

# Remote Suite of Products



The Remote suite of products includes monitoring and control devices that provide IP management to remote sites and equipment. Remote provides site alarm monitoring, protocol conversion, and equipment connectivity and acts as an intelligent extension of your Operations Support Systems (OSS). It is designed to enhance your network management strategy, reduce operational costs, and improve operational efficiency with reduced truck rolls.

The Remote suite features the Remote RMX-3200, a highly integrated site management system includes eight serial, eight Ethernet, and 80 I/O ports. It also includes modular WAN communication and expansion options, providing site management flexibility and growth. The Remote RMM-1400 is a cost-effective site management solution for small sites or locations where a limited number of systems require integration. It provides four serial and four Ethernet ports and supports the Remote RMB-1 to provide more than 80 I/O ports. Select Remote products can support up to four RME-1000 expansion shelves and 12 expansion modules, providing port capacity for any situation.

An integral part of the Site Management Solution from Kentrox, the Remote suite of products resides at your network's remote locations and connects to each element via a wide variety of interface options. Remote performs protocol mediation and interface conversion, collects alarms and monitoring data, and supports bi-directional management control with the Optima management portal via Ethernet, T1/E1, or wireless communication options. Together, Remote and Optima provide detailed monitoring, remote control, and management for virtually all remote site devices.



Remote RMX-3200



Remote RMM-1400



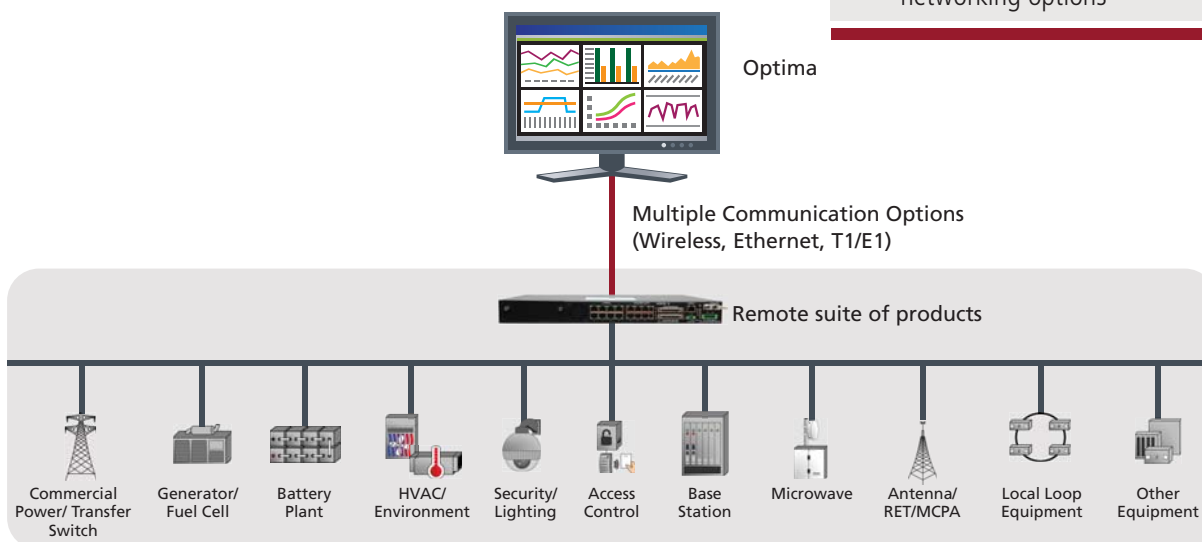
Remote RMB-1



Remote RMB-2

Remote suite of products provides IP network connectivity for remote site management and remote site alarm monitoring. The highlights include:

- Capacity flexibility and scalability for any size site
- Modular WAN and I/O expansion options
- PoE for site security applications (Remote RMX-3200 and RMM-1400)
- Easy-to-use GUI with Optima management portal
- Expanded equipment management and protocol conversion
- Custom application extension support
- Flexible IP network connectivity including wireless networking options



Proactively manage all critical remote site elements

# Remote Suite of Products

## Ordering information

Remote RMM-1400	Remote RMM-1400 system
Remote RMM-1421	RMM-1400 with EVDO wireless
Remote RMM-1431	RMM-1400 with HSPA wireless
Remote RMX-3200	Remote RMX-3200 system
Remote RMX-3210	RMX-3200 with dual T1 module
Remote RMX-3211	RMX-3200 with T1 DAC module
Remote RMX-3212	RMX-3200 with dual E1 module
Remote RMX-3213	RMX-3200 with E1 DAC module
Remote RMX-3221	RMX-3200 with EVDO module
Remote RMX-3231	RMX-3200 with HSPA module
Remote RMX-3240	RMX-3200 with GigE WAN module

