SPECIFICATIONS

- **Protocol:** IBM 5250 and 5250 Express for Systems AS/400 and 3X
- **Terminals Supported:** 3179, 3180, 3196, 3197, 3476, 3477, 5250, 5251, 5291, 5292 and compatibles
- **Printers Supported:** 3262, 3812, 4214, 4224, 4234, 5219, 5224,5225, 5226, 5262 and compatibles

- **Interface (per each star):**
- **Host:** One (1) Twinax and/or One (1) RJ45/RJ11
- **Devices:** Seven (7) RJ45/RJ11
- **Mating Connectors Supported:**
    - **Twinax:** IBM 7362229 or Equivalent
    - **UTP:** RJ45 pins 4-5 active or RJ11 pins 3-4 active
- **Cable Types:**
- **Twinax:** IBM 7362229 or Equivalent
- **UTP:** Level 3 (EIA/TIA 568): 24 AWG solid copper 100 +/- 15 ohms @ 1.0 MHz 7.8 db per 1,000 ft. @ 1.0 MHz. (Lower grade wiring supported at shorter distances)

- **Data Rate:**
    - **Standard 5250:** 1 Mbps -2%, +4%
    - **5250 Express:** 1 or 2 Mbps -2%, +4%
- **Supported Distances:**
    - **Host to Star (Twinax):** 5,000 ft.
    - **Host to Star (Level 3 UTP):** 3,000 ft.
    - **Star to Device (Level 3 UTP):** 3,000 ft.
    - **Star to Device (Level 3 UTP):** 3,000 ft.
- **Indicators (two per enclosure):**
    - **Power:** Yellow LED (1)
    - **Activity:** Green LED (9)
    - **Parity Error:** Red LED (1)
- **Physical Dimensions:**
    - **Dual:**
        - **Rackmount:** W:19.0"xD:6.0"xH:1.75"
        - **Tabletop:** W:17.5"xD:6.0"xH:1.75"
    - **Single:**
        - **Tabletop:** W:8.0"xD:6.0"xH:1.75"
- **Weight:**
    - **Double:** 3 lbs.
    - **Single:** 1.5 lbs.
- **Power:** 115 or 230 VAC, 150 mA
- **Temperature:**
- **Operating:** 0° to 40°C
- **Storage:** -40° to 75°C
    - **Humidity:** Up to 90% (non-condensing)

TECHNICAL SUPPORT

For assistance in installing this product, contact Omnitron's Technical Support Department.

Phone: (949) 250-6510
Fax: (949) 250-6514
Address: Omnitron Systems Technology, Inc.
            27 Mauchly #201
            Irvine, CA 92618, USA
Email: support@omnitron-systems.com
URL: www.omnitron-systems.com

OST **Omnitron Systems Technology, Inc.**

OmniStar™ 400

AS400/3X 5250 and 5250 Express Star/Repeater

User's Manual

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SAFETY CONSIDERATIONS

Warning

The instructions in this User's Manual are for use by qualified personnel only. To avoid electrical shock, do not perform any servicing of this unit or its accessories (such as power units) other than that contained in the operating instructions, unless you are qualified and certified to do so by Omnitron Systems Technology, Inc.

Caution

All user-required operations can be performed without ever opening the unit's cover. Never attempt to open or remove the unit's cover or tamper with its power units (other than plugging and unplugging them as specified in the operating instructions).

Line Voltage

Before Connecting the Power units to the line voltage, make sure that the voltage of the power source (wall outlet) matches the voltage specified on the power units.

Warranty

This **OST** product is warranted to the original purchaser against defects in material and workmanship for a period of **TWO YEARS** from the date of shipment. This warranty period may be extended to **LIFETIME** by the original purchaser if the product is **REGISTERED** with **OST** within 90 days from the date of shipment. TO REGISTER, PLEASE COMPLETE AND MAIL OR FAX BACK THE REGISTRATION CARD. During the warranty period, **OST** will, at its option, repair or replace a product which is proven to be defective.

