BITSTREAM®

Leader in time synchronization and data transmission solutions

Ethernet Switch
Hyperion - 200

Secure transmission in extreme weather conditions .

Solid

Reliable

Easy to use

Safe

Hyperion-200 - *ideal for industry*

Industrial managed Ethernet switch equipped with 4x 1/2.5/10 Gbps and 8/16x 10M/100M/1G RJ45 PoE÷High PoE IEEE802.3bt or 8/16x 100M/1G SFP interfaces

- ✓ A family of industrial switches featuring 4x 10/2.5/1Gbps SFP/SFP+ slots and 8/16x 10M/100M/1Gbps RJ45 ports or 100M/1Gbps SFP slots
- ✓ Additional NMI UTP RJ45 10/100Mbit/s management port
- ✓ ITU-T G.8032 compliant ring operation with < 20ms reconfiguration, up to 64 rings simultaneously
- ✓ Support for STP, RSTP and MSTP protocols.
- ✓ IEEE802.1x authentication, Radius, Tacacs+ - AAA
- ✓ Support for PRP (IEC 62439-3 Clause 4) or HSR (IEC 62439-3 Clause 5) on ports in the R module.
- ✓ The following IEEE1588 v.2 (PTPv.2)-based precision time synchronization profiles are available in the HYPERION-200.2 hardware-supported version: 1588 default, G.8265.1 and G.8275.1
- ✓ NTP protocol in server/client mode and SNTP
- ✓ Switch designed in accordance with the requirements of IEC61850-3, IEEE1613 standards for substations
- ✓ As standard, secondary surge protection in UTP modules on RJ-45 ports only in the transmission path, ITU-T K.44 4kV 10/700us
- ✓ Management IPv4, IPv6, Web, telnet, SSH and local CLI (RS232), SNMP v1,2,3
- ✓ Access security SNMPv3, HTTPS, SSH
- ✓ DDMI - SFP module monitoring function
- ✓ Energy Saving with Energy Efficient Ethernet (EEE).
- ✓ Ethernet OAM support (Link OAM and Service OAM)
- ✓ Standard equipped with I/O interfaces: interface 4 inputs and 2 outputs 'cc' for monitoring, alarms and control purposes
- ✓ Operating temperature: -40 to +85°C when conditions are met
- ✓ Rugged metal housing for DIN rail mounting
- ✓ Power supply 36-60 VDC or 80-350 VDC/75-240 V AC

Optional features

- ✓ L3 routing support - static routing,
- ✓ **PoE ÷ High PoE** (IEEE 802.3bt) support up to 90W per UTP port (500W max on all ports), **PoE Watchdog**.

Optional features under the license

- ✓ Extension of in **IEEE 1588-2008v.2 (PTPv2)** with **Power Profile**; synchronization for real-time power applications in **accordance with IEEE C37.238-2011, C37.238-2017; IEC61850-9-3**,
- ✓ **Synchronous Ethernet G.8261** (available on optical ports only 200. 2)

Features of Hyperion-200

Solid

The Hyperion-200 switch has been designed to withstand operation in extreme environmental conditions. The device is equipped with a durable IP-30 rated enclosure, and the switch is designed in accordance with the requirements of IEC61850-3, IEEE1613 standards. Above that, the device is suitable for operation in temperatures from -40°C to +85°C under the appropriate conditions.

Easy to use

We designed the user interface to be as user-friendly as possible for the network administrator and installer. From the very first moment you will make the configuration in an intuitive way, despite having a lot of functionality in the management of the switch. You can configure the switch through secure interfaces and pre-prepared configuration files.

Just what you need

You choose from among the many versions of the device that we have created in response to the demand of our customers. Various options of the device are available with 4x 1/2.5/10 Gbps and 8 or 16x 10M/100M/1G RJ45 PoE÷High PoE IEEE802.3bt or 8 or 16x 100M/1G SFP interfaces.

Safe

Access, of course, is through a secure https connection, SSH server, SNMPv3 agent centralized RADIUS authentication. The implemented storm control mechanism will avoid unwanted traffic and network congestion.

With a platform for communication

Bitstream switches can be managed, via the BTNet platform. This environment allows you to easily monitor your network topology. After a short setup, you can manage your network and the third-party devices implemented in it from anywhere in the world.

