BITSTREAM®

Leader in time synchronization and data transmission solutions

Ethernet Switch

HYPERION-300

Industrial switch with support for openDNP3 in slave mode and DLMS for communication with measurement units..

Reliable

Industrial

Easy to configure

Solid

Hyperion-300

10-port managed industrial Ethernet switch equipped with 2x 100M/1000M/2.5G FO SFP and 6x 100M/1000M FO SFP or 8/2x 10M/100M/1G RJ45 PoE÷PoE+, additional control and measurement interfaces

- ✓ Available interfaces: up to 8x 10M/100M/1G RJ45 of which 2x 10M/100M/1G RJ45 and FO SFP are combo ports
- ✓ Available interfaces: 2x 100M/1000M/2.5G FO SFPs.
- ✓ Available interfaces: up to 6x 10M/100M/1G FO SFPs
- ✓ ITU-T G.8032 compliant ring operation with < 20ms reconfiguration, up to 64 rings simultaneously
- ✓ The following IEEE1588 v.2 (PTPv.2)-based precision time synchronization profiles are available in the HYPERION-30x.2: 1588 default, G.8265.1 and G.8275.1
- ✓ NTP protocol in server/client mode and SNTP
- ✓ Optional control and measurement functions: interfaces 2x RS232, 1x RS232/485 , 1-Wire (T/H), 2x digital input, 4x relay outputs (available in Hyperion-30x-3 version)
- ✓ Support for an external **MOD-EXT-IO** module for increasing the number of I/O interfaces and DC voltage measurement (Module support available in Hyperion-30x-3 version. When using MOD-EXT-IO module, T/H sensor cannot be connected)
- ✓ Save Energy with **Energy Efficient Ethernet 'EEE'** Technology
- ✓ **Radius** - centralized authentication
- ✓ Support for **PROFINET Class A, DNP3** and **DLMS** protocols
- ✓ Ethernet **OAM** support **(Link OAM and Service OAM)**
- ✓ Access security **SNMPv3, HTTPS, SSH**
- ✓ Additional optional security mechanisms
- ✓ Operating temperature: **-40 to +85°C** when conditions are met
- ✓ Rugged **IP-30 DIN** metal housing
- ✓ Redundant **DC** power supply
- ✓ **AC** power supply

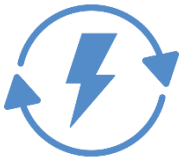
Optional features

- ✓ **PoE÷PoE+** support up to 30W per port, power on all ports up to 240W, **PoE watchdog**

Optional features under the license

- ✓ Extension in the **IEEE 1588-2008v.2 (PTPv2)** protocol for **power** profiles; synchronization for real-time power applications in accordance with **IEEE C37.238-2011, C37.238-2017; IEC61850-9-3**,
- ✓ **Synchronous Ethernet G.8261** (only available version 30x. 2)

Features of Hyperion-300



Energy efficient

Using IEEE 802.3az-compliant Energy Efficient Ethernet technology, the Hyperion-300 can significantly reduce power consumption by optimizing the operation of interfaces based on port traffic load, and allows an electrical port to go to sleep if the connected device is not generating traffic.

Easy to set up

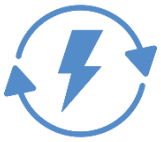
BitStream's devices and software are designed to be as user-friendly as possible for network administrators and installers. From the first moment you will make the configuration in an intuitive way, despite having a lot of functionality . The incorporation of an HTTPS server, SSH server allows you to securely configure the parameters of the device through a standard web browser or command line, and thanks to the incorporation of SNMPv.3 agent, monitoring from the level of any management platforms equipped with SNMP protocol.

Robust

The Hyperion-300 was designed to withstand operation in extreme climatic conditions. The rugged metal housing with IP-30 rating, guarantees protection against mechanical damage. In addition, the device is suitable for operation in the temperature range from -40°C to +85°C with the conditions met.

Guaranteeing connection redundancy

The Hyperion-300 switch supports Ethernet Ring Protection Switching (ERPS) technology compliant with ITU-T G.8032 standard, enabling operation with transmission path redundancy with a reconfiguration time of less than 20ms with support for up to 64 rings.



Strong

Hyperion-300 can optionally support PoE÷PoE+ (Power over Ethernet) technology in accordance with IEEE802.3af, IEEE802.3at standards. With PoE+ technology, each port can operate at up to 30W, and the maximum power on all ports is up to 240W.

