

Preface

As network infrastructures become more complex in industrial applications, the risk of system failure and data loss also grows. A proactive network monitoring approach is necessary for system operators, as it will help them to be more responsive in tracking problems before they escalate into major crises.

With its simplicity and usability, a management system becomes an indispensable tool when building large network systems. However, management is no longer limited to the routine maintenance of software and hardware, as users' expectations in terms of network service reliability and quality increase. Therefore, a reliable and highly effective NMS must be implemented in order to provide real-time and optimized remote network control.

This paper discusses the importance of network monitoring in industrial applications, and highlights the intelligence that Korenix' network management system brings through its JetNet and JetPoE switches for simplifying and improving remote control and maintenance of industrial networks.



Preface

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Network Management System Overview and Role

Importance of Network Management in Industrial Applications

Installing equipment and designing network connections in industrial applications is perhaps the least complicated part of the overall network infrastructure. Administrators not only need to provide connectivity and data communication between devices, but they also need to monitor the status of the connected devices, their

topologies in order to have a clear image of the system and maintain the network. Therefore, to guarantee that the network operation is successful, and to prevent the overall system or connected devices from failure while in use, a management tool is a must-have.



Configuring, maintaining, monitoring and troubleshooting networks manually can be time-consuming and complicated. Moreover, when industrial networks become larger in size and more complex through time, manual management poses additional problems for users, implying that if something goes wrong in the system,

it will take longer time to locate and track the problem. Herein, automating these tasks through software can improve the operational efficiency and performance of the network infrastructure. This is where the network management software (NMS) becomes of critical importance.

What is Network Management Software

A network management protocol is a tool that enables simple and flexible administration and monitoring of the devices in networks. It evaluates the condition of your devices and the network attached to it, and accumulates diagnostic and troubleshooting data to hand over to the system administrator for further analyses.

Thus, to improve efficiency of the process, using a comprehensive and proactive network monitoring software is required. This will allow users to be more responsive in tracking problems before they pose a system downtime or application outage, and thus, affect the end-user's operation performance.



Network Management Protocols

Although there were initially a number of remote management protocols, SNMP (Simple Network Management Protocol) has become the "de facto" standard for network monitoring and management. SNMP is an IETF standard protocol, designed to give remote management access to an Ethernet network device and provide network administrators with the ability to monitor and control their rapidly-growing Ethernet infrastructures.

The SNMP network management architecture consists of managed devices, SNMP agents, and network management stations.

Besides this traditionally used SNMP protocol, most networking device vendors develop and provide their own system for network management with more possibilities and better adjusted to their device functionalities, while aiming to improve the performance of the whole industrial system.



JetView Pro – Korenix Intelligent Network Management System

To improve management performance for industrial network users, Korenix has designed its own network management system for industrial applications, the JetView Pro.

What is JetView Pro and how does it run

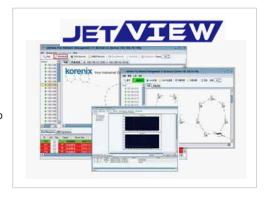
JetView Pro is an award winning* Korenix patented NMS, which outstands among other management software by combining intelligent functionalities into its comprehensive platform design, aiming to simplify administrator's network management duties and allowing him to focus on more challenging tasks.

With JetView Pro, users are able to:

- Manage IP-based devices from central office and remote sites
- Manage up to 1024 network nodes
- Auto-discover network and visualize topology
- Manage Device and MSR group
- Handle events via polling, syslog, email and SNMP trap
- Send out notifications via email, application programs, SNMP trap, XMPP**, SMS** and MSN Messenger**
- Configure devices via SNMPv1/v2/v3, Web, Telnet and SSH
- Manage performance
- Manage accounting
- Ensure system scalability, reliability and real-time status through server-client operation Perform centralized management etc···.

The JetView Pro is specifically designed to manage, remotely control and maintain mission-critical IP-based networks of such applications, as Intelligent Traffic Control Systems, Factory Automation, Power Utility systems, Oil and Gas sectors, Maritime and Military applications, and many more.

