

Evolution Series

MultiMux™ Data Multiplexer

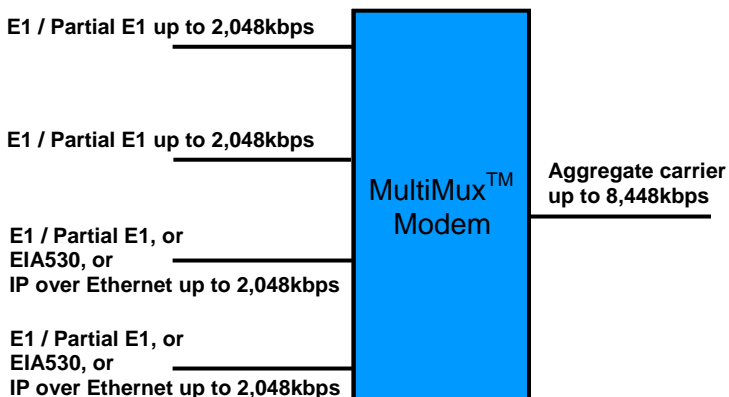
Option for all Evolution Modems

New MultiMux™ Option

The revolutionary **MultiMux™** multiplexing feature from Paradise Datacom allows a Satellite modem to accept multiple data streams, using more than one type of terrestrial interface, and multiplex these into a single carrier.

This has a number of benefits and applications including:

- ▶ Saves on capital expenditure by reducing the number of modems needed to carry multiple services.
- ▶ Can carry up to 3 different traffic types multiplexed into one carrier.
- ▶ Saves on RF ground segment by amalgamating carriers - a single carrier requires less amplifier backoff than multiple carriers, therefore smaller power amp required.
- ▶ Supports hybrid GSM G.703 E1-TCP/IP satellite services, facilitating the transition of GSM systems from legacy E1 to TCP/IP transport streams.
- ▶ Creates a truly high-rate Engineering Service Channel (ESC) for secondary serial or TCP/IP communications between a hub and remote site.
- ▶ Rack space efficient - modem and multiplexer in 1RU.
- ▶ Can be used stand-alone or in 1:1 Redundant configuration.



Principle of Operation

The **MultiMux™** builds upon the technology already incorporated into the highly successful **P3706 Quad E1 G.703 Mux** card. The Quad E1 card allows up to four G.703 E1 interfaces, each supporting Drop & Insert with up to 32 timeslots, to be multiplexed together. The new **MultiMux™** feature allows up to two of the E1 bearers to be replaced by different physical interface on the modem.

The following alternative physical interfaces are currently supported:

- ▶ TCP/IP over Ethernet (RJ45)
- ▶ EIA530 offering RS422, X.21, V.35

Other traffic interfaces will be supported in the future - please contact Paradise Sales Support for more details.

All traffic ports are independently user-configurable from 64kbps up to a maximum of 2,048kbps in steps of 64kbps. The maximum data rate on the IP and EIA530 interfaces will be increased in the future - please contact Paradise Sales Support for more details.

The data streams are multiplexed together into a single carrier at the transmitting modem and de-multiplexed back to their corresponding physical interfaces on the receiving modem.

The EIA530 interface port, in **MultiMux™** mode is clocked as follows:

Tx Clocking is derived from the lowest-numbered active E1 Port (1-3) if present and will switch to an internally derived reference if all three E1 ports fail.

Rx Clocking is derived from the relevant clock selected in the Rx Clock selection menu.

Why should you consider the new Modem MultiMux™ ?

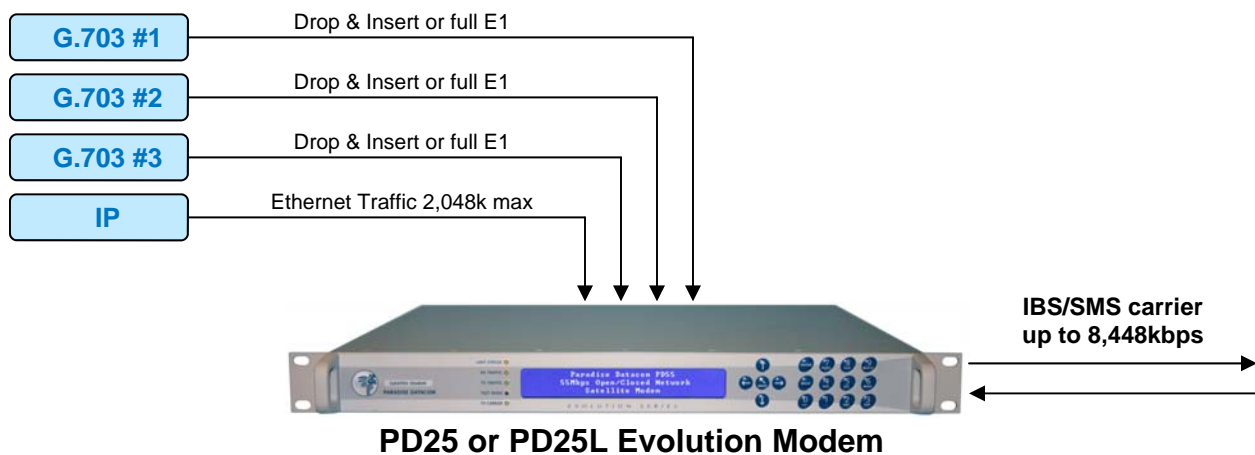
The Paradise Datacom MultiMux™ offers many benefits where different data services must be carried over satellite:

- ▶ A single composite datastream carrying diverse traffic types and diverse traffic formats requires just one modem at each site for a point-to-point link — **reduces modem count for no reduction in flexibility.**
- ▶ An RF power amplifier carrying a single carrier may be operated closer to saturation than an amplifier carrying multiple carriers — e.g. an SSPA with 2 x carriers must be backed off by 2.5dB more than a single carrier SSPA system (TWTAs require even more backoff!). An SSPA with 3 x carriers requires 3.5dB backoff. The single carrier benefit results in more useable power from a given RF amplifier, therefore requires a smaller RF amplifier than multi-carrier solutions.
- ▶ As a result of the above, both hub and remote costs are reduced — **results in more cost effective solutions for complex systems.**
- ▶ 1:1 Redundancy protection is available on the combined Modem MultiMux™ — **offers improved reliability for both the modem and multiplexer functions and the 1:1 redundancy controller is included free of charge in the modems.**
- ▶ More services can be carried simultaneously with no increase in system complexity — **expandable through software activated feature codes.**
- ▶ Less hardware means smaller equipment size and less weight — **makes the Modem MultiMux™ ideal for transportable and mobile systems.**
- ▶ Suitable for both Military and Commercial applications — **has uses in Battlefield Comms links, GSM over Satellite (particularly during migration to IP traffic), Distance Learning, Outside Broadcast Co-ordination, Disaster Recovery and more.**
- ▶ Offers more services to the user at minimal extra cost — **multiple traffic links are concentrated into a single carrier.**
- ▶ The MultiMux™ is an optional feature for Evolution Series Modems, which are available with IF or L-band interfaces, and the entire Modem family include free monitoring tools such as a Spectrum Analyser, Constellation Monitor, performance graphing versus time up to 1 month in duration, plus full Monitor & Control via Internet Explorer — **the modem plus MultiMux™ offers unique features which are both cost effective and easy to use...why buy a basic modem when an advanced modem is available with so much to offer ?**

Applications – GSM, Hybrid Services, Cost/Carrier-Reduction

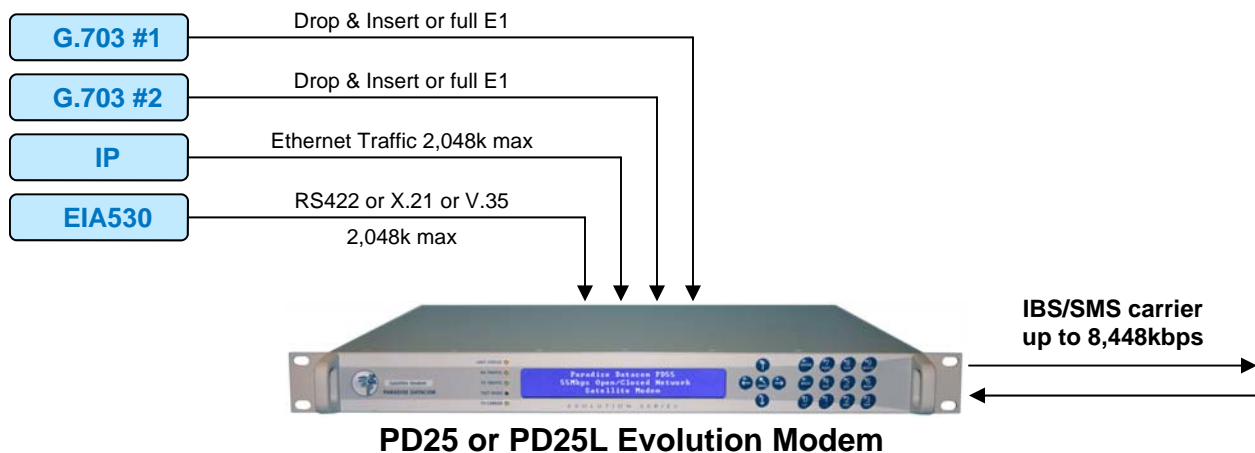
- ▶ GSM over satellite migration from G.703 telephony to IP traffic
- ▶ GSM over satellite mixed G.703 plus IP data services
- ▶ Mixed G.703 and VoIP telephony streams

Example of a GSM system during migration from G.703 to IP traffic



- ▶ G.703 Traffic plus multiple data services

Example of a hybrid G.703 plus data system



MultiMux™ — Summary of Features

MultiMux™ Traffic Interface Permutations
EIA530 + IP Traffic
EIA530 + IP Traffic + up to 2 x E1 or Partial E1 bearers
EIA530 + up to 3 x E1 or Partial E1 bearers
IP Traffic + up to 3 x E1 or Partial E1 bearers

**Multiple traffic streams
and traffic types
multiplexed into one carrier**



Quad E1 Mux Card

P3706 Quad E1 G.703 Mux card — Summary of Features

- ▶ Supports up to 4 x synchronous E1 G.703 balanced interfaces multiplexed to a single carrier
- ▶ Includes Drop & Insert function on port 1 as standard
- ▶ Can be configured as Drop & Insert or full E1 on any port
- ▶ Supports the Extended Drop & Insert function, provided this feature is in the host modem, catering for any number of timeslots 1 to 31
- ▶ Provides efficient use of satellite bandwidth by transmitting only revenue earning traffic
- ▶ Requires IBS/SMS option in the host modem
- ▶ Can be operated in stand-alone or 1:1 redundant configuration