Supported transmission standards

- ✓ IEEE 802.3 10Base-T Ethernet
- ✓ IEEE 802.3u 100Base-TX Fast Ethernet
- ✓ IEEE 802.3u 100Base-FX Fast Ethernet Fiber
- ✓ IEEE 802.3ab 1000Base-T
- ✓ IEEE 802.3z Gigabit Fiber
- ✓ IEEE 802.3ae 10GBASE-SR/LR/ER/ZR (SFP+) 10 Gigabit Ethernet,
- ✓ IEEE 802.3x Flow Control and Back-pressure
- ✓ IEEE 802.1AB Link Layer Discovery Protocol (LLDP)
- ✓ IEEE 802.1p Class of Service (CoS)
- ✓ IEEE 802.1Q VLAN
- ✓ IEEE 802.1ad QinQ
- ✓ IEEE 802.1D- Spanning Tree Protocol (STP)
- ✓ IEEE 802.1D-2004 Rapid Spanning Tree Protocol (RSTP).
- ✓ IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)
- ✓ IEEE 802.3ad Link Aggregation Protocol (LACP)
- ✓ IEEE 802.1ak Multiple Registration Protocol (MRP, GARP, GVRP),
- ✓ IEEE 802.1x Port Based Network Access Protocol, EAP, TACACS+, RADIUS - authentication, authorization and accounting functions - AAA,
- ✓ IEEE 802.3az EEE
- ✓ IEEE 802.3af/at type 1/2 and PoE+ up to 30W per port, maximum on all ports 500W
- ✓ IEEE 802.3bt High PoE up to 90W per port, 500W maximum on all ports
- ✓ ITU K.44 - built-in secondary overvoltage protection on RJ-45 for transmission path, 4kV, 10/700us compliant: Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Basic Recommendatio n

Supported protocols

- ✓ IPv4, IPv6, ARP, ICMP, TCP, UDP, DNS
- ✓ IGMP v1, v2, v3, MLD v1, v2, GMRP, GVRP,
- ✓ SNMP v1/v2c/v3,
- ✓ DHCP client/server,
- ✓ NTP client/server, SNTP,
- ✓ IEEE1588 PTP v2 (available only version 200.2),
- ✓ Synchronous Ethernet (only available on version 200.2)
- ✓ HTTP, HTTPS, Telnet, SSH v2, Syslog,
- ✓ EtherNet/IP, SNMP Inform, RMON, LLDP, LLDP-MED,
- ✓ MIB-II, Ethernet-Like MIB PROFINET Conformance Class A
- ✓ IEEE 802.1x Port Based Network Access Protocol, EAP, TACACS+, RADIUS, NAS

Supported standards, recommendations and directives EMC, safety*

PN-EN 55032:2015-09	Electromagnetic compatibility of multimedia devices	*Emission requirements.*
PN-EN 55024:2011	Electromagnetic compatibility of multimedia devices	Resistance requirements
PN-EN 60825-1:2014-11	Safety of laser devices	Part 1: Equipment classification and requirements.
PN-EN IEC 62368-1:2020-11	Audio/visual, information technology and telecommunications equipment	Part 1: Safety requirements
EMC 2014/30/EU	EMC Electromagnetic Compatibility Directive.	
LVD 2014/35/EU	LVD Low Voltage Directive.	
IEC 61000-4-2	Electromagnetic compatibility (EMC)	Part 4-2: Test and measurement methods - Test of resistance to electrostatic discharge
IEC 61000-4-3	Electromagnetic compatibility (EMC)	Part 4-3: Test and measurement methods - RF radiated electromagnetic field immunity test
IEC 61000-4-4	Electromagnetic compatibility (EMC)	Part 4-4: Test of resistance to a series of fast electrical transients
IEC 61000-4-5	Electromagnetic compatibility (EMC)	Part 4-5: Test and measurement methods - Impact resistance testing
IEC 61000-4-6	Electromagnetic compatibility (EMC)	Part 4-6: Test and measurement methods -- Testing for immunity to conducted disturbances induced by radio frequency fields
IEC 61000-4-8	Electromagnetic compatibility (EMC)	Part 4-8: Testing for immunity to mains frequency magnetic fields
IEC 61000-4-11	Electromagnetic compatibility (EMC)	Part 4-11: Tests for resistance to voltage drops, short interruptions and voltage changes
IEC 61000-4-12	Electromagnetic compatibility (EMC)	Part 4-12: Test and measurement methods -- Test of resistance to damped sinusoidal waveforms
IEC 61000-4-29	Electromagnetic compatibility (EMC)	Part 4-29: Testing for immunity to voltage dips, short interruptions and voltage changes at the DC power connection
IEC 61850-3:2014	Communication systems and networks for automation of electric power enterprises -- Part 3: General requirements	
IEEE 1613-2009	IEEE standard on environmental and test requirements for network communication equipment installed in substations	

* - The scope and list of supported standards may change as the device evolves.