- * "2010 Product of the Year Award" of Control Engineering Poland in the category of "Industrial Networking, Industrial Ethernet"
- ** Available in JetView Pro V2.0

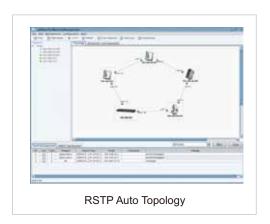


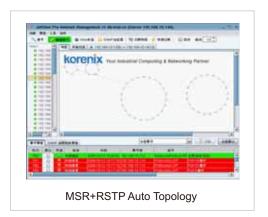
Benefits of JetView Pro for industrial network users

JetView Pro is a comprehensive platform, which introduces advanced features that improve users' experience while employing the software. Some of the major advantages offered in JetView Pro compared to other industrial network management tool vendors are discussed as below:

Automatic Fast Network Discovery and Visualization

JetView Pro can easily discover all IP or SNMPbased devices in the network, including device information, link status, port status, etc. Users are given the possibility to discover and manage up to 1024 Korenix or 3rd party devices in large LAN, WAN, WLAN networks.





JetView Pro outstands by the supported Automatic Fast Scanning functionality, which further enables users to scan the connected devices in the same or different subnets of the network in just a few seconds and automatically draw their topologies .

For users' convenience and improved visibility, the JetView Pro also offers the ability to export or print the topologies to diverse formats (JPG, BMP, PNG and PDF), include dashed lines to show link blocked status, etc···





Group Configuration and Management

JetView Pro allows users to easily configure Korenix devices through Web, Telnet, SSH and SNMP browser. Compared to other vendors'



NMS, Korenix' JetView Pro outstands through its capability of configuring and managing devices not only one by one, but also in groups.



Users can upgrade firmware and boot loader, restore and backup configuration files, assign or modify IP addresses in groups, which increases the network performance and users' work efficiency, as it allows them to complete multiple tasks within shorter timeframe.

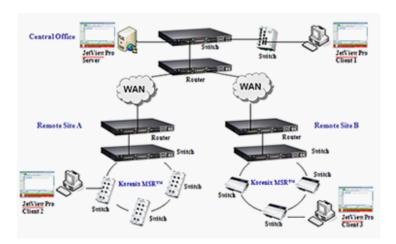




■ Setup of 30 devices for MSR takes 20 seconds only

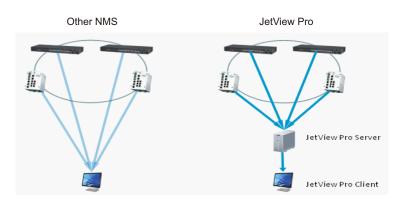
Intelligent Server-Client Operation

JetView Pro is built on Server-Client architecture to improve network management performance while allowing users to receive all the updated information from network server in real-time. One JetView Pro server can serve many remote access JetView Pro clients.



The benefits of the Server-Client mode over Peer to Peer network management are numerous. Here are the major advantages:

FAST

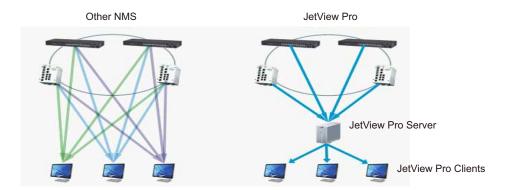


In a typical network, the end-user must periodically reload network system to collect the non-synchronized information from each device individually. So it should rediscover the network each time it restarts. In Server/Client mode, Server will monitor the status of the devices all the time. All the files and

device data will be stored at the same place (in the server), making management and finding of files easier for users. They will also be able to easily reload network and system status from server agents and collect real-time synchronized data from multiple users in extended, large-scale networks.



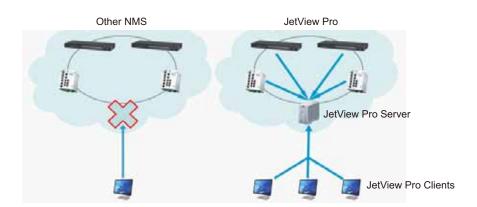
SCALABLE



In traditional systems, the devices and computers work individually, which increases network loading. Besides, the received data cannot be synchronized. This limits the NMS implementation to a small network with only a few number of clients.

In JetView Pro, the server acts as an agent, which collects all the information in a centralized place and synchronizes it for further use. So it will be easier for users to load the network. Therefore, the NMS can be installed in large networks.

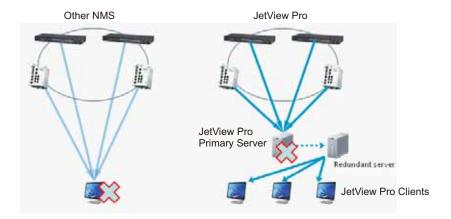
CENTRALIZED and ACCESSIBLE



Typical NMS cannot access the private client domains and search facilities remotely. Compared to it, the JetView Pro clients can access the server from various platforms in the network through

NAT remotely. Thus, network administrators can further remotely monitor client connections across Internet and achieve high network performance with easy maintenance.

