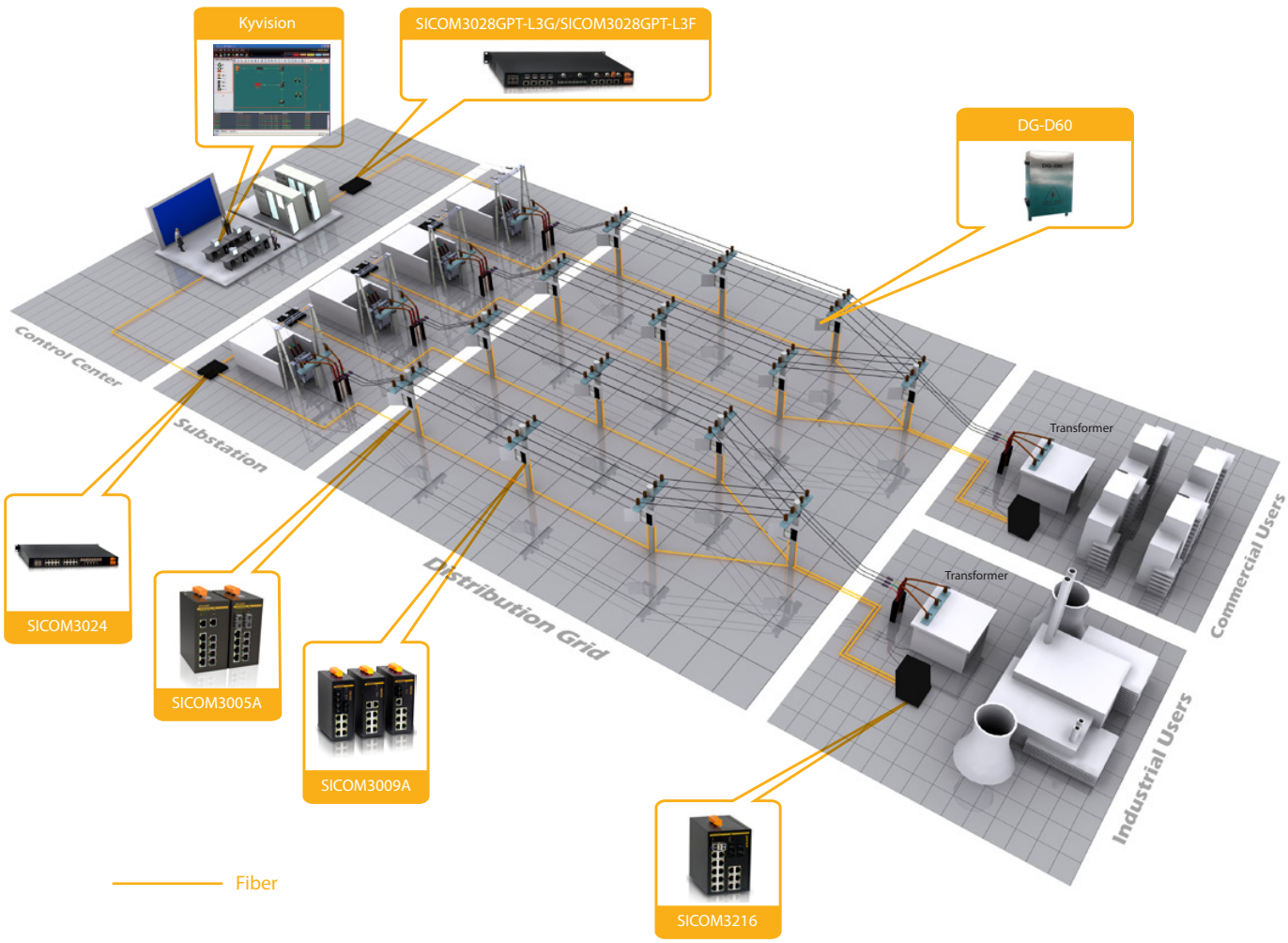
SICOM3024
Layer 2 24+4G ports managed rack mounted switch
Exceed IEC61850-3 and IEEE1613
Support port based/ VLAN based DRP, DHP

