

PowerTrunk^T



TETRA

Powerful • Secure • Reliable • Scalable

LMR

Digital TETRA Infrastructure System

For Voice and Data Land Mobile Radio Communications
Trunked UHF and 800 MHz





PowerTrunk TETRA Has Arrived *New to the U.S. — Proven Worldwide*

PowerTrunk™ Inc. is proud to introduce our TETRA land mobile radio solution to the U.S. market — the same solution we have deployed in utilities, oil and gas, public safety and transportation networks around the world for over ten years.

The PowerTrunk-T Infrastructure System for TETRA land mobile radio networks delivers excellent coverage, security and reliability in a platform designed for efficient implementation and cost-effective scalability. Throughout the system our engineering exceeds standard requirements where it matters most.

PowerTrunk-T is the only TETRA system that is 100% end-to-end IP. You can build a secure and reliable network with distributed switching, distributed intelligence and complete fault-tolerant redundancy — and lower network costs by deploying standard equipment.

With an outstanding 75 watts of RF output power in each repeater and triple receiver diversity, PowerTrunk-T provides the best coverage performance available in a TETRA network. It is loaded with advanced capabilities such as multi-slot packet data (up to 28.8 Kbps), simultaneous voice and data, FIPS Level 3-oriented E2EE management, real-time statistics of network performance and off-the-shelf solutions optimized for AVL, telemetry and transportation — all in a platform that is hardware-ready for migration to TEDS high speed data.

Choose PowerTrunk-T for its IP architecture, optimized coverage, high level of security, unmatched reliability and enhanced data capabilities.



To comply with existing FCC and IC emission masks and occupied bandwidth limits, the modulation roll-off factor has been modified from the standard value of 0.35 to 0.2. Field tests have shown no operational loss of performance.

Features	Benefits
<i>The only TETRA Infrastructure that is 100% end-to-end IP</i>	
All modules can be duplicated for full redundancy	Build a complete fault-tolerant system for unprecedented reliability
All system components can be freely distributed	Implement any network topology
No need to geographically centralize system main controllers	Avoid single points of failure
Patented method to optimize voice packets inside the IP network reduces IP delays	Reduce application bandwidth requirements
Use standard networking equipment	Reduce risk of obsolescence while lowering costs
<i>Exceptional coverage</i>	
75 watts RF output power	Benefit from the best coverage on the TETRA market
Repeaters can be upgraded from dual to triple diversity	Increase coverage even further
Repeater sites can be sectorized to include directional antennas	Optimize available coverage
Transmitting sites include state-of-the-art cavity combiners	Minimize outpower power losses
<i>Optimized simultaneous voice and data communications</i>	
Dynamically configures every repeater site with up to 3 secondary control channels, plus the main control channel	Maximize bandwidth available for simultaneous voice/ data applications and support higher user density
Data speed of 28 Kbps, the TETRA standard	Support packet data and fast data transfer services
Hardware-ready for TEDS (TETRA Enhanced Data Service)	Boost packet data up to 538 Kbps
Best-in-class SDM (Synchronous Data Manager) and IP data booster servers	Optimize throughput available for external data applications
All TETRA data modes are offered: status, short, multi-slot packet and circuit mode data	Choose the most efficient data mode for each application, even low-resolution video
<i>Unmatched interoperability, flexibility, and scalability</i>	
Integrated interfaces to legacy systems, other LMR networks and common backhails	Facilitate network deployment
Supports synchronous and asynchronous backhaul links between the node and the base stations	Eliminate the need for transcoding
Modular architecture that scales from single site to nationwide	Add new channels, new sites, or new agencies cost-effectively
Each central node (master site) manages up to 250 repeater sites, each repeater site supports up to 32 carriers (128 voice channels) and interconnects up to 64 central nodes (master sites)	Reduce the amount of LMR network equipment required and create a network of up to 8,000 repeater sites
Fully integrated CAD option	Manage large coordination centers
<i>Highest level of network security</i>	
FIPS 140-2 Level 3-oriented tamper-proof E2E encryption modules available in every system gateway	Ensure the highest level of security
Each encryption module supports up to eight algorithms including AES 256 and OTAK functionality	Ensure the highest level of security
Repeater sites do not require a GPS for synchronization	Reduce network vulnerability to vandal attacks and facilitate indoor installation
<i>Centralized network management</i>	
FCAPS ISO model network management	Seamlessly share your network with other agencies yet independently manage your subscribers
Real-time alarm management	Minimize equipment downtime
Real-time statistics module	Obtain real-time network performance indicators
SNMP support	Interface with higher-level network management systems

Complete Digital TETRA Infrastructure System

PowerTrunk-T BSR

The Base Station/Repeater is a modular unit that is easy to deploy and maintain. Each plug-and-play module contains different functional blocks and provides specific alarms to minimize in-field repair time. Provides outstanding RF performance via 75 W output power, triple diversity option and highest sensitivity levels that boost your TETRA network coverage.



