

The logo for KYLAND, featuring the word "KYLAND" in a bold, italicized, yellow sans-serif font. The background of the entire page is a collage of industrial power infrastructure, including a substation with large transformers and insulators on the left, and high-voltage transmission towers with power lines on the right. The image is overlaid with large, overlapping geometric shapes in shades of blue and black, creating a modern, layered effect.

# *KYLAND*

## POWER AUTOMATION SOLUTIONS

Industrializing Ethernet – Simplifying Industrial Communication

[www.kyland.com](http://www.kyland.com)



## Company Profile

Kyland Technology Ltd. is focusing on the research and implementation of industrial control networking total solutions. We are a leading Chinese company of industrial networking technology innovation and exploration. Our mission is to build the next generation industrial control ecosystem based on internet connectivity.

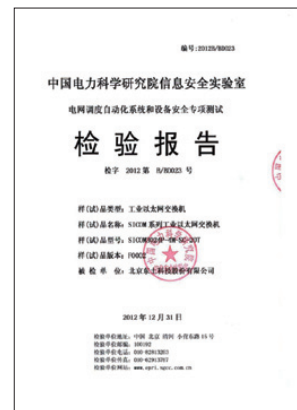
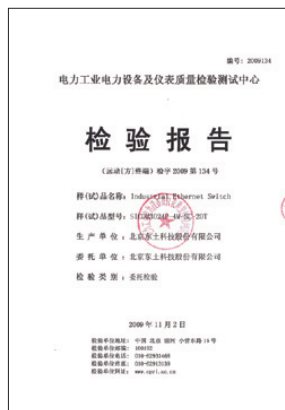
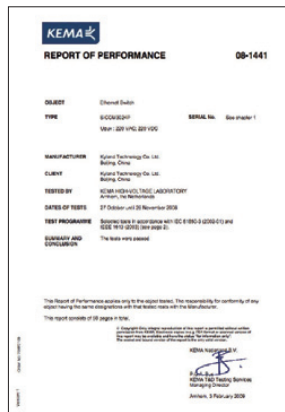
Kyland's primary R&D directions are: industrial Ethernet communications technologies, IP-based industrial fieldbus technologies, network-based field controller technologies, cloud-based industrial controlling server technologies, network-based controlling precise time/clock technologies, control message communication security technologies.

Kyland has been involved in the 3 international standards for industrial automation: IEC61158, IEC62439, IEEE C37.238, and the Chinese national standard GB/T 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.

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



A high-voltage power line tower stands in a field of tall, golden-brown grass. The sky is a clear, bright blue. A semi-transparent blue horizontal banner is positioned across the middle of the image, containing the text "POWER AUTOMATION SOLUTIONS" in white, bold, sans-serif font. The power lines are visible as thin, dark lines stretching across the sky and connecting to the tower.

**POWER AUTOMATION  
SOLUTIONS**





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## Introduction

Power Distribution Automation is an important part of today's Smart Grid. Integration and interoperability are essential for grid operational efficiency and system reliability. Smart Grid technologies around the world are helping to reduce power outages & identify the root causes of blackouts and brownouts; improving restoration times and cutting operational costs.

## System Requirements

- A wide range of operating temperatures built to withstand water & dust ingress while providing increased EMC/EMI protection
- A complete system of Layer 2 and Layer 3 Industrial Ethernet Network devices
- Fast network recovery linked to device failure and fault isolation
- Cyber Security protection
- Serial connectivity for legacy devices
- Easy network expansion without disconnecting existing network devices
- Integrated network management software for quick and efficient maintenance

## Why Kyland

- A complete offering of industrial network solutions including Layer 2 & Layer 3 switches fully integrated with Gateway and FTU options
- DRP with fast recovery times within 20ms for redundancy. VLAN based DRP support to construct multiple redundant networks with variable uplinks
- DHP protocol with flexible redundant chain schemes for network extension
- Network security features: SSH, SSL, SNMP v3, IEEE802.3x, TACAS+, Radius and ACL
- Ethernet ports and serial ports RS232/RS485, 110VDC & 220VAC power options

- KYVISION® network management software to manage large networks for easy troubleshooting and visualization
- Industrial operating temperatures (-40°C to + 85°C), IP40, conformal coating available – EMC level 4
- DG-P8/16 supports multiple protocol conversion (IEC61850/DNP, Modbus 3.0, IEC60870-5-101/104)
- DG-P8/16 integrated with large storage capacity
- DG-D60 suitable for all types of pole mounted breakers and ring network topologies
- DG-D60 support for IEC60870-5-101 and DNP3.0
- DG-D60 remotely maintained and configured by GPRS fiber optic and wireless communication

## Recommended Products



### SICOM3028GPT

Layer 2/3 modular switch up to 28 gigabit ports or 4G+24 fiber or copper ports, 1U  
Support OSPF/RIP/RRP  
Security features supported  
EMC level 4, IP40



### SICOM3024

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



### SICOM3216

Layer 2 16+2G ports managed DIN-Rail switch 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



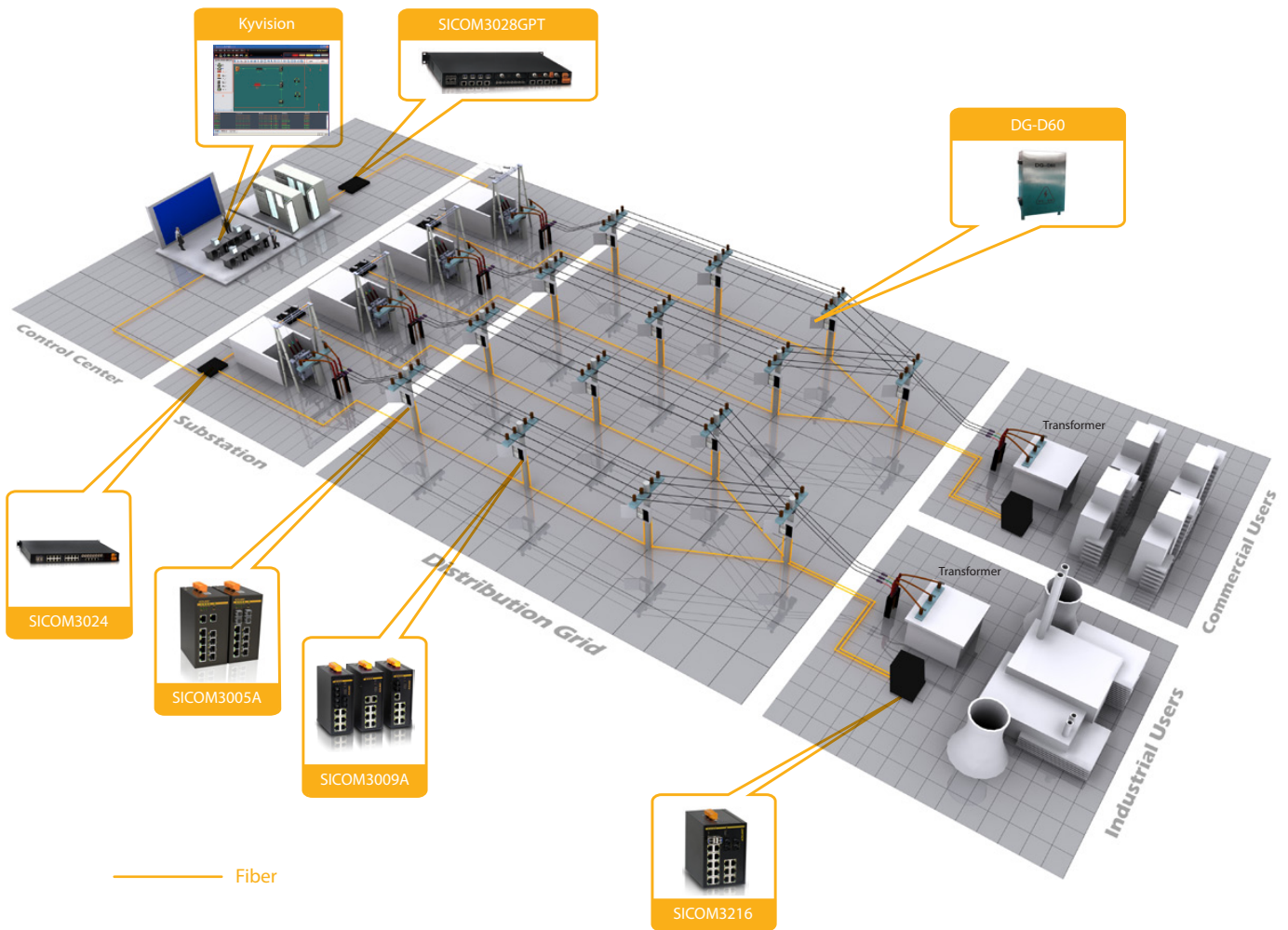
### SICOM3005A

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  
IEC61850-3, IEC61850-4  
Supports IEEE1588 time sync  
Supports IIRIG-B, PPX, NTP time sync, generates IIRIG-B output signal automatically  
Supports embedded Linux, VxWorks, QNX, MontaVista  
Different data communication paths for various communication protocols  
Supports communication protocols  
DNP3.0/DNP3.0 over LAN(server & client), Modbus(RTU/ASCII)/Modbus over TCP/IP(server&client), ABB® Spabus, AREVA Courier, GE Multilin, SEL® Fast-meter, IEC60870-5-101/102/103/104 (server & client), CDT(server & client), SC1801, ABB/Siemens/Mitsubishi/Toshiba PLC



### DG-D60

Suitable for all types of pole-mounted breakers, load switches, isolating breakers and ring-network interconnection switch applications  
Supports IEC61870-5-101/104 and DNP3.0. Local remote control operations with D60-RC Engineer  
Configuration with FTU and D60-WPE  
Intelligent DC power supplies dual circuits and solar, battery activation, remote measurement and life span monitoring



## IEC61850-3 Industrial Ethernet Switch

### Why Kyland:

- Wide product range: Modularly designed rack mount switches and DIN-Rail models with high voltage input
- Compliant with IEC61850-3 and IEEE 1613
- Supports NTP, precise time sync IEEE1588v2 and ITU-T.G.8261/G.8262 (Sync-E)
- Supports redundancy protocols: IEC62439-3(HSR/PRP), IEC62439-6(DRP), DT-Ring family, RSTP
- Multi-service platform for switches and time server with GPS and IRIG-B modules
- Built-in IEC61850 data modeling with MMS server for device management
- Supports legacy RS232/485/422 serial connections combined with data switching



**SICOM3028GPT**  
19 inch  
Rackmount  
Modular  
IEEE1588  
Ethernet switch



**SICOM3024P**  
19 inch  
Rackmount  
Ethernet switch



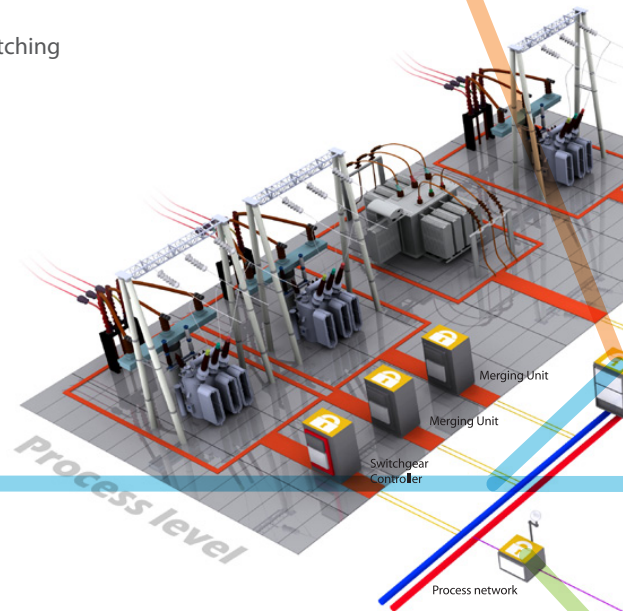
**Ruby 3**  
HSR/PRP  
Redbox/Switch



**SICOM3005A**  
Serial Server and  
Switch



**SICOM3306PT**  
DIN-Rail  
IEEE1588  
Ethernet switch



## Intelligent Gateway for IED integration

### Why Kyland:

- Supports data collection from both legacy IEDs and IEC61850 IEDs with ethernet and serial connections
- Easy configuration by importing standard .CID files
- Supports 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)
- Supports BRCB and URCB reports, GOOSE messaging, MMS file transmissions and IEC61850 modules



**DG-X1**  
19inch Rackmount  
Intelligent Gateway



**DG/850-iBox**  
Intelligent Gateway

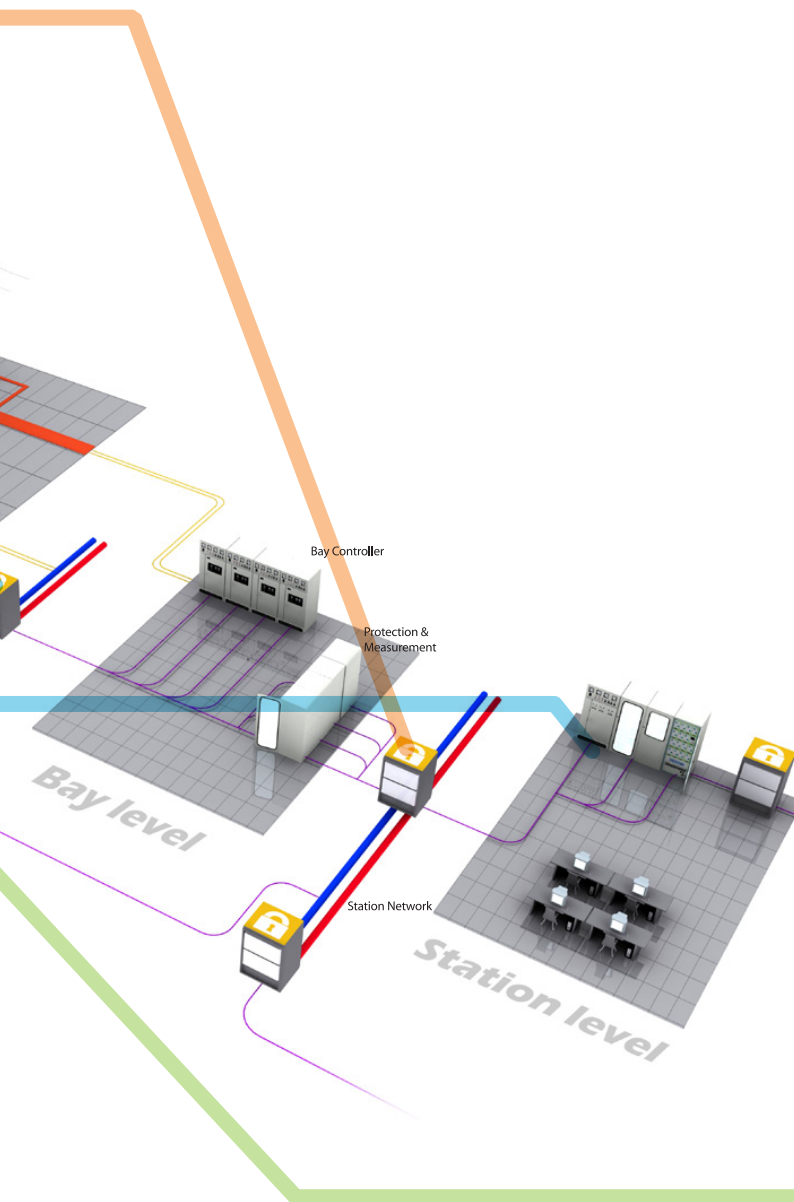


**DG-Mini**  
Plugin Gateway  
module for GE D20



# 2

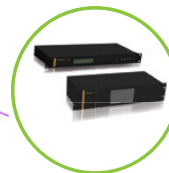
## IEC61850 Substation Automation Solutions



### Precise Time Synchronization Solution

#### Why Kyland:

- Product portfolio includes time server, IEEE1588v2 Switch, clock converter, time test instrument
- High precision time server with  $\pm 100\text{ns}$  accuracy with multiple reference satellite systems: GPS, BD, GLONASS
- Supports 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 capacity of wind-powered generators was 197 gigawatts (GW).