SICOM3216
Layer 2 16+2G ports managed Din-Rail switch
Exceed IEC61850-3
Support port based/ VLAN based DRP, DHP

SICOM3009A
Layer 2 9 ports managed Din-Rail switch
As low as 5.5 watts full load power consumption
Support port based/ VLAN based DRP, DHP
EMC level 4, IP40 protection class, one-key recovery

SICOM3005A
Layer 2 6 ports managed Din-Rail Serial Device Server Integrated Ethernet Switch
Support port based/ VLAN based DRP, DHP
Integrated Ethernet switch with 4 RS232/RS422/RS485 ports
EMC level 4, IP40 protection class

1 Power Distribution Automation Solutions



DG-P8/16

Industrial-grade communication protocol converter
Exceed IEC61850-3, IEEE1613
Support IEEE1588 time sync
Support IRIG-B, PPX, NTP time sync, generate IRIG-B output signal automatically
Support embedded Linux, VxWorks, QNX, Montavista, etc
Different data communication paths can use different communication protocols
Support communication protocols :
DNP3.0/DNP3.0 over LAN(server&client), Modbus(RTU/ASCII)/Modbus over TCP/IP(server&client), ABB® Spabus, AREVA Courier, GE Mutilin, SEL® Fast-meter, IEC60870-5-101/102/103/104(server&client), CDT(server&client), SC1801, ABB/Siemens/Mitsubishi/Toshiba PLC

DG-D60

Fit for all types of pole-mounted breaker, load switch, isolating breaker and ring-network interconnection switch applications.
Support IEC61870-5-101/104 and DNP3.0 Local remote control operation with D60-RC Engineer can do FTU configuration with D60-WPE
Intelligent DC power helps power supplying from dual circuits and solar, battery activation, remote measurement and life span monitoring

IEC61850-3 Industrial Ethernet Switch

Why Kyland:

- Various product range: Modular design rack mounting switch with maximum 28 ports, DIN-Rail models with HI voltage input.
- Compliant with IEC61850-3 and IEEE 1613, Pass KEMA Test.
- Support NTP, precise time synchronization IEEE1588v2 and ITU-T.G.8261/G.8262 (Sync-E).
- Support redundancy protocols: IEC62439-3(HSR/PRP), IEC62439-6(DRP), DT-Ring family, RSTP.
- Multi-service platform for switching and time server with GPS and IRIG-B modules.
- Built-in IEC61850 data modeling with MMS server for device management .
- Support legacy RS232/485/422 serial connection combined with data switching.

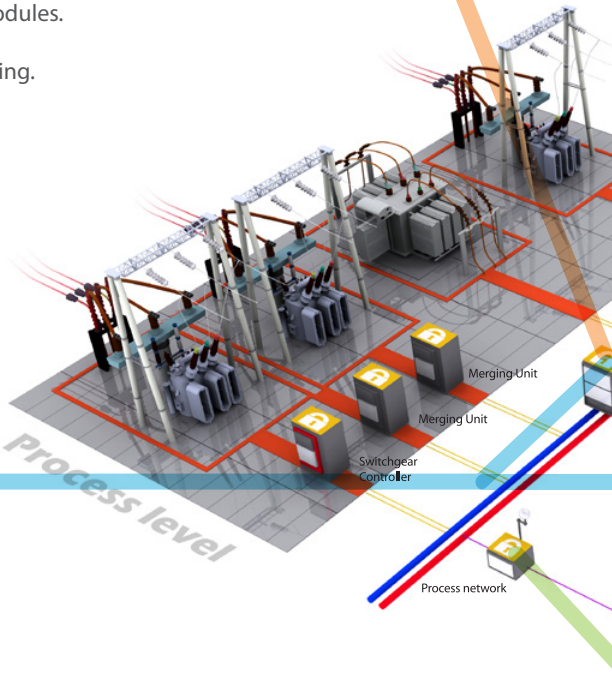
SICOM3028GPT
19 inch
Rackmout
Modular
IEEE1588
Ethernet switch

