GE
Digital Energy

Lentronics NMX Unit

Advanced Network Management and Alarm Storage for T1MX Nodes

GE's Lentronics™ NMX Unit enhances the Network Management and alarm storage capabilities of remote T1MX Multiplexers. Existing T1MX sites that previously employed serial NMS communications can be upgraded with an NMX Unit to securely manage groups of T1MX nodes via Ethernet. Multiple NMX Units can be cost effectively installed at strategic sites within a network domain for improved NMS redundancy.

The Lentronics NMX Unit acts as a NMS gateway between the Lentronics NMS engine, VistaNET™ and the T1MX Compact Digital Access X-connect Unit (CDAX). A robust, reliable and secure protocol detects T1MX nodes and their associated inventory (down to the individual 64kb/s DS-0 card level) for traditional Operations, Administration and Maintenance (OAM), commonly found only in NMS solutions servicing higher-order Multiplexers.

Alarm monitoring and on-board alarm recording ensure events are locally captured while standard SNTP support ensures accurate time stamping. Historic events are automatically retrieved via VistaNET.

Management Applications

Management Engines
- VistaNET Network Interface with or without NMS server
- SNMP manager e.g. GE's MDS PulseNET™

Remote Management Features
- Inventory and logical circuit management
- Circuit provisioning
- Circuit testing and troubleshooting
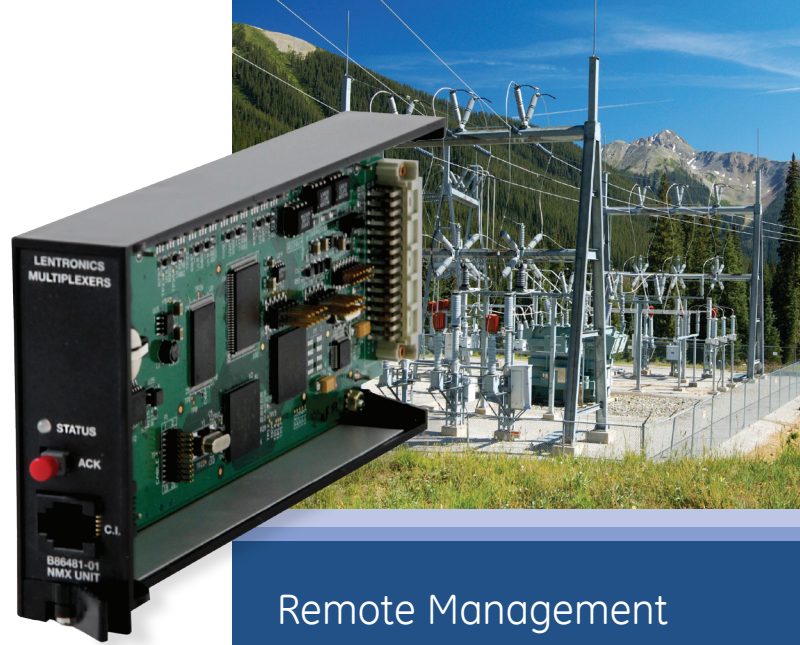- Status and alarm monitoring

Alarm & Event Storage
- Stores unit alarms from T1MX members
- Stores local and external (via I/O) events
- Alarm retrieval and integration via VistaNET

Precision Event Recording
- Simple Network Timing Protocol (SNTP) support for sub-second event accuracy

Remote Management
- Optional NMX Unit offers Ethernet gateway for remote NMS connectivity
- Event driven alarm storage with SNTP time stamping for sub-second accuracy
- Real time remote management expedites repairs and reduces field management costs

Integrated NMS Solution
- Fully compatible with VistaNET NMS software to merge JungleMUX™ SONET and T1 NMS domains
- No VistaNET NMS licenses required
- Minimal training of existing SONET users

Reliable & Scalable
- Common NMS across the SONET/T1 network
- Optionally redundant hardware placed at any T1MX Multiplexer node within T1 NMS domain
- Capacity for managing for up to 50 T1MX Multiplexer nodes per NMX Unit
- Storage for up to 2500 events

Secure
- Password protected access and lockdown

Utility Hardened
- Operation in extreme temperatures from -20°C to 60°C
- IEEE 1613 compliant
- Earthquake Risk Zone 4 tolerant

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T1MX Group Management

The VistaNET network management software provides T1 element management through a serial connection directly to the T1MX node (via the CDAX), or now through an Ethernet connection (via the NMX Unit). The element manager within VistaNET supports both JungleMUX SONET T1 spurs and standalone T1MX network topologies. Groups of T1MXs form standalone T1 networks, while SONET and T1 networks often converge to form a single NMS domain.