## System Requirements

- Wind farms span vast distances
- Harsh EMC/EMI environments
- Extreme temperatures, dust, moisture and vibration
- Required to boot up under extremely low temperatures
- Ruggedized network devices support long distance and reliable transmission capabilities

## Why Kyland

- Built to operate in harsh industrial environments, with EMC industrial level 4, wide operating temperatures, dustproof, fanless design
- Boot up temperatures between -40°C (-40 °F )
- IEC62439-6/DRP protocol with fast recovery ensures reliability of the network
- Unified management software KYVISION® 3.0" for real-time network monitoring and easy management
- KYEXPLORER® management tool for batch IP address configuration.
- DIN Rail switch supports 110/220AC/DC high voltage power supplies
- Reset button for default settings recovery & reboot
- 3 fiber port solutions enable fiber optic connection within the tower and redundant fiber ring connections
- PCB coating for dust/moisture/corrosion proof ability
- Compact design for easy installation
- "Green" industrial Ethernet solution featuring low power consumption
- 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



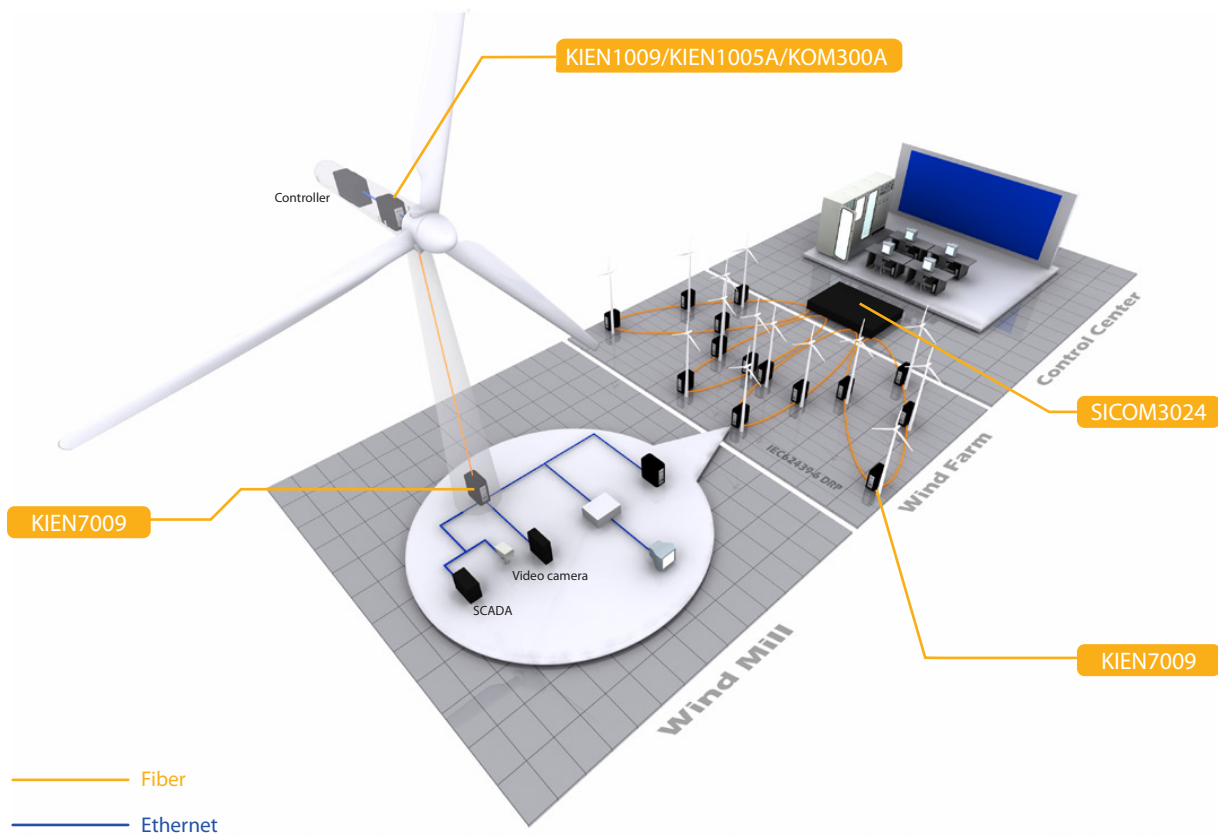
### KIEN7009

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

Solar farms use semi-conductive components to absorb solar radiation and turn it into electric energy. Solar energy is becoming common in the global energy market because of its endless storage and low cost. Solar energy is developing quickly around the world and is considered an important part of sustainable development in every country.

Solar power stations utilize photovoltaic cells, combiner boxes, low-voltage DC cabinets, inverter cabinets, low-voltage AC cabinets and step-up transformers.

## System Requirements

Solar power plant monitoring systems use real-time monitoring of each component within the PV power station. The purpose is to monitor the station's running state making sure that the power generation system is stable.

The system requires:

- Product performance in harsh climates and environments at PV power plants
- Prevention from EMI/EMS interference
- Strict MTBF requirements
- Network management systems
- Support for ring topology network
- Available bandwidth for video monitoring
- Data collection from intelligent terminals through gateways
- Ethernet access via serial ports

## Why Kyland

- Fanless design, EMC level 4, operating temperatures  $-40^{\circ}\text{C}$  to  $85^{\circ}\text{C}$ , IP40 protection levels
- At least 300,000 hrs MTBF, one-key recovery
- Low power consumption designs
- NMS software, KYVISION<sup>®</sup> provides integrated network management with alarms and topology management
- Supports IEC62439-6/DRP to provide network recovery time in less than 20ms in ring topology networks
- Gigabit ports maximum of 28 ports Rack mounted products and high-voltage DIN-Rail products
- DG series intelligent gateways support several communication standards including IEC61850 for collection of raw data from intelligent terminals, data exchanged using communication protocols IEC61850-8-1(MMS),
- IEC60870-5-104, Modbus over TCP/IP, DNP3.0 over TCP/IP
- Serial servers connect serial devices to Ethernet networks

## Recommended Products



### SICOM3024

Layer 2 24+4G ports managed rack mounted switches  
IEC61850-3 and IEEE16133



### KIEN7009

Layer 2 9 port managed DIN-Rail switches  
5.5 watts full load power consumption  
Supports IEC62439-6/DRP  
EMC level 4, IP40 protection class, one-key recovery



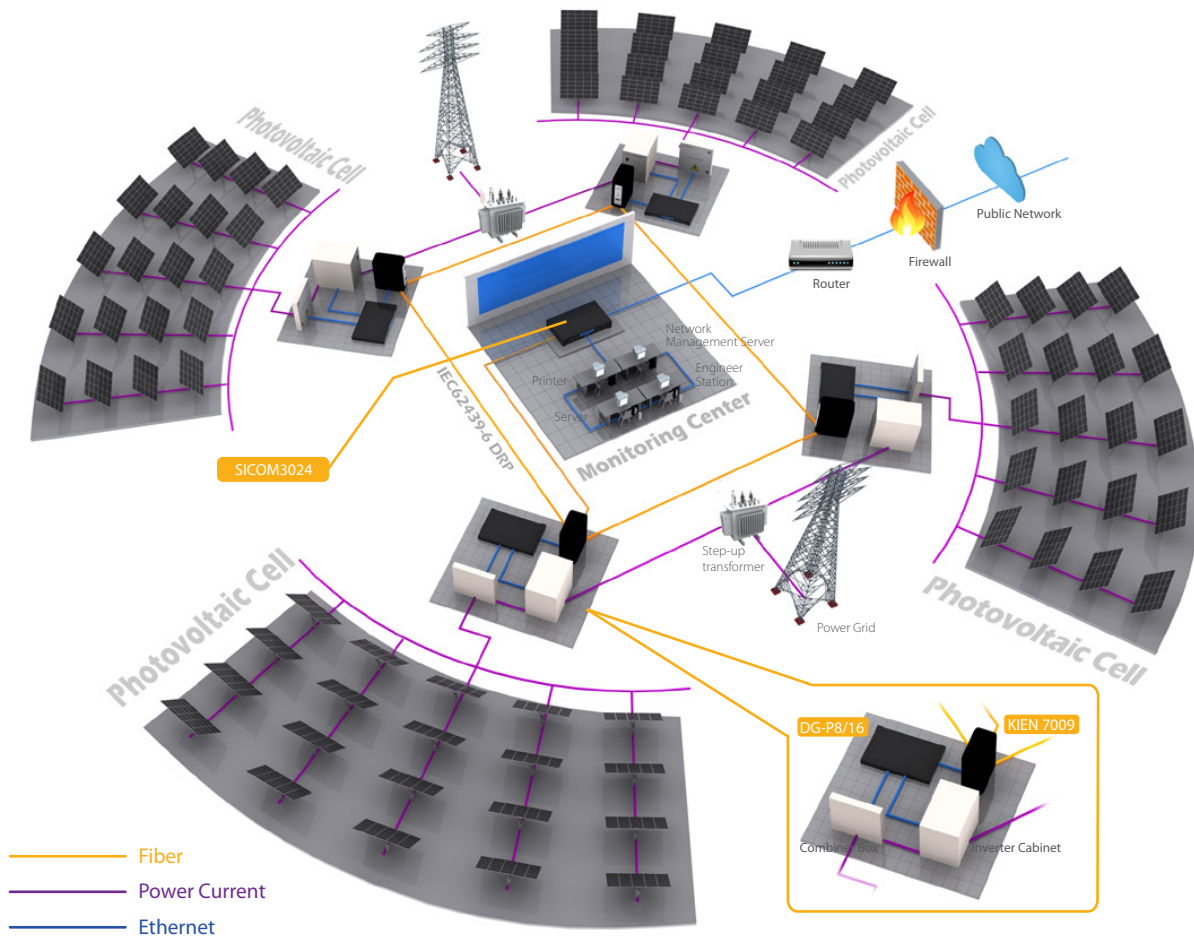
### SICOM3016

Layer 2 20 port managed DIN-Rail switches  
IEC61850-3



# 4

## Solar Power Networking Solutions



### SICOM3005A

Layer 2 6 port managed DIN-Rail Serial Devices  
Server Integrated Ethernet Switch  
Supports IEC62439-6/DRP  
Supports 4 RS232/RS422/RS485 ports



### DG-P8/16

Industrial-grade communication protocol converters  
Exceeds IEC61850-3, IEEE1613  
Supports IEEE1588 time sync  
Supports IRIG-B, PPX, NTP time sync, generates IRIG-B output signal automatically  
Supports 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

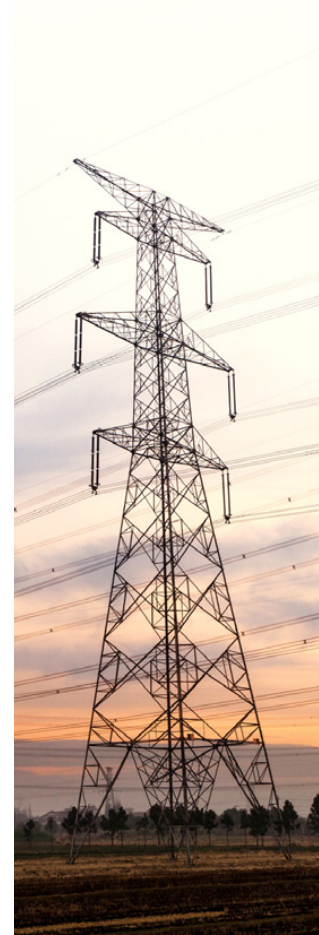
Location	Project
Spain	Gamesa wind farms in Asia Pacific Region
Canada	Vizimax wind farms in Canada
UK	Siemens offshore wind farms in UK
Thailand, Theppana	Thailand Theppana Wind Farm
Romania, Mereasa	Romania Mereasa wind power project
Bolivia, Bernard	Bolivia Goldwind Wind Farm Project
Ecuador, VILLONACO	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	GansuShandan50MWphotovoltaicpowerplant
China, Gansu	GansuJinchang100MWphotovoltaicpowerplant

### 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(IEE1588 )
China, Hebi	Xiaomazhuang Qixian 220KV (IEE1588)
China, Inner Mongolia	Tongliao Shebotu 220kv
China, Tianjin	Tianjin Eco-city 110KV Substation(IEE1588 )





# Global Reference



China, Henan	Henan Luoyang Jingyuan 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 Xiaozhuang 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	Chengdu 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 Suburb area distribution automation 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	Tuyouqi distribution automation system
China, Xiamen	Xiamen distribution automation system
China, Wuxi	Wuxi distribution automation system





Industrializing Ethernet – Simplifying Industrial Communication

[www.kyland.com](http://www.kyland.com)

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# **KYLAND**



## **RAIL AUTOMATION SOLUTIONS**



Industrializing the Ethernet, Simplifying Industrial Communication

[www.kyland.com](http://www.kyland.com)



## Company Profile

Kyland Technology Ltd. is focusing on the research and implementation of industrial control networking total solutions. We are a leading Chinese company of industrial networking technology innovation and exploration. Our mission is to build the next generation industrial control ecosystem based on internet connectivity.

