GENERAL DYNAMICS
Mission Systems

Tactical Mobile Router – TMR308

Enterprise Class L3 Router with PNT Replication

Tactical Mobile Router – TMR308

Tactical mobile battlefield networks are characterized by a heterogeneous set of bearers that provide orders

of magnitude variations in available bandwidth, ranging from 1000Mbps+ LANs to Combat Net Radios (CNR) links providing 100s bps to 10s kbps. Disruptions to GPS systems and radio networks occur for a wide variety of reasons, including: mobile fading, terrain obstruction, combat losses, intentional and unintentional jamming.

Current battlefield networks are increasingly employing standard Internet transport protocols which impose high bandwidth overhead and rely on consistent end-to-end connectivity. This technological solution has difficulty providing acceptable message delivery performance over tactical networks. Similarly, standard Internet protocols are being used to distribute accurate timing and position information across the battlefield.

The TMR308 overcomes these challenges by analyzing network feedback to characterize links as Desired, Disadvantaged or Disrupted and then delivering information via the most appropriate bearer. TMR uses advanced protocols to transfer messages with reliability, efficiency and reasonable latency in a disrupted heterogeneous network environment.

Transport protocols transfer variable length messages with reliability, efficiency, reasonable latency and end-to-end congestion control. Standard Internet transport protocols like UDP and TCP have difficulty providing acceptable performance over disrupted and disadvantaged links as they rely on end-to-end connectivity.

To further the reliability of message delivery across disadvantaged links, the General Dynamics-developed Comprehensive FEC-based Protocol (CFP) provides proven transport reliability and efficiency in high packet loss environments.

Standard internet routing protocols, such as OSPF, impose a high bandwidth overhead on low bandwidth radio links. The TMR solves this problem by using the General Dynamics-developed Tactical Routing Service (TRS) over CNR, SATCOM and wireless LAN links. The TRS is scalable up to 2,000 nodes in an ad hoc mobile network and integrates with standard routing protocols used on high bandwidth links.

Today's vehicle installations often require multiple GPS receivers (with complicated antenna configurations) to provide assured Position/ Navigation/Time solutions to multiple on-board devices. The TMR-308 simplifies the installation complexity by accepting the PNT information from a single port and replicating it to multiple devices.

Technical Information

Tactical Mobile Router features:

- Message Delivery Service with Transport Performance Enhancing Proxies, Web Proxies
- Auto-selection of UDP, TCP, and CFP transport protocols based on path quality
- Tactical Domain Name Service with RFC 1034/1035 DNS interface
- Network Quality of Service (QoS) using Differentiated Services Code Point (DSCP)
- Open Shortest Path First (OSPF) and Border Gateway Protocol (BGP-4) routing for desired links
- Tactical Routing Protocol (TRS) for disadvantaged links
- Multi-protocol inter-domain route re-distribution
- RFC 8175 Dynamic Link Exchange Protocol (DLEP) for radio aware routing
- IPv4, with support for IPv6
- RFC 2131 Dynamic Host Control Protocol (DHCP) server
- Network Time Protocol (NTP) server
- Network management via web browser, SNMP, RFC 6241 Network Configuration Protocol (NETCONF)
- Easily customized Linux software base
- Small form factor reduces space, weight and power needs
- MIL-STD-810D and MIL-STD-461E qualification for reliable operation in harsh environments
- MIL-STD-1275E vehicle power

Interfaces:

- Ethernet:
  - Qty. (12) x 10/100/1000 Mbps
- Audio:
  - Qty. (1) x Audio I/F Port + PTT
- Radio:
  - Qty. (2) x Analog Audio (Voice) + PTT
  - Supports Radio Data via Ethernet and serial
- Serial:
  - Qty. (5) x RS-232
  - Qty. (1) x RS-232/RS-422
  - Qty. (3) x USB 2.0
- Accurate Timing:
  - Qty. (6) x 1 PPS
  - Qty. (12) x PTPv2
  - Optional integrated Chip Scale Atomic Clock (Stratum I)
  - 1PPS signals and RS232 messages from locally connected GPS receiver device replicated
- Expansion:
  - Qty. (1) x expansion slot support for industry standard Qseven, SMARC, M2 interface
- Processing:
  - Qty. (1) x Xilinx Zynq 7000 series FPGA with Dual-core ARM v9
  - Qty. (1) x Dual-core ARMv7
  - Qty. (1) x DSP
  - Qty. (1) x Marvell Advanced L3 Router IC
- Emergency IC:
  - Supports distribution of Instant-On Emergency IC

Display and Controls:

- Built-in Test, Power, and Ethernet status LEDs
- Unit Reset and Backlight mode switches

Reliability:

- MTBF greater than 10,000 hours
- MIL-HDBK-217F, Ground Mobile Environment @ 25°C

Physical Characteristics:

- Height 109 mm (4.29 inches)
- Width 180 mm (7.09 inches)
- Depth 152 mm (6.00 inches)
- Weight 2.24 kg (4.95 pounds)

Environmental Characteristics:

- -40°C to +60°C (-40°F to +140°F) operating
- -51°C to +80°C (-60°F to +176°F) storage
- MIL-STD-810D tested for vibration (wheeled and tracked), transit drop, shock, salt fog, sand and dust, fluid contamination, NBC decontamination, immersion, fungus and altitude

Electromagnetic Effects:

- MIL-STD-461E

Input Power Requirements:

- 24 to 32 VDC (MIL-STD-1275B), Max. consumption 22 Watts

Best-of-Breed Confidence

General Dynamics is a distinguished worldwide provider of ruggedized electronic equipment designed and qualified to withstand operation in the most extreme tactical environments. Our MESHnet® Family of products is field proven and trusted globally for robustness and reliability.

General Dynamics products are based on proven, configurable modules and are available in standard or custom configurations. This product sheet describes many of the options for this product family. For availability and details of specific configurations or for custom requirements, please contact General Dynamics.

GENERAL DYNAMICS
Mission Systems

1941 Robertson Road • Ottawa, Ontario • CANADA • K2H 5B7 • Phone +1 613-596-7000 • info@gd-ms.ca • www.gdmissionsystems.ca