RELIABLE



When using traditional NMS system with peer computing, user needs to take backup at every workstation. So it becomes difficult to offer redundancy of the system. In a server-client mode, because all the data is stored on server, it is easier to make a back-up of it. As the redundant server has the same info as the primary server, in case if some break-down happens, the system can be recovered easily and efficiently.

3rd party Conformance

Korenix NMS outstands from similar industrial network management protocols provided by other industrial networking solution vendors, as it is 100% compatible with 3rd party devices. This means that any SNMP or IP-enabled device provided by other vendors can be easily integrated within network infrastructure and can be maintained the same way, as Korenix products are done.

Windows Compatible

To achieve the best compatibility of Korenix NMS running on PCs with different operating systems, JetView Pro fully supports Windows 7 32/64-bit Operating System in addition to Windows XP, Windows Server 2008 32/64-bit, and Windows Vista 32/64-bit.

Multi-Language Support

For users' convenience, multiple languages are supported in just one version of JetView Pro, including English, Russian, Simplified Chinese, and Traditional Chinese. This enables multilingual users improve their experience of network management and maintenance in their complex and large-scale industrial network infrastructures.

Korenix Product Selection Guide – Industrial Rackmount Managed Gigabit Switch







JetNet 5828G Series



JetNet 5628G Series



JetNet 5428G JetNet 5428G-DC JetNet 5428G-2G-2FX

	Layer 3 Stackable Managed Switch	Layer 3 Modular Managed Switch	Modular Managed Switch	Managed Switch
Interface				
Number of Ports: 10/10	0TX	Max. 24	Max. 24	24
Number of Ports: 10/10	0/1000TX 24	4	4	4(JetNet 5428G/5428G-DC) 2(JetNet 5428G-2G-2FX)
Number of Ports: Fiber	4G Combo	Max. 22 (18+4G)	Max. 22 (18+4G)	4G combo (JetNet 5428G/5428G-DC); 2G com +2x 100M/Gigabit SFP(JetNet 5428G-2G-2F)
(Multi Mode Fiber)	Gigabit SFP	100-FX SC/SFP or Gigabit SFP	100-FX SC/SFP or Gigabit SFP	Gigabit SFP (JetNet 5428G/5428G-DC) 100M/Gigabit SFP (JetNet 5428G-2G-2FX)
(Single Mode Fiber)	Gigabit SFP	100-FX SC/SFP or Gigabit SFP	100-FX SC/SFP or Gigabit SFP	Gigabit SFP (JetNet 5428G/5428G-DC) 100M/Gigabit SFP (JetNet 5428G-2G-2FX)
Console	•	•	•	•
AC Power Input	90-264VAC(JetNet 6524G)	85-264VAC*1(JetNet 5828G) 85-264VAC*2(JetNet 5828G-2AC /JetNet 5828G-R)	85-264VAC*1(JetNet 5628G) 85-264VAC*2(JetNet 5628G-2AC /JetNet 5628G-R)	90-264VAC (JetNet 5428G/ 5428G-2G-2FX)
DC Power Input	24V*2(JetNet 6524G-DC24) 48V*2(JetNet 6524G-DC48)	24/48VDC*2 (JetNet 5828G)	24/48VDC*2 (JetNet 5628G)	24V(12-48V)DC x2 (JetNet 5428G-DC)
Power Consumption	Max. 50 Watts	Max. 50 Watts	Max. 50 Watts	Max. 20 Watts
Fault Relay Output		2 DI + 2 DO	2 DI + 2 DO	
Fan	2 FAN(JetNet 6524G) Fanless(JetNet 6524G-DC24/48)	Fanless	Fanless	Fanless
Mechanical				
1U Rack Mount	•	•	•	•
F.E. Module		•	•	
Dimension (Unit=mm)	44(H) x 438 (W) x 237 (D)	44(H) x 431 (W) x 375 (D)	44(H) x 431 (W) x 375 (D)	44(H) x 438 (W) x 170 (D)
Operating Temperature	-10~55°C(JetNet 6524G) -40~65°C(JetNet 6524G-DC)	-40~85°C	-40~85°C	-25~70°C
Rack-Mount Kit	•	•	•	•
Protocols				
JetView Pro NMS	•	•	•	•
JetView/CLI/Web Confi	iguration •	•	•	•
Modbus TCP/IP		•	•	•
IPv6 Managed		•	•	•
Jumbo Frame	•	•	•	•
Port Trunking	•	•	•	•
Network Redundancy (MSR, RSTP, MSTP)	MSR member, RSTP, MSTP	•	•	•
Maximum Ring	1	14	14	14
IGMP Snooping & IGMF	Query •	•	•	•
Tag-VLAN	•	•	•	•
Private VLAN, QinQ		•	•	•
Quality of Service	•	•	•	•
SNMP V1/V2c/V3	•	•	•	•
IEEE 802.1AB LLDP	•	•	•	•
ACL	L2~L4	L2~L4	L2~L4	L2~L4
HTTPS,SSH,Port/IP Se	curity, 802.1x •	•	•	•
Layer 3 IP Routing	•	•		
Layer 3 Unicast/Multica	st Routing •	•		
Regulatory Approval: C	E/FCC •	•	•	•
IEC 61850-3/NEMATS		Compliance	Compliance	
EN 50121-4 Railway EN		Compliance	Compliance	
· · · · · · · · · · · · · · · · ·	•	•	•	•

