

# Cisco ROSA EM Element Management System



The Cisco® ROSA® Element Manager (EM) is specifically designed to cost effectively monitor and control the transmission network of headends, hub sites, HFC outside plants, and transmitter sites. This unit manages the equipment that is co-located at the site where the ROSA EM resides, whether this equipment has an SNMP, serial (RS-232/422/485), or contact closure interface.

**Figure 1.** ROSA EM – Element Management System



The ROSA EM is a polling engine that actively polls all of the devices that it manages looking for problems. In the event a problem is detected, ROSA EM will send alarm notifications to the appropriate personnel via SNMP trap, Email, Pager, or SMS. ROSA EM communicates with the managed devices via proprietary protocols or contact closures, then translates this information to SNMP, which can be passed to a higher level network management system. When ROSA EM is configured to perform backup protection, it will automatically initiate pre-defined backup schemes that reroutes signals, activates, and configures standby devices, all within seconds of a device failure. ROSA EM is fully integrated on the ROSA Network Management (NMS) and ROSA Video Service Management (VSM) systems.

The main functions of the ROSA EM are to:

- Automatically backup failed devices
- Monitor the health of the transmission network
- Act as an SNMP proxy
- Send alarm notifications when a problem occurs
- Perform local automation tasks

The ROSA EM is a 2 RU high, 19-inch rack-mount embedded platform that operates without a monitor or keyboard. The operator uses a standard web interface with the ROSA EM via a simple easy-to-use GUI. Communication to the ROSA EM can be established over any LAN/WAN network that supports Ethernet. In addition, dial-in and dial-out (e.g., ISDN) is supported for cases where only a switched connection is available.

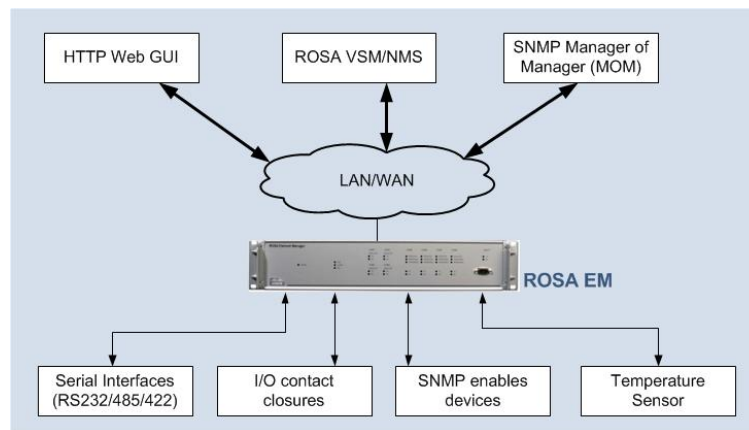
## Features

- Cost-effective solution for management of devices in all locations (large headend to small hubs/OTN)
- Manages Cisco IPVS Video Processing Devices and optional third-party equipment via proprietary protocol, SNMP, or contact closures
- Translates proprietary protocols to SNMP and passes configuration/alarm information to upper level network managers
- Highly reliable hardware and software solution (no fans or hard drive)
- Easy to use and intuitive Web browser interface
- Provides easy integration with multiple client options – Web browser, TNCS, ROSA NMS, Third-party NMS
- Open standards based interfaces (SNMP, HTTP, FTP, HMS, DateTime, etc.)
- Automatic remote backup and restore to save the entire configuration of the ROSA EM
- Seamless integration into currently installed ROSA NMS en VSM systems
- Dual temperature probes available as an option
- 2 RU, 19-inch rack-mount chassis

## System Description

ROSA EM supports open standards interfaces, which enable cost-effective integration of equipment into the ROSA EM, as well as cost-effective integration of the ROSA EM into upper-level network managers.

**Figure 2.** ROSA EM – Northbound and Southbound Management Interfaces



The northbound management interfaces are composed of:

- Web browser client interface on the ROSA EM that allows management of network devices as well as viewing real-time status and alarms.
- The SNMP agent in ROSA EM provides a northbound SNMP interface to higher level Network Management Systems (supports TRAPS, GETS and SETS).
- Utilizes FTP to remotely upgrade ROSA EM software as well as the backup and restoration of ROSA EM configuration data.

