GE
Grid Solutions

TTMX Teleprotection Terminal

Fast and Secure Teleprotection for Transmission and Distribution Grids

Protecting your critical assets after a fault is crucial to maintaining power system stability and safety. You need reliable communication solutions for fault protection that are simple to implement in your substation architecture. Existing technology is becoming harder to implement with telephone companies suspending their connection leases. You need a new way to address teleprotection, including Direct Transfer Trip, Permissive Transfer Trip, Blocking and Unblocking applications.

GE's Lentronics Teleprotection Terminal (TTMX) is a simple, cost-effective solution that's certified to IEC 60834-1 for assured teleprotection preformance. Its substation hardened design, proprietary signal encoding scheme, and link redundancy can help minimize false trip signals and monitor that proper trip signals are transmitted when needed.

In addition to fault-clearing, the TTMX provides communication monitoring and management, assessing the health of the multiplexer communications link. This allows an operator to look at settings, trips, device health, status of the link, and alarms, all from a remote location.

Secure and Dependable Communications

Built on layers of redundancy and substation hardened to help ensure reliable operation within harsh substation environments.

Flexible and Scalable Platform

Single or multiple digital interfaces support fiber-optic or copper connections to microwave systems. Modular and hot-swappable interface units. We also support an expansive range of physical electrical communication protocols used by relay vendors:

- 4W VF
- 2W VF
- FXO/FXS
- RS 232
- PTM Data
- G.703 Data
- NX64 Data (Optical & Electrical)
- DTT Tx/Rx
- Contact I/O

Simplified and Secure

Powered by the same technology as field-proven JungleMUX, TN1U SONET/SDH products, offering over 28 years of tele-protection experience across 300 utilities worldwide.

Key Benefits

- Hardware independence from the telecommunication platform
- Simplify spares and provisioning of service in 115, 230, 400, or 765 kV line applications that require 4, 8, or 12 commands per line
- LDAP and Active Directory authentication can improve security by helping keep out unauthorized users

Key Features

- Create communication redundancy on multiple interfaces: DS0/E1
- Flexible configuration of trip commands for Site-to-Site and Site-to-Multiple Sites
- Remotely monitor alarms, trip status, and communication link status with a dedicated NMS
- Integrate management of the TTMX into larger network management suites with SNMP
- Compliant to IEC 60834-1 Teleprotection Performance Standard

Rack Space Requirements

- Mounts in a 19” Rack
- 15 Shelf Slots
- 4 Rack Units High

The TTMX is a simple, yet flexible solution, able to be used for only teleprotection or expanded to support additional capabilities like voice communications, Ethernet, telemetry, serial data, and NMS with additional modules.

TELE PROTECTION

DTT-TxRx

CHANNELS

Teleprotection and Data Interfaces

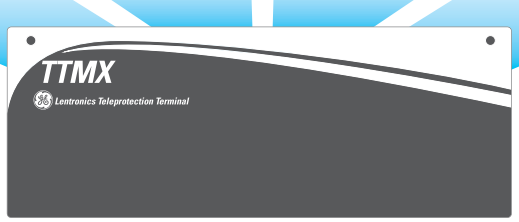
- V.35
- G.703
- RS 422
- C37.94

NMS

- NMX Management Unit
- VistaNET
  Network Management software
- EnerVista INSIGHT
  Manager of Managers

Complementary Interfaces

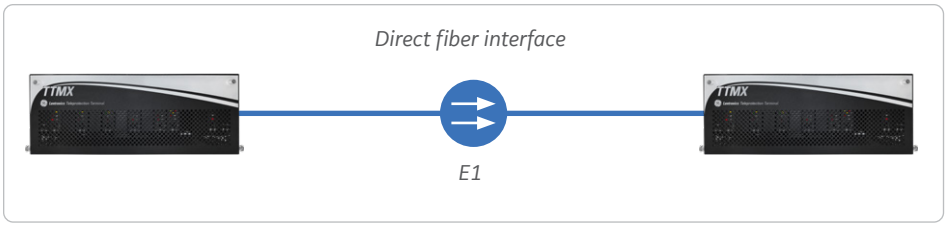
- ETHERNET
  Point-to-point or Multipoint L2 Ethernet
- RS 232
  Point-to-point or Multipoint Serial SCADA data
- 2W/4W
  Voice Frequency Interfaces Analog tele-protection
- CONTACT
  For monitoring or remote security



Chassis 48/130v DC Power

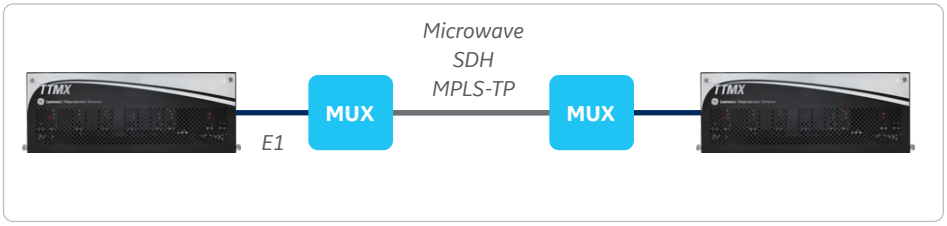
P2P Configuration – Direct Fiber Interface

Simplest configuration—point-to-point over a dedicated fiber connection.



