

ATCS-IP FIELD CODE NETWORK ARCHITECTURE

Use of ATCS Internet Protocol in the CTC environment offers network operators significant advantages when integrating/updating legacy systems, installing and extending networks and adopting digital communication technology. For interface equipment product specifications, see Section A-3 of Safetran's Communications Equipment Catalog.

Advantages of ATCS-IP Network Architecture

- FCC Licensing not required, allows for quick deployment
- Cost-effective deployment of proven Safetran Packet Switch technology
 - Serves as IP Gateway for legacy code systems providing Ethernet connectivity
 - Legacy serial and DC code system protocols supported so no development is required (connects directly to Field Code Units)
 - Conversion to ATCS messages and addressing for guaranteed end-to-end delivery of Controls and Indications
 - ATCS **Type-5** and **Type-7** addressing supported
 - ATCS messages transported in UDP/IP packages to allow for routing across standard LAN/WAN topologies
 - Offers a wide variety of dial back-up and redundancy options
 - Capable of serving as an IP Gateway for applications such as train inspection, axle counters, tag readers, etc.
 - Allows for Remote Diagnostics and Configuration from the CTC Office
- Minimize leased circuit expenses by RF hubbing to a central distribution point
- Safetran Ethernet RF Bridge provides:
 - Choice of 2.7Mb or 11Mb Ethernet RF transceivers for bandwidth capacity to support data delivery in addition to Code System Control
 - Secure proprietary RF protocol
 - Ethernet connectivity from the office to the Field Code Unit to allow for increased visibility of your code system on the ASERVER/WCCMAINT office NMS system
 - Support for Echelon LONTALK devices with an external adapter
 - Remote reconfiguration of radios over the RF link
 - Full temp. spec operation from -40 °C to +70 °C
- Ease of Installation / No Service Disruptions
 - Identify *Field Code Hub Distribution Points* and desired level of redundancy
 - Install digital data circuits and connect field routers at the identified *Field Code Hub Distribution Points*
 - Install ATCS IP Gateway (WCM) devices and secure Ethernet bridge equipment (& DBU equipment if desired)
 - Configure Office Packet Switch and Field WCM devices so all ATCS IP Gateway components are on line (this to can be completed remotely from the office via ASERVER/WCCMAINT)
 - Transfer one Control Point at a time to the ATCS enabled IP transport Field Code Network
 - Test CONTROLS, INDICATIONS, RECALLS, and DBU functions
 - Disconnect previous wire-line circuits

Additional Potential Cost-savings Benefits

- Potential for Additional Leased Circuit Savings
 - Installation of a T-1 fan-out for the frame relay connections to the Field Code Hubs, would have the capacity to support additional customer services
 - Provide Wireless Access Points for other remote data locations
 - Provide an opportunity to eliminate high-cost analog grade circuits
 - Possibly migrate Dispatcher Radio Base Stations to available T-1 capacity
 - Potential risks associated with T-1 outages can be mitigated by way of dial-access
 - Direct DBU to select WCM or Field Routers
 - Direct DBU to Dispatcher Voice Base Stations by way of the A47725 Universal Base Station Controller Assembly