Kyland's primary R&D directions are: industrial Ethernet communications technologies, IP-based industrial fieldbus technologies, network-based field controller technologies, cloud-based industrial controlling server technologies, network-based controlling precise time/clock technologies, control message communication security technologies.

Kyland has been involved in the 3 international standards for industrial automation: IEC61158, IEC62439, IEEE C37.238, and the Chinese national standard GB/T 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.

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



EN50155 & EN50121



Shock & Vibration



Electromagnetic Interference



Operating Temperature  
(-40 to 85 °C )

## Testified by the highest railway in the world, Qinghai to Tibet trackside network

- The world's highest rail track at 5,072m (16,640 feet) above sea level
- Extremely cold temperature down to -40°C (-40 °F )
- Relatively low humidity and severe electromagnetic interference and surge
- Over 800 Kyland Ethernet switches and media converters have been operating since 2006





**RAIL AUTOMATION  
SOLUTIONS**





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## Introduction

The Railway backbone network always carries versatile applications, such as PIS/PA, BAS, FAS, CCTV, IT, ISCS, video conference and data communications, which are transmitted through SONET/SDH or Ethernet.

It is getting more and more popular to converge tele-com and data-com into one big network.

## System Requirements

- Deterministic communications for versatile applications
- Diverse interfaces for different services
- Large uplink bandwidth up to 10G
- Ring topology for redundancy
- Easy management and maintenance
- Steady end-to-end service assurance and bandwidth management
- Network segregation to isolate vital and non-vital services

## Why Kyland

- Supports MPLS-TP and IP/MPLS, L2VPN, L3VPN functions
- Supports both Ethernet and E1 interfaces
- Supports max. 8 10G ports for uplink and 96 1G ports for access
- Provides IEEE 802.1x, TACACS+, RADIUS, ACL, SSH, SSL, SNMPv3 security technologies
- Supports various ring technologies based on ITU-T G.8132 for network protection with recovery time < 50ms

- Supports end-to-end MPLS-TP PW/LSP/section layer OAM based on ITU-T G.8113.1
- Supports service quality control, priority mapping according to DSCP, IP, EXP of MPLS, 802.1p; PQ, WFQ, PQ+WFQ queue scheduling; committed access rate (CAR) and traffic classification, hierarchical QoS (HQoS)
- Supports time synchronization protocol, such as IEEE1588, NTP, ITU-T.G.8261/8262 with accuracy down to 10ns

## Recommended Products



### Adamas7896G

- MPLS-TP and IP/MPLS
- Max. 8 10G SFP+ and 96 1G ports
- Max. 32 E1 ports
- 9U modular design



### Adamas7448G

- MPLS-TP and IP/MPLS
- Max. 4 10G SFP+ and 48 1G ports
- Max. 32 E1 ports
- 9U modular design



### Adamas3224G

- MPLS-TP and IP/MPLS
- Max. 2 10G SFP+ and 24 1G copper/fiber ports
- 1U modular design

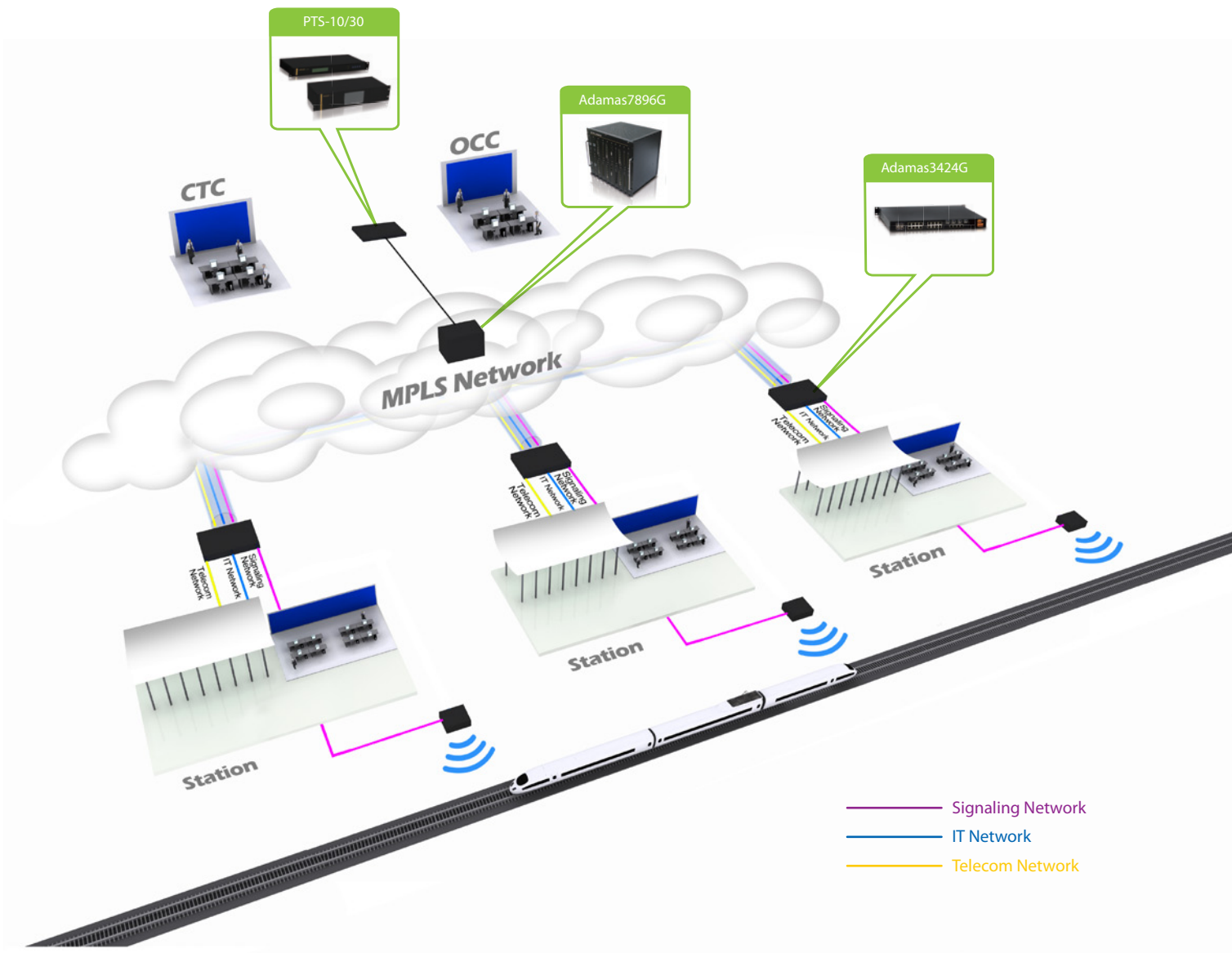


### PTS-10/30

- High precision time server

# 1

# Converged Network System for Railway Communications Backbone







## Introduction

Railway signaling system is the most critical and essential system for train control and operation.

It was evolving from traditional relay interlocking towards electronic interlocking, and moving forward to most sophisticated ERTMS/ETCS Level 3.

The communications are also evolving from traditional hard-wire, to serial and now most popular Ethernet communications along the track.

## Why Kyland

- Supports wide operating temperature, ranges from -40 to 85°C
- Compliant with EN50121-4, with high EMC resistance
- Supports various Ring redundant protocols, like STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP) protocols
- Unified NMS, Kyvision3.0 for network monitoring and management
- SICOM3028GPT multi-functional platform supports RIP, OSPF layer 3 routing protocols and rich options of interface modules to ease the network expansion and migration

## System Requirements

- Supports Gigabit Fiber optic Ring topology with fast self-healing functionality in a large-scale network
- Able to operate properly under extreme temperature with long sustainability
- Able to resist severe electromagnetic interference and surge
- Centralized network management software to monitor, to configure and to maintain the network devices remotely
- Layer 3 capability to separate vital and non-vital networks

## Recommended Products



### SICOM3028GPT-L3G

- Max 28G ports or 4G + 24 Fast Ethernet ports
- Flexible modular design with Ethernet/Fiber, Serial, GPS, HSR/PRP...etc. options
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports RIP, OSPF layer 3 routing protocols and VRRP
- Compliant with IEC61850-3 and EN50121-4
- Operating Temp.: -40~85°C



### SICOM3000

- 2 Gigabit SFP and 8 10/100Base-TX ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports GMRP, DHCP, SNMP, QoS
- Supports SNMPv3, HTTPS, SSH, 802.1X
- Compliant with IEC61850-3 and EN50121-4
- Operating Temp.: -40~85°C



### SICOM3306

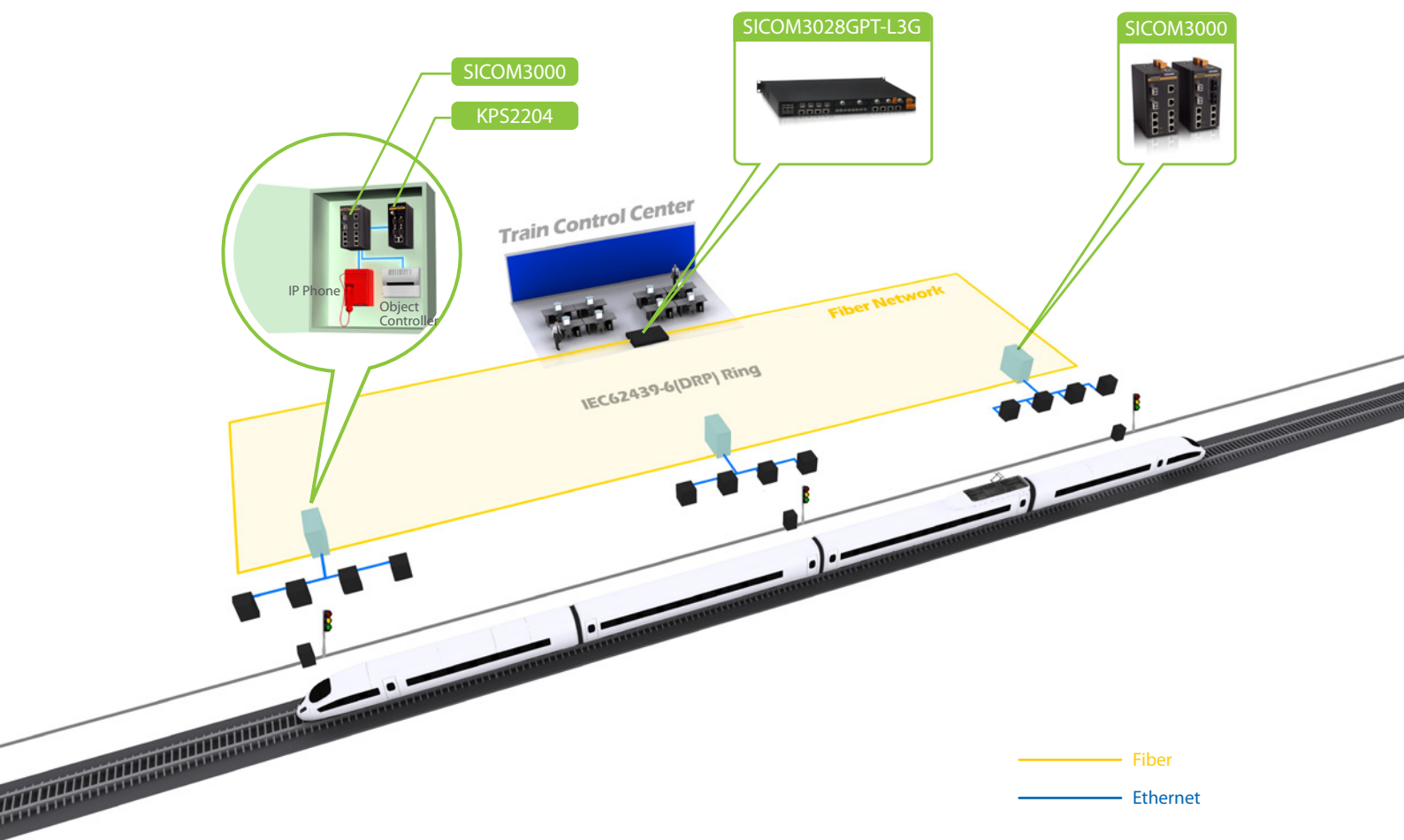
- 3 Gigabit SFP and 6 10/100Base-TX ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports GMRP, DHCP, SNMP, QoS
- Supports SNMPv3, HTTPS, SSH, 802.1X
- Compliant with IEC61850-3 and IEEE1613
- Operating Temp.: -40~85°C



### KPS2204

- 2 10/100Base-TX ports and 4 RS232/422/485 serial ports
- 15KV ESD protection circuit for serial ports
- Programmable (Linux system)
- Operating Temp.: -40~85°C

# 2 Networking Solutions for Mainline Signaling System





## Introduction

Mass Transit system is one of the most important infrastructures in the modern cities, while its Signaling system is the core of an efficient and effective train operation. Over the past decade, CBTC (Communication-based Train Control) technology is widely implemented throughout the world for urban transportation, which requires a highly reliable DTS (Data Transmission System).