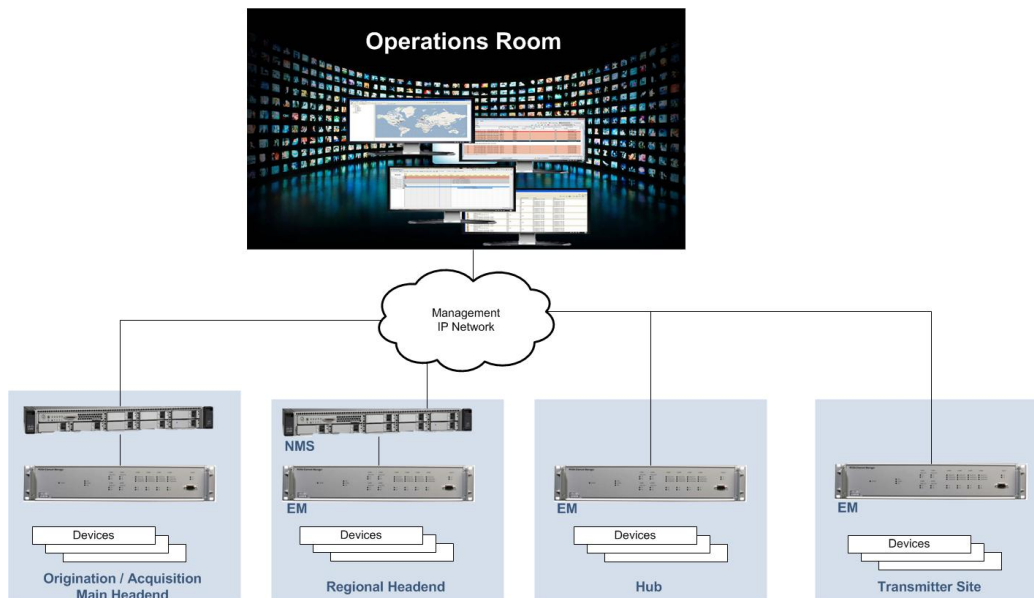
The southbound management interfaces are designed to communicate with the managed devices and consist of:

- Multiple serial ports (RS-232, RS-485, RS-422)
- Digital and analog I/O contact closures interface
- SNMP Manager
- Temperature probes
- Network interface card

There are four fundamental client options available for the ROSA EM; a Web browser, ROSA VSM client , ROSA NMS client and third party Network Management Systems each designed to meet specific needs of the user. ROSA EM can be configured to do as much or as little as required to meet the needs of the technicians and engineers charged with managing the broadband network.

## Deployment

**Figure 3.** ROSA EM Deployment



ROSA EM can be deployed in different applications throughout a Video Delivery network:

- Origination / Acquisition Main Headend and Regional Headend
  - Video Processing Device redundancy architecture for Encoders, IRDs, and DCMs.
  - Audio/Video Router (SDI) controller.
  - Protol Gateway for different types of Video Processing gears, such as IF Redundancy Switches and Legacy interfaces.
- Hub and Transmitter Sites:
  - Protection of Cisco eQAM devices
  - Monitoring of Electrical / Optical transport gear
  - Environmental monitoring over Temperature Sensor and GPIO interfaces

## Redundancy Controller for Cisco IPVS Video Processing Devices

ROSA EM is a key element in the redundancy architecture of Cisco's video processing gear in the Acquisition and Origination Suite.

The combination of the Cisco Digital Content Manager (video processor) and the Cisco ROSA control system, provides device level redundancy for many applications at content acquisition (for example, IRD redundancy) and processing (for example, Encoder redundancy). In certain applications, such as the Cisco Reference Architecture of the D9036 - DCM - Statmux System, ROSA EM guarantees up to channel redundancy.

## Integrated with the ROSA VSM System and ROSA NMS System

ROSA EM integrates where device redundancy is required in the Acquisition and Origination type video processing platform, such as in the Cisco Reference Architecture of the D9036 - DCM - Statmux System.

It serves as the Device Redundancy Controller, it guarantees service uptime, and it is a key element in the Control and Management (M&C) tasks. It operates and manages daily activities in linear video channel processing environments, known as Cisco's Acquisition and Origination Suite.

## Product Specifications

**Table 1.** Product Specifications

Specification	Value
<b>Remote Control and Configuration Ports (*)</b>	
Ethernet Management Port (Note 1)	
Number of Ports	2
Connector Type	RJ-45
Physical layer	10/100BaseT
LED indication	LINE and ACT
Dielectric isolation	1.5 kV AC
<b>RS-232 Serial Ports</b>	
Number of Ports	4
Connector type	Male, 9-pin Sub-D
Pin Layout	Standard DTE
Physical Layer	RS-232
Baud Rate	Up to 38.4 kbaud
Protocol	RCDS, SMC or other
ESD	Max. 15 kV Performance Criterion B
<b>RS-232 / RS-485 / RS-422 Serial Ports (Configurable)</b>	
Number of Ports	4
Connector type	Male, 9 pin Sub-D
Pin Layout	Configurable (for RCDS or SMC pin layout refer to user guide)
Physical Layer	RS-232, RS-422, RS-485
Baud Rate	Up to 38.4 kbaud
Protocol	RCDS, SMC or other
ESD	Max. 15 kV Performance Criterion B
<b>Digital Input Ports</b>	