SICOM3024P
19 inch
Rackmout
Ethernet switch

Ruby 3
HSR/PRP
Redbox/Switch

SICOM3005A
Serial Server and
Switch

SICOM3306PT
DIN-Rail
IEEE1588
Ethernet switch



Intelligent Gateway for IED integration

Why Kyland:

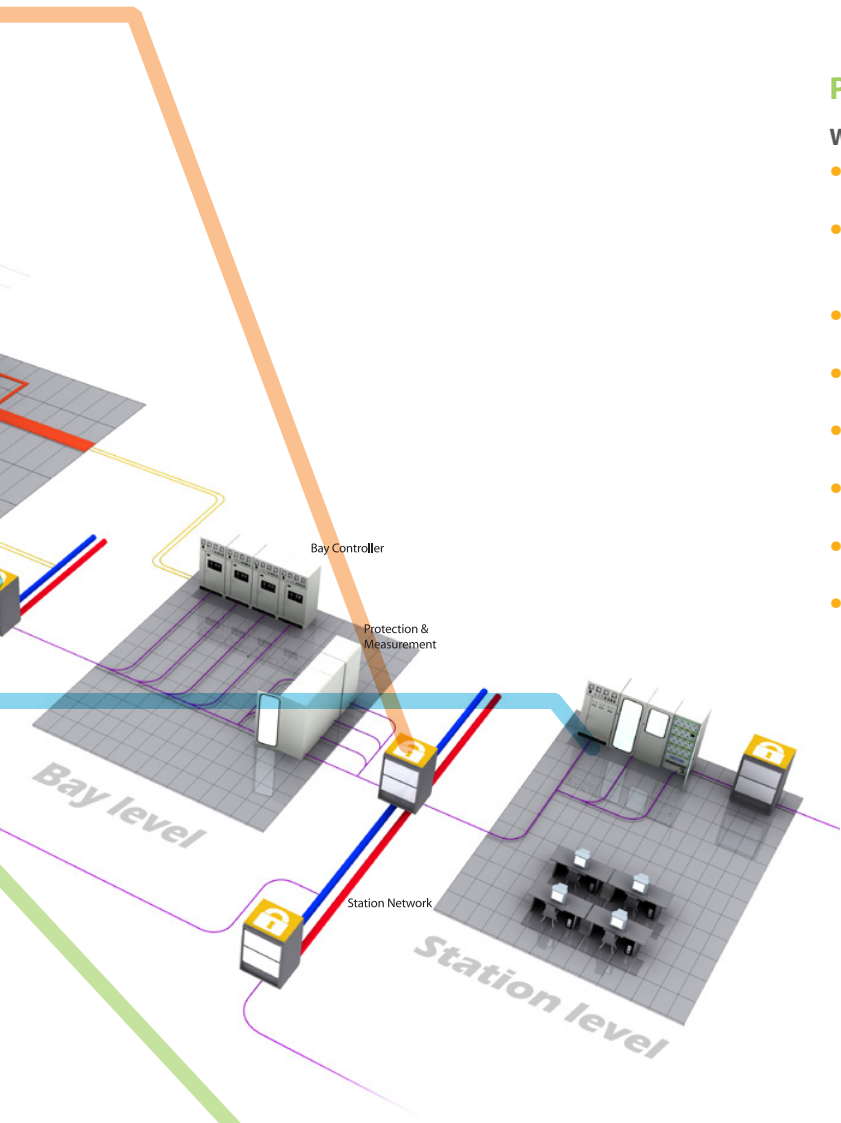
- Intelligent gateway products support data collection from both legacy IEDs and IEC61850 IEDs with Ethernet and serial connection.
- Easy configuration by importing standard .CID file in integrated configuration tool for Intelligent Gateways.
- Support various protocols : IEC60870-5-101, IEC60870-5-102 (Master), IEC60870-5-103 (Master & Slave), IEC60807-5-104 (Master & Slave), MODBUS (Master & Slave - RTU/TCP), DNP 3.0(Master & Slave - Serial/over TCP/IP), SEL(Master - Fast Meter/SER), AREVA(Master - Courier).
- Support BRCB and URCB report model, GOOSE subscription, MMS file transmission for IEC61850 application.

