

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 use T1 and Serial transport mechanisms for critical SCADA communication to RTUs. This transport requires leased TDM circuits that incur monthly costs and are 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 TDM 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 cut costs through the use of existing SCADA equipment while meeting the objective of redundant, diverse transport over IP/Ethernet networks.

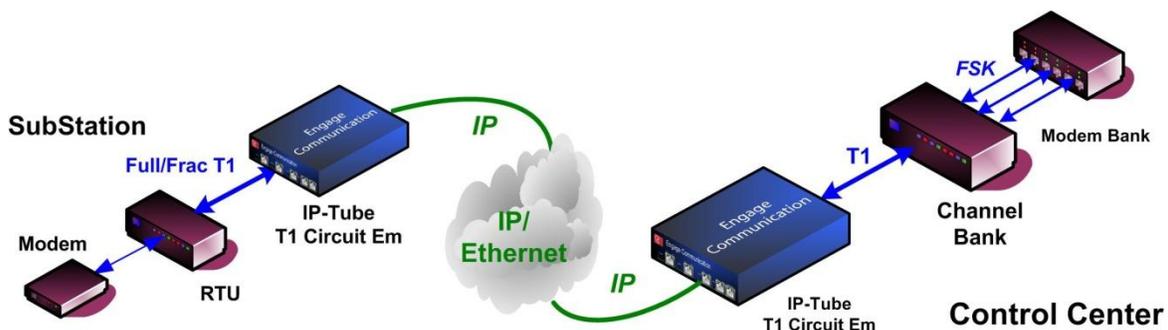


Fig. 1 – IP-Tube Circuit Emulation for SCADA Transport over IP

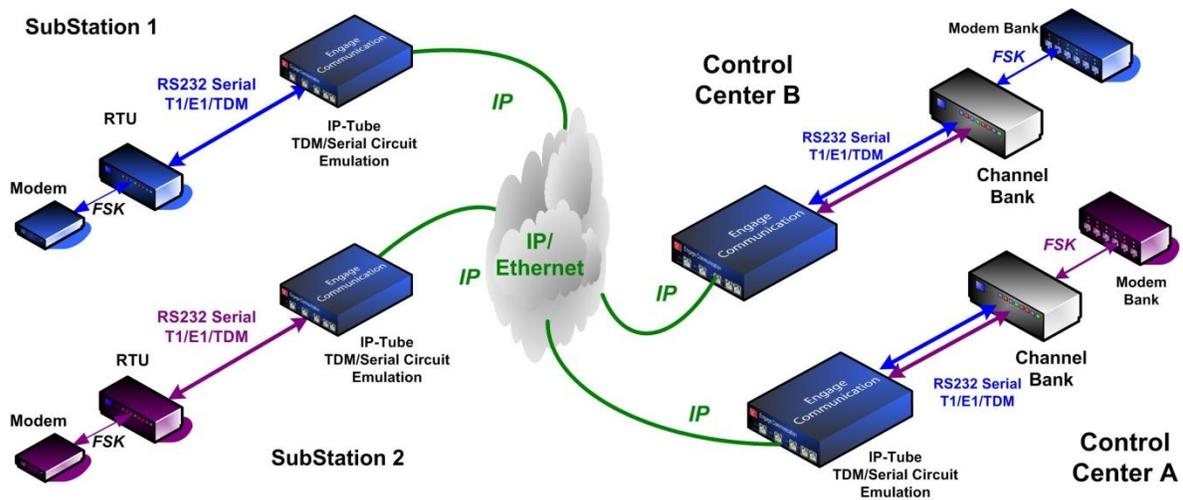


Fig.2 – IP-Tube Serial Circuit Emulation for Redundant Control Centers

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 provides for redundant transport over flexible and ubiquitous Ethernet connections.
- Automatic failover between Control Centers upon disruption.
- Digital Signal processing and Control signal monitoring is utilized to automatically detect the active Control center. RTU SCADA data is simultaneously delivered to the redundant control centers.
- Transparent support for SCADA protocols including Modbus RTU, RP-570, Profibus & Conitel.
- Dual redundant power supplies, dual LAN connections with auto switch to backup LAN.

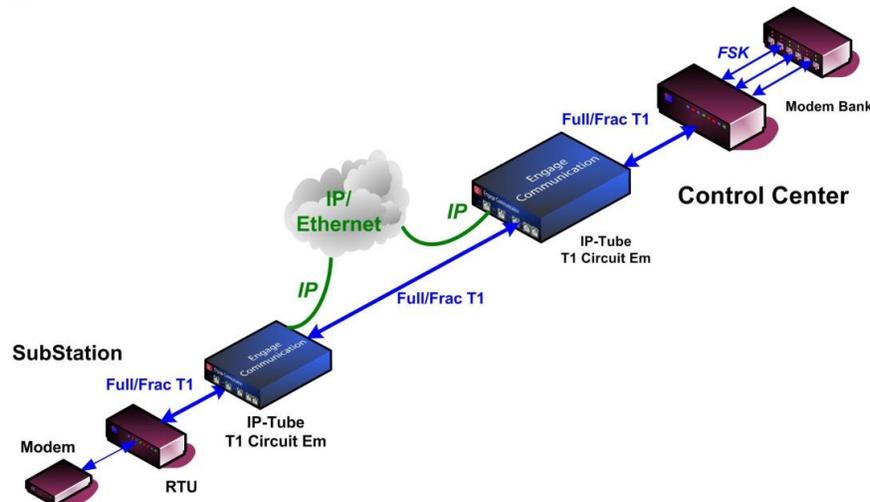


Fig.3 IP-Tube LINK PROTECTOR

IP-Tube circuit emulation also offers Auto Protection Switching (see Fig. 3) for backup of T1/TDM connections over IP. Primary T1

connection is monitored and, in event of failure, automatically switches to secondary T1 path and/or to T1-over-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.