General Electric IS420ESWBH3A

01 Scope and system boundary

Installed function

General Electric IS420ESWBH3A is an unmanaged Mark VIe IONet switch with sixteen 10/100Base-TX RJ45 copper ports and no fiber ports. An unmanaged switch forwards Ethernet frames without a per-port management configuration workflow. Its physical wiring and the surrounding control-network design therefore carry the essential network identity. Port LEDs help localize faults but do not replace controller diagnostics.

Functional sequence

01	A controller or I/O device transmits an Ethernet frame through an RJ45 copper link.
02	The switch learns source MAC addresses and buffers incoming traffic.
03	Frames are forwarded to the relevant port or ports.
04	Receiving control equipment interprets the data according to the IONet configuration.

Before work starts

Check	Technical purpose
Capture the port map	Identify every controller and I/O connection before removal. Label both ends of each cable so that physical port changes do not obscure the intended network assignment.
Identify the hardware	Verify the ESWB sixteen-port form and the H3A copper-only configuration. A switch with fiber ports is a different hardware option even when its enclosure appears similar.

Isolation and handling

Check link indication separately from end-to-end IONet communication. A lit Ethernet link confirms the physical connection but does not prove that the controller is exchanging valid data with the intended I/O equipment.

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02 Connections and readiness

Interface preparation

Interface	Function	Check
Sixteen copper ports	Ethernet frame exchange	No direct optical connection on H3A.
TB1	First DC supply path	Check independently from TB2.
TB2	Second DC supply path	Provides the other diode-ORed feed.
Port LEDs	Physical link diagnostics	Separate physical-link checks from control data validation.
Rail attachment	Mechanical support	Use the ESWB orientation-specific clip.

Engineering considerations

The 1 A maximum input requirement applies to the switch power design. Two supply terminals provide independent feed paths rather than two separate network channels. A redundant electrical supply does not create a redundant Ethernet topology; the network must retain the architecture designed for the control system.

Relevant setup data

Item	Value or condition
Parallel DIN-rail clip	259B2451BVP1
Perpendicular DIN-rail clip	259B2451BVP4
Power indication	Dedicated power-status LED
Per-port indication	Link, activity, duplex and speed

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03 Installation and replacement

Execution details

Stage	Action and reason
Capture the port map	Identify every controller and I/O connection before removal. Label both ends of each cable so that physical port changes do not obscure the intended network assignment.
Identify the hardware	Verify the ESWB sixteen-port form and the H3A copper-only configuration. A switch with fiber ports is a different hardware option even when its enclosure appears similar.
Prepare the rail attachment	Select 259B2451BVP1 for a long edge parallel to the DIN rail or 259B2451BVP4 for a perpendicular orientation. Ensure the attachment supports the installed cable loading.
Connect the DC sources	With both sources isolated, wire TB1 and TB2 to their intended 24/28 V feeds. Confirm polarity and source identity before energizing either path.
Restore the copper links	Use Cat 5e UTP with RJ45 connectors. Reconnect each labeled cable, check latch engagement and route the cable so that the plug is not under side load.
Establish physical links	Observe power status and the two-color indicators for each occupied port. Confirm the expected speed and duplex behavior with the attached equipment.
Prove supply redundancy	Where dual feeds are part of the installation, test each source independently under the approved procedure. Verify stable network operation without relying only on the presence of two wires.
Prove IONet operation	Check the controller’s I/O communication status and the intended process signals. Restore the plant only after network-level and functional checks have passed.

Before energization

Identify all copper cable destinations before disconnecting the existing switch. Confirm the replacement is the H3A configuration with no fiber interfaces. Isolate both DC power feeds before wiring the power connectors. Use the correct ESWB mounting clip for the selected rail orientation.

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04 Commissioning and fault isolation

Functional acceptance

Test	Action	Expected result
Copper link	Check every occupied port indicator	Expected link and negotiation state are present.
Power path	Test each intended feed separately	The switch remains powered through the available path.
Control communication	Review controller I/O status and representative signals	The intended I/O data is exchanged without network faults.

Interpret the symptom

Observation	Investigation	Decision boundary
No link on one port	Inspect cable, latch and remote-device power	Repair the physical path before investigating IONet data.
Link present but no valid I/O	Compare cable destination and controller diagnostics	Resolve network assignment or endpoint issues.
Loss when one feed is removed	Measure the remaining source at its terminal	Correct the independent supply path before declaring redundancy.

Acceptance limits

Parameter	Required condition
Copper Ethernet ports	16 × RJ45, 10/100Base-TX
Fiber ports	0
Switch management	Unmanaged
Link negotiation	10/100 Mbps; full/half duplex

Controlled return to service

Retain the final port-to-device map, selected mounting orientation and both supply-path test results. Confirm that temporary test leads are removed and all controller I/O communication indications are normal.

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05 Technical checks and handover

Questions that affect the work

Must a crossover cable be selected for an IS420ESWBH3A copper connection?
The switch supports HP-MDIX automatic sensing and uses Cat 5e UTP cables with RJ45 connectors. Verify the negotiated link after making the connection.

Which link characteristics can IS420ESWBH3A negotiate automatically?
The copper interfaces negotiate 10 or 100 Mbps and full or half duplex. Connected equipment must establish a compatible operating mode.

Final checks

Check	Requirement
1	Route Cat 5e UTP cables without stressing the RJ45 connectors.
2	Keep convection paths clear and assess the actual local ambient temperature.
3	Verify each supply input independently where redundant power is used.
4	Confirm port status and controller-to-I/O communication before returning control.

Related catalogue pages

General Electric IS420UCSBH1A

General Electric IS200TDBTH2ACD

General Electric IS400JPDHG1A

Technical basis

GEI-100869A, Mark VIe Industrial Ethernet / IONet Switches Summary Sheet, July 2019; GFT-870 switch specifications.