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01 Address translation in a mixed network

System purpose

The Address Translation Station gives existing I/A Series Nodebus stations a communication path to The Mesh control network. Traffic travels transparently in both directions, so Nodebus stations do not require software changes simply to use this forwarding path.

Logical communication path

01	A station sends traffic over its 10 Mbps Nodebus.
02	The ATS forwards the traffic across the Nodebus-to-Mesh boundary.
03	A 100 Mbps full-duplex link carries ATS traffic to a Mesh Ethernet switch.
04	The destination Mesh station receives the forwarded communication.

Architectural uses

Expansion
Add FCP270 or ZCP270 control stations to an existing Nodebus system.

Backbone migration
Use Mesh communication as the backbone between nodes replacing Carrierband LI connections.

Mixed stations
Exchange data between retained Nodebus stations and Mesh control-network stations.

Redundant bridge
Fit paired ATS modules to provide primary and backup responsibilities.

The ATS remains a bridge

The station forwards communication rather than acting as a replacement for each attached controller. Controller applications, the Nodebus station inventory and the Mesh host relationship remain separate parts of the system design.

Identify the full migration scope

Moving a backbone connection does not automatically migrate boot hosting or remove every existing LI. The actual arrangement of each node determines the ATS mode and the functions retained elsewhere.

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02 Transmission and capacity limits

Communication ratings

Parameter	Rating
Nodebus transmission rate	10 Mbps; CSMA/CD
ATS-to-switch rate	100 Mbps; full duplex
Maximum packet throughput	1000 packets/s
Nodebus station limit	63 stations per ATS
Mesh network station limit	1920 combined Nodebus and Mesh stations
Redundant module changeover	Less than 1 s

Rates belong to different links

Rate	Applicable segment
10 Mbps	ATS to I/A Series Nodebus stations
100 Mbps full duplex	ATS to Fast Ethernet switch
1 Gbps	Interswitch communication in the Mesh architecture

Station limits are hierarchical

The 63-station value applies to the Nodebus served by an ATS. The 1920-station value covers the combined control network, including Nodebus and Mesh stations. Multiplying local limits does not by itself establish an acceptable network design.

Throughput is not cable speed

Packet throughput and physical link speed describe different constraints. A 100 Mbps link does not remove the ATS processing limit of 1000 packets per second. Plan the traffic and station population together.

Changeover is a pair characteristic

The less-than-one-second switching value applies to redundant ATS modules. It does not specify the recovery time of every host, application, switch route or attached process function.

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03 Operating modes and hosting boundary

Mode behavior

Mode	Selection condition	Network effect
LAN Interface mode	No LI on the same node	The ATS acts as the node LAN Interface.
Nodebus extender mode	LI remains on the same node	Mesh stations appear local to the Nodebus stations.

Supported services

Service	Behavior
Transparent forwarding	Nodebus-to-Mesh and Mesh-to-Nodebus traffic
Interprocess communication	Compound and block parameter data
ATS hosting	A Mesh-connected workstation is required
Nodebus boot hosting from Mesh	Not supported

Soft letterbug identity

The I/A Series Letterbug Configurator assigns the ATS soft letterbug through infrared communication. The same configurator can read the letterbug or hardware ID, allowing the module identity to be checked independently of application communication.

One Mesh network boundary

A multi-node I/A Series system connects to only one Mesh control network. The presence of several ATS modules must not be interpreted as permission to connect that system to several independent Mesh networks.

Forwarding without Nodebus software changes

The ATS transparently forwards traffic on behalf of the existing stations. This forwarding property does not eliminate the need to define the host workstation, physical topology and station identities correctly.

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04 Interfaces, supply and environment

Physical network interfaces

Interface characteristic	Value
Optical connector	LC
Optical cable	62.5/125 µm multimode fiber
Maximum switch-to-ATS fiber distance	2 km
Copper connector	RJ-45
Copper cable	Shielded copper
Maximum switch-to-ATS copper distance	100 m

Electrical and environmental envelope

Parameter	Value
Typical supply voltage	39 V DC
Maximum power per module	15 W
Operating temperature	0 to +60 °C
Storage temperature	-40 to +70 °C
Relative humidity	5–95%, noncondensing
Operating altitude	-300 to +3000 m
Storage altitude	-300 to +12000 m
Vibration	0.5 g; 5–500 Hz

Installation conditions act together

Assess temperature, humidity and vibration together. The enclosure can modify the environmental range applicable to the assembled installation.

Supply planning example

A pair of 15 W modules contributes a calculated 30 W maximum load, excluding switches and other station equipment.

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05 Reliability and diagnostic interpretation

Health monitoring mechanisms

Mechanism	Role
Power-up	Internal self-checking
During operation	Run-time checks and watchdog timer
Pair coordination	Network and local-interlink health/state exchange
Automatic takeover	Backup assumes primary responsibility after loss of the primary healthy indication

LED observation domains

ATS status
Module operational state.

Ethernet A
Communication activity on the A control-network link.

Ethernet B
Communication activity on the B control-network link.

Nodebus
Communication activity toward the I/A Series node.

Independent paths require independent observation

A module may continue communicating through a surviving route while the redundant route is unavailable. Evaluate both physical links and the partner state before treating the installation as fully redundant.

Data availability is the final functional result

Local diagnostics help locate a problem, but the intended stations must still exchange the required data. Distinguish a physical-link indication, a healthy module, a working redundant pair and successful application communication.

Explore other Foxboro catalogue pages

Foxboro AD908AA FBM201

Foxboro FBI10E P0972AJ

Technical basis

Foxboro PSS 21H-1C4 B3, Address Translation Station, August 2007, pp. 1–7.