

# Use Network Fault Management to Help Detect a Problem Before it Becomes a PROBLEM

The MOSCAD™ Network Fault Management solution permits a Network Management Center, using standard SNMP or similar protocols, to monitor and control many non-SNMP devices located at distant sites. The RTUs that serve as remote device managers communicate through a MOSCAD Wide Area Network and use the IP Gateway as a mediation device to the Network Management Center.

## Network Management Support

The Network Fault Management system provides the Network Management Control center with access to communication and environmental devices at remote sites. This provides the operator and system manager with some of the tools needed to identify and possibly correct faults within the communication system. The IP Gateway offers a standard interface to a wide range of Network Management Center platforms, including HP/OpenView, SUN/Solstice, IBM/NetView, and more.

► One operator may monitor and control both the wireless and telecommunication network infrastructures. The operator is provided with an easy, cost-effective, and realtime method for the early detection and reaction to communication system problems.

## SNMP and CMIP Connectivity

The Network Management Center uses the SNMP protocol and a generic MIB (Management Information dataBase) to auto-discover the IP Gateway, the communication sites, and the devices. The Network Management Center may poll the network elements and any connected devices to refresh its database plus display unsolicited events. When CMIP is required in a Telecommunication Management Network system, an SNMP-to-CMIP adaptor may be added to make the needed conversion.

► Interconnectivity among the TCP/IP, SNMP, and CMIP protocols commonly used in computer LANs and in Network Management is easily obtained.

## NFM RTU and IP Gateway

The Network Fault Management RTU is responsible for monitoring and controlling in-field devices and equipment, such as microwave radios, base stations and comparators, plus items of site environmental equipment such as the AC mains circuit breakers, the backup power generator, the battery charger, air conditioning, and more. This RTU uses the MDLC protocol to exchange messages, via contention, polling, and command, with the IP Gateway. The IP Gateway serves as an SNMP proxy agent so that an SNMP-aware Network Management Center may monitor and control network elements that are not SNMP-aware.

► The NFM RTU has advanced input/output handling capabilities, including the ability to communicate via multiple protocols to many different network elements. It enables field devices that are not inherently capable to communicate within an SNMP-based fault management system.

### **MDLC Protocol**

MDLC is the seven layer protocol that conforms to the ISO recommendation for Open System Interconnection and is used by MOSCAD. It is designed to support communication over various communication links and makes possible simultaneous RTU-to-Gateway data sessions.

▶ A designed-for-WAN protocol optimizes the data transfer between field RTUs and the IP Gateway.

### **Telnet Application**

The IP Gateway includes a standard Telnet server application in addition to the SNMP protocol agent.

▶ Multiple users throughout the LAN can use Telnet, through the standard Telnet server application in the IP Gateway, to monitor and revise the parameters of end use ASCII devices.

▶ The remote use of Radio Service Software (RSS) on QUANTAR™ base stations or similar equipment is a common use of Telnet.

### **Configuring the System**

The Network Fault Management solution includes a Windows-based configuration tool that allows the system engineer to build the MOSCAD NFM sites plus set the TCP/IP, SNMP, and MDLC communication parameters. The engineer may use this tool to define the objects and attributes of each device at the remote sites. It includes a library of ready-to-run drivers for common communication devices, including TADIRAN radios; Premysis TeNSr; Motorola DIU, QUANTAR, ASTRO™TAC, and Site Sentry; Telnet for remote RSS; and general input/output for on-site environmental devices.

▶ The functionality and connectivity capabilities of the Network Fault Management configuration tool eases the definition and diagnostics of all the elements within a system.

### **Terminal Server Support**

One or two ports on the IP Gateway may be used for communication with RTUs via different physical media. Additional communication ports may be obtained by adding Terminal Server hardware to the LAN and Terminal Server software to the IP Gateway.