Korenix Product Selection Guide – Industrial Din Rail Managed Gigabit Ring Switch











JetNet 6059G

JetNet 5018G

JetNet 5012G

JetNet 5010G

JetCard 5010G-P

	Full Gigabit Managed Switch	1	Gigabit Managed Switch		Gigabit Managed Switch Board
Interface					
Number of Ports: 10/100TX	(16	8	7	8
Number of Ports: 10/100/1	000TX 4 + 5 (Combo)	2(Combo)	2 (Combo)	3 (Combo)	
Number of Ports: Fiber	5 (Gigabit&100FX SFP)	2(Gigabit SFP)	4 (Gigabit SFP)	3 (Gigabit&100FX SFP)	2 (Gigabit SFP)
(Multi Mode Fiber)	Multi-mode SFP	Multi-mode SFP	Multi-mode SFP	Multi-mode SFP	Multi-mode SFP
(Single Mode Fiber)	Single-mode SFP	Single-mode SFP	Single-mode SFP	Single-mode SFP	Single-mode SFP
Console	Isolated	•	•	•	•
Power Input	DC24*2(10.5~60V)	DC24*2(12-48V)	DC24*2(12-48V)	DC24*2(12-48V)	DC3.3V
Fault Relay Output	•	•	•	•	
HiPot	RJ-Case/RJ-RJ 1500VAC Power-Case 2200VDC	1500VAC	1500VAC	1200VAC	
Mechanical					
Aluminum Case	•	•	•	•	
Protection	IP31	IP31	IP31	IP31	
Dimension (Unit=mm)	160 (H) x 95 (W) x 136 (D)	137(H) x 96(W) x 129(D)	137(H) x 96(W) x 129(D)	137(H) x 96(W) x 119(D)	30 ↓ (H) x 127.4(W) x 122.5(D)
Operating Temperature	-25~70°C (JetNet 6059G) -40~75°C (JetNet 6059G-w)	-25~70°C (JetNet 5018G) -40~70°C (JetNet 5018G-w)	-25~70°C (JetNet 5012G) -40~70°C (JetNet 5012G-w)	-25~70°C (JetNet 5010G) -40~75°C (JetNet 5010G-w)	-25~70°C
Din Rail/Wall Mount	•	•	•	•	
Protocols					
JetView Pro NMS	•	•	•	•	•
JetView/CLI/Web Configur	ration •	•	•	•	•
Modbus TCP/IP	•	•	•	•	•
IPv6 Managed	•	•	•	•	•
Jumbo Frame		•	•		•
Port Trunking	•	•	•	•	•
Network Redundancy (MSR	, RSTP, MSTP)	•	•	•	•
Maximum Ring	4	9	6	5	5
IGMP Snooping & IGMP Q	uery	•	•	•	•
Tag-VLAN	•	•	•	•	•
Private VLAN, QinQ	•	•	•	•	•
Quality of Service	•	•	•	•	•
SNMP V1/V2c/V3	•	•	•	•	•
IEEE 802.1AB LLDP	•	•	•	•	•
Layer2+ ACL		•	•		
HTTPS,SSH,Port/IP Secur	ity, 802.1x	•	•	•	•
Certifications		1			
Regulatory Approval: CE/F	CC/UL CE/FCC	•	•	•	
RoHS/WEEE	•	•	•	•	•
NEMA-TS2	Compliance				