Number of Ports	108
Connector type	Female, 25 pin Sub-D
Contacts per port	2
Decision threshold	TTL / CMOS
Input Voltage Range	Max. $\pm$ 15V
ESD	Max. 15 kV Performance Criterion B
<b>Galvanic Isolated Digital Input Ports</b>	
Number of Ports	12
Connector type	Female, 25-pin Sub-D
Contacts per port	2
Decision threshold	Low: < 0.8V, High: > 2V
Differential overvoltage protection	Max. $\pm$ 15V
Common mode input voltage	Max. 60 V DC or 42 V AC
ESD	Max. 15 kV Performance Criterion B
Dielectric isolation	500 V port to port
<b>Relay Outputs</b>	
Number of Ports	24
Connector type	Female, 25-pin Sub-D
Contacts per port	3 (common, normally open, normally closed)
Maximum voltage	42 VAC / 60 VDC
Maximum load current	1A @ 30 VDC
Dielectric isolation	500 V
Load	Resistive load
<b>External Temperature Sensor (Note 2)</b>	
Number of Ports	2
<b>Analog Inputs</b>	
Number of Ports	8
Connector type	Female, 25-pin Sub-D
Contacts per port	2
Input range	0 to +15 V by default, configurable to 0 to +60 V
Type	Differential input
Resolution	8-bit (55 mV step with 15 V input range, 250 mV step with 60 V input range)
Input impedance	> 100 k $\Omega$
<b>Analog Outputs</b>	
Number of Ports	2
Connector type	Female, 25-pin Sub-D
Contacts per port	2
Output voltage range	0 to +10V
Resolution	8-bit (40 mV step)
Output impedance	1 k $\Omega$
<b>Craft Interface</b>	
Number of Ports	1
Connector type	Male, 9-pin Sub-D
Pin Layout	Standard DTE

Physical Layer	RS-232
Baud Rate	Up to 38.4 kbaud (default 19.2 kbaud)
ESD	
<b>Keyboard and Mouse</b>	
Number of Ports	2
Connector type	PS/2
Pin Layout	Standard PS/2
Physical Layer	RS-232
ESD	Max. 15 kV
<b>Monitor</b>	
Number of Ports	1
Connector type	DB15H
Pin layout	VGA
Resolution	Up to 1024 x 768 (SVGA)

(\*) Note concerning Safety Extra-Low Voltage (SELV) Circuit Warning

**Notes:**

- To avoid electric shock and in order to comply with the product's regulatory safety compliance certifications:
- Do not connect any I/O, signal or communication port to circuits falling beyond the requirements for SELV circuits
- Always verify voltage, current and energy levels of connected circuits against SELV requirements (for a full definition of SELV requirements, refer to UL, EN or IEC 60950 standards for limit values).
- Ensure that only 'Digital Input Ports', Galvanic Isolated Digital Input Ports' or 'Relay Outputs' are connected to outdoor circuits.

**Important:**

- SELV voltage limits for indoor connections are < 60 VDC (or peak) or < 42.4 VAC RMS.
- SELV voltage limits for outdoor connections are lower than those for indoor connections.
- Outdoor voltages should be no greater than 15 Vrms, 21.2 Vpk, and 30 VDC under normal operating conditions.
- Cabling of outdoor circuits must be shorter than 140 feet or 42 meters.
- In all cases it is needed to protect outdoor cabling by means of a Primary Surge Protector at the position where the wiring enters the building.
- Outdoor cabling should be routed away and spaced with adequate clearances from power and lighting conductors.
- For installations in the United States, refer to the appropriate sections in the National Electrical Code (NEC).
- For installations in other countries, ensure that the installation complies with the National requirements taking in account the above-mentioned recommendations.
- In case a client (simple Web browser, TNCS client, ROSA NMS client or third-party NMS) is used in combination with ROSA EM, it must be possible to perform a successful ping command between ROSA EM and the client in both directions.
- Temperature sensors are available as an option.