For warranty service/repair, the product must be sent to an **OST** designated repair facility, shipment prepaid by the Buyer. **OST** will pay postage/shipping charges to return the product to Buyer (using **OST**'s standard shipping method).

Limitation of Warranty

The foregoing warranty shall not apply to defects resulting from improper or inadequate use and/or maintenance of the equipment by Buyer, Buyer-supplied equipment, Buyer-supplied interfacing, unauthorized modifications or tampering with equipment (including removal of equipment cover by personnel not specifically authorized and certified by **OST**), misuse, operating outside the environmental specification of the product (including but not limited to voltage, ambient temperature, radiation, unusual dust, etc.), or improper site preparation or maintenance.

No other warranty is expressed or implied. **OST** specifically disclaims the implied warranties of merchantability and fitness for any particular purpose.

Exclusive Remedies

The remedies provided herein are the Buyer's sole and exclusive remedies. **OST** shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any legal theory.

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CONNECTING THE HOST SIDE

Twinax

When utilizing a twinax host connection, the host link polarity is not important. The standard IBM twinax cable should be connected to the back of one of the star units while observing and monitoring the host's link 1 activity green LED for at least 10 seconds. The LED blink indicates that the host is attempting to poll the devices connected to it and that the wire quality is adequate.

If no LED is blinking within 10 seconds, that might indicate a faulty or mis-wired cable, or too long a cable run. If the red LED blinks, that might indicate an impedance mismatch (too many twinax segments, poor cable quality), or too long a distance.

UTP

When utilizing a UTP host connection, the host link polarity control switch should be set first in order to accommodate the host side balun polarity. This is accomplished by connecting the RJ connector to the host link 0 jack and monitoring its activity green LED for at least 10 seconds. The LED blink indicates that the host is attempting to poll the devices connected to it and that the polarity is correct. If no LED blinking is observed, the switch should be toggled and the LED observation repeated.

If still no LED blinking is observed within 10 seconds, that might indicate a faulty or mis-wired cable, too long a cable run, or an incompatible balun. If the red LED blinks, that might indicate either an impedance mismatch (non-level 3 wiring), or too long a distance.

DEVICE PORTS

UTP

Once the host polarity is established and the host is blinking, any device side port can be connected.

An RJ45/RJ11 cable should be connected to any desired device port jack. A terminal or an appropriate twinax device should be connected on its remote side. The device should be powered and configured to respond to twinax communication (this is specifically important for PC based twinax emulators).

Once the cable is connected on both ends, and the twinax device is powered and configured properly, the appropriate green activity light should be lit. If after approximately 15-20 seconds, and after the host LED blinking has been observed and there is no immediate blink on the connected device LED, the device polarity switch should be toggled.

The observation process should be repeated. Once both LED's are blinking (host and device), a connection has been made.

If still no LED blinking is observed within 20 seconds, that might indicate a faulty or mis-wired cable, too long a cable run, or an incompatible balun. If the red LED blinks, that might indicate either an impedance mismatch (non-level 3 wiring), or too long a distance.

Once a device has been connected, the process should be repeated for other devices. It should be noted that once a Device Port polarity has been established, all device baluns must use the same polarity (only one control per star).
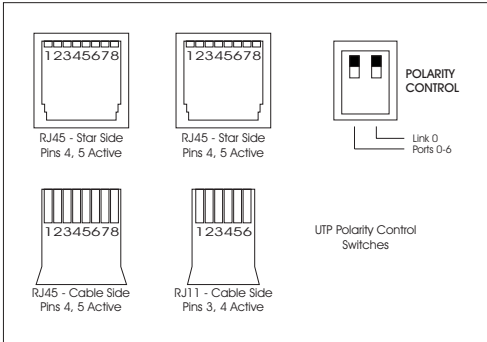
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Figure 1 Host and Device side connections

Baluns

All UTP impedance must meet the level 3/twinax impedance specification. The polarity is not important. The active signals must be 4, 5 when using RJ45 and 3, 4 when using RJ11.