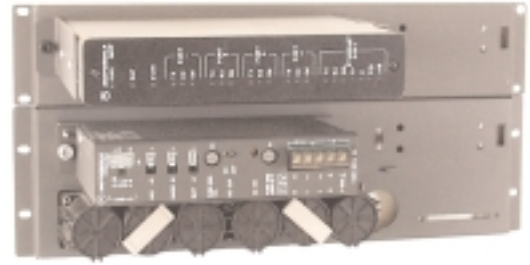
▶ Connectivity is maximized through flexible Terminal Server support.

▶ Terminal Server hardware may be located at the IP Gateway site or distributed through the LAN.

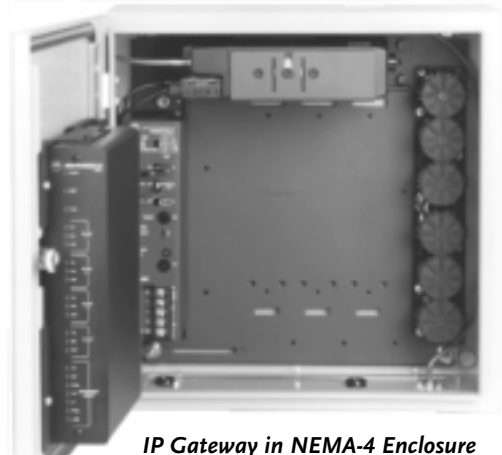
### **Agent Simulator**

A development tool is available to simulate the SNMP MIB and the communications between the Network Management Center, the IP Gateway, and the field equipment.

▶ The Agent Simulator permits the Network Management Center and IP Gateway to be defined and tested independent of the field RTUs and devices.