## System Requirements

- Supports Gigabit Fiber Optic ring topology with fast self-healing functionality in a large-scale network
- Supports network security functions
- Centralized network management software to monitor, to configure and to maintain the network devices remotely
- Layer 3 capability to separate vital and non-vital networks

## Why Kyland

- Supports wide operating temperature, ranges from -40 to 85°C
- Compliant with EN50121-4, with high EMC resistance
- Supports various Ring redundant protocols, like STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP) protocols
- Unified NMS, Kyvision3.0 for network monitoring and management
- SICOM3028GPT multi-functional platform supports RIP, OSPF layer 3 routing protocols and rich options of interface modules to ease the network expansion and migration
- Supports VLAN, QoS, IGMP for broadcast bandwidth control

## Recommended Products



### SICOM3028GPT-L3G

- Max. 28G ports or 4G + 24 Fast Ethernet ports
- Flexible modular design with Ethernet/Fiber, Serial, GPS, HSR/PRP..etc. options
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports RIP, OSPF layer 3 routing protocols and VRRP
- Compliant with IEC61850-3 and EN50121-4
- Operating Temp.: -40~85°C



### SICOM3024P

- Max. 4G and 24 Fast Ethernet ports
- Flexible Ethernet or Fiber ports combination
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports Syslog, SNMP Trap
- Compliant with IEC61850-3 and EN50121-4
- Operating Temp.: -40~85°C



### SICOM3000

- 2 Gigabit SFP and 8 10/100Base-TX ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports GMRP, DHCP, SNMP, QoS
- Supports SNMPv3, HTTPS, SSH, 802.1X
- Compliant with IEC61850-3 and EN50121-4
- Operating Temp.: -40~85°C



### SICOM3306

- 3 Gigabit SFP ports, 6 10/100Base-TX ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports GMRP, DHCP, SNMP, QoS
- SNMPv3, HTTPS, SSH, 802.1X enhance network security
- Operating Temp.: -40~85°C



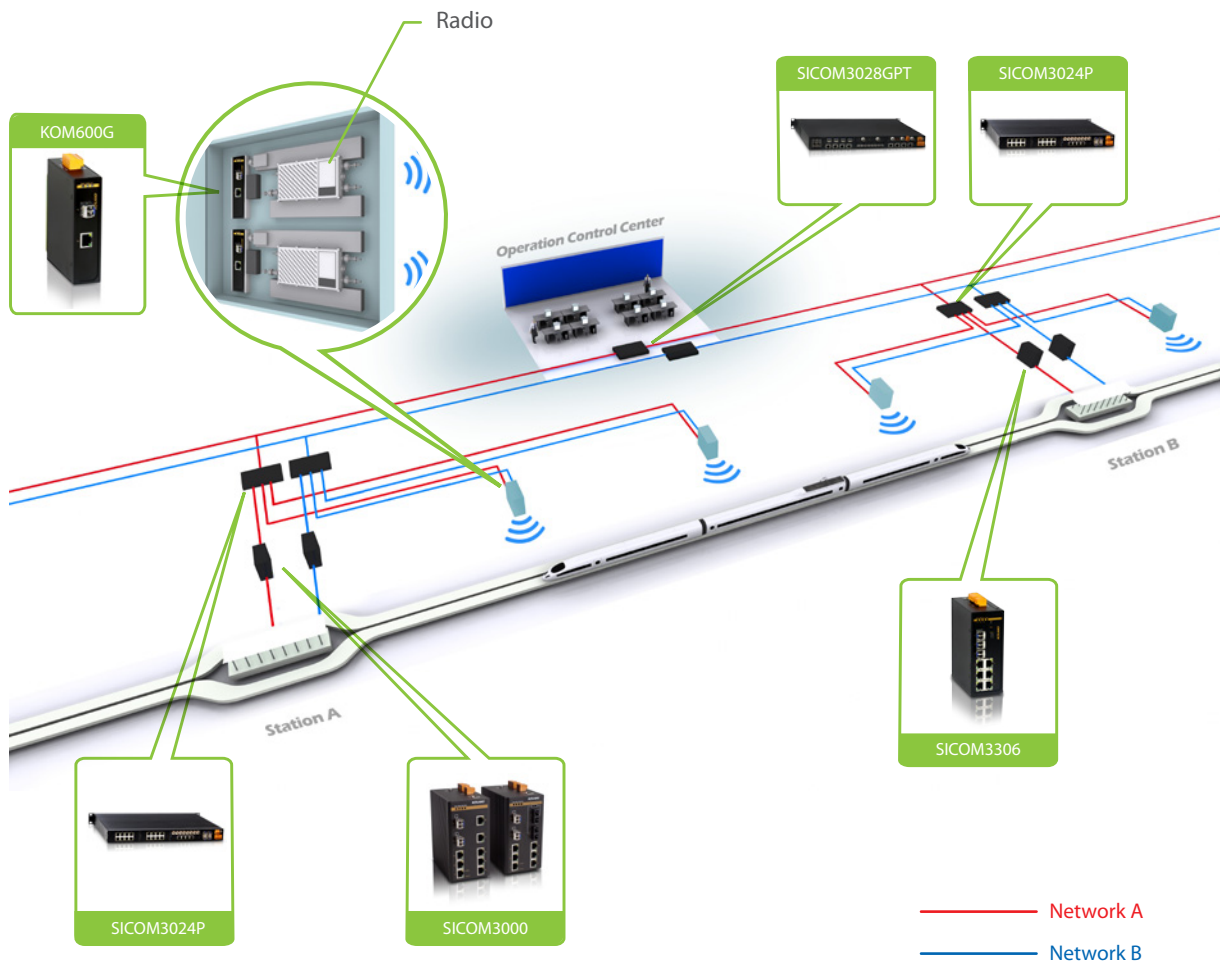
### KOM600G

- 1 10/100/1000Base-TX port, 1 Gigabit SFP port
- Redundant power inputs with less than 4.5W power consumption (full loaded)
- Supports LFP (Link Fault Pass-Through)
- Operating Temp.: -40~85°C



# 3

## Data Transmission Network for Mass Transit Signaling System



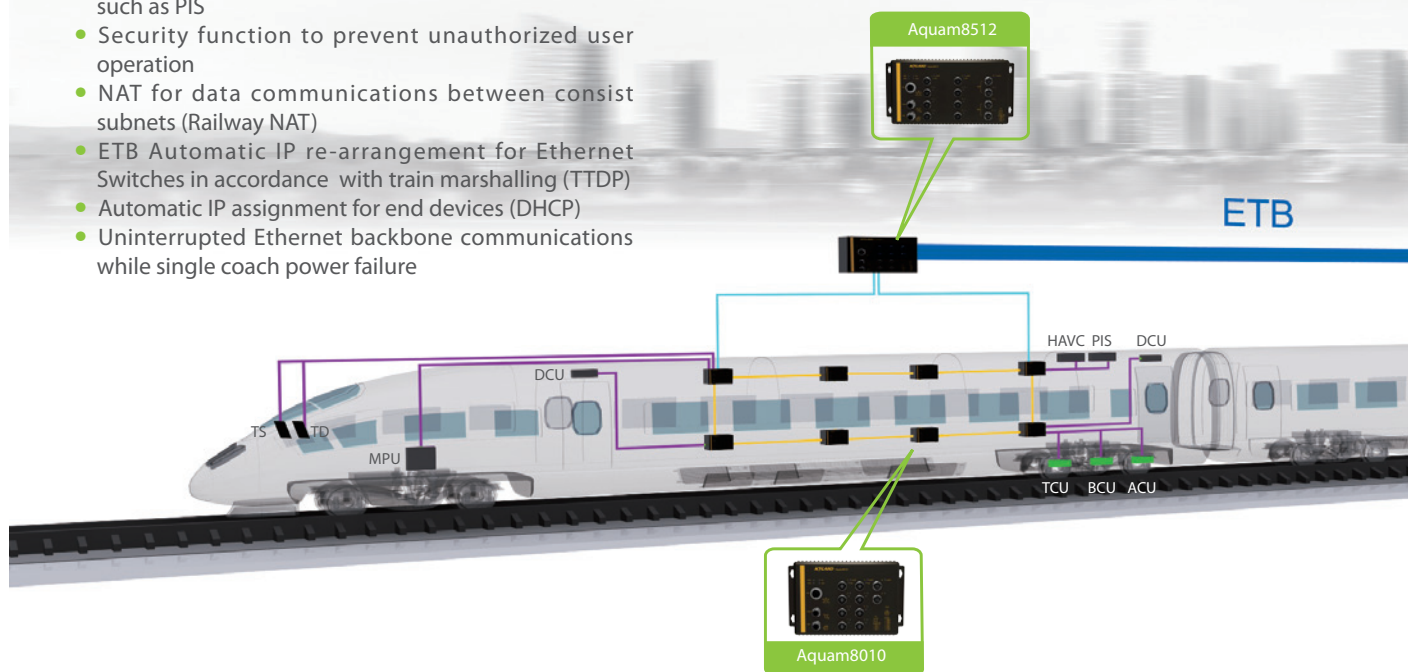


## Introduction

TCMS (Train Control and Management System) is the core of train operation, which carries several critical services, such as traction power, auxiliary power, speed, location, braking, door control, HVAC, train status monitoring and diagnosis. With the popularity and maturity of Ethernet technologies, an IP based TCMS and related specifications such as ETB (Ethernet Train Backbone) and ECN (Ethernet Consist Network) are defined in IEC61375.

## System Requirements

- Extraordinary industrial design against shock, vibration, EMC, unstable power supply for onboard environment
- PoE output for low and medium power electronics, such as PIS
- Security function to prevent unauthorized user operation
- NAT for data communications between consist subnets (Railway NAT)
- ETB Automatic IP re-arrangement for Ethernet Switches in accordance with train marshalling (TTDP)
- Automatic IP assignment for end devices (DHCP)
- Uninterrupted Ethernet backbone communications while single coach power failure



## Why Kyland

Aquam series is specially designed for onboard ETB & ECN applications

- Supports typical Layer 3 and Layer 2 functionality
- Compliant with EN50155 with M12 connectors
- Max. 9 PoE ports with IEEE802.3af & IEEE802.3at compliance
- Supports IEEE802.1X, SSH/SSL, TACACS+, RADIUS security function
- Supports R-NAT (ETBN)
- Supports TTDP
- Supports DHCP server, DHCP client, DHCP Opt. 82
- Relay bypass function to avoid power failure communication interruption

# 4

## IP Based TCMS Network for Onboard Systems

### Recommended Products



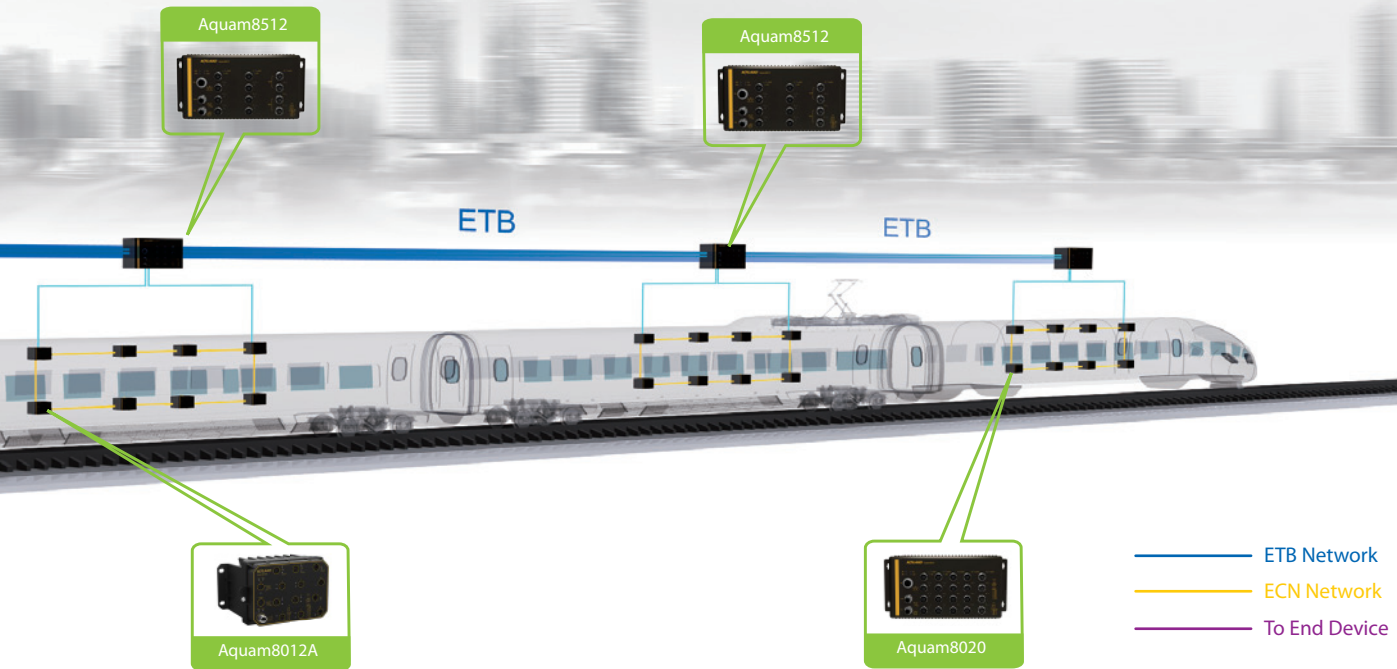
#### Aquam8512

- Layer 3 ETB Industrial Ethernet Switch with IP67 rating
- 4G+8 or 12 10/100M ports with max. 8PoE
- Compliant with IEC61375-2-5
- Supports R-NAT, TTDP, DHCP
- Supports relay bypass
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Compliant with EN50155 & EN50121



#### Aquam8012A

- Layer 2 ECN Industrial Ethernet Switch
- 4G+8 or 3G+9 10/100M ports with max. 9PoE
- Supports relay bypass
- Supports 24-110VDC wide range power input with max. 100W PoE output
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Compliant with EN50155 & EN50121



Aquam8012A



Aquam8020



#### Aquam8010

- Layer 2 ECN Industrial Ethernet Switch with IP67 rating
- 2G+8 10/100M ports with max. 8PoE
- Supports DHCP Snooping
- Compliant with EN50155 & EN50121



#### Aquam8020

- Layer 2 ECN Industrial Ethernet Switch with IP67 rating
- 4G+16 10/100M ports with max. 8PoE
- Supports DHCP Snooping
- Compliant with EN50155 & EN50121





## Introduction

Accurate & reliable operation of Passenger Information and Public Address Systems are the primary factors for passenger satisfaction. PIS/PA are generally composed of display board, broadcasting audio system, and a reliable communications network, not only the onboard network but also the ground network towards the operation control center.