Ethernet Interfaces

- ✓ Ethernet Connectors: 4 x 1G/2.5G/10Gbps SFP+, 8/16x 10/100/1000Mbps RJ45 ports or 8/16x 100M/1000M SFP slots (100Mbps speed on Optical Interface only works with optical SFP inserts)
- ✓ Non-blocking matrix (Switching Capacity): 160Gbps
- ✓ Forwarding: 84-72 Mpps depending on the number of ports
- ✓ QoS: Support for 8 physical queues, Weighted Round Robin algorithm and Strict Priority queuing. Priority settings based on: 802.1p PCP priorities, DSCP/ToS, port-based priority settings, TCP/UDP port number-based priority configuration capabilities

- ✓ VLANS: 4094 VLAN entries, 802.1Q, 802.1QinQ, private VLANs, VLAN translation.
- ✓ Flow Control: Flow Control - controls the sent and received packets to prevent buffer overflow, i.e. data loss
- ✓ Storm protection: filtering for incoming traffic of Broadcast, Multicast, Unknown DA or all packets, outgoing traffic filtering for packets of all types, bandwidth limiting
- ✓ Security: HTTP/HTTPS, SSL/SSH, IEEE 802.1x Port Based Network Access Protocol, EAP, TACACS+; RADIUS authentication, authorization and accounting functions - AAA
- ✓ IGMP snooping: V1/V2/V3, IGMP Filtering/Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- ✓ Syslog - cooperation with the syslog server,
- ✓ Port Mirroring: monitoring or analyzing traffic on selected ports
- ✓ IEEE 802.3az: Energy Efficient Ethernet, reduced power consumption, 4 modes
- ✓ Port Trunk: IEEE 802.3ad LACP or static aggregation
- ✓ RMON, MIB II, Port mirroring, DNS, IEEE802.1ab LLDP, LLDP-MED
- ✓ MAC address table: up to 32k entries
- ✓ Optional L3 - static routing
- ✓ Network redundancy
  - ITU-T G.8032 Ethernet Ring (ERPS)
  - IEEE 802.1d - Spanning Tree (STP)
  - IEEE 802.1w - Rapid Spanning Tree Protocol (RSTP)
  - IEEE 802.1s - Multiple Spanning Tree Protocol (MSTP)
  - IEC 62439-3 Clause 4 and 5 support Ethernet Ring (HSR/PRP)
- ✓ ITU K.44 - embedded in TRX.1 modules on RJ-45 ports for the transmission path, secondary, 4kV, 10/700us overvoltage protection in accordance with the requirements: Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents - Basic Recommendation

Network synchronization

- ✓ The device is equipped with a TCXO on-board generator
- ✓ NTP protocol in server/client mode and SNTP
- ✓ IEEE 1588-2008 v2 PTP - The following IEEE1588 v.2-based Precision Time Synchronization (PTPv.2) profiles are available with version 200.2 hardware support: 1588 default, G.8265.1 and G.8275.1 in the following modes:
  - ➢ Transparent clock (TC): peer to peer, end to end with one step, two step;
    - Time error typically 50ns
  - ➢ Boundary clock (BC);
    - Time error for BC (Boundary clock) typically < 200ns
  - ➢ Slave
- ✓ Optional synchronization with Power Profile IEEEC37.238-2011, IEEEC37.238-2017 and Power Utility Profile IEC/IEEE 61850-9-3,
- ✓ In version 200.2 under license, support Synchronous Ethernet, G.8261 on optical ports

I/O interface - inputs

- ✓ Number of inputs - 4
- ✓ Input type - digital, potential-free
- ✓ Connector: screwed

I/O interface - outputs

- ✓ Number of outputs - 2
- ✓ Type of outputs - relay NO/NC
- ✓ Maximum switching current - 0.5A 60VDC with resistive load
- ✓ Connector: screwed