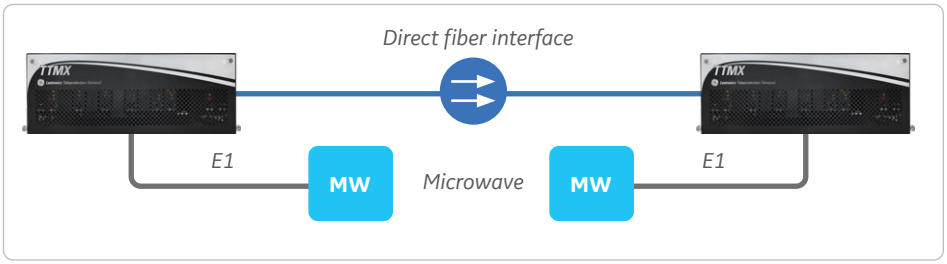
P2P Configuration – Established Link

With a high capacity point-to-point established link, such as a Multiplexer or Microwave, you can connect the TTMX to standard interfaces.



P2P Configuration – Transport Media Redundancy

With two transport media options available, the TTMX can provide a redundant solution.



P2P Configuration – Multi-terminal

Add/Drop flexibility provides point-to-point connectivity between any two sites on the network.

Specifications

E1 INTERFACES	
Line Rate	2.048 Mb/s ± 50 ppm
Line Code Options	HDB3 and AMI
Framing Format	CRC multi-frame
	Signaling multi-frame (CAS)
	Per ITU-T G.704
PRBS Generator	2^{11} -1, 2^{15} -1
Pulse Shape	ITU-T G.703 compliant
Nominal Line Impedance	120 Ω balanced ± 5% resistive
Connectors	RJ-48C for electrical E1 (balanced)
	SFP cages for optical E1
	3-pin header for both major and minor shelf alarm contact outputs
	3-pin header for shelf power supply(s) alarm contact input

TELEPROTECTION INTERFACES	
Transfer Trip	Separate transmit and receive units
Nx64 kb/s Data Optical	N=1 to 12 64kb/s channels
	IEEE C.37.94 standard for fiber optical connection to protection relays
G.703 Data	64 kb/s channel supporting co-directional timing and Form-C relay alarm output

ENVIRONMENTAL	
Operating Temperature	-20°C to +60°C (-4°F to +140°F)
Storage Temperature	-40°C to +70°C (-40°F to +158°F)
Humidity	5-95% non-condensing
Earthquake	Earthquake Risk Zone-4 shock and vibration

ENVIRONMENTAL – ELECTRIC POWER SUBSTATION	
EMI/RFI	Designed to meet ANSI/IEEE C37.90.2 RFI
SWC/ISOLATION	Designed to meet ANSI/IEEE C37.90.1 SWC

PHYSICAL DATA	
Height	133 mm (5.25 inches)
Width	483 mm (19 inches)
Depth	413 mm (16.25 inches)
Weight	Dependent upon configuration

OPTIONAL INTERFACES	
	DATA INTERFACES
Low Speed Data	RS232 interface
	Sub-rate multiplexing
	Point-to-point and multi-point
	Synchronous and asynchronous
High Speed Data	64 (56) kb/s rates
	RS422, V.35, G.703 and OCUDP interfaces
Nx64 kb/s Data Electrical	N = 1 to 12 64 kb/s channels
	TELEMETRY INTERFACES
Contact Input/Output	Transport of contact closure
	VOICE INTERFACES
4W VF	Optional E&M signaling
	Point-to-point and multi-point
2W VF	Optional E&M signaling
2W Foreign Exchange	Loop, ground or PLAR signaling

SYSTEM ALARMS	
Major	Form-C alarm relay (singular)
Minor	Form-C alarm relay (singular)

POWER
48 VDC or 130 VDC
Optional redundant power supply units

CERTIFICATIONS
IEC 60834-1 Teleprotection Performance

NETWORK MANAGEMENT
VistaNET, operating on MS-Windows based PCs, allows network access via E1 or SDH Multiplexer nodes for system monitoring and diagnostics
Alarm logging and time stamping
Simple troubleshooting and network maintenance
RS-232 serial and IP LAN access, as well as SNMP software license choices

GE
2018 Powers Ferry Road
Atlanta, GA 30339
1-877-605-6777 (toll free in North America)
678-844-6777 (direct number)

GEGridSolutions.com

GEA-33191(E)
English
211115