DG-X1
19inch Rackmount
Intelligent Gateway

DG/850-iBox
Intelligent Gateway

DG-Mini
Plugin Gateway
module for GE D20

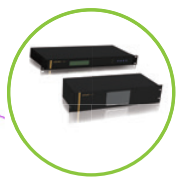
2 IEC61850 Substation Automation Solutions



Precise Time Synchronization Soltuion

Why Kyland:

- Product portfolio including Time Server, IEEE1588v2 Switch, clock converter, time test instrument.
- High precision time server with ±100ns accuracy with multiple reference satellite systems: GPS, BD, GLONASS.
- Support multiple reference source switchover within 200ns.
- Different oscillator options support holdover performance up to 1us/1h.
- IEEE1588 to IRIG-B conversion device for backward compatibility.
- Reliable multiple source selection algorithm and holdover performance.
- Optional management protocols of MMS/IEC60870-5-104/SNMP for time server.
- Compliant with IEEE PC 37.238 Power Profile.



PTS-10/30
Precise Time Server

PTC1000
DIN-Rail Clock Converter

ePT-100
3U Time Tester

Introduction

Wind Farms are gaining attention as an energy source that requires no fuel, produces no pollution, and is virtually inexhaustible. At the end of 2010, worldwide nameplate capacity of wind-powered generators was 197 gigawatts (GW).

System Requirements

- Wind farms span vast distances.
- Harsh EMC/EMI environment.
- Extreme temperatures, dust, moisture and vibration.
- Boot up under extremely low temperature.
- Rugged networking devices support long distance and reliable transmission capabilities.

Why Kyland

- Operates in harsh industrial environment with EMC industrial level 4, wide operating temperature, dustproof, fanless design.
- Outstanding performance of booting up under -40°C(-40°F) extremely low temperature.
- Fast recovery IEC62439-6/DRP protocol ensures the reliability of the network.
- Unified management software Kyvision3.0 for real-time network monitoring and easy management.
- KyExplorer management tool for batch IP address configuration.
- Din Rail switches support 110/220AC/DC high voltage power supplies.
- Reset button for default settings recovery & reboot.
- 3 fiber ports solutions enable the fiber optic connection to the top of wind tower and redundant fiber ring connections.
- PCB coating enables dust/moisture/corrosion proof ability.
- Small dimension for easy installation.
- Green industrial Ethernet solutions with low power consumption design.
- Field proven with more than 150 wind farm deployments.

