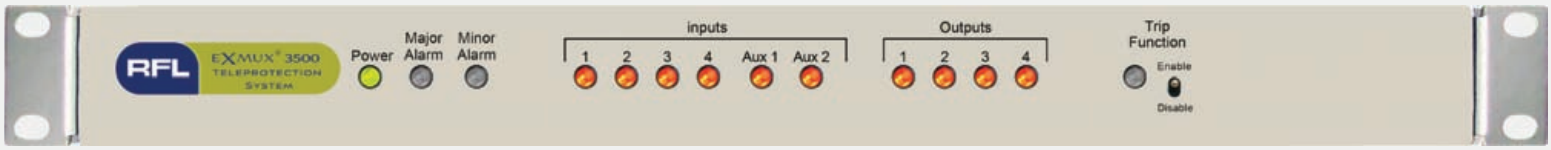
SOLUTIONS FOR AN EVOLVING WORLD

eXmux® 3500

Teleprotection System



The eXmux 3500 Teleprotection System provides an integrated end-to-end teleprotection function in the eXmux 3500 IP Access Multiplexer. The teleprotection system comprises of an eXmux TPS Interface Unit and a 1 RU TPS I/O Box, providing a teleprotection channel over Ethernet/IP or MPLS network using TDM over IP. It is mid-span compatible with the IMUX 2000 T1/E1 multiplexer MTS Teleprotection system.

The eXmux 3500 Teleprotection system provides 4 bidirectional transfer trip commands point-to-point between two peer units or between one unit and an IMUX 2000 MTS unit. The system allows the transport of two independent 4 function inputs/outputs; in addition to 2 controlling inputs logic and 2 outputs for alarming & status for each TPS I/O unit.

Key Features & Benefits

Transfer Trip over Ethernet/IP/MPLS
Provides Teleprotection channel over an Ethernet/IP or MPLS network

Programmable Logic
Supports a number of programmable logic functions including auxiliary controlling inputs

Communication Interface
Two independent 64kb/s DS0 using TDM over IP technology with future option to include Serial to IP with encryption

Inputs/Outputs
4 Optically isolated inputs with 2 auxiliary controlling inputs logic and 4 outputs with solid state and relay options

Sequence of Events (SOE)
Maintains 1500 SOE records, each time stamped with 1 ms accuracy and synchronized via NTP/ SNTP or IEEE 1588 network timing signals