Mounting

Secure the OmniStar main chassis to either a flat surface (if tabletop) or to a standard 19" rack if Rack-mountable.

Power-up

In order to minimize the possibility of accidental power shut off to the OmniStar 400, no power switch has been designed into the product. Special care must be taken when applying power to the OmniStar unit.

WARNING
The OmniStar unit does not have a power switch, so extra care must be taken in powering the unit. Always plug the Power Adapter into the back of the Star unit first. This is in order to prevent damage to the Star unit and prevent potential shorts, sparks, and fire hazards.

Verify that the power supply voltage (by reading the label on each power adapter unit) is consistent with the facility's line voltage (115/230 volts), and that the Power Adapter plug fits in the outlet.

Plug each Power Adapter's cable connector to the appropriate matching connector in the back of the OmniStar Unit.

Plug the (left in dual stars) Power Adapter into the wall outlet. Observe that all LED's in the powered section light for approximately 0.5 seconds. After 0.5 seconds, all extinguish except the yellow power LED; It stays On.

If dual star, repeat operation with the right star Power Adapter unit.

OmniStar™ 400
AS400/3X 5250 and
5250 Express Star/Repeater

User's Manual

GENERAL DESCRIPTION

The OmniStar 400 is a third generation IBM 5250 and 5250 Express compatible active Star/Repeater. It connects up to 14 IBM twinax-type terminals or PCs (equipped with twinax emulation hardware) to an IBM AS/400 or System 34/36/38 computer via unshielded twisted pair (UTP) wire. This User's Manual Describes the following models:

STANDARD MODEL	EXPRESS MODEL	DESCRIPTION
2500	2560	Single, Half size tabletop
2501	2561	Dual, Dual Power Supply, Stackable
2503	2563	Dual, Dual Power Supply, Rack-mountable
2506	2566	Single (Upgradeable to Dual), Stackable
2507	2567	Single (Upgradeable to Dual), Rack-mountable
2508	2568	Dual, Stackable, Rack-mountable
2509	2569	Dual, Rack-mountable
2510	2570	Single Upgrade Kit (2510 for models 2506, 2507; 2570 for models 2566, 2567)

The OmniStar 400 is capable of reliably locking and maintaining synchronization with data rate variations of -2% to +4%. It features Digital Phase Locking Architecture. This architecture facilitates a highly reliable noise immune operation. It allows the OmniStar not only to reliably synchronize and lock to legitimate data frames, but also to discriminate and ignore any open, shorted or noisy inputs (induced or crosstalk). This makes the OmniStar 400 a reliable solution in environments where high availability and low maintenance are important.

The Host interface facilitates a standard Host Controller Twinax cable/connector or alternatively an Unshielded Twisted Pair (UTP) Level 3 wiring with RJ45/RJ11 (user selectable) connector. Both interfaces are provided as standard and are user selectable. The OmniStar 400 supports Host to Star distances of 5000/3000 ft. when using Twinax/UTP respectively. It supports Star to Device distances of 3000 ft. when using UTP.

For critical applications which require Host Link redundancy, a Hot Backup Host Link may be configured to provide increased connection availability.

The OmniStar's Diagnostic features make it easy to install and maintain. It detects

and displays true port activity and true data parity errors. This is accomplished by individual port monitoring and searching for legal sync and frame header patterns. Upon the detection of a valid frame pattern, a per port green LED indicator displays the detected activity. This feature assists in installation and in the selection of correct polarity Baluns. The active port data is analyzed for correct parity and the detection of a parity error is indicated by a red LED. This feature facilitates the continuous monitoring of signal and line quality.

Host and Device ports support polarity configuration. This facilitates the usage of different Balun types. Exploiting the Data Frame Regeneration and Sync Bits Reconstruction facilitates the cascading of the OmniStar 400 for complex site configurations. The OmniStar 400 supports cascading of up to four (4) stars. This powerful feature is very useful in scattered terminal environments.