## System Requirements

- Redundant network technology to ensure fail-over recovery
- Extraordinary industrial design against shock, vibration, EMC, unstable power supply for onboard environment
- Routing and NAT to ease onboard inbound/outbound communications
- Automatic IP assignment for end devices
- Network multicasting function
- PoE output for low and medium power electronics, such as display board
- Long distance Ethernet extension to reach out trackside cabinets

## Why Kyland

- Supports versatile Ring technologies, e.g. STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Compliant with EN50155 with M12 connectors for onboard Ethernet switches
- Supports DHCP, TTDP, R-NAT and static, RIP, OSPF routing features
- Supports IGMP Snooping
- Compliant with IEEE802.3af IEEE802.3at PoE
- Compact DIN-Rail type industrial Ethernet-to-Fiber converter

## Recommended Products



### Aquam8512

- Layer 3 ETB Industrial Ethernet Switch with IP67 rating
- 4G+8 or 12 10/100M ports with max. 8PoE
- Compliant with IEC61375-2-5
- Supports R-NAT, TTDP, DHCP
- Supports relay bypass
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Compliant with EN50155 & EN50121



### Aquam8012A

- Layer 2 ECN Industrial Ethernet Switch
- 4G+8 or 3G+9 10/100M ports with max. 9PoE
- Supports relay bypass
- Supports 24-110VDC wide range power input with max. 100W PoE output
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Compliant with EN50155 & EN50121



### SICOM3024P

- Max. 4G and 24 Fast Ethernet ports
- Flexible modular design for Ethernet or Fiber ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports Syslog, SNMP Trap
- Compliant with IEC61850-3 and EN50121-4
- Operating Temp.: -40~85°C

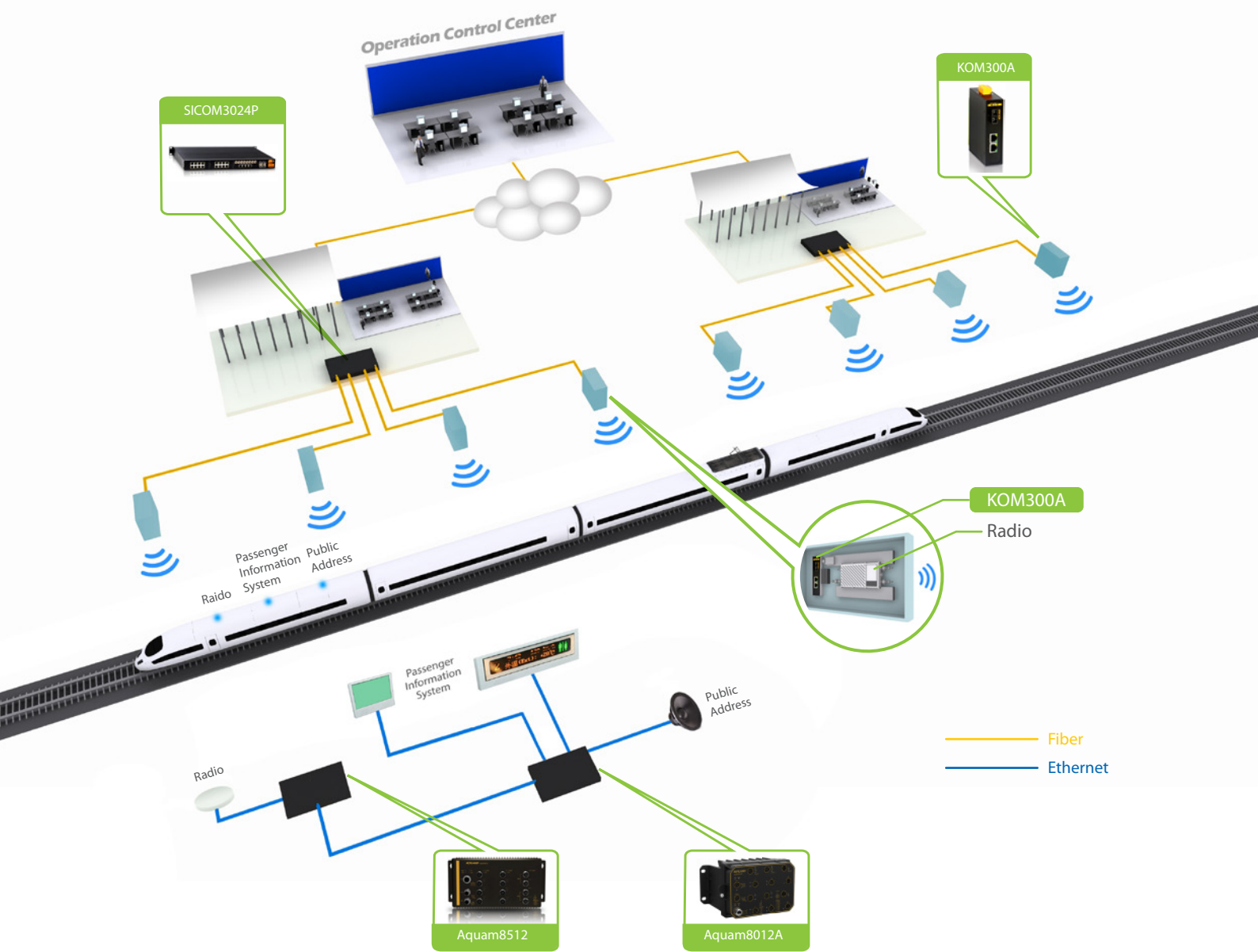


### KOM300A

- 1FX/1TX 100Mbps Fiber converter
- High EMC resistance with IP40 rating
- Supports standard 12,24/48V and high voltage 220VAC/DC power input
- Operating temp.: -40~85°C
- Compliant with Class 1 Div. 2

# 5

## PIS/PA Networking Solutions





## Introduction

In order to retain smooth and effective ticketing operation for railways, automated fare collection (AFC) system is introduced to modern transportation.

It generally consists of ticket vending machine, fare gate and backend accounting system.

Though it's less critical for train operation, it's most critical for the operator working capital.

## System Requirements

- High availability with low failure rate
- Industrial design to resist shock & vibration, and also extreme operating ambience
- Network redundancy to mitigate link or node failure effects
- High bandwidth and routing platform for inter-station connection
- Support centralized management
- Support routing protocols to exchange data with external network

## Why Kyland

- Fanless design, dual power supplies with long MTBF (>200,000hrs)
- Supports -40 - 85°C wide operating temperature and high EMC resistance
- Supports various redundant Ring redundant protocols, like STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports Layer 3 routing protocols such as RIP and OSPF
- Supports VRRP for layer 3 redundancy

## Recommended Products



### SICOM6496

- Layer 3 core switch
- Max. 48G/96G+8G ports
- Supports static routing, RIP, OSPF, VRRP
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports IEEE802.1X, ACL
- Operating temp.: -10~65°C



### SICOM6424SM

- Layer 3 core switch
- Max. 24+4G ports
- Supports static routing, RIP, OSPF, VRRP
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports IEEE802.1X, ACL
- Supports QoS, VLAN, SNMP
- Operating temp.: -40~85°C



### SICOM3024

- Max. 4G+24 Fast Ethernet ports
- Supports max. 4 RS232/422/485 Serial ports
- Supports STP/RSTP, MSTP, DT-Ring
- Supports Syslog, SNMP Trap
- Compliant with IEC61850-3 and IEEE1613
- Operating temp.: -40~85°C



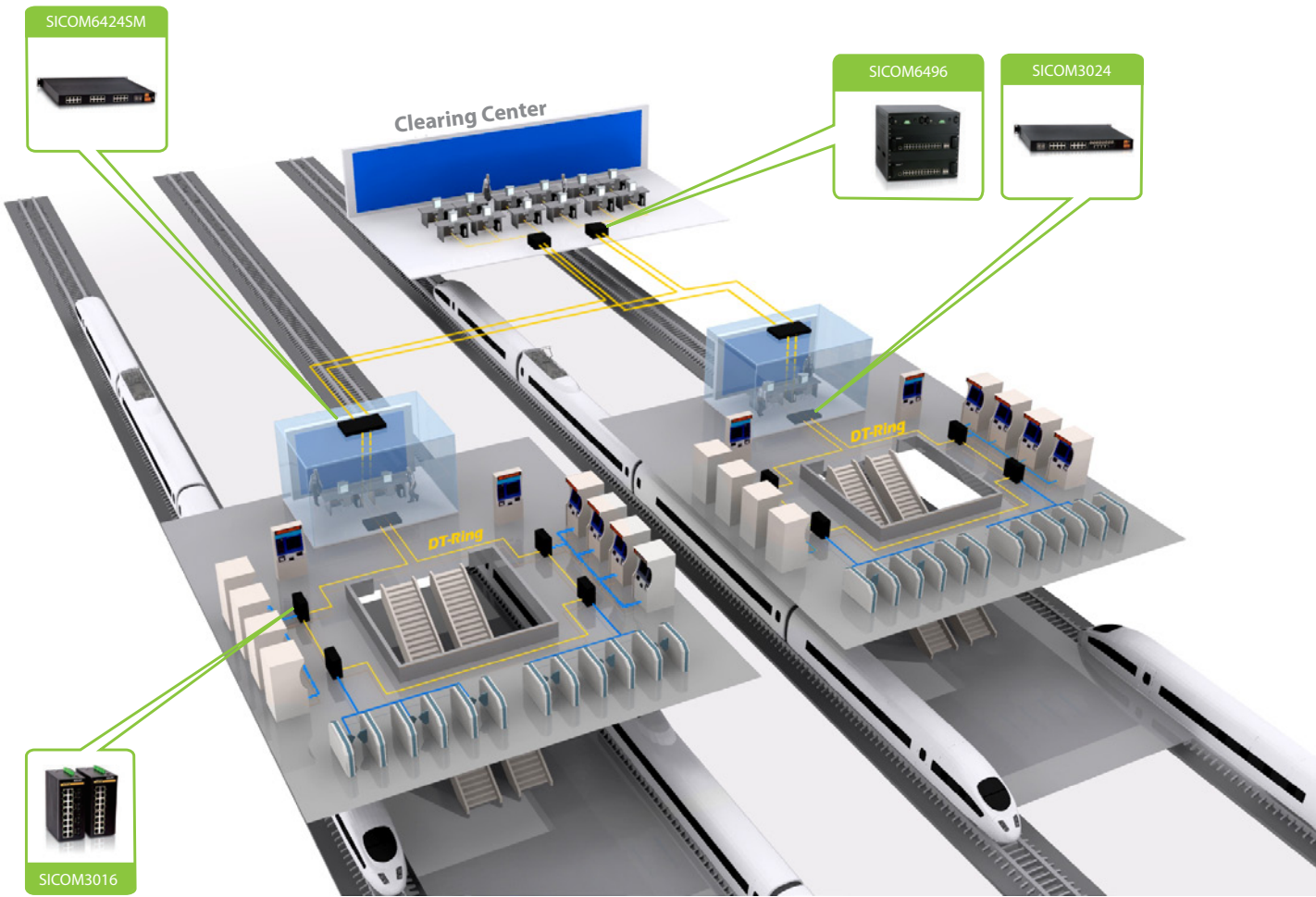
### SICOM3016

- Max. 4FX + 16TX ports
- Supports STP/RSTP, MSTP, DT-Ring
- Supports QoS, VLAN, SNMP
- Compliant with IEC61850-3 and IEEE1613
- Operating temp.: -40~85°C



# 6

## AFC Networking Solutions



— Fiber  
— Ethernet



## Introduction

Integrated Supervisory and Control System, ISCS plays a crucial role to make a centralized and comprehensive operation for city metro. All the major systems, from vital to non-vital, from the field to center, such as AFC, PIS/PA, Clock, CCTV, BAS, FAS, PSCADA, ATS, TMS... etc. can be integrated into one single supervision and control room.

## System Requirements

- High bandwidth with 10G capability to support multiple services into one big backbone network
- Flexible, fast recovery and dual ring network with failure-free power supply
- Routing and network protection to work with different network segments
- User friendly network management

## Why Kyland

- Rich industrial Ethernet Switch portfolio ranges from 5 10/100Mbps to max. 48G/96G+4 10G
- Comprehensive network redundant functions, e.g. RSTP, DT-Ring, DRP (IEC62439-6), HSR/PRP (IEC62439-3) with sub-second recovery time and multiple ring connectivity
- Redundant & hot swappable power module
- Backbone Layer 3 switch supports RIP, OSPF, IEEE802.1X, ACL
- Own developed NMS with intuitive GUI, Kyvision3.0 for network monitoring and management

## Recommended Products



### SICOM6448G/6496G

- Layer 3 core switch
- Max. 48G/96G + 4 10G ports
- Supports static routing, RIP, OSPF, VRRP
- Supports IEEE802.1X, ACL
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports QoS, VLAN, SNMP



### SICOM3028GPT

- Layer 3 multi-function switch
- Max. 28G ports
- Support static routing, RIP, OSPF, VRRP
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports QoS, VLAN, SNMP



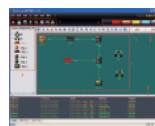
### SICOM3016

- Max. 4FX + 16TX ports
- Supports STP/RSTP, MSTP, DT-Ring
- Supports QoS, VLAN, SNMP



### SICOM3005A

- 2FX+4TX or 6TX Fast Ethernet ports
- 4 RS232/422/485 Serial ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- High EMC resistance

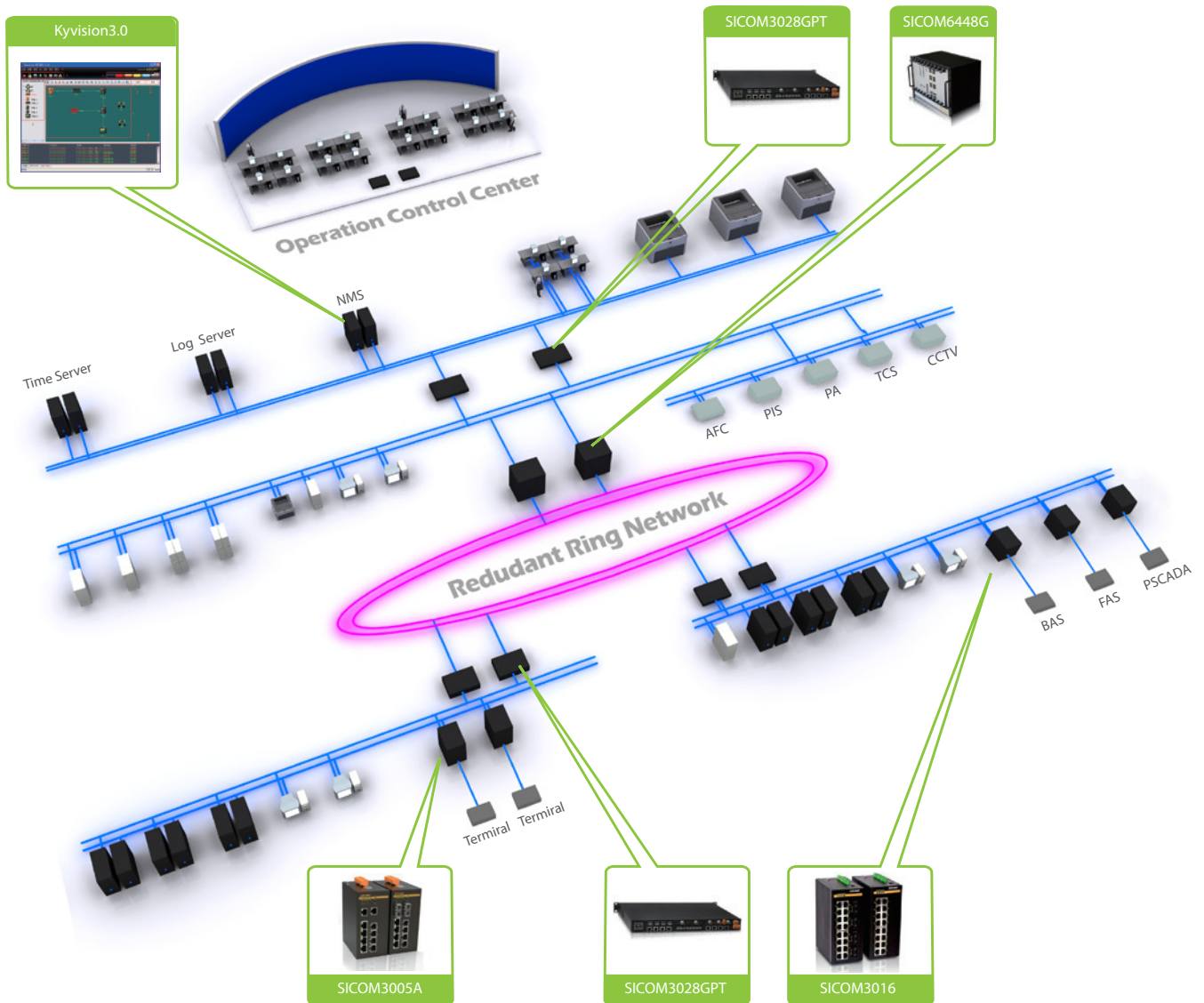


### Kyvision3.0

- Supports max. 1000 nodes
- Supports LLDP and user-friendly GUI
- Supports historic operation journal and alarm log
- Supports real-time alarm via email or SMS

# 7

# ISCS Network Aggregation Solutions







## Introduction

Traction power supply systems are the basic infrastructure for train operation. Transformers, switch-gears, low-voltage power distribution and control/protection devices are installed along the tracks, while the Power SCADA system ensures the service availability through its real time control and supervision.