MTBF

- ✓ Time: 650000 hrs.
- ✓ Standard: Telecordia , SR-332

Management

- ✓ SNMP v1/2c/3
- ✓ HTTP/HTTPS protocol - via web browser
- ✓ SSH v2, TELNET
- ✓ Local CLI Console (RS-232) - RJ45 connector ,
- ✓ "Privilege level" - Privilege level configuration - read/write, configurable not dependent for multiple users w

REDBOX module

- ✓ Module that enables lossless network redundancy
- ✓ 2x SFP slots - including 2x HSR/PRP ports supporting HSR (High-availability Seamless Redundancy) / PRP (Parallel Redundancy Protocol) for network redundancy and 1x RJ45 Ethernet Legacy port
- ✓ Support IEC 62439-3 Clause 4
- ✓ Support IEC 62439-3 Clause 5
- ✓ Supports IEEE 1588v2 PTP (only available on 200.2)
- ✓ Transparency for transmission in PRP mode

Power supply

- ✓ DC 36-60V power supply
- ✓ Power supply DC 80-350V; AC 75-240V
- ✓ Optional two DC power inputs - redundant,
- ✓ Screw connector for AC or DC power supply
- ✓ Total power consumption (without PoE ports) - <40W

PoE power supply

- ✓ Compatible with IEEE802.3af, IEEE802.3at, IEEE802.3bt
- ✓ Power available per port up to 90W
- ✓ For 55VDC power supply, the maximum total PoE power is 500W.

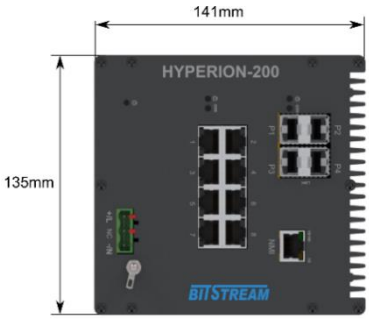
Physical characteristics

- ✓ DIN rail or free-standing mounting
- ✓ Dimensions [141/183x135x120] mm
- ✓ Metal casing
- ✓ Weight up to 2.5kg

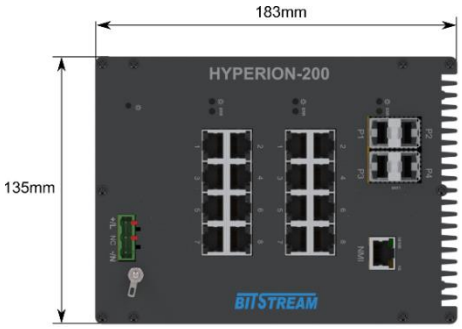
Environmental requirements

- ✓ Operating temperature: -40 to +85°C with a minimum airflow of 0.4m/sec.
- ✓ Operating temperature: -40 to +70°C with a minimum airflow of 0.0m/sec.
- ✓ Operating time at a maximum temperature of +85°C is up to 16 hours
- ✓ Standard ambient humidity during operation: 0 to 95 percent (non-condensing),
- ✓ Location type: class C according to EN 60870-2-2 - sheltered locations
- ✓ Degree of protection according to IP-30