PowerTrunk-T CNC

The Central Node Controller provides the intelligence and processing capability for the trunking system. It manages call processing, users' configurations, and real-time locations inside the network. These features ensure fast call setup, seamless roaming, and automatic switchover to a redundant unit in case of failure. The hardware is an industrial-grade, high-performance computer using a real-time operating system.



PowerTrunk-T NMS

The Network Management System is based on a client/server networking architecture. Data collection and management are distributed across multiple client workstations through standard IP protocols. Designed according to the FCAPS model, the PowerTrunk-T NMS can be configured for different access privileges to permit separate technical and operational management. The NMS allows multiple agencies to share the network, yet isolates each agency's subscriber management.



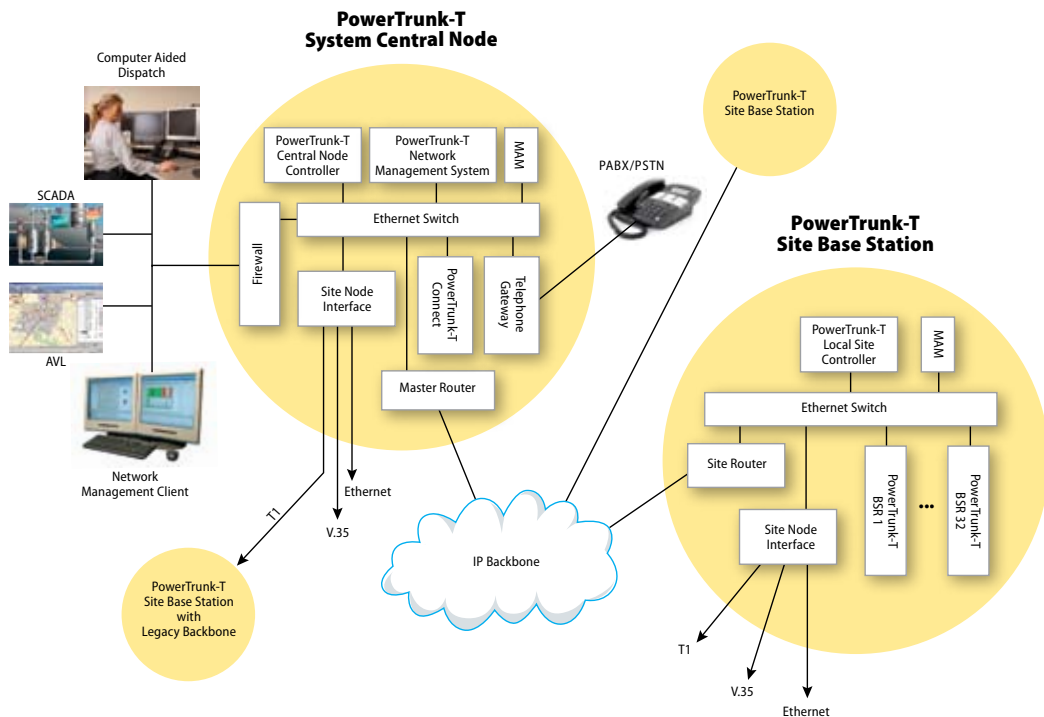
PowerTrunk-T LSC

The Local Site Controller maintains communication with the Central Node Controller and manages the repeater units in case the link with the CNC is lost. Should that happen, the LSC provides a powerful fallback operation by maintaining all trunking functionality as a single site.



PowerTrunk-T Connect

The Connect Module provides an interface for interoperability with other systems such as mutual-aid channels, analog systems, or legacy trunking systems. It is also the VoIP gateway for the CAD system: one module supports up to 10 dispatch consoles and 20 radio interfaces. Additional modules can be interconnected to increase capacity.





Solutions Optimized for Your Industry

Utilities Ready

- Optimized to allow greater data management efficiency for telemetry measurement, and remote management.
- Native IP data connectivity means you can easily integrate SCADA systems.
- Enables the highest density of measurement points for power management utilities due to support of three secondary control channels and TETRA's 4 time-slot TDMA structure.
- Synchronous Data Manager (SDM) allows efficient and fast polling of measurement units.
- Real-time alarms when a measurement unit fails will minimize your equipment downtime.