## System Requirements

- Industrial design to sustain under harsh environment, severe EMC condition in substation
- Network redundancy to mitigate link or node failure effects
- Network management capabilities to ease maintenance and operation
- Versatile mounting types and power input options

## Why Kyland

- Compliant with IEC61850-3
- Supports various redundant Ring redundant protocols, like STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Unified NMS, Kyvision3.0 for network monitoring and management
- Standard 19" rack-mount type and also compact DIN-Rail type Ethernet switches with high voltage power input

## Recommended Products

### SICOM3024P



- Max. 4G and 24 Fast Ethernet ports
- Flexible modular design for Ethernet or Fiber ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Supports Syslog, SNMP Trap
- Compliant with IEC61850-3
- Operating temp.: -40~85°C

### SICOM3009A



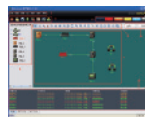
- Max. 3FX + 6TX, or 8TX
- Flexible modular design for Ethernet or Fiber ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- Compliant with IEC61850-3
- Operating temp.: -40~85°C

### SICOM3005A



- 2FX+4TX or 6TX Fast Ethernet ports
- 4 RS232/422/485 Serial ports
- Supports STP/RSTP, MSTP, DT-Ring and IEC62439-6(DRP)
- High EMC resistance
- Operating temp.: -40~85°C

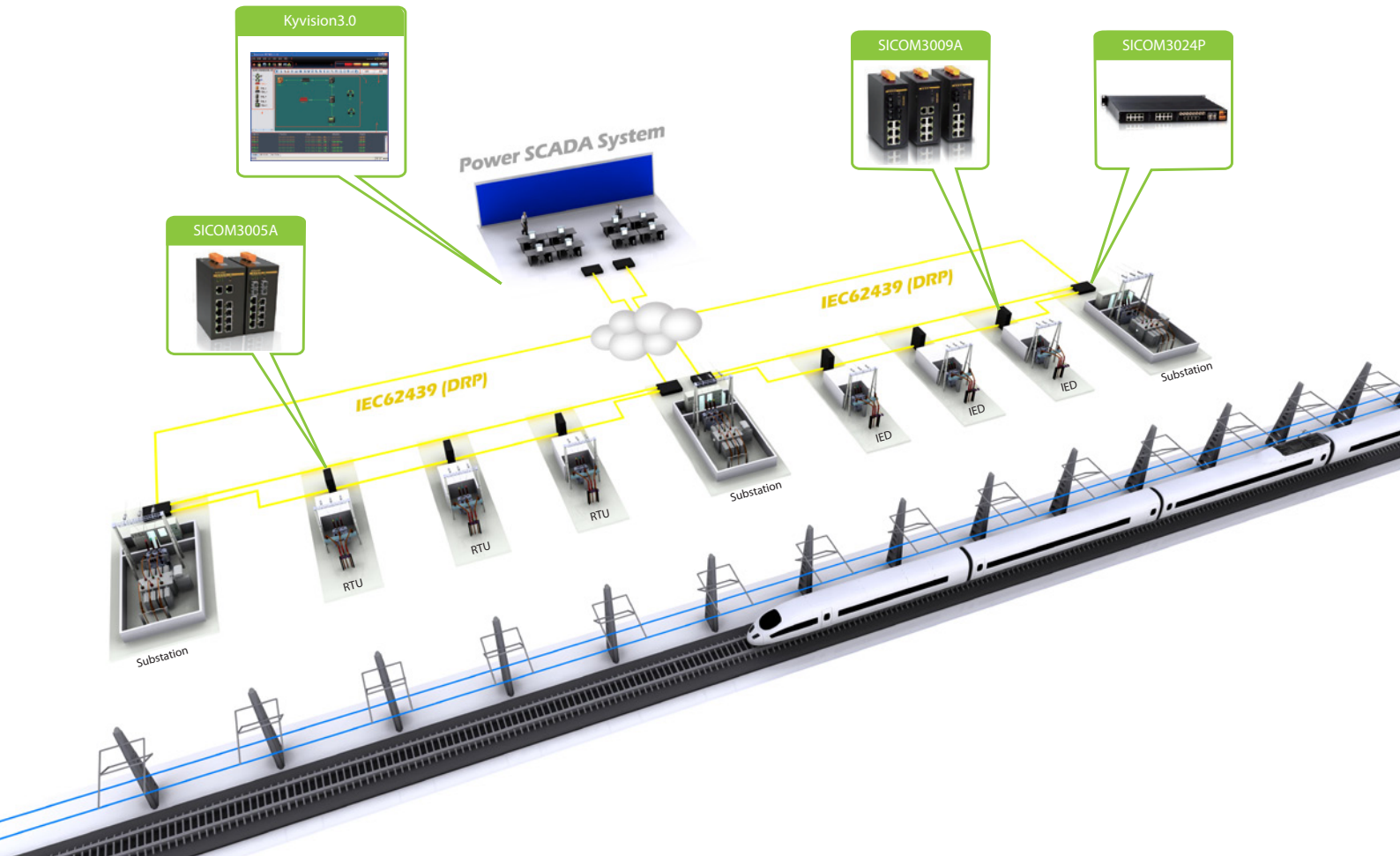
### Kyvision3.0



- Supports max. 1000 nodes
- Supports LLDP and user-friendly GUI
- Supports historic operation journal and alarm log
- Supports real-time alarm via email or SMS

# 8

## Power SCADA Networking Solutions for Railway Traction System



## Mass Transit

### PIS/PA, CCTV, Access Control Systems

Location	Project
China, Shanghai	PIS display renovation network for Shanghai metro stations
China, Shenzhen	PIS/PA network for Shenzhen metro line 2
China, Shenzhen	PIS/PA network for Shenzhen metro line 3
China, Wuhan	PIS/PA network for Wuhan metro line 4
China, Chengdu	PIS/PA network for Chengdu metro line 2
China, Shanghai	PIS/PA network for Shanghai metro line 2
China, Shanghai	PIS/PA network for Shanghai metro line 3
China, Shanghai	PIS/PA network for Shanghai metro line 4
China, Shanghai	PIS/PA network for Shanghai metro line 5
China, Shanghai	PIS/PA network for Shanghai metro line 6
China, Shanghai	PIS/PA network for Shanghai metro line 8
China, Shanghai	PIS/PA network for Shanghai metro line 9
China, Guangzhou	PIS/PA network for Guangzhou metro Guang-Fo line
China, Chongqing	PIS/PA network for Chongqing metro line 1
China, Tianjin	CCTV network for Tianjin metro line 2
China, Tianjin	CCTV network for Tianjin metro line 3
China, Shenzhen	CCTV network for Shenzhen metro line 2
China, Shenzhen	CCTV network for Shenzhen metro line 5
China, Beijing	ACS for Beijing metro Fangshan line
China, Shenzhen	ACS for Shenzhen metro line 2

### AFC/ACS/CBTC/TCS

Location	Project
China, Shenzhen	AFC network for Shenzhen metro line 2
China, Shenyang	AFC network for Shenyang metro line 2
China, Chengdu	AFC network for Chengdu metro line 1
China, Beijing	AFC network for Beijing metro line 13
India, Chennai	AFC network for Chennai metro
China, Chengdu	CBTC trackside network for Chengdu metro line 1
China, Changchun	TCS network for Changchun Railway Passenger Trains

### ISCS/PSCADA/FAS/BAS

Location	Project
China, Shenzhen	ISCS network for Shenzhen Metro line 1 extension
China, Shenzhen	ISCS network for Shenzhen Metro line 2
China, Beijing	Power SCADA network for Beijing metro line 4
China, Beijing	Power SCADA network for Beijing metro line 5
China, Beijing	Power SCADA network for Beijing metro line 15
China, Beijing	Power SCADA network for Beijing metro airport line
China, Wuhan	Power SCADA network for Wuhan line 1 phase 2
China, Shenzhen	Power SCADA network for Shenzhen metro line 2
China, Shenzhen	Power SCADA network for Shenzhen metro line 3
China, Shenzhen	Power SCADA network for Shenzhen metro line 5
China, Shanghai	Power SCADA network for Shanghai metro line 7
China, Haerbin	Power SCADA network for Haerbin metro line 1
China, Nanjing	Power SCADA network for Nanjing metro line 2
China, Shenzhen	BAS network for Shenzhen metro line 2
China, Shenzhen	BAS network for Shenzhen metro line 3
China, Guangzhou	FAS network for Guangzhou metro line 5
India, Hyderabad	Power SCADA network for Hyderabad metro line 1





## Mainline/High-speed Rail

### Trackside Network Systems

Location	Project
China	Trackside network for Nanchang-Jiujiang inter-city railway
China	Trackside network for Changchun-Jilin inter-city railway
China	Trackside network for Dazhou-Chengdu High-speed railway
China	Trackside network for Taiyuan-Zhongwei High-speed railway
China	Trackside network for Longyan-Xiamen High-speed railway
China	Trackside network for Suining-Chongqing High-speed railway 1 <sup>st</sup> Line
China	Trackside network for Suining-Chongqing High-speed railway 2 <sup>nd</sup> Line
China	Trackside network for Zhengzhou-Xi'an High-speed railway
China	Trackside network for Baotou-Lanzhou High-speed railway
China	Trackside network for Xiamen-Shenzhen High-speed railway
China	Trackside network for Shenzhen-Xiamen High-speed railway
China	Trackside network for Chongqing-Lichuan High-speed railway
China	Trackside network for Wuhan-Huanggang High-speed railway
China	Trackside network for Maoming-Zhanjiang High-speed railway
China	Trackside network for Liuzhou-Nanning High-speed railway
China	Trackside network for XiangGui High-speed railway
China	Trackside network for Nanjing-Anqing High-speed railway
China	Trackside network for Da-Cheng High-speed railway
China	Trackside network for Cexian, Neimeng High-speed railway
China	Trackside network for Chengdu east line High-speed railway
China	Trackside network for Wuhan-Xianyang line High-speed railway
China	Trackside network for Beijing-Tianjin High-speed railway
China	Trackside network for Shandong High-speed railway

### PSCADA/BAS/ISCS/Interlocking Systems

Location	Project
China	Power SCADA network for Lanzhou-Xinjiang railway
China	Power SCADA network for Hefei-Nanjing railway
China	Power SCADA network for Wuhan-Guangzhou high speed railway
China	Power SCADA network for Shanghai-Hangzhou railway
China	Power SCADA network for Chengdu-Kunming railway
China	Power SCADA network for Zhengzhou-Xi'an high speed railway
China	Power SCADA network for Guangzhou-Foshan railway
China	Power SCADA network for Wenzhou-Fuzhou railway
China	Power SCADA network for Beijing-Jiulong railway
China	Power SCADA network for Beijing-Tianjin railway
China	BAS network for Qinghai-Tibet railway
China	BAS network for Wuchang railway
China	BAS network for Nanjing South railway station
China	Interlocking network for Hong-Nao-San railway
Russia	Interlocking network for Russian railway
China	ISCS network for Cheng-Yu railway
China	ISCS network for Lan-Xin railway
China	ISCS network for Lan-Xin railway line 2
China	ISCS network for Chongqing inter-city railway
China	ISCS network for Wu-Guang railway
China	ISCS network for Shenyang railway
China	ISCS network for Guangzhou-Shenzhen-Hongkong railway
China	ISCS network for Wuhan-Yichang railway



Industrializing the Ethernet, Simplifying Industrial Communication

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**KYLAND**



**OIL & GAS AUTOMATION  
SOLUTIONS**

Industrializing Ethernet, Simplifying Industrial Communications

[www.kyland.com](http://www.kyland.com)

# Company Profile

Kyland Technology Ltd. is focusing on the research and implementation of industrial control networking total solutions. We are a leading Chinese company of industrial networking technology innovation and exploration. Our mission is to build the next generation industrial control ecosystem based on internet connectivity.

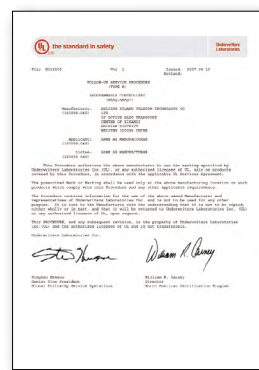
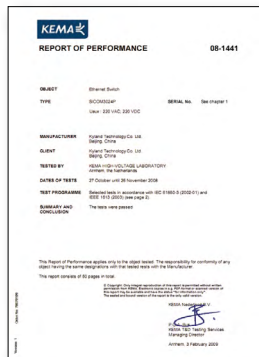
Kyland's primary R&D directions are: industrial Ethernet communications technologies, IP-based industrial fieldbus technologies, network-based field controller technologies, cloud-based industrial controlling server technologies, network-based controlling precise time/clock technologies, control message communication security technologies.

Kyland has been involved in the 3 international standards for industrial automation: IEC61158, IEC62439, IEEE C37.238, and the Chinese national standard GB/T 30094. With the well-known test and certificates such as KEMA, CE/ FCC, UL508, ATEX/IECEX, 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.