The Lentronics NMX Unit can act as the primary or redundant NMS gateway. In Figure 1 below, NMX Unit #1 provides a direct Ethernet connection, however the T1MX spur is also serviced through the NMS connection made to the JungleMUX SONET ring. NMX Units #2 and #3 provide redundant connections to the standalone T1MX network. Deploying NMX Units at sites in addition to NMS redundancy provides precision for locally generated alarms and events.
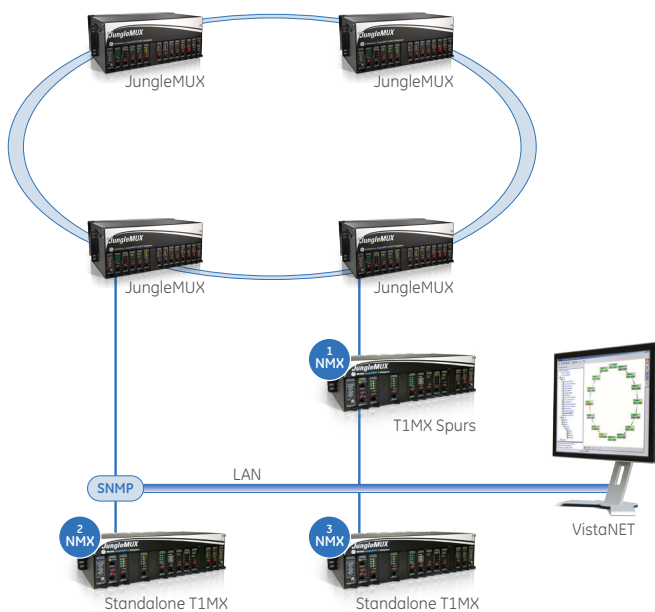

Fig. 1: NMX Units equipped in T1MX nodes merge T1 group into NMS domain

Fig. 2: Standalone T1MX networks can store alarms and events for later retrieval

NMX Units can also deliver SNMP traps to a 3rd party SNMP manager via VistaNET VSNMP.

Simple Installation and Low Operational Expenditure

NMX Units are can be installed into existing T1MX shelves without affecting live traffic. Additionally, the units are hot swappable and offer simple shelf and LAN interconnects without the need for complex unit provisioning. VistaNET will detect the new gateway and manage the connection and associated NMS cluster for operational simplicity.

Security

Privacy and access control provide essential security. The NMX Unit is equipped with two access points, one is a craft port (RS232) that allows local unit configuring, the other is an Ethernet port for TCP/UDP IP network connections. Craft port access is controlled by VistaNET (ensuring users are first authorized before restricted read/write privileges are granted). Password lockout can be optionally enabled. Additionally, the NMX Unit logs intrusion attempts.

Timing

SNTP (Simple Network Timing Protocol) is employed within the NMX Unit for accurate time-of-day event stamping. When a Network Time Protocol (NTP) server is deployed, the NMX Unit will lock to the NTP and maintain sub-second accuracy. At sites without a network connection or if the NTP server is lost, the NMX reverts to an internal Real Time Clock (RTC) for adequate, but less precise time reference.

Integrated Alarm Engine and Management

The NMX Unit's alarm and event manager captures, stores and annunciates adverse network conditions to administrators managing the health of T1MX clusters. Each fault condition is tagged with a T1MX Group and Node number that isolates the condition to a specific site.

Although NMX Units can be deployed in every T1MX node, it's not essential. While each NMX card collects alarms from the entire T1 cluster, it will only capture events from the local I/O connections made to the unit's paddleboard.

Alarms and events captured by the NMX Unit are stored locally within the unit's internal non-volatile memory for later retrieval. Approximately 2500 alarms and events can be retained, after which time a FIFO scheme is employed. An optional unit alarm flag is raised when the alarm storage reaches 90% full. Events are optionally purged from the unit after a connection to VistaNET is established.

Fault conditions are time stamped with SNTP accuracy, in addition to the fault description, unit, NMS path (i.e. Node and Group #) and unit/location alias. With a secure VistaNET connection, conditions are integrated into its alarm engine and synchronized with remote VistaNET sessions.

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