## Expansion shelves and modules ordering information

Remote RMB-1	RMB-1 alarm collector
Remote RME-1000	3 slot expansion shelf
Remote RME-S8	8 serial async port module
Remote RME-B64	80 I/O port module (see table)
Remote RME-E8	8 Ethernet port module
Remote RMX-WGE-40	GigE WAN module
Remote RMX-WTE-10	Dual T1 module
Remote RMX-WTE-11	T1 DAC module
Remote RMX-WTE-12	Dual E1 module
Remote RMX-WTE-13	E1 DAC module
Remote RMX-WWAN-21	EVDO wireless WAN module
Remote RMX-WWAN-31	HSPA/GPRS wireless WAN module

## Remote supported protocols

PPP/BCP bridging (RFC-1638)  
 PPP/IPC static routing (RFC-1332)  
 HDLC static routing  
 Spanning Tree (IEEE 802.1d)  
 NTP client (RFC 1305)  
 TACACS+ AAA  
 Virtual LAN - IEEE 802.1q (Remote RMX-3200)  
 Serial protocols: RS232, RS422, RS485 (Remote RMX-3200 and Remote RMM-1400)

## Remote management and management access

Command Line Interface (CLI)  
 Console port local access on select Remote products  
 Wizard configuration support  
 Telnet / SSHv2 / FTP / SFTP  
 SNMP MIB  
 Optima management support

## Remote intelligent applications support

Optional Intelligent generator monitoring and battery management  
 Native TBOS support  
 TL1 or SNMP status reporting

## Remote RMX-3200 physical specifications

Depth: 12 in. (30.5 cm)  
 Height: 1.75 in. (4.45 cm)  
 Width: 16.86 in. (42.8 cm)  
 Weight: 8.5 lbs. (3.86 kg)  
 Rack mounting: 19 or 23 in. racks, (1-RU)  
 Power requirements: Dual input (A/B feed) +/- 20-60 VDC; 15W (typical), 50W (max)

Product	Async Ports	Console Ports	Ethernet Ports	Discrete Ports	Control Outputs	Analog Inputs	Voltage
Remote RMB-1*	--	--	1 ***	64	4	8	PoE Class 4
Remote RMB-2*	--	--	1 ***	64 ****	4	8	PoE Class 4
Remote RMX-3200	8	1	8 (2 PoE)	64	4	12	20-60 VDC
Remote RMM-1400	4	--	4 (2 PoE)	Remote RMB-1	Remote RMB-1	Remote RMB-1	20-60 VDC
Remote RME-B64 **	--	--	--	64	4	12	20-60 VDC
Remote RME-S8 **	8	--	--	--	--	--	20-60 VDC
Remote RME-E8 **	--	--	8	--	--	--	20-60 VDC

\* Requires a host Remote RMM-1400 or RMX-3200

\*\* Requires a host Remote RMX-3200 and RME-1000 chassis or an available RMX-3200 expansion slot

\*\*\* Connection to host Remote RMM-1400 or RMX-3200 only

\*\*\*\* Supports wet or dry contact inputs and input voltages of 4-72 VDC with positive or negative grounding

## Remote RMM-1400 physical specifications

Depth: 8.6 in. (21.8 cm)  
 Height: 1.6 in. (4.1 cm)  
 Width: 11.8 in. (30 cm)  
 Weight: 3.35 lbs. (1.5 kg)  
 Mounting: 19 or 23 inch racks (1RU) or wall mount  
 Power requirements: Dual input (A/B feed) +/- 20-60 VDC; 40W (max)  
 Note: the Remote RMM-1400 does not support expansion with Remote RME

## Remote RME-1000/Expand-D functional specifications

Up to four expansion systems are managed by a host Remote  
 Connection is via Ethernet (daisy-chained to additional units)  
 No additional IP addressing required

## Remote RME-1000 physical specifications

Depth: 12 in. (30.48 cm)  
 Height: 1.75 in. (4.45 cm)  
 Width: 16.86 in. (42.8 cm)  
 Weight: 10 lbs. (4.54 kg)  
 Mounting: 19 or 23-in. racks (1-RU)  
 Power requirements: Dual input (A/B feed) +/- 20-60 VDC

## Remote RMB-1 physical specifications

Depth: 1.25 in. (3.2 cm)  
 Height: 4.8 in. (12.2 cm)  
 Width: 11 in. (27.9 cm)  
 Weight: 1.85 lbs. (0.8 kg)  
 Mounting: Wall mount hardware included. Available in 19 or 23 inch rack mounting options  
 Power requirements: 802.3af Power over Ethernet (PoE) Class 4