*IP Gateway Rackmount*



*IP Gateway in NEMA-4 Enclosure*



*MOSCAD Rackmount RTU used as NFM RTU*

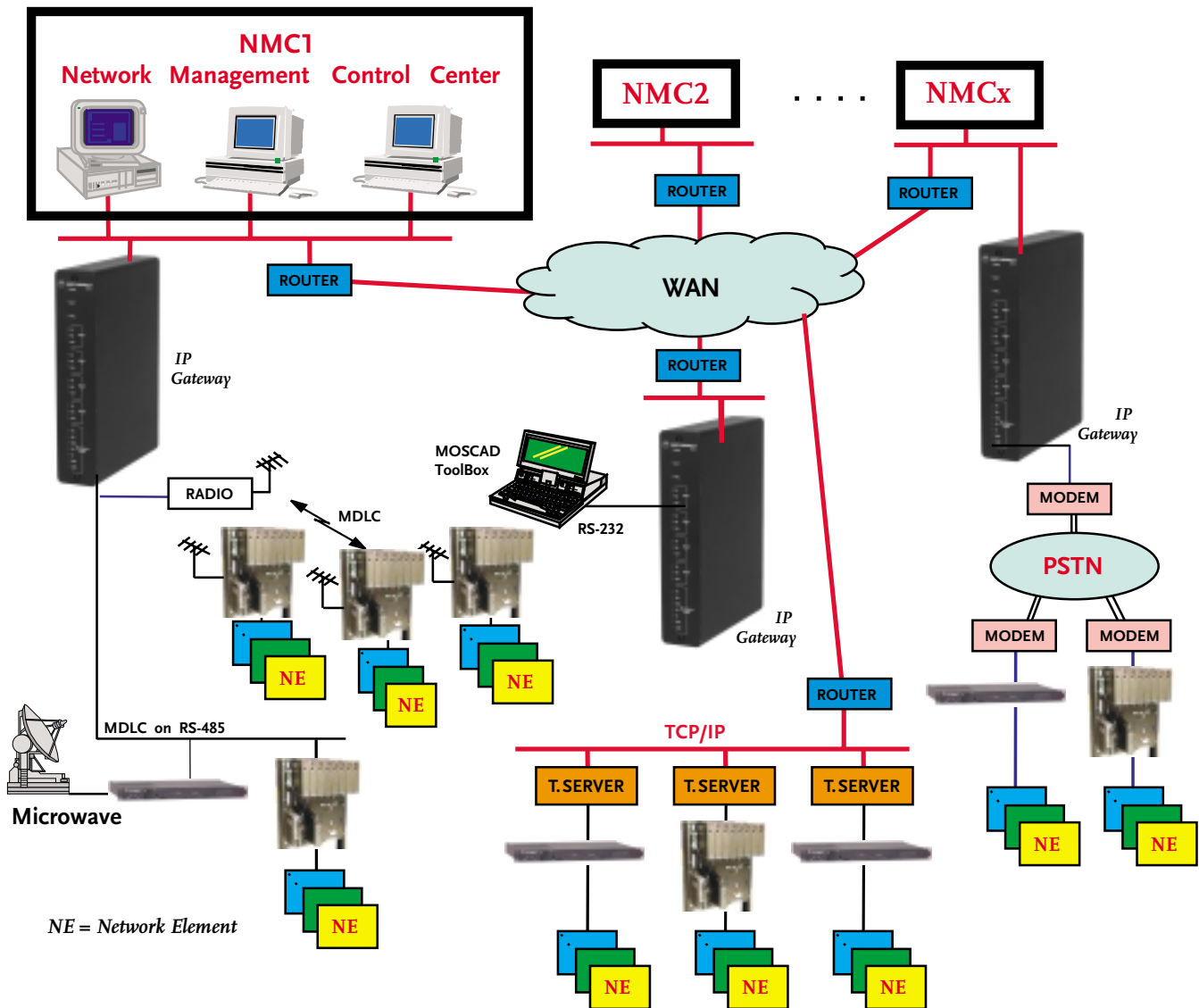


*Overview of 48DI NFM-RTU*



*Front Panel View of Multiport NFM-RTU*

## System Description



1. The Network Management Center may consist of one or more computers, all interconnected by TCP/IP and all using either SNMP or Telnet. A CMIP-to-SNMP protocol converter may be added whenever a CMIP-aware computer is connected.
2. The IP Gateway may be connected directly, via TCP/IP, to the Network Management Center. Communications to the Network Fault Management RTUs may occur via two-way radio, or by RS232 or RS485 – directly or over a digital microwave link.
3. Additional IP Gateways may be connected through an existing Wide Area Network (WAN) via router hardware.
4. Terminal Server hardware may be used to connect non-MOSCAD RTUs to the network via TCP/IP. Terminal Server support software is included with the IP Gateways so that the required conversion to/from SNMP may occur.
5. The scope of the fault management service may be extended via wireline modems that are directly connected or operate through the dial-up telephone network.
6. The MOSCAD Programming ToolBox may be connected to any MOSCAD device or directly to the WAN. The ToolBox may then be used to program or diagnose any MOSCAD device anywhere in the network – MDLC provides the protocol, and the interconnected IP Gateways, router hardware, and WANs provide the connectivity.

# Network Fault Management

## Network Fault Management RTU Specifications

### Order

48DI NFM RTU:	F45x0 [See catalog sheet R3-11-1043.]
MultiPort NFM RTU:	F45x5 [See catalog sheet R3-11-1043.]
MOSCAD as NFM RTU:	F69xx-family (xx denotes radio frequency and power level) with V051 Rackmount option. [ See catalog sheet R3-11-078.] Add I/O modules plus Series 400 CPU modules according to site requirements.
Software:	F4516 RTU Site Builder and Drivers plus one V375 Type A license per connected device.

## IP GatewaySpecs

### Order

NEMA-4 Enclosure:	F43xx-family (xx denotes radio frequency and power level) [See catalog sheet R3-11-095.]
Rackmount:	F43xx + V051 Rackmount option
Accessories:	F4510 SNMP Gateway Simulator

### Terminal Server Support

Ports:	Up to 32; may be distributed among 1-32 Terminal Server hardware (hardware not included).
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Printed in U.S.A. (0103) VPS-C

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