Recommended Products

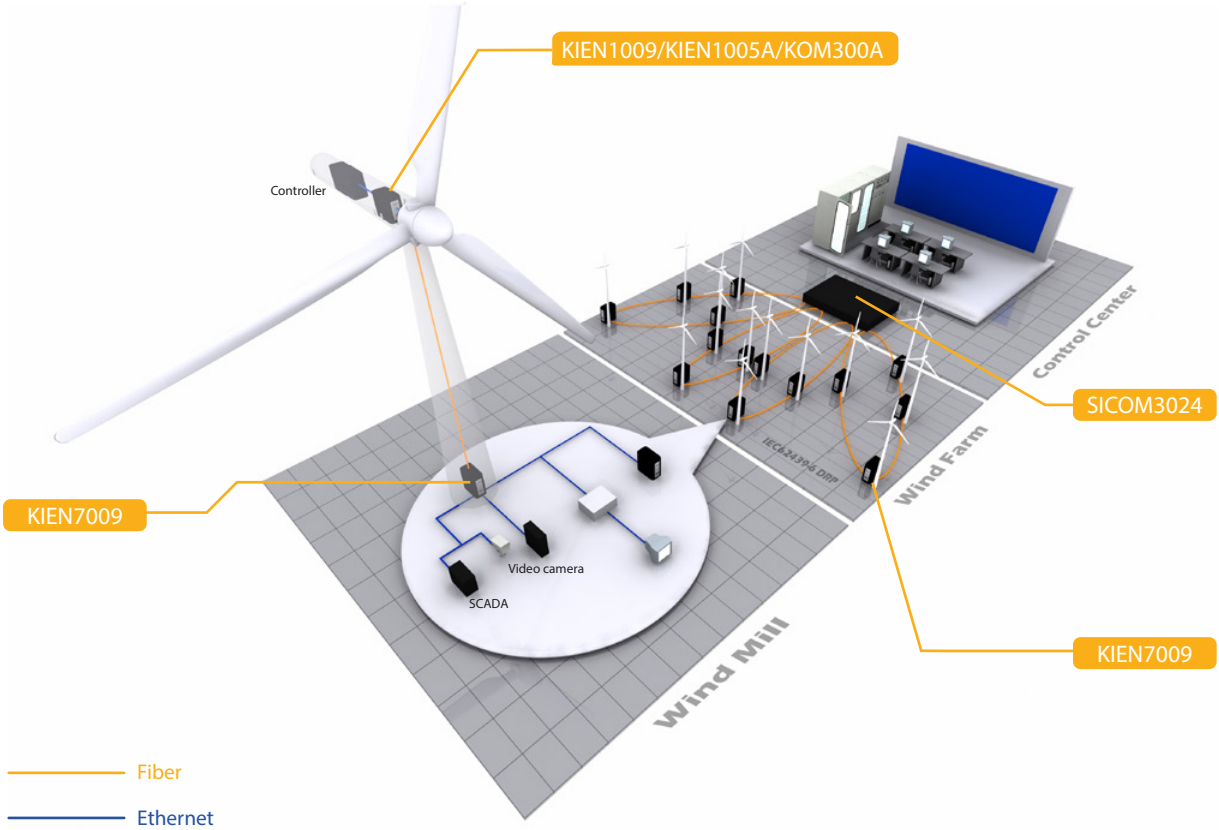
KOM300A:
Media convertor with 2 10/100Base-TX ports, 1 100Base-FX fiber port

KIEN1005A:
Unmanaged, 4 10/100Base-TX ports, 1 100Base-FX fiber port

KIEN1009:
Unmanaged, 6 10/100Base-TX ports, 3 100Base-FX fiber ports

KIEN7009:
Managed, 6 10/100Base-TX ports, 3 100Base-FX fiber ports

3 Wind Power Networking Solutions



SICOM3306:
Managed, 6 10/100Base-TX ports, 3 Gigabit SFP ports

SICOM3004/SICOM3006:
Embedded 4 10/100Base-TX ports, 2 100Base-FX fiber ports

SICOM3024:
Layer2 managed rack mounted, 24 10/100Base-TX ports, 4 Gigabit SFP ports

SICOM3005A:
Managed, 4 10/100Base-TX ports, 2 100Base-FX fiber ports, 4 RS232/422/485 serial ports

Introduction

Photovoltaic industry is named also as solar energy industry, it uses semi-conductive component to absorb solar radiation and turns it into electric energy. Solar energy, as a kind of renewable energy, has shown its potentiality in global energy market because of its endless storage, cleanness and low cost. This new energy has attracted global attention and is developing quickly all over the world, it is considered as an important part of sustainable development of every country.

A photovoltaic power station includes mainly the array of photovoltaic cells, combiner box, low-voltage DC cabinet, inverter cabinet, low-voltage AC cabinet and step-up transformer. The generated high-voltage electric power is finally input to Power Grid.

System Requirements

PV (photovoltaic) power plan monitoring system is used for real-time monitoring of each single part of PV power station such as PV cells, inverter cabinet, etc. The purpose is to monitor station' s running state to make sure that the whole PV power generation system is stable.

The system requires:

- Adaption to harsh climate and environment at PV power plant.
- Prevention from EMI/EMS interference.
- Strict MTBF requirement.
- Network Management System.
- Support for ring topology network.
- Enough bandwidth for video monitoring.
- Collection of data from intelligent terminals (combiner box, inverter cabinet, etc) through gateways.
- Capability of Ethernet access via serial port.