## Remote RMB-2 physical specifications

Depth: 1.75 in. (4.45 cm)  
 Height: 3.5 in (8.89 cm)  
 Width: 17.5 in. (44.45 cm)  
 Weight: 4 lbs (1.8 kg)  
 Mounting: Rack mount hardware included. Supports 19, 21, or 23 inch EIA and ETSI racks  
 Power requirements: 802.3af Power over Ethernet (PoE) Class 4

## Reliability/maintenance

MTBF - 200,000 hours @ 25°C  
 MTTR - 30 minutes

## Environmental

Extended temperature range of -40°C to 65°C (-40°F to 149°F)  
 Humidity – 0%-95% (non-condensing)

## Certifications

FCC certified  
 EN 60950 Safety  
 CE Mark  
 NEBS compliant  
 Temperature hardened

## Additional applications supported

In addition to the functionality provided in the Optima Management System and Remote suite of products, modules are available for specific applications. These modules are pre-packaged and designed to support specific systems. The three modules currently available include:

- Tower management
- Power management
- Environmental management

Each packaged module supports several applications and includes the information, reports, measurements, network elements, alarms, and sensors/controllers that are needed for each application. The modules include a new Optima Live View showing the per site status overview of the specific application's alarms and key performance indicators (KPIs). It provides an auto-refresh and single click links to pre-defined reports, alarms, analysis, and controls. The standardized reports are context sensitive and provide a one click zoom to the selected alarms or KPIs to better understand site status.

## Tower Management module

Tower providers and their footprint are growing rapidly. As their footprint expands, understanding site conditions becomes more challenging. One of the most difficult requirements is monitoring tower assets (access, commercial power, tenant power, generators, batteries, tower lights, etc.) and more importantly, knowing how to accurately bill each tenant for energy consumption, including the varying cost of providing the power (commercial, fuel-based back-up sources, etc.).

Detailed site power and energy management is required, including the analysis and monitoring of three phase power at the tenant level. This allows the tower provider to support multiple tenants and to accurately bill and manage each individual tenant.



Optima Live View report for tower management module showing status of tower site

The Kentrox tower management module provides the applications needed to help tower providers meter, monitor, and manage multi-tenant sites. The applications use Optima and the Remote suite of products to monitor tower assets by providing the following:

- Environmental monitoring: monitors the indoor and outdoor temperature and humidity at the tower site and initiates alarms on conditions that are outside of a specified range. Monitors and reports on tower lights and alarms in any failure condition.
- Battery monitoring: monitors the voltage during float and discharge conditions and predicts the battery discharge time during outages.
- AC power monitoring: monitors power quality and energy usage including support for multi-tenant billing scenarios.
- Generator management and control: monitors the generator status, initiates alarms when potential issues arise, and starts/stops supported generator systems.
- Fuel monitoring and management: monitors fuel level and consumption, initiates alarms for potential theft, and helps to prioritize fuel delivery.
- Tenant energy metering: provides detail on site power and energy used for each tenant for accurate billing for commercial AC and generator power.

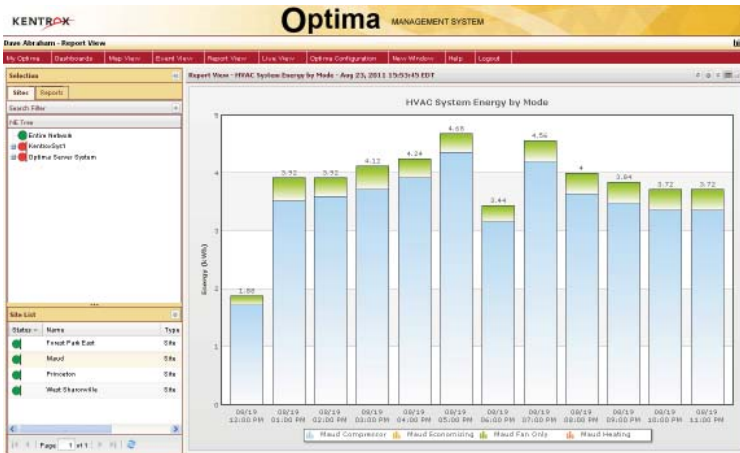
Optima provides complete visibility and control of network infrastructure sites, such as cell sites, substations, and remote communication huts and all its systems, such as power, environmental, security, and networking. Optima gives immediate operational cost reductions for organizations that need to access, monitor, and manage large numbers of sites. Optima delivers these benefits by providing remote monitoring, control, and automation over the maintenance and management of site infrastructure and physical elements.