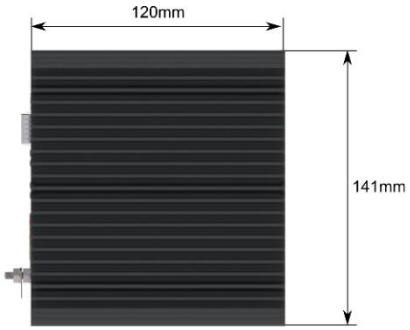
Mechanical drawing



View - front
Version 8x RJ45 ports



View - front
16x RJ45 ports version



View - side

Signs

HYPERION-200(.X)-Y-(L)-(Z)-(R)-K-U

Hyperion-200	(. X)	Y	(L)	(Z)	(R)	K	U
Standard	-						
Dedicated version for power substations	2						
Available versions							
8x RJ45 (10M/100M/1G) + 4x SFP / SFP+ (1G/2.5G/10G)		1					
16x RJ45 (10M/100M/1G) + 4x SFP / SFP+ (1G/2.5G/10G)		2					
8x RJ45 (10M/100M/1G) + 8x SFP(100M/1G) + 4x SFP/SFP+ (1G/2.5G/10G)		3					
8x SFP (100M/1G) + 4x SFP / SFP+ (1G/2.5G/10G).		4					
4x SFP / SFP+ (1G/2.5G/10G) + 1x Redbox module		5[A]					
8x RJ45 (10M/100M/1G)+4x SFP/SFP+ (1G/2.5G/10G) + 1x Redbox module		6[A]					
8x SFP (100M/1G)+4x SFP/SFP+ (1G/2.5G/10G) + 1x Redbox module		7[A]					
Routing functionality (optional)							
Standard			-				
Static routing			L3				
Power over Ethernet (PoE) (optional)							
No PoE				-			
8x PoE+ PSE				S8P			
16x PoE+ PSE				S16P			
8x HIGH PoE (802.3bt) PSE up to 90W per port				S8P2b			
16x HIGH PoE (802.3bt) PSE up to 90W per port				S16P2b			
Optional modules							
Without the module					-		
REDBOX PRP/HSR support on additional SFP ports (2x SFP 1G) on the module.					R		
Additional features							
Standard built-in secondary 4kV 10/700µs ITU K.44 surge protection on RJ-45 ports for the transmission path						K	
Power supply							
Power supply 36-60VDC, for PoE in the range of 46-57VDC							77p[1]
Power supply 80-350V DC, 75-240VAC							C[2]

Legend:

A - W ersion with built-in REDBOX module (PRP/HSR) - select the module in the field marked R
1 - For the version with PoE, the maximum power available on all RJ45 ports is 500W
2 - Option only available for device without PoE

Set of licenses to extend the capabilities of the Hyperion-200 switch

1. **SYNCE LICENSE - Synchronous Ethernet G.8261 -** license to add Synchronous Ethernet G.8261 functionality (Timing and synchronization aspects in packet networks) on optical ports , providing precise synchronization of internal clocks of devices using frequency, among other applications in the energy industry.

2. **PTP SYNCHRONIZATION LICENSE WITH POWER PROFILE - a** license that extends in the IEEE1588 PTPv2 protocol with POWER PROFILE - IEEEC37.238-2011, IEEEC37.238-2017 and IEC61850-9-3 for precise time synchronization among other applications in the power industry.

NOTE: Licenses only available in version 200.2

Additional accessories

Designation	Transmission speed	Wavelength	Fiber optic type	Distance	Insert type	Connector type	Operating temperature	Comments
BTPP-85192-SRC	10 Gbps	850 nm	MM	300 m	SFP+	LC	0~70 ° C	---
BTPP-31192-LRC	10 Gbps	1310 nm	SM	10 km	SFP+	LC	0~70 ° C	
BTPP-31192-L2C	10 Gbps	1310 nm	SM	20 km	SFP+	LC	0~70 ° C	---
BTPP-55192-ERC	10 Gbps	1550 nm	SM	40 km	SFP+	LC	0~70 ° C	---
BTP-8524-S5TD	1.25 Gbps	850 nm	MM	550 m	SFP	LC	40~85 ° C	---
BTP-3124-L2TD	1.25 Gbps	1310 nm	MM/SM	2/20 km	SFP	LC	40~85 ° C	---
BTP-3124-L4TD	1.25 Gbps	1310 nm	SM	40 km	SFP	LC	40~85 ° C	---
BTP-5524-L8TD	1.25 Gbps	1550 nm	SM	80 km	SFP	LC	40~85 ° C	---
BTE-GB-P1RT	10/100/1000 Mbps	100m (UTP-5)	---		Copper	RJ-45	40~85 ° C	
BTE-GB-P3RT	10/100/1000 Mbps	100m (UTP-5)	---	---	Copper	RJ-45	40~85 ° C	---

List of proposed power supplies for BITSTREAM devices

Designation of the power supply	Output voltage range	Nominal output power	Number of ports with PoE (15W)	Number of ports with PoE+ (30W)	Number of ports with PoE++ (60W)	Number of ports with PoE++ (90W)	Operating temperature C-standard T-industrial	Comments
	DC	W						
ZAS-48V56-60-R-T	48 - 56 V	60	3	1	0	0	-20°C ~ +70°C	PoE support
ZAS-48V55-120-R-T	48 - 55 V	120	6	3	1	1	-20°C ~ +70°C	PoE support
ZAS-48V55-240-R-T	47 - 56 V	240	13	6	3	2	-20°C ~ +70°C	PoE support
ZAS-48V55-480-R-T	47 - 56 V	480	30	14	7	4	-20°C ~ +70°C	PoE support
ZAS-48V55-960-R-T	48 - 55 V	960	60	30	15	8	-20°C ~ +70°C	PoE support

Legend of designations: W - plug-in; S - standalone; R - for DIN rail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