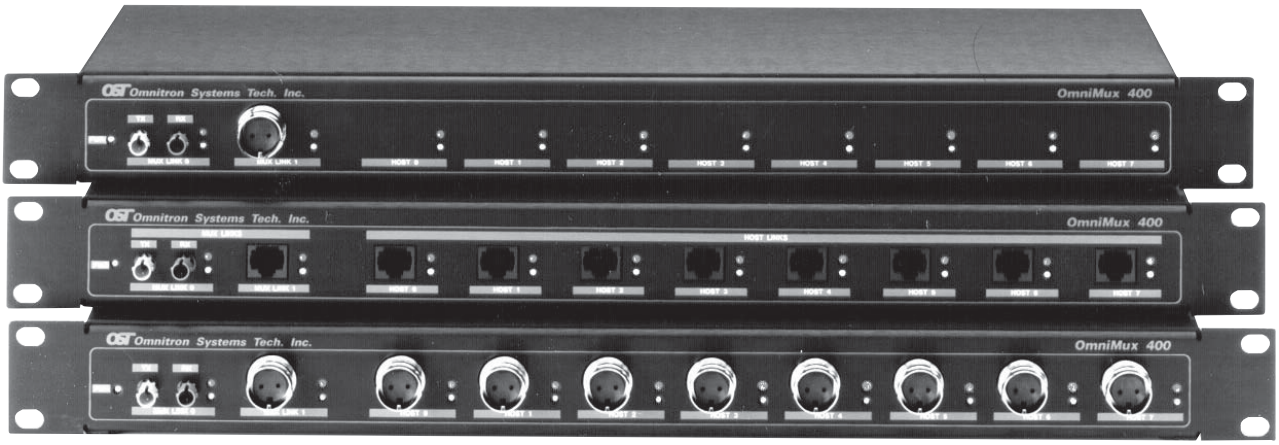
Omnitron Systems Technology, Inc.

OmniMux™ 400

AS400/3X 5250 and 5250 Express Multiplexer



FEATURES

- Twinax 5250 and 5250 Express compatible multiplexer that concentrates AS/400 or system 3X twinax cables and delivers them to distances up to 25,000 feet via a fiber pair, twisted pair or a single twinax.
- Seamlessly connects to IBM AS/400 and 3X local and remote twinax controllers and workstations.
- Operates with traditional twinax cabling or modern fiber and twisted pair wiring.
- Retiming repeater technology regenerates and reclocks data, eliminating clock jitter and noise.
- Digital Phase Locked Architecture provides acquisition of data rates of 1 Mbps for 5250 or 2 Mbps for 5250 Express (-2%, +4%), resulting in high immunity to noise and crosstalk.
- Twinax or RJ11/45 connectors and polarity controls provide easy installation and flexibility.
- Clear display and software independence make installation and monitoring intuitive and easy.

DESCRIPTION

The OmniMux™ 400 is an IBM compatible multiplexer that provides part or full local or remote 5250 and 5250 Express twinax controller connectivity to a distant location. It replaces up to eight AS/400 twinax cables with a single link. This link may be a twinax, twisted pair or a multimode or single-mode fiber pair. Optionally, the OmniMux can eliminate the twinax distribution box ("brick") and provide a direct single cable connection to the host controller, replacing all host controller twinax with a single DB25 cable. The OmniMux supports up to 56 addresses per link.

The OmniMux operates as a multiplexer (Mux), a demultiplexer (Demux), a demultiplexer-star (Demux-Star) or a star.

In the Mux and Demux modes, the OmniMux operates in pairs. On the host side, the Mux is connected to the local or remote controller's twinax connectors, concentrating their twinax ports into a single link. At the far end, the Demux recreates each host port. Each port behaves as the original host port it is recreating. It can connect to the distant workstations via twinax daisy chains, twisted pair star hubs, such as the OmniStar™, or via fiber to desk repeaters, such as the OmniRepeater™ FTD.

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In the Star mode, the OmniMux delivers twisted pair or twinax connectivity to the workstation while providing fiber connectivity back to the host end. The fiber conversion at the host end can be done using any OmniRepeater™ fiber converter.

The Demux-Star mode is used for multi-drop applications, when seven or less workstations at the far end are required. In this configuration, the OmniMux with an OmniMux XL multi-port mux supports the multi-drop requirement and allows a single host port to be selected for delivery to the far end.