Why Kyland

- Fanless design, EMC level 4, operating temperature -40℃ to 85℃ , IP40 protection level.
- At least 300,000 hrs MTBF, one-key recovery.
- Low power consumption design.
- NMS software (Kyvision), Kyvision provides integrated network managment with alarm, topology management, etc.
- Support IEC62439-6/DRP, provide network recovery time less than 20 ms in a ring topology network.
- Provide Gigabit ports, maximum 28 ports Rack mounted products, and HI-voltage Din-Rail products.
- DG series intelligent gateway supports several communication standards including IEC61850 for the collection of raw data from intelligent terminals, then the processed data by gateway will be exchanged using communication protocols such as IEC61850-8-1(MMS), IEC60870-5-104, Modbus over TCP/IP, DNP3.0 over TCP/IP, etc.
- Serial server integrated products to connect serial devices to an Ethernet network.

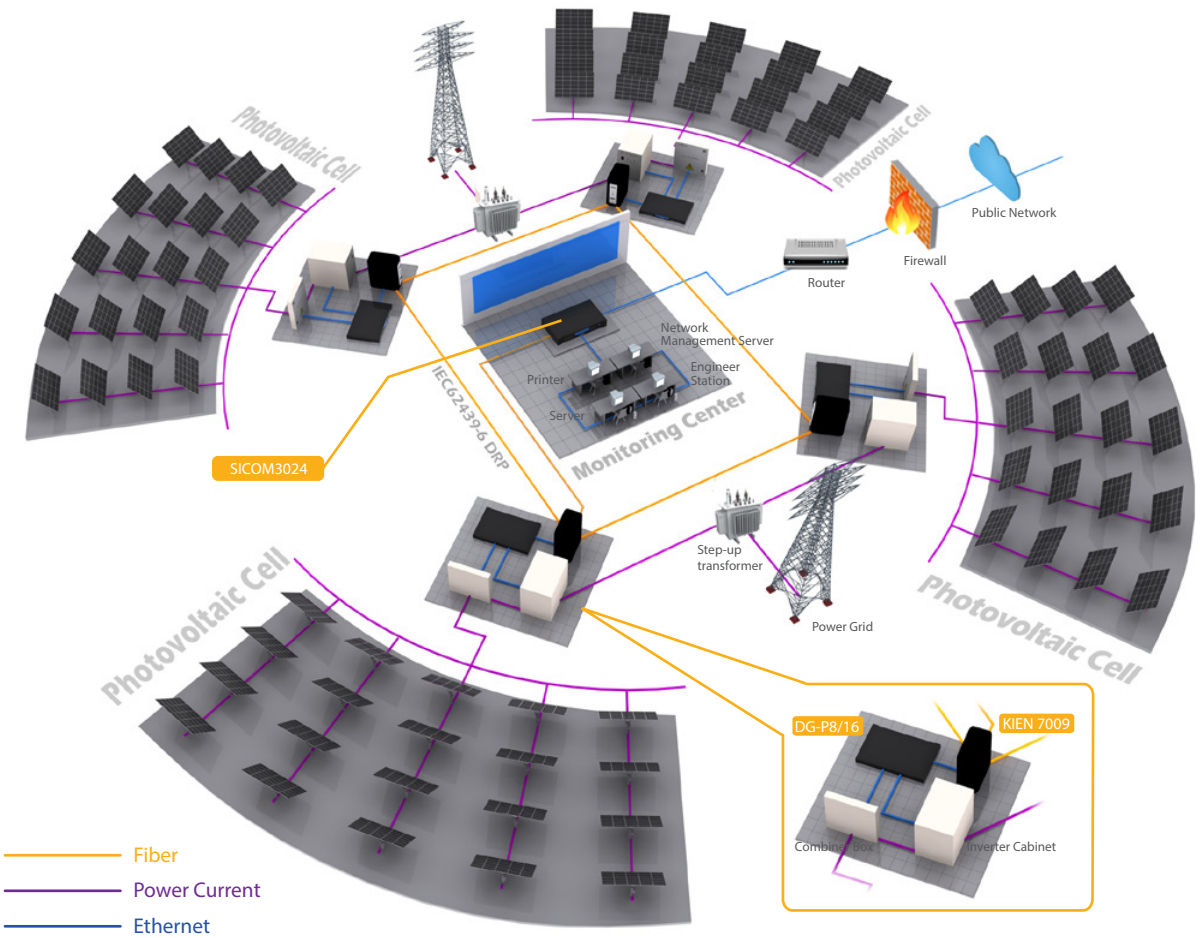
Recommended Products

SICOM3024
Layer 2 24+4G ports managed rack mouned switch
Exceed IEC61850-3 and IEEE1613