Pew

The Ethernet switch is equipped with two power connectors. The redundant power supply function guarantees stable and continuous operation in case of failure of one of the power sources .

Just what you need

As a company, we know that different customers have different demands, so we have created multiple versions of devices with configuration options. Available from 2x to 8x electrical ports, with 10/100/1000 Mbps throughput. In addition, we have equipped the switches with 2/6x SFP ports with 2.5Gbps or 2/6x SFP ports with 100/1000Mbps. In addition, the Hyperion-300 can be equipped with additional control and measurement interfaces.

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 802.3x 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 802.1x Port Based Network Access Protocol
- ✓ IEEE 802.3az EEE
- ✓ IEEE 802.3af/at type 1/2 up to 30W

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,
- ✓ HTTP, HTTPS, Telnet, SSH v2, Syslog,
- ✓ EtherNet/IP, SNMP Inform, LLDP, RMON,
- ✓ IEEE1588 PTP v2 (only available in 30x.2),
- ✓ Synchronous Ethernet **G.8261 (**only available on 30x.2)
- ✓ MIB-II, Ethernet-Like MIB
- ✓ IEEE 802.1x Port Based Network Access Protocol, EAP, TACACS+, RADIUS, NAS
- ✓ OpenDNP3 (IEEE-1815, DNP3).
- ✓ DLMS

Supported standards, recommendations and directives EMC, safety*

PN-EN 55011:2016	Industrial, scientific and medical equipment	Radio frequency disturbance characteristics - Permissible levels and methods of measurement.
PN-EN 55035:2017-09	Electromagnetic compatibility of multimedia devices	Resistance requirements
PN-EN IEC 62368-1:2020-11	Audio/visual, information technology and telecommunications equipment	Part 1: Safety requirements
PN-EN 60825-1:2014-11	Safety of laser equipment Part 1: Equipment classification and 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 test.
IEC 61000-4-6	Electromagnetic compatibility (EMC)	Part 4-6: Test and measurement methods -- Test 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 field.
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 resistance to voltage drops, short interruptions and voltage changes at the DC power connection.

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

Ethernet Interfaces

- ✓ Ethernet connectors: 2x SFP 100/1000M/2.5Gbps, 2/6x SFP 1002/1000Mbps, 8/2x RJ45 10/100/1000Mbps.
  - ✓ (in Hyperion-301 version: 2 RJ45/SFP ports - combo), (100Mbps speed on Optical Interface works only with optical SFP inserts)
- ✓ Matrix switching capacity: 20Gbps
- ✓ Forwarding: 17.9 Mpps
- ✓ 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: 4096 VLAN entries, 802.1Q, 802.1QinQ, private VLANs, VLAN translation.
- ✓ Bandwidth control: filtering for incoming traffic of Broadcast, Multicast, Unknown DA or all packets, outgoing traffic filtering for packets of all types, bandwidth limiting
- ✓ IGMP snooping V1/V2/V3, IGMP Filtering/ Throttling, IGMP query, IGMP proxy reporting, MLD snooping V1/V2
- ✓ RMON, MIB II, Port mirroring, DNS, IEEE802.1ab LLDP, LLDP-MED
- ✓ Syslog - cooperation with the syslog server,
- ✓ Port Mirroring: Monitoring traffic on selected ports
- ✓ IEEE 802.3az: Energy Efficient Ethernet, 4 power saving modes
- ✓ Port Trunk: IEEE 802.3ad LACP or static aggregation
- ✓ MAC address table: up to 8192 entries
- ✓ IEEE 802.1x Port Based Network Access Protocol, EAP, TACACS+, RADIUS - authentication, authorization and accounting functions - AAA

- ✓ Security: HTTP/HTTPS, SSL/SSH
- ✓ Network Redundancy:
  - ITU-T G.8032 Ethernet Ring (ERPS)
  - IEEE 802.1D Spanning Tree (STP)
  - IEEE 802.1D-2005 Rapid Spanning Tree Protocol (RSTP).
  - IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)

1-wire interface

- ✓ Transmission speed 0 - 16.3 kbit/sec.
- ✓ Range ≤ 100m
- ✓ Connector: RJ45
- ✓ Input dedicated to MOD-EXT-IO module or T/H sensor

RS232/485 interfaces

- ✓ UDP/TCP; server/ client
- ✓ Transmission speed:
  - 0-115.2 kbit/s for RS232
  - 0-230 kbit/s for RS 485
- ✓ Interface type configuration:
  - 1x port with RS485 interface - 2/4 wire or 1x RS232
  - 2x port with RS232 interface
- ✓ Connector: RJ45