OPERATION

Inputs

The OmniStar 400 is built around the Digital Phase Locking Architecture. This allows monitoring and processing of data signals at each individual port, thus discriminating between true data and noise. A Priority mechanism further increases the isolation between individual ports, thus reducing the crosstalk effect. The incoming Manchester encoded data is oversampled 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 utilizing dual Clock Oscillators facilitates the synchronization and frequency locking within - 2% and + 4% of the reference frequency.

Processing

Once the data has been recovered and synchronized, it is processed internally for verification of legitimacy. The Processor analyzes the Frame Header and expects at least 3 sync bits followed by a Code Violation. When legal Frame Header is detected, the port is "declared" Active and the Data Frame is accepted for retransmission.

Outputs

The retransmitted Data Frame is fully regenerated and reclocked. Any lost sync bits are regenerated; and the data is reclocked at a 50% duty cycle, thus completely eliminating the effect of any accumulated phase shift or jitter. The regenerated signal amplitude is restored to its nominal value and the pre-distortion logic pre-compensates for anticipated Phase shift and attenuation.

Displays

As indicated earlier, the true data signal activity is being displayed by a per port green LED. The data parity errors are displayed by a red LED. While the Activity LED assists in detecting connectivity, signal strength and polarity inversion problems, the Error LED assists in detecting connectivity quality, signal strength, impedance mismatches, discontinuities and signal reflection problems. As such, these two indicators help in the installation and maintenance of the star.

Auto Link Backup

Utilizing the two Host ports (Twinax/UTP), a full link redundancy architecture can be implemented. The Twinax Primary port can be backed up by the standby UTP Secondary port. When the Primary port communication is lost or quality is degraded

beyond recovery, the UTP Host port is switched in automatically. When the Primary port functionality is restored, the circuit switches back automatically to the Twinax port. The activity LED's for both ports report the activity in the Primary and Secondary ports and report of Primary port failure and Secondary port engagement.

INSTALLATION

Unpacking

a. Visual Inspection – Before unpacking, a visual inspection should be conducted in order to detect any physical damage to the equipment. Any evidence of damage should be noted and reported immediately.

b. Unpacking – Place shipping container on a flat surface, cut straps or tape, open top. Take out each item carefully and place securely on a clean flat surface. Return all packing material into a container (foam, boxes, etc.), close and store away for future reuse.

c. Inspection – Inspect each item for any apparent damage, any evidence of damage should be noted and reported immediately.

d. Content – Review the content; the following items should be included:

> Models: 2500, 2506, 2507, 2508, 2509, 2560, 2566, 2567, 2568, 2569
> (a) OmniStar 400 Unit
> (b) One (1) Power Unit
> (c) User Manual (this document)
>
> Models: 2501, 2503, 2561, 2563
> (a) OmniStar 400 Unit
> (b) Two (2) Power Units
> (c) User Manual (this document)

Please note any missing items or discrepancies and report them immediately.

SITE REQUIREMENTS

Power

A power outlet 115 volts/60 Hz (230 volts/50 Hz) should be available within 5 ft. of the unit.

Cabling

The OmniStar can accommodate twinax or unshielded twisted pair (UTP) wiring. The UTP wiring must be a level 3 type as a minimum in order to maximize the equipment's performance (100 +/- 15 ohms, 24 AWG solid copper, 7.8 db per 1,000 ft. @ 1MHz attenuation or better). Lower grade wiring will operate with downgraded performance.

a. Host Side - The OmniStar 400 accommodates both a standard IBM twinax connection as well as an RJ45 (pins 4, 5) or RJ11 (pins 3, 4) connection. The polarity of the balun is not important since the OmniStar supports polarity control on the Host UTP Link.

b. Device Side – The OmniStar 400 accommodates an RJ45 (pins 4, 5) or RJ11 (pins 3, 4). The active signals must be 4, 5 when using RJ45 and 3, 4 when using RJ11. The polarity of the balun is not important, however, all baluns must be of the same polarity since there is only one polarity control switch for all device ports in each Star.