

Redundant Control Centers and Transport for Power Utilities using Circuit Emulation

Power utilities face an ever-increasing number of threats to their power generation, transmission and distribution systems. Natural disasters such as earthquakes and hurricanes, as well as man-made disruptions from domestic sabotage or cyber-attack, all pose risks for the utility infrastructure.

At the heart of the utility infrastructure is the control center with the communications network connecting it to remote substations. Critical data is collected from remote telemetry units (RTU) at the substations for analysis at the control center. Appropriate maintenance, operational and emergency actions are initiated, all within the SCADA (Supervisory Control and Data Acquisition) industrial control systems. Reliance on the power grid has never been greater and it is no longer acceptable for single points of failure in the SCADA system to put our economy, households, and safety at risk.

Many in the industry are adopting redundant control centers to provide quick recovery from physical disasters and to isolate and duplicate

data resources. Redundant transport is also implemented, ensuring uninterrupted data collection, analysis and control. This redundancy requires new capabilities from the data network such as automatic switching between control centers and continuous delivery of RTU data to multiple control servers.

Power utilities generally use T1 transport mechanisms for critical SCADA communication to RTUs. T1 transport requires leased TDM circuits that incur monthly costs and are becoming less available and less reliable as the telephone infrastructure ages. Redundant transport, either for failover or for simultaneous delivery to multiple sites, is also more difficult using T1 transport.

Ethernet transport provides exceptional economy, resiliency and availability but cannot directly interface with the serial RTUs and TDM-based Channel Banks in use by utilities. Circuit Emulation provides an answer – offering T1-over-IP and Serial-over-IP solutions to allow existing SCADA equipment to communicate over IP and Ethernet networks.

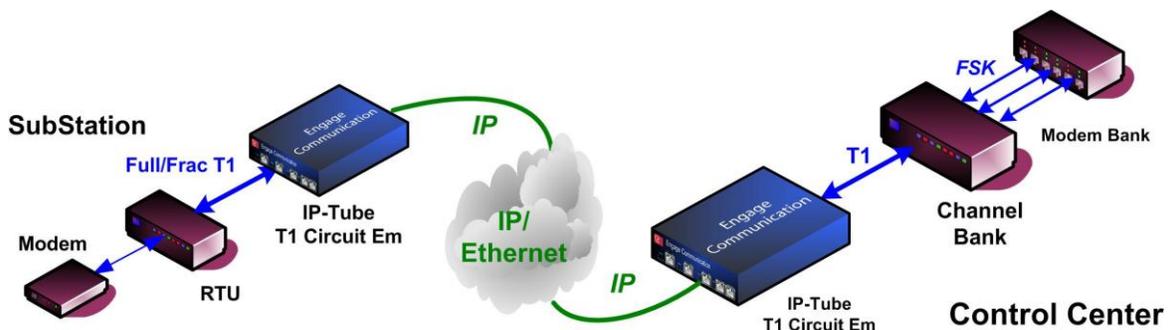


Fig. 1 – IP-Tube Circuit Emulation for SCADA Transport over IP

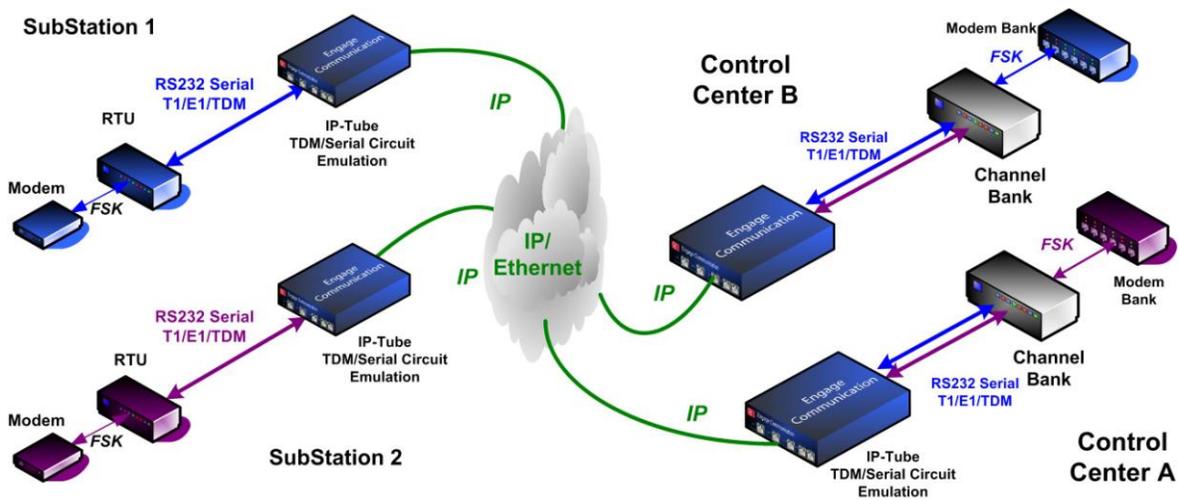


Fig.2 – IP-Tube Serial Circuit Emulation for Redundant Control Centers

IP-Tube circuit emulation systems from Engage Communication offer solutions for redundant control centers and redundant transport with features specifically designed for this critical application:

- Serial-over-Ethernet and TDM-over-Ethernet conversion provides for redundant transport over flexible and ubiquitous Ethernet connections.
- Intelligence to simultaneously deliver RTU data to redundant control centers while

distinguishing active communication links from backup links, ensuring only the proper control center is in communication with each RTU.

- Automatic failover between Control Servers upon disruption.
- Dual redundant power supplies, dual LAN connections with failover
- Auto Protection Switching provides backup for T1/TDM connections over IP

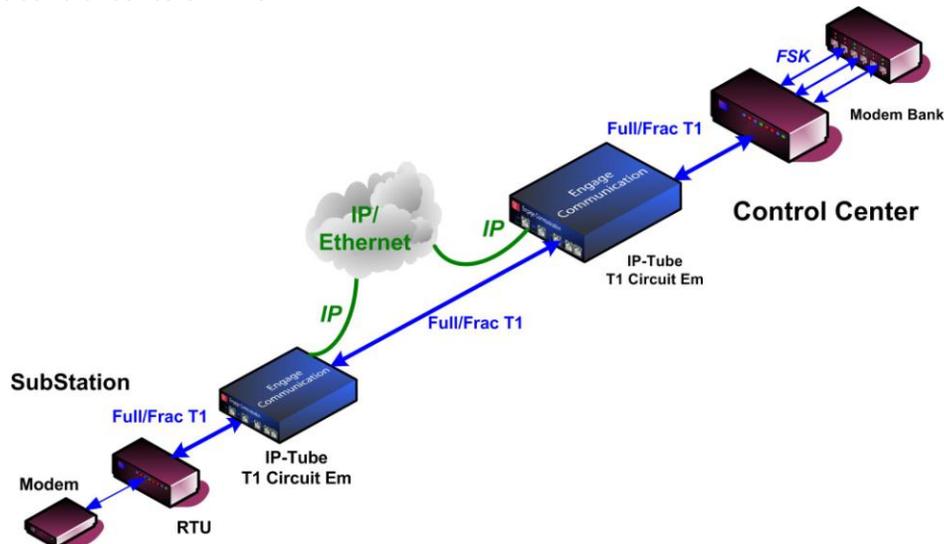


Fig.3 IP-Tube LINK PROTECTOR – Primary over T1 with Failover to IP

Since 1989 Engage Communication has developed and delivered specialized Networking and Telecom products for mission critical applications to the Utility, Defense and Public Safety industries.