General Electric IS420ESWBH3A

01 Product architecture

Product role

General Electric IS420ESWBH3A is an unmanaged Mark VIe IONet switch with sixteen 10/100Base-TX RJ45 copper ports and no fiber ports.

Operating context

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.

Additional engineering 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
Environmental coating class	G3 compliant
Functional-safety role	Non-interfering network component

Key capabilities

Capability 1
Negotiates 10/100 Mbps speed and full/half duplex on copper links.

Capability 2
Supports HP-MDIX automatic crossover sensing.

Capability 3
Accepts two independent DC sources through diode-ORed power inputs.

Capability 4
Displays per-port link, activity, duplex and speed status.

System integration

The switch is convection cooled and mounts with an orientation-specific DIN-rail clip. Network connections should retain their assigned IONet topology, while separate power feeds should be checked independently during commissioning.

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02 Technical data and interfaces

Principal technical data

Parameter	Value
Copper Ethernet ports	16 × RJ45, 10/100Base-TX
Fiber ports	0
Switch management	Unmanaged
Link negotiation	10/100 Mbps; full/half duplex
Automatic crossover	HP-MDIX
Ethernet compatibility	IEEE 802.3, 802.3u, 802.3x
Power input	24/28 V DC, 1 A maximum
Redundant feeds	TB1 and TB2, diode-ORed
Minimum packet buffer	256 KB
MAC address capacity	4 K
Copper cable	Cat 5e UTP, RJ45 (8P8C)
Cooling	Natural convection
Operating temperature	−40–70 °C
Storage temperature	−40–85 °C
Mounting	DIN rail, separate orientation-specific clip

How to apply these data

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.

Technical basis

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

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03 Integration and application

Interface map

Interface	Purpose	Engineering note
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.

Application contexts

Mark VIe IONet
Provides the Ethernet switching path within an engineered controller-to-I/O network.

Copper-only panels
Concentrates sixteen RJ45 connections where no optical uplink is required.

Redundant DC arrangements
Accepts two independent supply paths through separate terminal inputs.

Industrial cabinet networking
Uses convection cooling and DIN-rail mounting for installation in a control cabinet.

Integration constraint

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.

Commissioning record

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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04 Engineering decisions

Diagnostic decisions

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.

Product precautions

01
Identify all copper cable destinations before disconnecting the existing switch.

02
Confirm the replacement is the H3A configuration with no fiber interfaces.

03
Isolate both DC power feeds before wiring the power connectors.

04
Use the correct ESWB mounting clip for the selected rail orientation.

05
Route Cat 5e UTP cables without stressing the RJ45 connectors.

06
Keep convection paths clear and assess the actual local ambient temperature.

07
Verify each supply input independently where redundant power is used.

08
Confirm port status and controller-to-I/O communication before returning control.

Important notice

Confirm that the installation requires copper-only H3A hardware. Preserve every network assignment and verify communication after reconnecting the switch.

Related catalogue pages

General Electric IS420UCSBH1A

General Electric IS200TDBTH2ACD

General Electric IS400JPDHG1A

General Electric IS420ESWBH3A

05 Questions and functional acceptance

Product-specific engineering questions

Does IS420ESWBH3A include a fiber uplink?
No. The H3A configuration has sixteen 10/100Base-TX copper RJ45 ports and no fiber ports. A fiber cable cannot be connected directly to this version.

How do the two power terminals on IS420ESWBH3A provide redundancy?
TB1 and TB2 accept independent DC sources that are diode-ORed internally. Each source path should be verified separately when redundant power is required.

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.

What can the port LEDs on IS420ESWBH3A reveal during fault isolation?
The two-color port indicators show link presence, activity, duplex and speed. Compare the indication with the expected connected device before investigating higher-level communication.

Why does DIN-rail orientation affect the mounting clip for IS420ESWBH3A?
The ESWB form uses clip 259B2451BVP1 when its long edge is parallel to the rail and clip 259B2451BVP4 when perpendicular. The clip is ordered separately.

How much packet buffering and address storage does IS420ESWBH3A provide?
The switch provides a minimum 256 KB packet buffer and supports 4 K MAC addresses. These resources support Ethernet frame forwarding within the network.

Is forced-air cooling required by the IS420ESWBH3A design?
The switch uses natural convection and is rated for −40 to 70 °C ambient operation. Installation must preserve airflow and avoid local heating that exceeds this limit.

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.