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





A photograph of an oil and gas refinery at night. The scene is dominated by several tall, cylindrical distillation columns and a complex network of pipes and walkways. The facility is illuminated by numerous lights, creating a bright contrast against the dark blue twilight sky. In the foreground, there is a metal walkway structure and a fence. The overall atmosphere is industrial and active.

# OIL & GAS AUTOMATION SOLUTIONS



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## Introduction

With the advent of the digital oil & gas concept there is now an increased requirement for secure communications. A reliable and stable automation network is important for efficient production, limited downtime and effective remote management. All structures and offices throughout the oil & gas complex must have access to real time production data, field device status and other real time communications through a hardwired or wireless network. Traditional SCADA networks monitor and control the production process while a real time Ethernet backbone manages and transports larger data streams like video and data collection while providing a layer of redundancy and security.

## System Requirements

- Industrial level design offering security, reliability and stability for harsh environments
- Ethernet backbone network capable of transmitting large IP data such as video, voice and service data
- Self-healing network, quick recovery after network failure
- Secure network, protects system monitoring from deliberate attack
- Powerful network management for detection of network failures

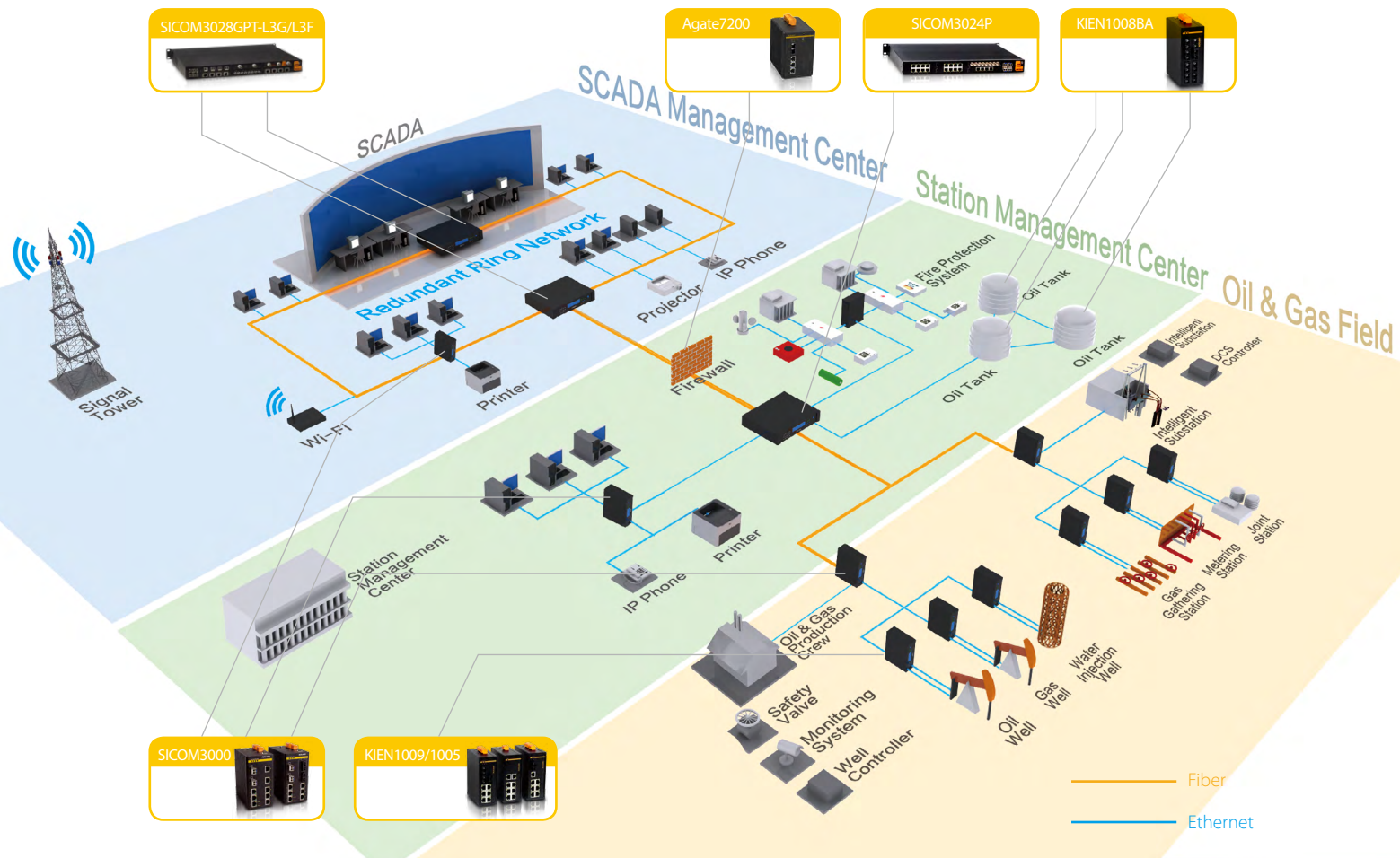
## Why Kyland

- Industrial level design, wide operating temperature -40~85°C
- Low power consumption, ATEX/IECEX certified
- Auto-negotiable gigabit network, supports Jumbo frame, real-time data collection, video and voice transmission
- Supports IEC62439-3(HSR/PRP), IEC62439-6(DRP), network recovery time < 20 ms
- Supports network security protocols, encrypted data transmission and access control, IEEE802.1X, Radius, TACACS+, etc
- Supports link detection, VCT(virtual cable test), remote maintenance and monitoring for network devices



# 1

# Digital Oil & Gas Field Communication Network Solutions



## Solution Characteristics

- Reliability: EMC level 4, -40~85 °C wide operating temperature with zero package loss, independent redundant power supply, ring network recovery time < 20ms
- Real-time: switching delay < 5us, delay jitter < 1us
- Security: C/S mode authentication, different user access levels, encryption mechanisms



## Introduction

Because oil & gas pipelines are one of the ways that both oil and gas are transported, automation systems play an important role. SCADA systems, video networks and voice systems are all part of the real time multi-service platform. Network devices are distributed in the control center, field stations and valve control areas which communicate over a fiber backbone. It is important that all communication devices have access to field instruments and provide stable, reliable and consistent data transmission.

## System Requirements

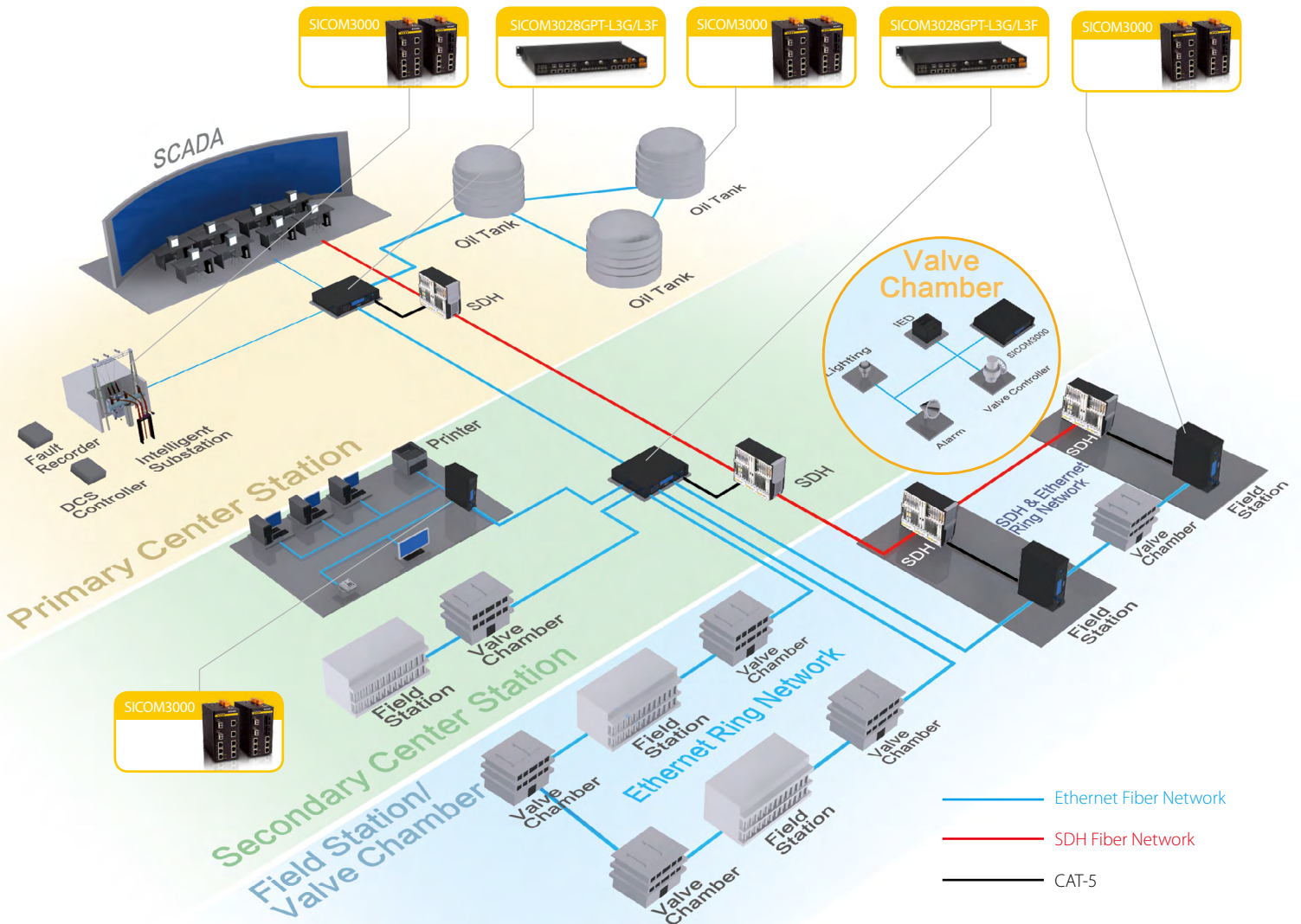
- SCADA and network management software can receive and monitor the state of the pipeline
- Remote data monitoring and real-time communication with central system through a stable fiber network
- Large bandwidth gigabit backbone network supporting real-time remote transmission of service, video and voice data
- Supports network self-healing, quick recovery after network failure, redundant protocols compatible with SDH and fiber systems
- Convenient network management and failure detection functions
- Industrial grade, wide operating temperature, adapted to harsh environments

## Why Kyland

- Kyland provides complete network solutions, layer 3 core industrial Ethernet switches and rack-mount/DIN-rail layer 2 industrial Ethernet switches suitable for management centers, field stations and valve control
- Supports IEC62439-6(DRP), ring network recovery time < 20 ms (Supports SDH system)
- Supports Network Management System, Kyvision provides convenient and reliable monitoring of network state and network failure detection
- Supports port mirroring, port statistics
- EMC level 4, IP40 protection class
- Wide operating temperature -40~85°C , independent redundant power supply
- Low power consumption design

# 2

## Oil & Gas Pipeline Monitoring and SCADA Communication Network Solutions



### Solution Characteristics

- Reliability: EMC level 4, IP40 protection class, fanless design, -40~85°C wide operating temperature with zero package loss, independent redundant power supply, ring network recovery time < 20ms
- Real-time: switching delay < 5us, delay jitter < 1us
- Security: C/S mode authentication, different user access level, encryption mechanism
- Compatibility: POE products provide 802.3at interface





## Introduction

Intelligent devices are prevalent in today's Oil refineries. DCS, MES, SIS and security systems connect controllers and monitors via Ethernet to manage and monitor the production process.

## System Requirements

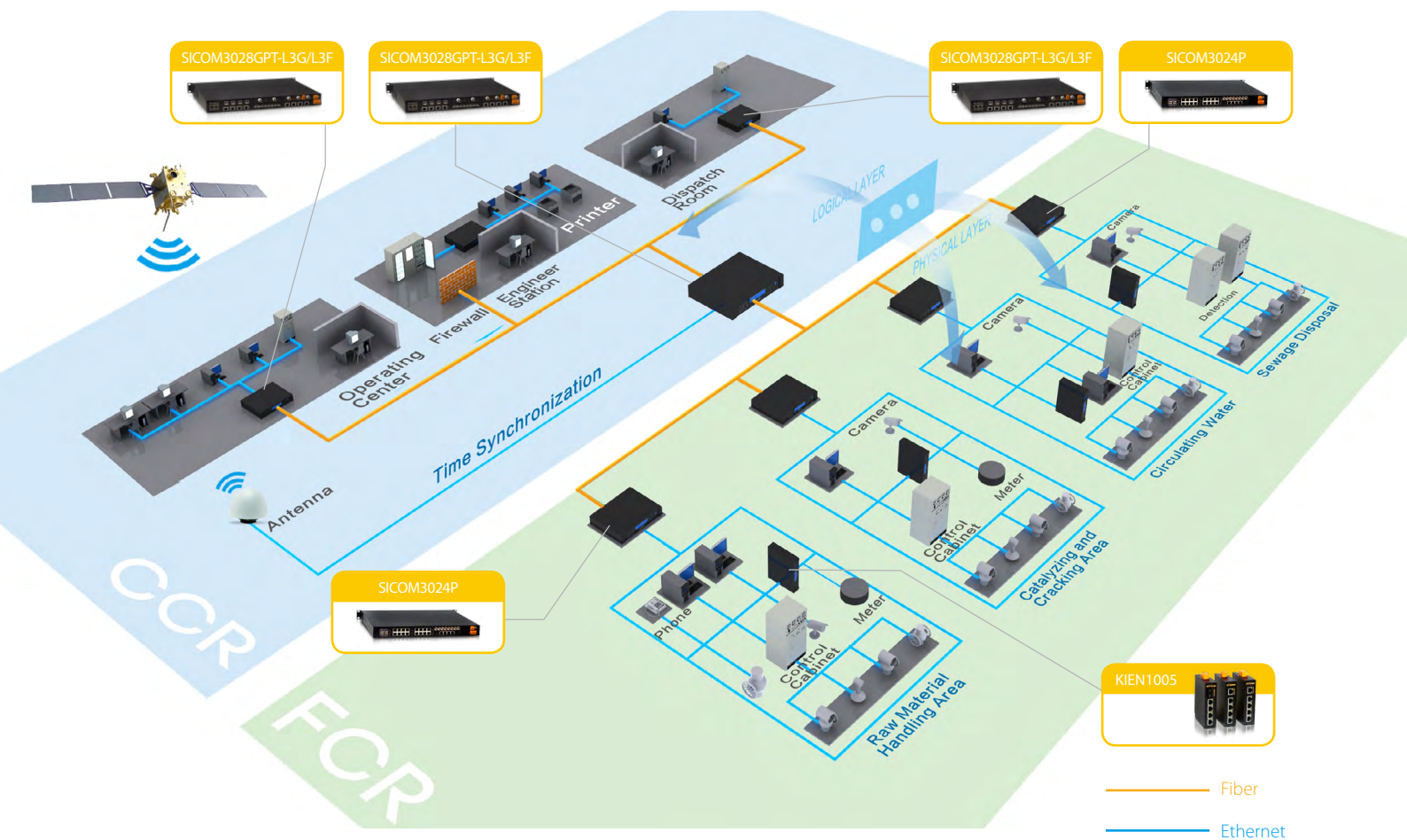
- Stable, flexible network
- Network redundancy for various systems, controllers and field devices
- Sufficient bandwidth to meet video monitoring requirements
- Failure isolation for DCS, SIS and MES problems
- Communication systems must provide data filtering and detect illegal access
- High electromagnetic protection, redundant power supply
- Low switching delay and delay jitter
- Secure access mechanism to avoid deliberate destruction of network