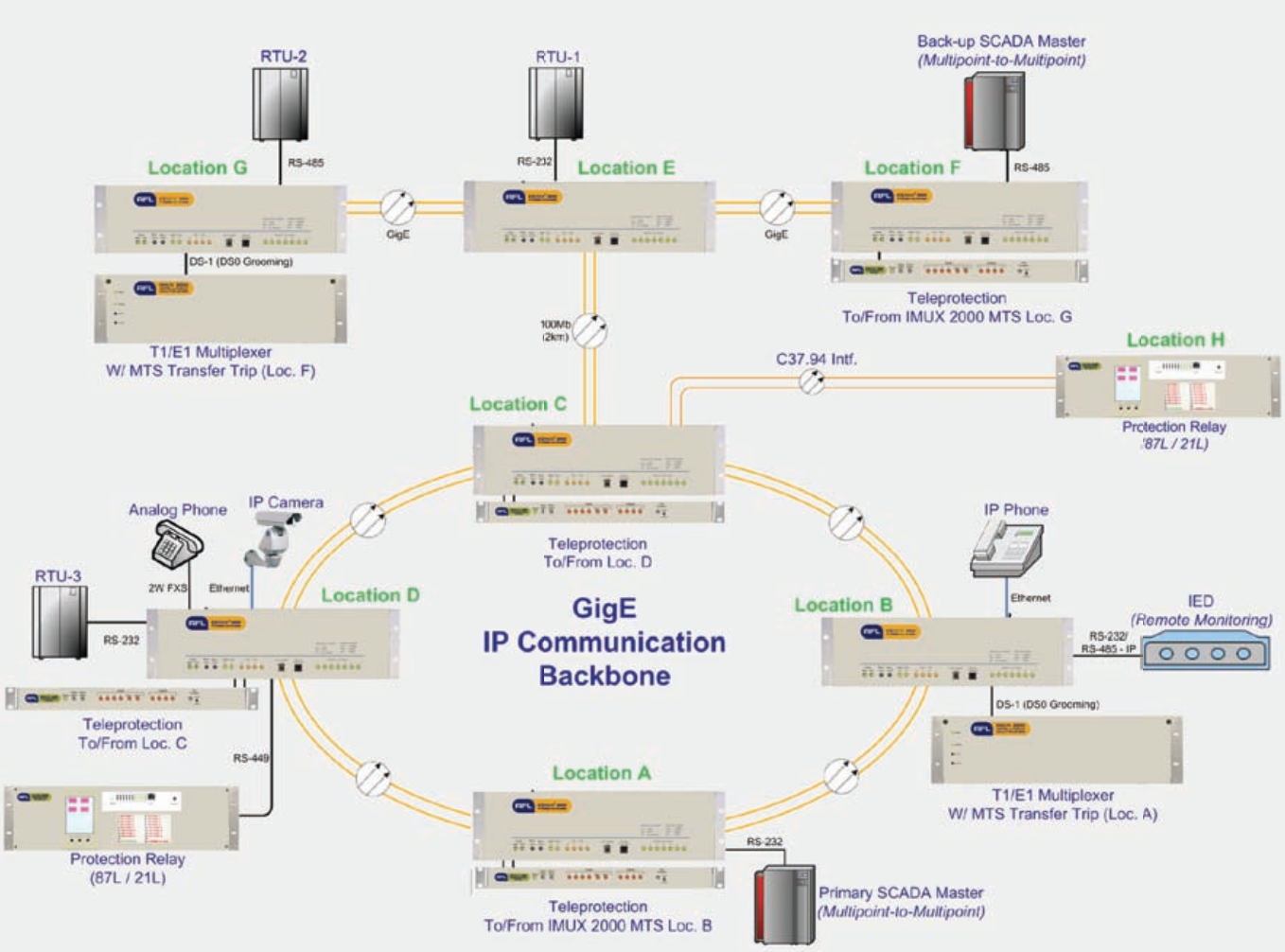
IMUX 2000 MTS Compatibility
Mid-span compatibility with IMUX 2000 T1/E1 multiplexer MTS Teleprotection module for ease of migration to IP

Hitless Teleprotection Channel
Teleprotection channel packets are sent simultaneously both ways around the ring for a zero-data-loss path recovery, providing high dependability/availability using TDM over IP

User Friendly Interface
User interface via the slickest eXmux 3500 Visual Network Management Software for an effortless user friendly experience and easy system management

Point-to-Multipoint Functionality*
Future capability to include point-to-multipoint communications providing integrated multipoint Teleprotection functionality between multiple substations (*Future)

eXmux® 3500 TPS Application



Technical Specifications

Programmable Logic

- Input / Output Inversion
- Input activation delay (de-bounce)
- Output activation delay (pre-trip)
- Output release delay (trip hold)
- Output hold in event of comms loss
- Directional Comparison blocking mode
- Unblocking
- Trip Input /Output Disable
- Input Or-ing & And-ing

Remote Access and Control

- eXmux 3500 VNMS

Inputs/Outputs

- Optically Isolated Inputs
- Input Voltage 24V, 48V, 125V, 250V
- Solid State Outputs
- Relay Outputs
- Compression or Screw Block Terminal

Status Indicators

- Inputs, Outputs, and Communications / Alarm Status LEDs
- Minor & Major Alarm LED and Form C Contacts

Sequence of Events (SOE)

- Records: 1500 SOE Records
- Synchronization: NTP/SNTP/IEEE 1588

Communications

- TDM over IP: Two independent Single 64Kb/s DS0
- Serial to IP with Encryption* (*Future option)
- Compatible with IMUX 2000 MTS Transfer Trip Module (TDM over IP mode only)
- Ping Pong Round Trip Delay measurement
- Trip Function Disable Switch