



T1 & E1 Transport Over Ethernet For Wireless Networks



The Low Cost Solution

Flanger™ from MemoryLink™ enables point-to-point multiplexing of T1 & E1 traffic across wired and wireless Ethernet devices. This small, simple-to-use unit provides seamless transport of T1 & E1 across an Ethernet link; allowing for dramatic cost savings compared to the cost of conventional leased lines. Flanger can support from one to four T1's or E1's per link. Flanger also allows multiplexing of LAN traffic along with the T1/E1 payload. The LAN traffic utilizes the available bandwidth in the connection to deliver even more value.

Designed For Wireless

The MemoryLink system uses a unique algorithm to transport the T1 & E1 data streams. This algorithm has been optimized for wireless Ethernet transport. Because of the potential for changing conditions that could affect wireless network throughput, the Flanger unit provides the capability for recovering from data loss, without propagating the errors to following frames. This is accomplished with MemoryLink's Channel Look-Ahead™ and Programmable Channel Optimization™ features.

Easy Setup And Configuration

Within the Flanger Utility user interface, Profiles are provided by MemoryLink for each tested Ethernet radio. These Profiles are the optimized values of the combination of Packet Size and Buffer Depth that achieve best performance and reduced latency. Additionally, custom Profiles may be specified by the user. This allows a complete link to be setup in hours versus waiting for the Telco to provision a T1/E1 circuit.

Because Flanger provides physical pass-through of the T1 & E1 link, no special configuration or setup is required regardless of the format (e.g., fractional, channelized, clear channel, checksum on or off, etc.). The T1 & E1 signals are precisely repeated using a clock locked to the incoming line. In case of signal interruption at the source, no additional resynchronization is required at the Flanger device level. No special setup is needed to enable such things as fractional T1; whatever is impressed upon the T1 connection at one end appears unchanged at the other.



Flanger- Wireless T1 and E1

- Eliminate monthly leased line charges
- Ideal for PBX's in campus environments
- Cellular backhaul
- Protect legacy equipment investments
- Disaster recovery and redundant T1/E1 links
- POTS line extension
- Broadband for special events

Flanger Gets Smarter Over Time

With MemoryLink's exclusive Malachi™ architecture, Flanger's hardware becomes interactive, reprogrammable and reshapable—with scalability and greater dimensionality. Flanger is superior to competitive technologies that have built-in obsolescence and deliver a far greater value over silicon-based circuitry.

Network Connectivity

Flanger can be deployed across a networked environment using wireless broadband, wired Ethernet, or a combination. Channel Look-Ahead continuously estimates the variation of arrival time; in conjunction with the Programmable Channel Optimization feature, the MemoryLink system can deliver optimum reliability under changing network conditions. For example, when used with a wireless system, Flanger provides "last mile" T1 & E1 transport across distances limited only by the selected radio's capabilities. It is an ideal, affordable solution for connecting PBX systems in remote office and campus environments. Flanger can also supplant wire-line T1 & E1 connections to cellular towers, eliminating monthly leased landline charges as well as the associated problems.

Flanger payload:

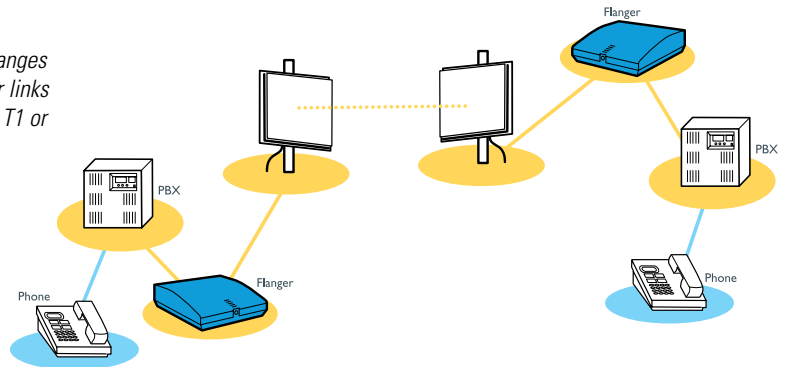
IPv4 tunneling. Flanger transports via IP tunnels using the differentiated services field to prioritize T1/E1 traffic over Flanger routed LAN traffic.