The OmniMux utilizes a Digital Phase Locked Architecture (PLA). It facilitates data synchronization of data rate variations of up to -2% to +4%. It also facilitates a high degree of noise and crosstalk immunity. Each port is monitored and each data packet is analyzed for validity and errors. Noisy, shorted or open ports are automatically ignored and only valid data is processed. The retransmitted data is repeated, regenerated and reshaped; this ensures its reliable delivery to its destination.

The Express models operate with both the 5250 and 5250 Express protocols. Each port provides data rates of 1 Mbps for standard 5250 and 2 Mbps for 5250 Express protocol.

The host and workstations can be connected via twinax, RJ11/45 twisted pairs or a 25-pin DB25 cable. The twisted pair polarity control allows interface to different baluns.

Utilizing two links simultaneously provides a hot backup connection for fault tolerance in critical applications.

The OmniMux diagnostics detect and display true port activity and parity errors. Each port is monitored for valid frame header patterns, a detected pattern is displayed via a per-port green Activity LED. The data is analyzed for parity errors; a detected error is displayed via a per-port red Error LED. These features assist in installation and monitoring of the OmniMux operation.

The OmniMux 400 is completely software transparent and no setup or any changes are required.

OPERATION

Inputs: The OmniMux 400 is built around a Digital Phased Locked Architecture (PLA). It allows the independent monitoring and processing of data signals at each individual port, discriminating between true data and noise. A priority mechanism increases isolation between individual ports, reducing any crosstalk effect. The incoming Manchester encoded data is over-sampled at a rate of 16 samples per bit cell. This sampling rate is instrumental in the digital filtering of noise. A unique clock extraction technology facilitates the synchronization to data, with frequency variations of -2% to +4%.

Processing: Once the data has been recovered and synchronized, it is processed internally for validity. The processor analyzes the Frame Header, expecting at least 3 Sync bits followed by a Code Violation. When a legal Frame Header is detected, the port is "marked" active and the data is allowed to be retransmitted.

Outputs: The retransmitted data is fully regenerated and reclocked. Lost sync bits are restored, and the data is reclocked at a 50% duty cycle, eliminating any accumulated phase shift and clock jitter. The regenerated signal is restored to its nominal shape and amplitude and the pre-distortion logic compensates for anticipated phase shift and attenuation.

Displays: Per port true data activity and parity errors are displayed by green and red LEDs. The green activity LEDs assist in monitoring signal strength and polarity. The red Parity Error LEDs assist in monitoring connectivity quality, signal strength, impedance mismatches and reflections.

Auto Link Backup: Utilizing two links simultaneously provides link redundancy. The primary F/O link can be backed up by a "Standby" twinax or UTP link. Switching between the primary and secondary links is done automatically by the hardware. The Activity LEDs report the activity of each link.

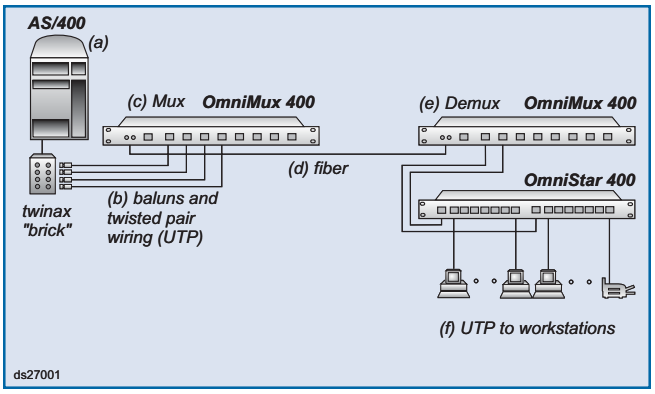
SAMPLE APPLICATIONS

The following illustrations depict several sample applications of the OmniMux 400:

Application 1. Standard Local Controller Extension

In this application, four AS/400 controller ports must be extended via fiber across a campus to a second building.