Mission-Critical Ready

- Authentication, air interface encryption, end-to-end encryption and protection against interferences provide the highest degree of security.
- Key Management Center generates true random number encryption keys using approved FIPS methods.
- Exceptional group communications include dynamic group assignments.
- Supports direct mode communication between radios outside the coverage area.
- Allows simultaneous voice communications and AVL without requiring a dedicated data network.
- Poll your entire fleet of subscriber units for GPS position in a matter of minutes with our Synchronous Data Manager

Transportation Ready

- Specialized on-board radio communication units easily integrate with the infrastructure system and the computer aided dispatch to:
 - Enable voice communications between the on-board unit and control center.
 - Manage and control transport system functions to determine real-time condition of the fleet and their status.
 - Automate functions such as doors openings, PA announcements and voice interconnection based on alarm triggers.
- Customize drivers' consoles to your voice and data requirements.

Technical Characteristics

Available links

- Synchronous:
 - E1 (G703/G704), V35, ISDN BRI (S/T), G703 co-directional
- Asynchronous:
 - Level 2: VLAN, WLAN, WiMAX
 - Level 3: Routers with IRB or L2TP (for instance CISCO routers from 1700 model)

Frequency bands

- RX/TX: 350-370, 380-400, 410-430, 450-470 MHz (full band switching)
- RX: 806 - 825 MHz / TX: 851 - 870 MHz

Processors

- CNC & NMS server: Compact PCI
- Other boards: RISC 32 bits (50 MIPS)

Transmitter (100% duty cycle)

- Transmitted power: 40W (46dBm). Control from 0.6 to 40W in 2dB steps. (32W for 350-370 MHz band)
- Transmitted power: 75W (48.7dBm). Control from 0.6 to 75W in 2dB steps. (32W for 350-370 MHz band)

Receiver

- Receiver class A. Diversity 2 and 3
- Typical static/dynamic sensitivity: -119/-112dBm (4% BER)

Internal synchronization

- Internal OCXO frequency accuracy: 0.2ppm (11 years maintenance free)

Gateways

- PABX / PSTN telephone
- N2A enables connection of 3rd party applications managing voice, status, SDS, packet data, alarms management (SNMP) and synchronous data manager
- SMS to GSM
- VoIP for line dispatcher
- VoIP for voice recorder
- Remote maintenance gateway
- Support for E2EE encrypted gateways

Services Supported

Mobility management

- Registration/de-registration
- Cell reselection (handover).

Security services

- Authentication (terminal and mutual)
- Air interface encryption DCK
- Algorithms: TEA1, TEA2 and TEA3
- OTAR (Over The Air Rekeying)
- Enable/disable (temporary and permanent)
- End-to-end encryption for network gateways including OTAK support
- Key Management Center for E2EE management

Voice services

- Individual / group
- Half-duplex / duplex
- Broadcast call
- PABX / PSTN
- Group call from PABX / PSTN
- Normal/priority/emergency
- SwMI wide emergency call
- Multiple group management

Supplementary services include:

- Dynamic group number assignment
- Late entry
- Ambience listening
- Calling line identification
- Talking party identification
- Priority call
- Preemptive priority call
- Call retention
- Barring of outgoing calls
- Barring of incoming calls
- Call authorized by dispatcher

Data services

- Status to individual or group address
- SDS (type 1, 2, 3 and 4) to individual or group address (with or without TL)
- Simultaneous status & SDS data during voice call
- SCCH Secondary control channel (up to 3)
- Circuit mode data
- Multi-slot packet data (up to 4 slots)

About PowerTrunk

A subsidiary of Teltronic® S.A.U., PowerTrunk Inc. is responsible for business development, distribution, and customer support for Teltronic TETRA and P25 land mobile radio projects in North America.

Teltronic S.A.U., headquartered in Spain, has deployed TETRA land mobile radio systems since the standard's inception ten years ago. With 35 years' experience designing, manufacturing, implementing and supporting digital and analog land mobile radio turnkey projects, Teltronic S.A.U. has more than 300 systems installed in 50 countries. Teltronic's LMR solutions are widely deployed in the public safety, oil and gas, transportation, and utilities industries.

We own 100% of our LMR technology which includes conventional and trunked infrastructure systems, mobiles, hand portables and dispatching consoles. The company manufactures conventional PMR, MPT-1327, TETRA, P25 and WiMAX solutions. Our end-to-end services worldwide include project engineering, installation and commissioning, maintenance, after-sales services and project financing when necessary.



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