**Table 2.** Management Interfaces

Management Interfaces
<b>Number of managed devices depends on license with an absolute maximum of 1000 devices</b>
Maximum number of simultaneously connected web browser sessions is 12

**Table 3.** Environmental Specifications

Environmental Specification	Value
Within specifications	+10°C to +45°C / +50°F to +113°F
Operating temperature	0°C to + 50°C / +32°F to +122°F
Storage temperature	- 20°C to + 70°C / -4°F to +158°F
Power Supply AC (Dual Power Supply)	
Nominal voltage range	2 x 100 – 240 VAC
Full voltage range	90 – 264 VAC, 47 – 63 Hz
Ripple & Noise	Compliant with ETSI ETS 300-132-1
Maximum power consumption	25 W
Power Supply	DC
Nominal voltage	-48 VDC
Ripple & Noise	Compliant with ETSI ETS 300-132-2
Maximum power consumption	25 W

**Table 4.** Mechanical Specifications

Mechanical Specifications	Value
Height	88 mm / 3.5 in. (2 RU)
Width	482 mm / 19 in.
Depth	470 mm / 18.5 in.
Weight	Approx. 5 kg / 11.02 lbs.

## Ordering Information

Cisco ROSA EM is available for purchase through regular Cisco sales and distribution channels worldwide. To place an order, visit the Cisco Commerce Workspace.

**Table 5.** Ordering Information – Cisco ROSA EM -- Hardware

Description	Part Number
ROSA Element Manager (EM), 2RU Chassis	ROSA-EM
<b>ROSA EM Chassis Option</b>	
• ROSA EM: Chassis - Dual AC Version	ROSA-EM-BASE-AC
• ROSA EM: Chassis - Single DC Version	ROSA-EM-BASE-DC
<b>Power Cord Pack</b>	
• AC PWR CABLE, ARGENTINA, IEC, 10AMP, 2.5m	CAB-PWR-DMN-ARG
• AC PWR CABLE, AUSTRALIA, IEC, 10AMP, 2.5m	CAB-PWR-DMN-AUS
• AC PWR CABLE, BRAZIL, 10AMP, 2.5m	CAB-PWR-DMN-BRA
• AC PWR CABLE, CHINA, IEC, 10AMP, 1.83m	CAB-PWR-DMN-CHN

• AC PWR CABLE, EUROPE, IEC, 10AMP, 2.5m	CAB-PWR-DMN-EU
• AC PWR CABLE, ITALY, IEC, 10AMP, 2.5m	CAB-PWR-DMN-IT
• AC PWR CABLE, JAPAN, IEC, 7AMP, 2.3m	CAB-PWR-DMN-JPN
• AC PWR CABLE, UK, IEC, 10AMP, 2.5m	CAB-PWR-DMN-UK
• AC PWR CABLE, US, IEC, 10AMP, 1.83m	CAB-PWR-DMN-US

**Table 6.** Ordering Information – ROSA EM – Licenses

Description	Part Number
ROSA EM Software Suite, Licenses and Upgrades	ROSA-LIC-EM-UPG
<b>EM Feature Pack Licenses</b>	
• ROSA EM License: Standard Functionality (no Backup support)	LROSA-E-STD
• ROSA EM License Upgrade: Support of Redundancy Control	LROSA-E-STD2RED
<b>EM Device Class Count Upgrades</b>	
• ROSA EM License: Device Class Support - Single Count	LROSA-E-DCL-CT
• ROSA EM License: Device Class Support - 50 Count Block	LROSA-E-DCL-CT50
• ROSA EM License: Device Class Support - 250 Count Block	LROSA-E-DCL-CT250
• ROSA EM License: Device Class Support - 500 Count Block	LROSA-E-DCL-CT500
• ROSA EM License: Device Class Support - 1K Count Block	LROSA-E-DCL-CT1K
<b>EM Redundancy Group Device Counts</b>	
• ROSA EM License: Redundancy Group Dev Count - Single Count	LROSA-E-RED-CT
• ROSA EM License: Redundancy Group Dev Count - 50 Count Block	LROSA-E-RED-CT50
• ROSA EM License: Redundancy Group Dev Count - 250 Cnt Block	LROSA-E-RED-CT250
• ROSA EM License: Redundancy Group Dev Count - 500 Cnt Block	LROSA-E-RED-CT500
• ROSA EM License: Redundancy Group Dev Count - 1K Cnt Block	LROSA-E-RED-CT1K
<b>EM Software Upgrade License</b>	
• ROSA EM: SW Upgrade to 4X	LROSA-E-UP-V4X-K9



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## Service and Support

Using the Cisco Lifecycle Services approach, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed, by technology and by network complexity, to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

## For More Information

For more information about Cisco ROSA Management and Control Solutions, visit <http://www.cisco.com/go/rosa> or contact your local Cisco account representative.



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