Korenix Product Selection Guide – Industrial Din Rail Managed Switch







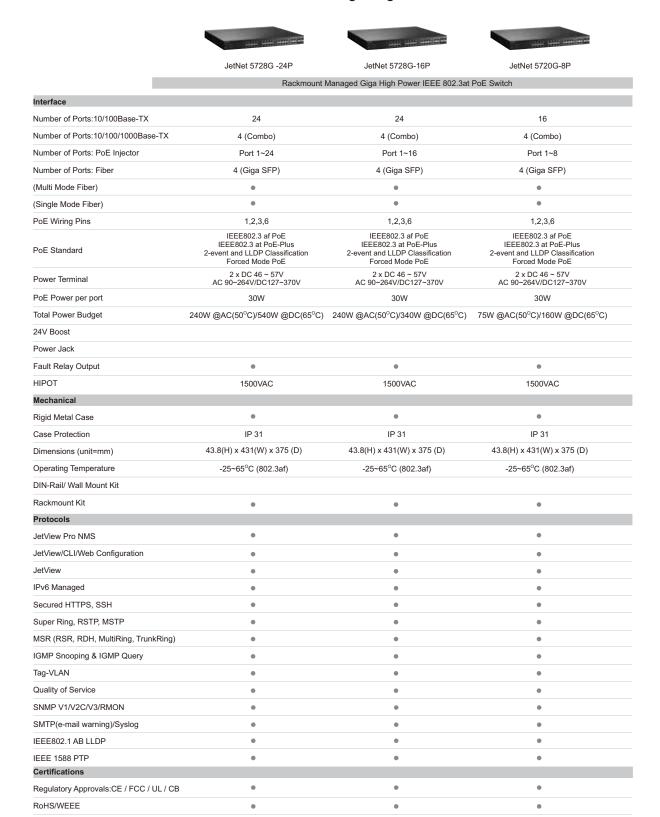
JetNet 4518-w

JetNet 4510

JetNet 4508/4508f

	Managed Ethernet Switch	Managed Ethernet Switch	Managed Ethernet Switch	
Interface				
Number of Ports: 10/100TX	16+2 Combo	7+3 Combo	8 (JetNet 4508) 6 (JetNet 4508f)	
Number of Ports: 10/100/1000TX				
Number of Ports: Fiber	2 (100FX SFP)	3 (100FX SFP)	2 (100FX) (JetNet 4508f)	
(Multi Mode Fiber)	Multi-mode SFP	Multi-mode SFP	2KM (JetNet 4508f-m)	
(Single Mode Fiber)	Single-mode SFP	Single-mode SFP	30KM (JetNet 4508f-s)	
Console	•	•	•	
Power Input	DC24*2(12-48V)	DC24*2(12-48V)	DC24*2(10-60V)	
Fault Relay Output	•	•	•	
HiPot	1500VAC	1200VAC	1500VAC	
Mechanical				
Aluminum Case	•	•	•	
Protection	IP31	IP31	IP31	
Dimension (Unit=mm)	137(H) x96(W) x 129(D)	137(H) x96(W) x 119(D)	149(H) x 55(W) x 131.2(D)	
Operating Temperature	-40~75°C	-25~70°C (JetNet 4510) -40~75°C (JetNet 4510-w)	-20-70°C (JetNet 4508) -10-70°C (JetNet 4508f) -40-75°C (JetNet 4508-w) -40-75°C (JetNet 4508f-w)	
Din Rail/Wall Mount	•	•	Din Rail	
Protocols				
JetView Pro	•	•	•	
JetView/CLI/Web Configuration	•	•	•	
Modbus TCP/IP	•	•	•	
IPv6 Managed	•	•	•	
Jumbo Frame	•			
Port Trunking	•	•	•	
Network Redundancy (MSR, RSTP, MSTP)	•	•	•	
Maximum Ring	9	5	4	
IGMP Snooping & IGMP Query	•	•	•	
Tag-VLAN	•	•	•	
Private VLAN, QinQ	•	•	•	
Quality of Service	•	•	•	
SNMP V1/V2c/V3	•	•	•	
IEEE 802.1AB LLDP	•	•	•	
Layer2+ ACL	•			
HTTPS,SSH,Port/IP Security, 802.1x	•	•	•	
Certifications				
Regulatory Approval: CE/FCC/UL	CE/FCC	•	CE/FCC	
RoHS/WEEE	•	•	•	

Korenix Product Selection Guide - Rackmount Managed High Power IEEE 802.3at PoE Switch





Korenix Product Selection Guide - Managed High Power (IEEE 802.3at) PoE Switch



JetNet 6710G-M12









40			
40			₹.