Digital outputs

- ✓ Number of outputs - 4
- ✓ Type of outputs - "relay contact"
- ✓ Maximum switching current - 0.5A 48VDC
- ✓ Connector: RJ45

Digital inputs:

- ✓ Number of inputs - 2
- ✓ Galvanically isolated inputs
- ✓ Input type - dry contact
- ✓ Connector: RJ45

Network synchronization

- ✓ 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 in version 30x.2: Default 1588, 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
- ✓ In version 30x.2 under license support Synchronous Ethernet, G.8261

MTBF

- ✓ Time: 628,000 hrs.
- ✓ Standard: Telecordia , SR-332

Management

- ✓ SNMP v1/2c/3, SSH
- ✓ HTTP/HTTPS protocol - management via web browser
- ✓ Local CLI console (RS232) - USB connector
- ✓ "Privilege level" - Privilege level configuration - read/write, configurable not dependent for multiple users

Power supply

- ✓ DC power supply, 12-60V VDC /0.95-0.16A (9.5W)
- ✓ Two power inputs, redundant power supply for DC power supply
- ✓ DC/AC power supply, 80-350VDC/75-240VAC (version available only without PoE function)
- ✓ Screw connector for AC or DC power supply

PoE power supply

- ✓ Compliant with IEEE802.3af, IEEE802.3at standards,
- ✓ Power available per port up to 30W
- ✓ For 55VDC power supply, the maximum total PoE power is 240W

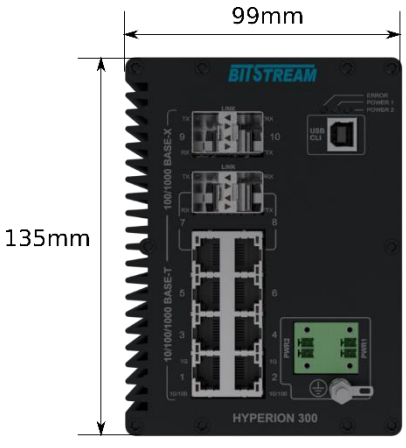
Physical characteristics

- ✓ Can be mounted on a DIN rail
- ✓ Metal housing IP-30
- ✓ Dimensions 135x125x99mm
- ✓ Weight 0.90kg

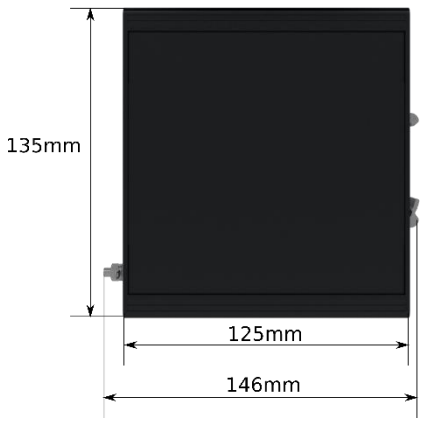
Work environment requirements

- ✓ 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.
- ✓ The 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 the standard,
- ✓ EN 60870-2-2 - sheltered locations,
- ✓ Degree of protection according to IP-30

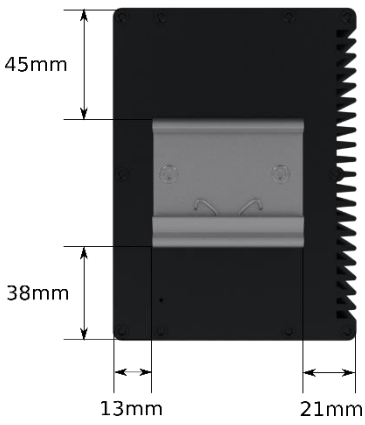
Mechanical drawing



view - front



view - top



view - rear

HYPERION-30X-(.Y)-Z-(P) -U

HYPERION	30X	(.Y)	Z	(P)	U
8x RJ45(10M/100M/1G) and 2x SFP(100M/1G) - 2x Combo + 2xSFP (100M/1G/2.5G)	1				
2x RJ45(10M/100M/1G) + 6x SFP(100M/1G) + 2x SFP(100M/1G/2.5G)	2				
Production version:					
standard		-			
version dedicated to power substations		2			
Additional interfaces					
baseline			1		
2x digital input, 4x relay outputs, 1-wire interface, 2xRS232 and 1xRS232/485			3		
Power over Ethernet (PoE) version 301 (optional)					
Version without PoE				-	
8x PoE+ PSE				S8P	
Power supply					
Redundant power supply 12-36V DC					66p
Redundant power supply 20-60V DC, for PoE 45-57V DC					
PoE (up to 15W) 45-57V					77p[2]
PoE+ (up to 30W) 52-57V					
Power supply 100-350VDC/85-240VAC					B[1]