T1 bandwidth (1.544 Mbps) X the number of T1's plus 256 Kbps of overhead in each direction per T1, thus occupying a total of 3.6 Mbps per T1.

E1 bandwidth (2.048 Mbps) X the number of E1's plus 256 Kbps of overhead in each direction per E1, thus occupying a total of 4.6 Mbps per E1.

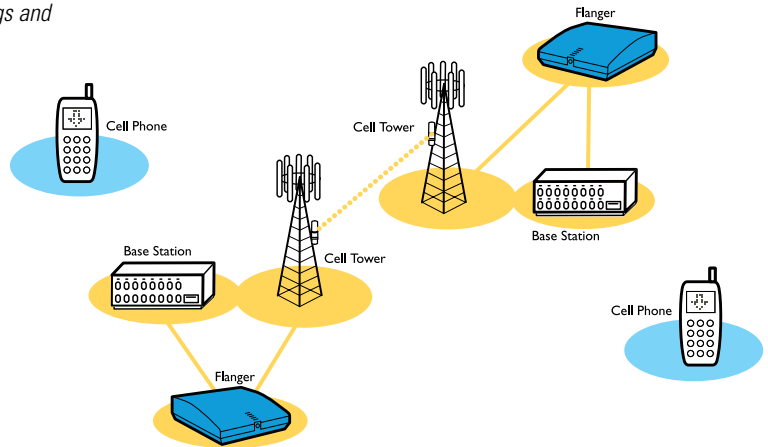
Remote PBX

One common application involves the inter-connection of Private Branch Exchanges (PBXs) in multiple locations. Connected as shown in the figure below, Flanger links can provide excellent service and reliability at a fraction of the cost of leased T1 or E1 lines.



Cellular Backhaul

Another application is to connect cellular telephone base station sites to the Mobile Telephone Switching Office. Flanger can be the key to substantial cost savings and enabling a completely independent and maintainable network.



Flanger FL4000A Specifications

LAN Interface

- Type - 10BaseT; Auto-negotiation
- Connector - RJ-45

WAN Interface

- Type - 10BaseT; Auto-negotiation
- Connector - RJ-45

T1/ E1 Interface

T1

- Connector - RJ-45
- Line Coding - AMI, B8ZS
- Framing - Transparent
- Number of TDM ports - 1, 2, 3, or 4
- Jitter and Wander tolerances - AT&T Pub 62411, ITU-T G.824
- Standards - AT&T TR-62411, ITU-T Rec., G.703, G.704, ANSI T1.403, G.824
- TDM Bandwidth - 1.544MB plus 256k overhead each way per T1.
Approximately 3.6MB total per T1

E1

- Connector - RJ-45
- Line Coding - HDB3I, B8ZS
- Framing - Transparent
- Number of TDM ports - 1, 2, 3, or 4
- Jitter and Wander tolerances - ITU-T G.824
- Standards - ITU-T Rec. G.703, G.704, G.706, G.732, G.823
- TDM Bandwidth - 2.048MB plus 256k overhead each way per E1.
Approximately 4.6MB total per E1

Management

- Protocol - HTTP - Telnet - CLI
- Interface - 10BaseT, CONSOLE port RJ-45 to Serial
- Upgrade capabilities - Downloadable

General

- Power in - Power over CAT5 on LAN port
- Power out - Will supply power over CAT5 on WAN port
- Protection - Lightning and power protection on every port

Mechanics

- IDU - Indoor unit
- Physical - Width 5 1/2 inches X Height 2 1/4 inches X Length 7 inches
- Weight - 13 ounces
- Material - ABS (Acrylonitrile Butadiene Styrene) enclosure

Environmental

Operating Temperatures - Industrial temperature rated: -40 to +85 degrees Celsius

Standards

- FCC approval Title 47 Part 15, subpart B, Class A devices
- CE approved

For more information, please call:
1-866-398-4336 or 847-259-9680
www.memorylink.com

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