KIEN7009
Layer 2 9 ports managed Din-Rail switch
5.5 watts full load power consumption
Support IEC62439-6/DRP
EMC level 4, IP40 protection class, one-key recovery

SICOM3016
Layer 2 20 ports managed Din-Rail switch
Exceed IEC61850-3

4 Solar Power Networking Solutions



SICOM3005A

Layer 2 6 ports managed Din-Rail Serial Device Server Integrated Ethernet Switch
Support IEC62439-6/DRP
support 4 RS232/RS422/RS485 ports
EMC level 4, IP40 protection class

DG-P8/16

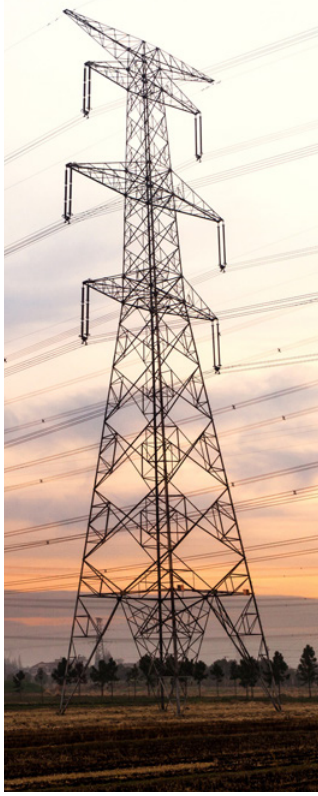
Industrial-grade communication protocol converter
Exceed IEC61850-3, IEEE1613
Support IEEE1588 time sync
Support IRIG-B, PPX, NTP time sync, generate IRIG-B output signal automatically
Support communication protocols:
DNP3.0/DNP3.0 over LAN(server&client), Modbus(RTU/ASCII)/Modbus over TCP/IP(server&client), ABB® Spabus, AREVA Courier, GE Mutilin, SEL® Fast-meter, IEC60870-5-101/102/103/104(server&client), CDT(server&client), SC1801, ABB/Siemens/Mitsubishi/Toshiba PLC

Global Reference

Wind Farm	
Location	Project
Spain	Gamesa wind farms in Asia Pacific Region
Canada	Vizimax wind farms in Canada
UK	Siemens offshore wind farms in UK
Thailand, Theppana	Thailand Theppana Wind Farm
Romania， Mereasa	Romania Mereasa wind power project
Bolivia, Bernard	Bolivia Goldwind Wind Farm Project
Ecuador, VILLONACO	Ecuador CELEC EP wind power project
Australia ， Gullen Range	Australia Gullen Range wind power project
China, Jiuquan	Longyuan Power Guazhou wind power
China, Inner Mongolia	Guodian United Power Inner Mongolia Wind Power Project
China, Xinjiang	XJ wind Santanghu Balikun wind power projects
China, Yunnan	Huaneng Dali, Yunnan Wuzipo wind power
China, Jiangsu	Longyuan Jiangsu Rudong offshore III
China, Xinjiang	Huaneng New Energy Saertuohai China Xinjiang Green River Wind Farm
China, Gansu	Three Gorges New Energy Magang Jinchang Wind Farm

PV power plant	
China, Jiuquan	Jiuquan Suzhou Dongdongtan photovoltaic power plant
China, Gansu	Liangzhou photovoltaic power plant
China, Liaoning	Jinzhou PV power plant
China, Ningxia	Wuzhong Taiyangshan photovoltaic power plant
China, Qinghai	Qinghai Golmud Xitieshan photovoltaic power plant
China, Qinghai	Qinghai Golmud photovoltaic power plant
China, Shanxi	Shanxi Lu'an Photovoltaic power plant
China, Shandong	Shandong Weishan photovoltaic power plant
China, Gansu	Gansu Shandan 50MW photovoltaic power plant
China, Gansu	Gansu Jinchang 100MW photovoltaic power plant