Legend
1 - Selected version requires contact with manufacturer, power option without PoE function
2 - For the version with PoE, the maximum power available on all RJ45 ports is 240W
3 - Option available only on Hyperion-30x version. 2

Example designations

HYPERION-301-1-S8P-77p	Hyperion-300 standard version with 8xRJ45 and 2xSFP - combo and 2xSFP 2.5Gb, redundant power supply for 8x PoE+ in the range of 52-57V DC, up to 30W per port
HYPERION-302.2-3-66p	Hyperion-300 dedicated version for substations with 2xRJ45 and 6xSFP and 2xSFP 2.5Gb with 10-36VDC redundant power supply and with PTPv2 IEEE 1588:2008, 1x digital input, 4x relay outputs, 1-wire interface, 2xRS232, 1xRS232/485, prepared to run SYNCE

Licenses to extend the capabilities of the Hyperion-30x switch.2

1. **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 for use in the power industry, among other applications.

2. **SYNCE LICENSE - Synchronous Ethernet G.8261 - a** license to add Synchronous Ethernet G.8261 (Timing and synchronization aspects in packet networks) functionality, providing precise synchronization of internal clocks of devices using frequencies for use in power generation, among other applications.

NOTE: Licenses only available in 30x.2 version.

Additional accessories

Designation	Transmission speed	Wavelength	Fiber optic type	Distance	Insert type	WDM	Connector type	Operating temperature	Comments
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-314G-L2TD	1.25 Gbps - 4.25 Gbps	1310 nm	SM	20km	DDM	---	LC	-40~85° C	2.5 Gb support
BTP-514G-L2TD	1.25 Gbps - 4.25 Gbps	1310 nm	SM	40km	DDM	---	LC	-40~85° C	2.5 Gb support
BTPB-3524L-L2TD	1.25 Gbps	1310/1550 nm	SM	20km	SFP	YES	LC	-40~85 °C	
BTPB-5324L-L2TD	1.25 Gbps	1550/1310 nm	SM	20km	SFP	YES	LC	-40~85° C	
BTPB-3524S-L2TD	1.25 Gbps	1310/1550 nm	SM	20km	SFP	YES	SC	-40~85 °C	
BTPB-5324S-L2TD	1.25 Gbps	1550/1310 nm	SM	20km	SFP	YES	SC	-40~85° C	
BTP-8503-02TD	155 Mbps	850 nm	MM	2 km	SFP	---	LC	-40~85 °C	---
BTP-3103-L2TD	155 Mbps	1310 nm	MM/SM	2/20 km	SFP	---	LC	-40~85° C	---
LT-19-TS-35-02	DIN 19" rail in an enclosure that allows rack mounting. Dimensions: 19" x 3U x 202-302mm (adjustable depth). Weight: 2.5kg. 4pcs. Vertical Hyperion-300 devices in 6-60V power supply version.								
Sensor T/H-2/5/10	Temperature and humidity measurement, cable length up to 2/5/10 meters (up to two sensors can be connected)								
MOD-EXT-6I2O3V	External module to extend digital input interfaces and digital outputs with voltage measurement inputs, operating temperature: -40~ +70°C, power supply 9-60V DC **(NOTE - only for HYPERION-30x-3 version)**								

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-industry	Comments
	DC							
ZAS-24-20-R-T	24 V	20 W	0	0	0	0	-20°C ~ +70°C	No PoE support
ZAS-48V56-40-R-T	48 - 56 V	40 W	2	1	0	0	-20°C ~ +70°C	PoE support
ZAS-48V56-60-R-T	48 - 56 V	60 W	3	1	0	0	-20°C ~ +70°C	PoE support
ZAS-48V55-120-R-T	48 - 55 V	120 W	6	3	1	1	-20°C ~ +70°C	PoE support
ZAS-48V56-240-R-T	48 - 56 V	240 W	13	6	3	2	-20°C ~ +70°C	PoE support
ZAS-48V56-480-R-T	48 - 56 V	480 W	30	14	7	4	-20°C ~ +70°C	PoE support

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