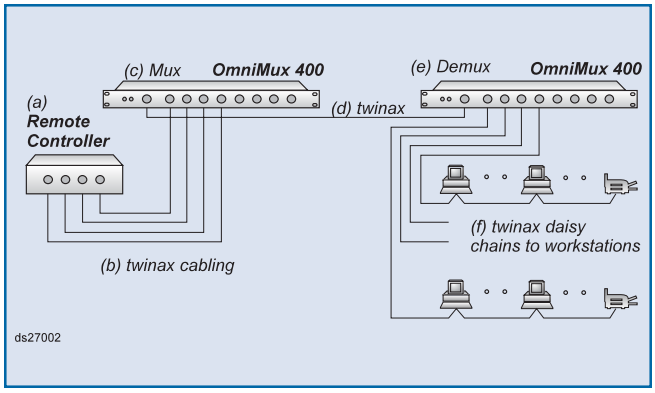
The host (a) is connected to the Mux (c) using baluns and UTP cabling (b). A fiber optic cable (d) connects to the Demux (e) which connects each port to a UTP star that provides UTP connectivity to each workstation (f).



Application 2. Remote Controller Extension

In this application an existing twinax cable, which is used to connect a single port with seven workstations, is being reused to increase the number of ports at a distant site to four and service up to 28 workstations. The workstations at the far end are to be connected via twinax.

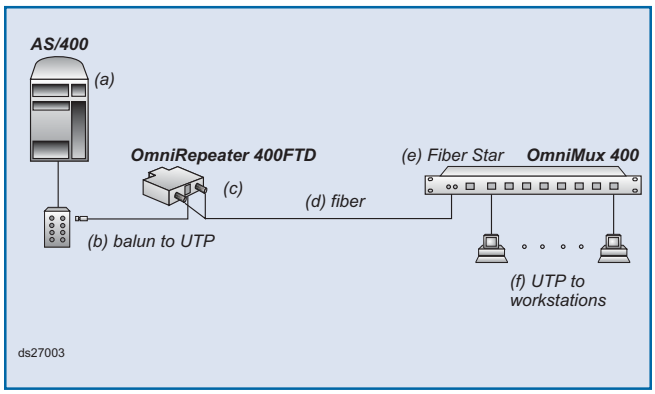
In this implementation, a 5494 type remote controller (a) is connecting the four twinax ports (b) to the Mux (c) which concentrates them onto the existing twinax link (d). The twinax link cable connects to the far end Demux (e) where the original ports are regenerated and provide connectivity to the 28 workstations. As required the workstations are connected via twinax directly from the Demux.



Application 3. The OmniMux As a Fiber Optic Star

In this example, a low-cost solution is desired for connecting a single AS/400 host port via fiber to a twisted pair distribution star.

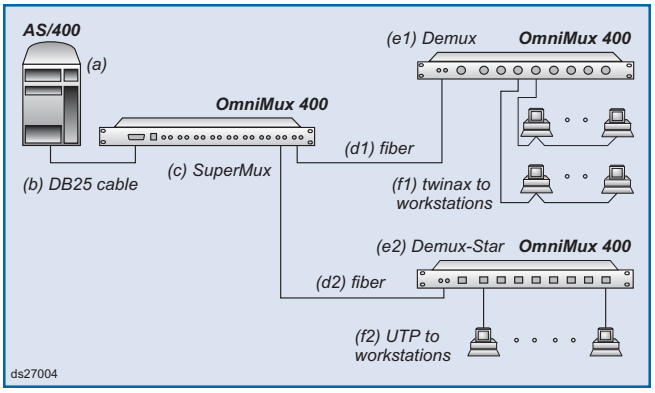
In the proposed implementation, the host (a) twinax port which originates at the local controller's distribution “brick” is converted into twisted pair via an impedance matching balun. The UTP wire is converted into fiber (d) using an OmniRepeater 400FTD (c). The fiber connects the far end OmniMux (e) which is operating in a fiber star mode and connects to each workstation (f) via UTP cables.



Application 4. Multi-Drop Demux-Star Layout

In this example, several buildings across a campus are required to be connected to the host via fiber. Some use one port with fewer than seven devices and others use multiple ports with more than seven devices.

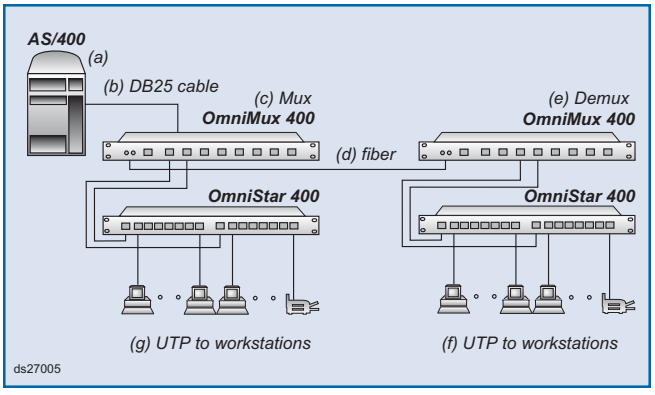
In this case an OmniMux 400XL (c) is connected via a DB25 (b) cable to the host (a) and provides the central fiber distribution point with each fiber link being able to connect any number of ports. The example shows one fiber (d1) connecting to a regular Demux (e1) with two ports connecting to its end workstations via twinax (f1) and a second fiber connecting to a Demux-Star (e2) servicing a single port directly from its UTP ports (f2).



