



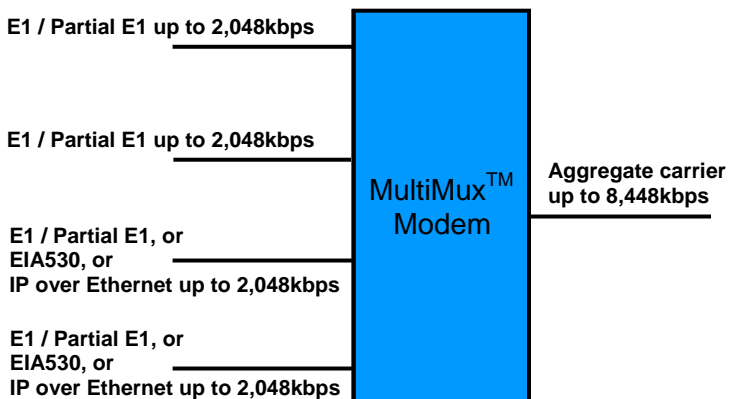
# Evolution Series MultiMux™ Data Multiplexer Option for all Evolution Modems

## 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™ ?

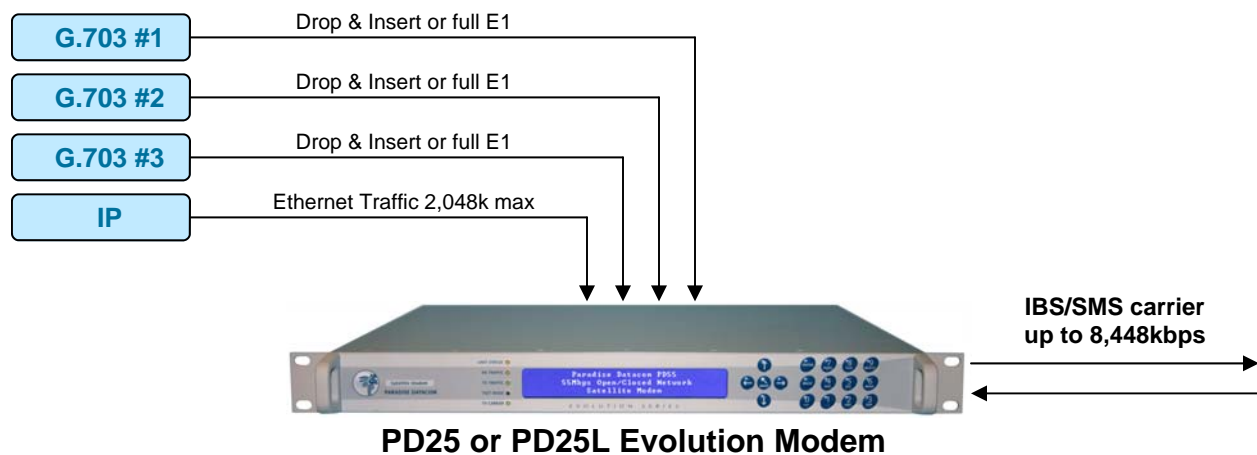
The Paradise Datacom MultiMux™ offers many benefits where different data services must be carried over satellite:

- ▶ 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

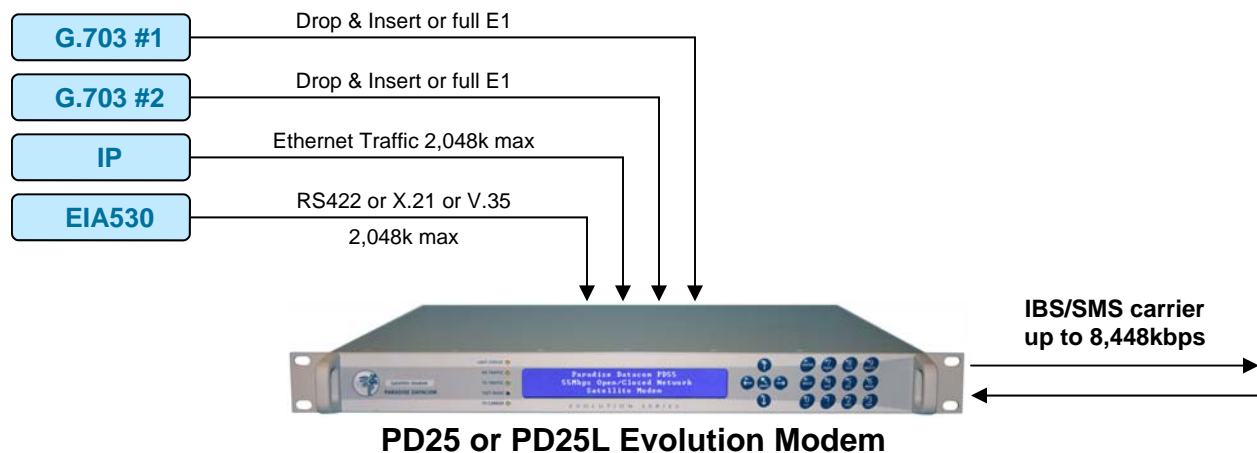
- ▶ GSM over satellite migration from G.703 telephony to IP traffic
- ▶ GSM over satellite mixed G.703 plus IP data services
- ▶ Mixed G.703 and VoIP telephony streams

### 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**



## 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