

# REASON H49

## All in one HSR/PRP Gigabit Redundancy Solution

Substation Ethernet network redundancy is key to achieve protection and automation system availability in case of a single failure. In the past, network redundancy was achieved with the RSTP protocol, which recovery time in case of failure can be as high as 5 ms per participating switch, leading to potential loss of traffic.

In the early 2000's, GE Vernova's H35 and H36 innovative redundant switch range brought 0 ms recovery time protocols to the market and later the IEC 62439-3 Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR) protocols were introduced across GE Vernova's grid automation product range. Now GE Vernova is proud to introduce the Reason H49, our next generation PRP/HSR gigabit redundancy box.

### Key Benefits

- All-in-one PRP and HSR redbox, HSR quadbox and PRP-HSR coupling
- IEC 62439-3:2016 PRP and HSR certification ensures interoperability
- Up to 4 SAN ports to connect PRP/HSR non-compliant devices to the redundant network, reducing the number of redboxes
- 3 available SAN ports when used as a PRP/HSR coupling box
- Any combination of fibre LC/copper RJ45 and 100/1000 Mbps transceivers accommodates all types of connections
- IEEE 1588 v2 boundary clock and transparent clock capable to distribute precision time across the substation network and PRP/HSR boundaries, saving the cost of cabling used to deliver IRIG-B signals
- First DNV/GL fully certified PRP/HSR/IEEE1588/IEC 61850-3 device

### Applications

- The Reason H49 is especially designed for the digital substation, for use on the substation bus and process bus, in a mix of PRP dual star and HSR rings.
- The 1000 Mbps HSR ring allows to transport multiple sampled value streams on the same ring, simplifying network topology.
- IEEE 1588 v2 and Power Profile compliance allow for high precision timing application such as synchrophasor application or sampled value timestamping.
- The Reason H49 cyber security is suitable for substations with the highest cyber security requirements.



### Redundancy

- HSR/PRP redbox with 4 SAN ports
- HSR/PRP coupling box with 3 SAN ports
- HSR Quadbox

### Industrially Hardened

- IEC 61850-3 and IEEE1613 approval for operation in electric substation environments
- Dual source power supply for increased reliability
- Harsh chemical environment ensures product function and viability

### Security by design

- Hardened operating system to reduce attack surface
- Secure management via TLS
- Multi-users, Role-Based Access Control
- Security event logging for forensic and regulatory auditing and reporting
- Achilles ACC Level 1 Certified
- Designed for NERC CIP compliance

### Managed Networks

- IEEE 1588 v2 including the C37.238 Power Profile timing support
- Supports SNMP v3 with full backwards compatibility for v1 and v2
- Traffic segregation and prioritization control via IEEE 802.1p and IEEE 802.1Q
- Hardware alarm contacts for detection of loss of power
- Simple but powerful web management interface for all configuration functions



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## Technical Specifications

### Network Standards and Compliance

Ethernet V1.0/V2.0 IEEE 802.3: 10Base-T  
IEEE 802.3u: 100Base-TX, 100Base-FX  
IEEE 802.3z: 1000Base-X Ethernet  
(Auto-negotiation)  
IEEE 802.3ab: 1000Base-X Ethernet  
IEEE 802.1p: Priority protocol  
IEEE 802.1q: VLAN tagging  
IEEE 1588v2 Timing compliance  
IEC62439-3-4:2016 PRP  
IEC62439-4-5:2016 HSR

### Power Supply

Power consumption: 16.5 W  
Dual power source  
AC Power input range: 85-230 V<sub>AC</sub>  
DC Power input range: 85-250 V<sub>DC</sub>  
Operative AC range:  
72.3 (85-15%)-253 V<sub>AC</sub> (230+10%)  
Operative DC range:  
38.4 (48-20%) - 280 V<sub>DC</sub>

### Physical Specifications

Height: 195 mm  
Width: 75 mm  
Depth: 177 mm  
Weight: 1.7 kg  
Mounting: DIN rail EN50022

### Environmental Specifications

Operating temperature: -25 °C/+55 °C  
Storage temperature: -40 °C/+ 70 °C  
Humidity: 95 %

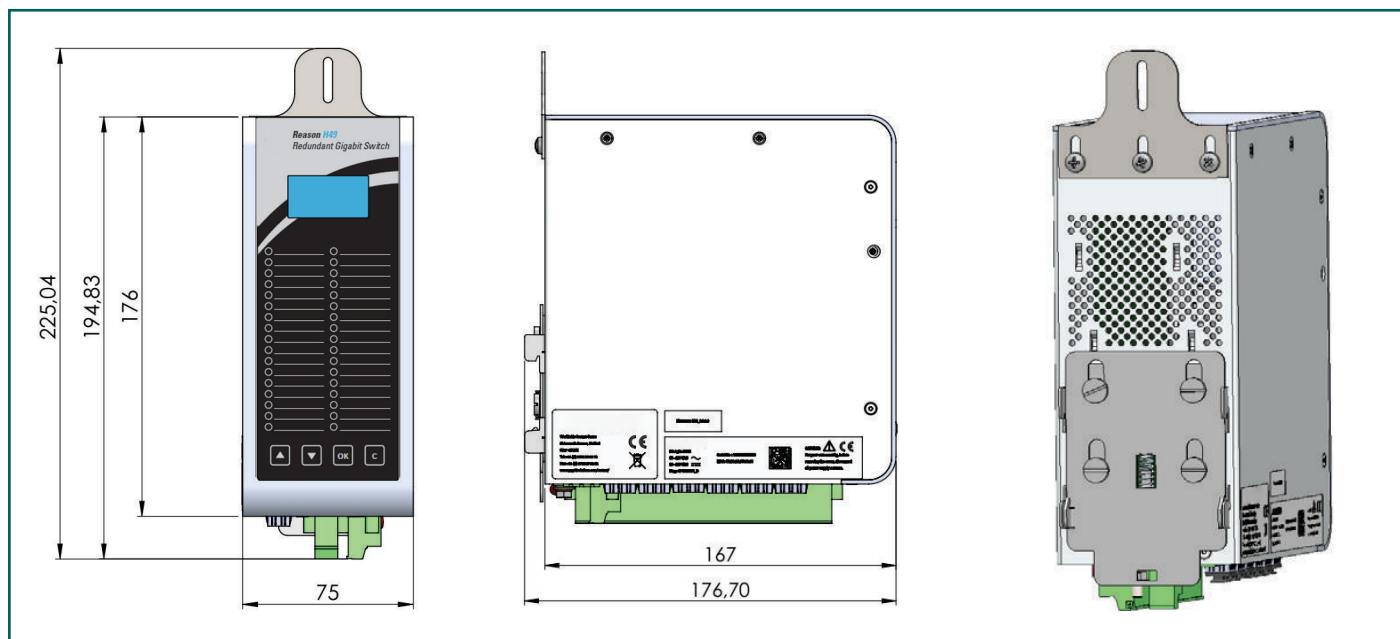
### Approvals

CE MARKING  
2014/35/EU: Low Voltage Directive  
2014/30/EU: EMC Directive

### EMI & OPERATING CONDITIONS FOR SUBSTATIONS

IEC 60255-26:2013  
IEC60255-27:2013  
IEC 61850-3:2013  
IEEE 1613 series

## Dimensions and Mounting



For more information, visit  
[gevernova.com/grid-solutions](http://gevernova.com/grid-solutions)

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