Virtually any type of system can be integrated with Optima to provide detailed surveillance, remote control, and periodic maintenance automation. This visibility into the network allows users to work proactively to prevent problems. When outages do occur, Optima reduces the need for site visits while enabling the operations team to resolve most network problems in 50% less time.

## Power Management module

Power - all networks require it. Whether it is a cell site, roadside cabinet, hut, vault, utility facility, or any other type of site, power is a necessity for the equipment. It can come from commercial service, solar panels, generators (diesel or propane), batteries, wind turbines, or hydrogen fuel cells, and it must be provided 24 hours per day, 7 days a week, to ensure the network availability that customers expect.

# Remote Suite of Products



Environmental management module report displaying HVAC energy consumed by type of equipment

Power failures for service providers, whether it's from infrastructure issues, malicious intent, contractor error, or adverse weather conditions, usually cause network downtime, lost revenue, safety issues, and potentially customer turnover. Reliable back-up power is critical, and preventative maintenance is ideal. A comprehensive power management solution reduces the need for physical site visits and enables structured and routine preventative maintenance. Service providers can monitor primary and backup power sources and their energy consumption from anywhere at any time.

The Kentrox power management module provides the applications needed to help service providers monitor and control multiple power sources at remote sites. The applications use Optima and the Remote suite of products to monitor site power and provide the following:

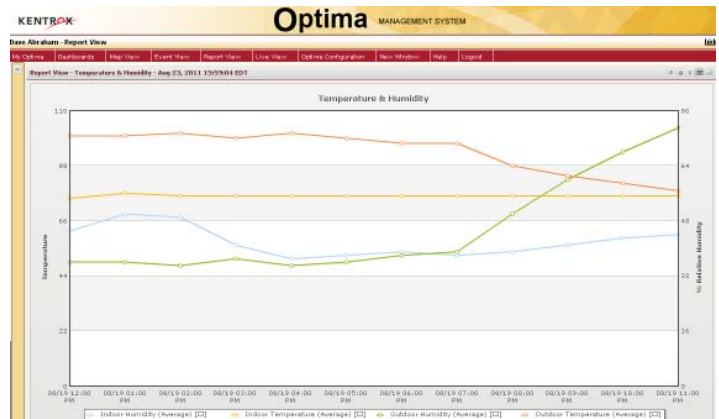
- Battery monitoring: monitors the voltage during float and discharge conditions and predicts the battery discharge time during outages.
- Rectifier monitoring: monitors detailed rectifier conditions (voltage, current, temperature, etc.) for supported rectifier systems.
- Generator management: monitors the generator status, initiates alarms when potential issues arise, and starts/stops supported generator systems.
- AC power monitoring: monitors power quality and energy usage including support for multi-tenant billing scenarios.
- Hybrid power management: monitors, manages, and controls power from multiple sources (commercial power, generators, batteries, wind turbines, solar panels, bio-fuel, hydrogen fuel cells, etc.).
- Fuel monitoring: monitors fuel consumption, initiates alarms for potential theft, and helps providers to prioritize fuel delivery based on information provided.

## Environmental Management module

Maintaining critical infrastructure at remote sites requires strict control over environmental site conditions. A failed Heating, Ventilating, and Air Conditioning (HVAC) system can be devastating for a remote site enduring harsh weather conditions. Water exposure can destroy huge equipment investments. Technicians must be notified quickly of pending damage or equipment failures to initiate proactive maintenance and minimize or prevent damage to systems and site availability.

The Kentrox environmental management module provides the applications required to help service providers monitor and control remote site conditions to ensure normal operation, provide notification of poor conditions, and enable remote management to reduce costly site visits. Required repairs or adjustments can be accomplished before service is affected. The applications use Optima and the Remote suite of products to provide the following:

- Environmental monitoring: monitors the indoor and outdoor temperature and humidity at the tower site and initiates alarms on conditions that are outside of a specified range. Monitors and reports on tower lights and alarms in any failure condition.
- HVAC management: centralizes control of HVAC conditions and initiates alarms on conditions outside of a specified range. Identifies sites where HVACs are underperforming or where systems can be replaced for better efficiency.
- HVAC energy monitoring: monitors real-time energy consumption of HVAC systems to verify efficiency of cooling systems. Provides valuable data for decision making of HVAC setpoints and future equipment purchases to obtain maximum efficiency.
- Hazardous gas monitoring: identifies presence of hazardous gases such as hydrogen, fuel vapor, or carbon monoxide and helps indicate where preventative maintenance may be required.



Tower and environmental module report indicating indoor/outdoor temperature and humidity

For more information, visit [www.kentrox.com](http://www.kentrox.com), email [info@kentrox.com](mailto:info@kentrox.com), or call 800-733-5511 (US), +1 614-798-2000 (outside US).