JetNet 6710G-RJ

JetNet 5710G

JetNet 5310G

JetNet 4706/4706f

		Managed Giga High Powe	er IEEE 802.3at PoE Switch	ch Man	aged High Power PoE Sw
Interface					
Number of Ports:10/100Base-TX	8 (M12)	8 (RJ45)	8	8	6(JetNet 4706) 4(JetNet 4706f)
Number of Ports:10/100/1000Base	e-TX 2	2	2	2	
Number of Ports: PoE Injector	Port 1~8	Port 1~8	Port 1~8	Port 1~8	Port 1~4
Number of Ports: Fiber					2
(Multi Mode Fiber)					2KM (JetNet 4706f-m)
(Single Mode Fiber)					30KM (JetNet 4706f-s)
PoE Wiring Pins	1,2,3,4	1,2,3,6	1,2,3,6	1,2,3,6	4,5,7,8
PoE Standard	IEEE802.3 af PoE IEEE802.3 at PoE-Plus LLDP Classification Forced Mode PoE	IEEE802.3 af PoE IEEE802.3 at PoE-Plus LLDP Classification Forced Mode PoE	IEEE802.3 af PoE IEEE802.3 at PoE-Plus LLDP Classification Forced Mode PoE	IEEE802.3 af PoE IEEE802.3 at PoE-Plus LLDP Classification Forced Mode PoE	IEEE802.3 af PoE Forced Mode PoE
Power Terminal	DC48~57V *2	DC48~57V *2	DC48~57V *2	DC48~57V *2	48V*2
PoE Power per port	30W	30W	30W	30W	25W
Total Power Budget	200W (60°C)	200W (60°C)	200W (60°C)	80W (60°C)	80W (60°C)
Fault Relay Output	•	•	•	•	•
HIPOT	1500VAC	1500VAC	1500VAC	1500VAC	1200VAC
Mechanical					
Rigid Metal Case	•	•	•	•	Aluminum
Case Protection	IP 30	IP 30	IP 30	IP 30	IP 31
Dimensions (unit=mm)	145.2 (H) x 2 x 75.7		145 (H) x 216.5 (W) x 65.3 (D)	160 (H) x 95 (W) x 127 (D)	46.5(H) x 185.3 (W) x 136 (D)
Operating Temperature	-40~60°C (802.3af)	-40~60°C (802.3af)	-40~70°C (802.3af)	-40~75°C (802.3af)	-40~60°C
DIN-Rail/ Wall Mount Kit	Wall Mount	Wall Mount	Wall Mount	Din-Rail	•
Protocols					
JetView Pro NMS	•	•	•	•	•
JetView/CLI/Web Configuration	•	•	•	•	•
JetView	•	•	•	•	•
Secured HTTPS,SSH	•	•	•	•	Super Ring, RSTP
Super Ring, RSTP, MSTP	•	•	•	•	•
MSR (RSR, RDH, MultiRing, Trunk	kRing)	•	•	•	•
IGMP Snooping & IGMP Query	•	•	•	•	Port-based VLAN
Tag-VLAN, Private VLAN, QinQ	•	•	•	•	•
Quality of Service	•	•	•	•	•
SNMP V1/V2C/V3/RMON	•	•	•	•	•
SMTP(e-mail warning)/Syslog	•	•	•	•	•
IEEE802.1 AB LLDP	•	•	•	•	
Certifications					
Regulatory Approvals:CE / FCC / I	UL CE/FCC	CE/FCC	CE/FCC	CE/FCC	•
RoHS/WEEE	•	•	•	•	•
EN 50121-4 Railway EMC	Compliance	Compliance	Compliance	Compliance	

Summary

With the rapid growth and technical advances of communication and networking technologies, administrators' task of managing networks becomes increasingly challenging.

By providing a highly intelligent and user-friendly network management protocol for industrial applications, Korenix JetView Pro NMS overcomes the challenges of network complexity and compatibility in large-scale industrial infrastructures by offering network operators unvarying service quality: maximum network visibility, efficient management, fast and real-time control and easier maintenance. In addition, with 3rd party conformance, it becomes a highly optimized tool for diagnosing and troubleshooting your flexible network.