Application 5. DB25 and Local Port Connectivity

In this case it is required to minimize twinax cabling at the host end and connect UTP workstations at the host and at the distant ends.

To minimize cabling, a single DB25 (b) cable replaces the "brick" and all twinax cables, and connects the host (a) to the Mux (c). The local workstations (g) are connected via a local star. The far end Demux (e) is connected via the fiber link (d) and the far end workstations (f) are connected to the Demux via a star. Note that the two stars use different host ports from their Muxes.



SPECIFICATIONS

- Protocol: IBM 5250 and 5250 Express for systems AS400 and 3X
- Devices Supported: All twinax IBM / compatible devices (terminals and printers)
- Interface:
  - Host/Device: Eight (8) Twinax or Eight (8) Twinax and DB25 or Eight (8) UTP or Eight (8) UTP and DB25
  - Mux Link: Fiber Optic (pair) and Twinax or Fiber Optic (pair) and UTP
- Mating Connectors Supported:
  - Fiber Optic: ST
  - Twinax: IBM 7362229 or equivalent
  - UTP: RJ11 pins 3-4 active or RJ45 pins 4-5 active
- Cable Types:
  - Fiber Optic: 50/125,62.5/125,100/140 um
  - Twinax: IBM 7362229 or equivalent
  - UTP: Level 3 (EIA/TIA 568): 24 AWG solid copper 100 +/- 15 ohms @ 1 Mhz 7.8 db per 1000 ft. @ 1.0 Mhz (shorter distance @ lower grade)
- Data Rate:
  - Standard 5250: 1 Mbps -2%, +4%
  - 5250 Express: 1 or 2 Mbps -2%, +4%
- Supported Distances:
  - Host/Device to Mux:
    - Twinax: 5,000 ft.
    - UTP: 3,000 ft.
    - DB25: 50 ft.
  - Mux to Mux:
    - Twinax: 5,000 ft.
    - UTP: 3,000 ft.
    - Multimode fiber: 15,000 ft.
    - Single-mode fiber: 30,000 ft.
- Indicators:
  - Power: Yellow LED (1)
  - Activity: Green LED (10)
  - Parity Error: Red LED (10)
- Physical features: Rackmounted
  - Dimensions: W:19.0”xD:6.0”xH:1.75”
  - Weight: 8 lbs.
- Power: 115 or 230 VAC, 150 mA
- Temperature:
  - Operating: 0 to 40 degrees C
  - Storage: -40 to 75 degrees C
- Humidity: Up to 90% (non condensing)

ORDERING INFORMATION

Standard 5250 Multimode Fiber	Standard 5250 Single-Mode Fiber	5250 Express Multimode Fiber	5250 Express Single-Mode Fiber	Description
2700		2740		8 Ports, RJ11/45 to F/O and RJ11/45
2701		2741		8 Ports, TWX to F/O and TWX
Models Discontinued as of January 2009				
	2720		2760	8 Ports, RJ11/45 to F/O and RJ11/45
	2721		2761	8 Ports, TWX to F/O and TWX
2702	2722	2742	2762	4 Ports, RJ11/45 to F/O and RJ11/45
2703	2723	2743	2763	4 Ports, TWX to F/O and TWX
2704	2724	2744	2764	2 Ports, RJ11/45 to F/O and RJ11/45
2705	2725	2745	2765	2 Ports, TWX to F/O and TWX
2710	2730	2746	2766	8 Ports, RJ11/45 and DB25 to F/O and RJ11/45
2711	2731	2747	2767	8 Ports, TWX and DB25 to F/O and TWX
2750	2771	2748	2768	8 Ports, DB25 to F/O and TWX
9100-DB25-30				DB25 Cable, 30 feet

Legend

TWX = Twinax, F/O = Fiber Optic

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