## Why Kyland

- Managed industrial Ethernet switches provide stable network connection, excellent performance 7 day X 24 hours uptime
- Support STP/RSTP, DT-Ring, IEC62439-6(DRP) for fast network recovery
- Backbone network provides 1000Mb bandwidth. Jumbo frame supported to increase utilization rate of bandwidth
- Port isolation, loopback detection and port flow statistics
- TCP/UDP package filtering, MAC address binding prevents network from illegal access
- SSH, SSL, SNMPv3
- EMC level 4, industrial design, -40~85°C wide operating temperature, independent redundant power supply

# 3

## Oil Refining Automated Communication Network Solutions



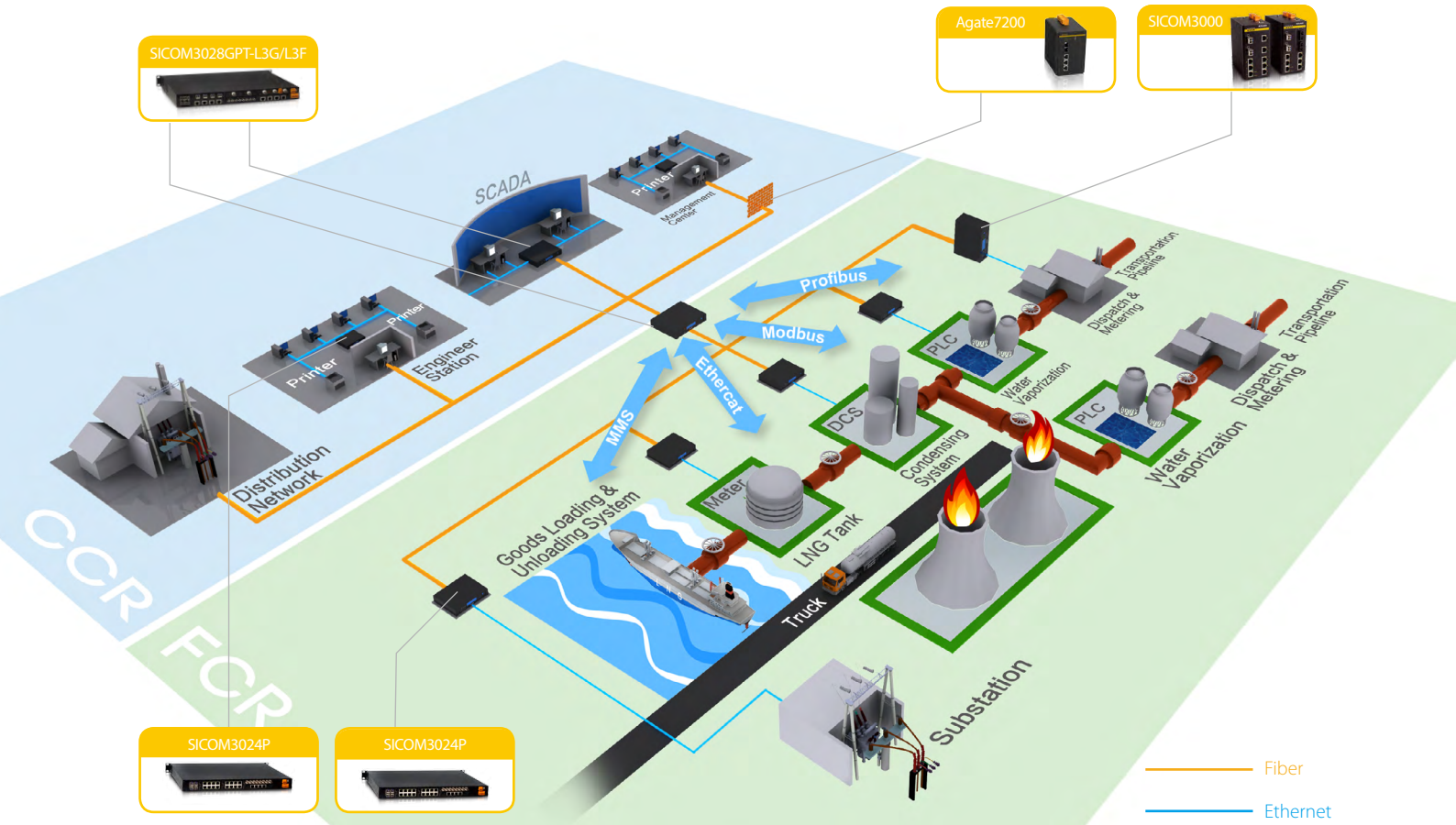
### Solution Characteristics

- Reliability: EMC level 4, IP40 protection class, fanless design, -40~85°C wide operating temperature with zero package loss, independent redundant power supply
- Real-time: switching delay < 5us, delay jitter < 1 us
- Security: C/S mode authentication, different user access level, encryption mechanism
- Explosion proof: low power consumption design suitable for explosion proof areas





# 4 LNG Receiving Station Network Solutions



## Solution Characteristics

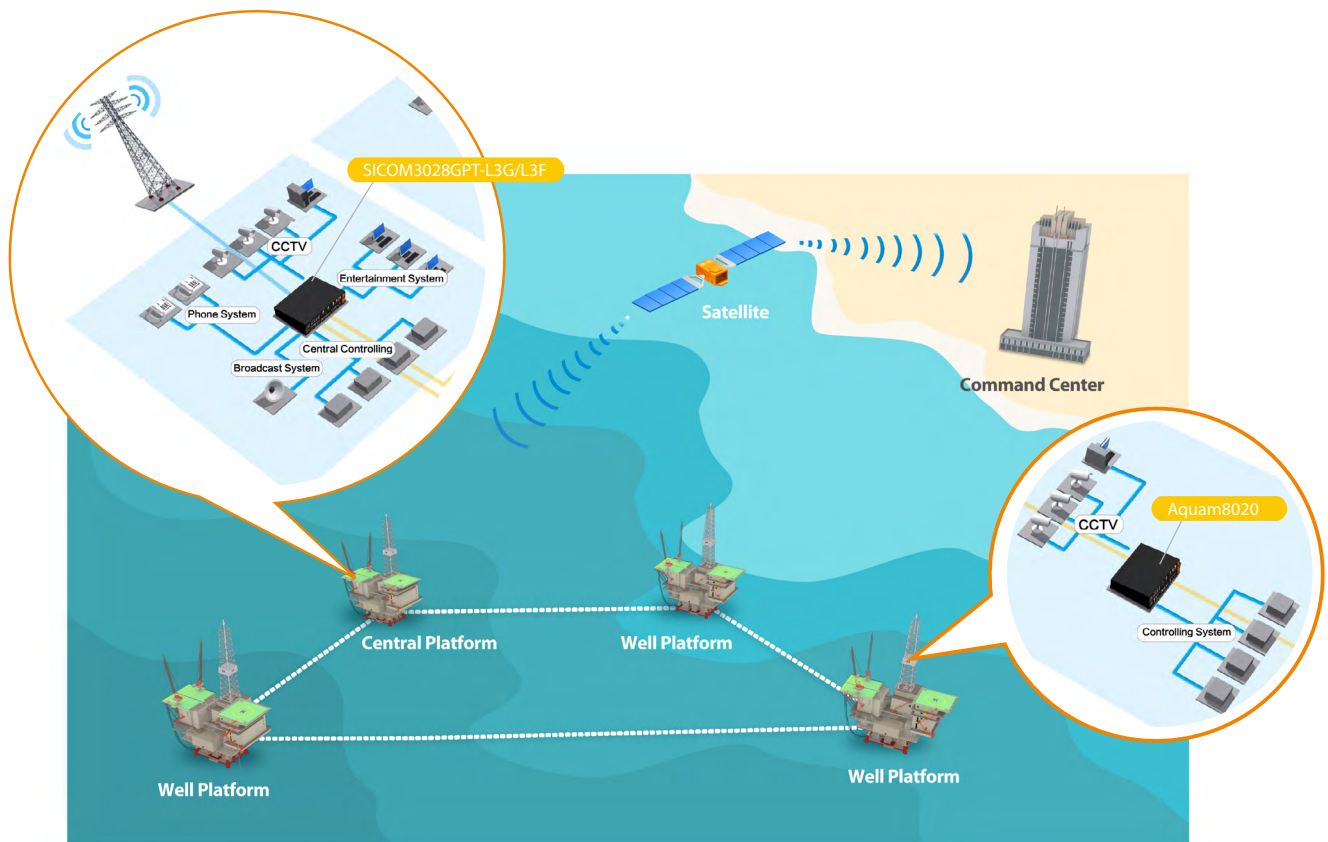
- Reliability: EMC level 4, IP40 protection class, fanless design, -40~85°C wide operating temperature with zero package loss, independent redundant power supply, ring network recovery time < 20ms
- Real-time: switching delay < 5us, delay jitter < 1us
- Security: C/S mode authentication, different user access level, encryption mechanism





# 5

## Offshore Oil Drilling Network Solutions



### Solution Characteristics

- Reliability: EMC level 4, IP67 protection class, -40~85°C wide operating temperature, independent redundant power supply, shock and vibration resistance
- Real-time: switching delay < 5us, delay jitter < 1 us
- Security: C/S mode authentication, different user access levels, encryption mechanism

## Typical Cases

### SINOPEC shale gas communication system in Chongqing Fuling

(The first commercialized shale gas project in China, Kyland provided more than 400 industrial Ethernet switches including 10-Gigabit products)

### Digitized oil field construction in Changqing Oilfield

(Kyland has been providing stable industrial Ethernet switches since 2012)

### PetroChina Co Ltd Internet of things project in Hade Oilfield

(Key project for PetroChina Co Ltd, Kyland took part in all the subsystems of this project)

### China-Russia oil pipeline, Moda section, communication system project

(More than 1000 kilometers, first extreme cold oil pipeline in China, Kyland switches functioning in harsh environment)

### SINOPEC Maoming Company ten-million-ton reconstruction DCS&SCADA&power monitoring system

(Largest refinery reconstruction project of SINOPEC, more than 20,000 controlled points in DCS, one of the largest DCS systems in China)

### CNOOC DCS & industrial television system for LNG project

(Largest clean energy base in northeast China, Kyland provided more than 100 switches)

## Onshore Oil & Gas Drilling

Location	Project
China, Heilongjiang	Daqing Oilfield Second Factory - communication system informatization project
China, Heilongjiang	Daqing Oilfield Third Factory - communication system project
China, Heilongjiang	Daqing Oilfield Third Factory - polymer communication system
China, Heilongjiang	Daqing Oilfield Secondary & Tenth Factory - communication system project
China, Heilongjiang	Daqing Oilfield Forth Factory - substation communication system
China, Xinjiang	Hade Oilfield data transmission and CCTV system
China, Shanxi	Shengli Oilfield Linpan Oil Production Plant project
China, Shandong	Shengli Oilfield Hekou Oil Production Plant video monitoring project
China, Xinjiang	Southern Xinjiang Natural Gas project
China, Xinjiang	PetroChina Fengcheng Oilfield 18th well zone ground construction
China, Xinjiang	Xinjiang Oilfield Company Huaidong Oilfield ground construction
China, Shanganning	Changqing Oilfield video system reconstruction
China, Xinjiang	Xinjiang Oilfield Company 35KV substation
China, Xinjiang	Talimu Oilfield Halahatang ground construction
China, Mobei	Mobei 116th well zone ground construction
China, Shanxi	Yanchang Petro Xiasiwang Oil Production Plant reconstruction project
China, Xinjiang	SINOPEC Tahe Oilfield ground construction
Syria	Oilfield monitor and control system
Kazakhstan	Oil well monitor and control system



## Oil refining and Petrochemical Operations

Location	Project
China, Xinjiang	Kelamayi oilfield crude oil production DCS system
China, Neimenggu	Changqing oilfield natural gas treatment plant DCS system
China, Zhejiang	SINOPEC refinery in Hangzhou DCS system
China, Guangdong	Maoming Petro-Chemical Corp. oil quality optimization DCS system
China, Tianjin	Tianjin 1 million tons Ethylene DCS system
China, Liaoning	Liaoyang Petro-Chemical Corp. polyester plant DCS system
China, Liaoning	Fuxin Petro-Chemical Corp. DCS system
China, Liaoning	Anshan Shengmeng Petro-Chemical Corp. DCS system
China, Liaoning	Yingkou natural gas liquefaction plant DCS system
China, Guangdong	Shell China in Guangdong DCS system
China, Tianjin	Dagang Petro-Chemical Corp. power SCADA system
China, Shanxi	Shaanxi Yanchang Petroleum refinery TV monitoring system
China, Shandong	Shandong Jingteng Petroleum TV monitoring system
Algeria	Condensate oil project monitor and control system
America	Texas oil refinery DCS system

## Oil & Gas Pipelines

Location	Project
China	Jingbian crude oil pipeline transportation monitor and control system
China	South-Xinjiang natural gas valve chamber monitor and control system
China	Lan-Cheng-Zhong-Gui crude oil pipeline monitor and control system
China	Changqing oilfield pipeline valve chamber SCADA system
China	Talimu oilfield Talun pipeline SCADA system
Niger	Crude oil pipeline monitor and control system
Chad	Crude oil pipeline monitor and control system
Uzbekistan	Crude oil pipeline monitor and control system

## LNG System & Offshore Oil Drilling

Location	Project
China	Dalian petroleum wharf transportation monitor and control system
China	China National Offshore Oil Corp. offshore oil storage monitor and control system
China	SINOPEC Jiangnan Oilfield LNG treatment factory project
China	Aoerkeqi Changmeng Company LNG project communication system