Substation	
Uruguay	Integrated Automation System for Smart Substations in Uruguay
India	India Schneider Substation Automation System
Indonesia	Indonesia Schneider Substation Automation System
Korea	Korea Substation Automation System
Vietnam	IEC61850 110KV Substation in Vietnam
Costa Rica	Areva Power Substation in Costa Rica
China, Zhejiang	Zhenan Substaion 1000KV UHV
China, Liaoning	Shenyang South 500KV
China, Hebei	Shijiazhuang West 500KV SAS
China, Shaanxi	Yan'an 330KV substation(IEEE1588)
China, Hebi	Xiaomazhuang Qixian 220KV (IEEE1588)
China, Inner Mongolia	Tongliao Shebotu 220kv
China, Tianjin	Tianjin Eco-city 110KV Substation(IEEE1588)



Global Reference

China, Henan	Henan Luoyang Jinguyuan 110kv
China, Datong	Shanxi Zuoyun Madaotou 220kV
China, Yangquan	Shanxi Yuxian 220kV
China, Luoyang	Henan Yanshi North 220 KV
China, Nanyang	Tanghe South 220 kV Henan Nanyang
China,Linyi, China	Linyi, Shandong Pingshang 220 kV
China,Zaozhuang	Shandong Zaozhuang DuMiao 220 kV
China,Zaozhuang	Shandong Zaozhuang Xiazhuang 220 kV
China, Zaozhuang	Shandong Zaozhuang Xi Zhong 220 kV
China,Aba	Sichuan Aba Shaba 220 kV substation
China,Aba	Sichuan Aba Xiaojin 220 kV substation
China,Aba	Sichuan Aba Zhawo 220 kV substation
China, Yuncheng	Yuncheng JiangXian Changgan 220 kV
China, Linfen	Linfen Yicheng South 220 kV
China, Jinzhong	Jinzhong Tianhu 220 kV
China, Taiyuan	Taiyuan Mayu 220 kV
China, Liaoning	Shuangxi 220 kV substation
China, Panjin	Fantun 220 kV substation
China, Panjin	Panjin South 220 kV
China, Chengdu	Chenga industrial park 220 kV substation
China, Chengdu	Chengdu Hongsha 220 kV substation
China, Chengdu	Qingyang 220 kV substation
China, Harbin	Tonghe 220 kV substation
China, Heilongjiang	Aijian 220 kV substation
China, Jixi	Baishi 220 KV substation
China, Jiamusi	Dongfeng 220 kV substation

Distribution	
China, Beijing	Beijing City distribution automation I, II
China, Beijing	The Power Distribution Monitoring System for Beijing Olympic Stadiums
China, Beijing	China 60 Anniversary Tian'anmen Square Power Distribution Monitoring System
China, Beijing	Beijing International Airport T3 Terminal power monitoring system
China, Beijing	Beijing Changping, Yanqing Surburb area distribution automaiton system
China, Shanghai	Shanghai Songjiang area distribution automation system
China, Tangshan	Tangshan distribution automation system
China, Dongguan	Dongguan distribution automation system
China, Fuzhou	Fuzhou distribution automation system
China, Nanning	Nanning distribution automation system
China, Zhangzhou	Zhangzhou distribution automation system
China, Shenzhen	Shenzhen Universiade venues Distribution Automation
China, Quanzhou	Quanzhou distribution automation system
China, Tianjin	Tianjin distribution automation system
China, Shenzhen	Shenzhen Distribution Automation Project I,II
China, Maoming	Maoming distribution automation system
China, Guyang	Guyang distribution automation system
China, Guangzhou	Guangzhou distribution automation system
China,Tuyouqi	Tuyou distribution automation system
China, Xiamen	Xiamen distribution automation system
China, Wuxi	Wuxi distribution automation system