BITSTREAM®

Leader in time synchronization and data transmission solutions

Ethernet Switch

Hyperion-105.2

Designed and built to work continuously under extreme conditions.

Solid

Robust

Easy to use

Safe

Hyperion-105.2 – *ideal for industry*

Industrial switch with 8/4x RJ45 10/100Mbps or 4x RJ45 10/100/1000Mbps and 2/4x SFP 100M/1000M/2.5Gbps (2x SFP 2.5 Gbps ports)

- ✓ Secondary surge protection on RJ-45 ports, ITU-T K.44 4kV 10/700us (only for the transmission path)
- ✓ Work in a ring compliant with the ITU-T G.8032 standard with reconfiguration < 20ms , up to 64 rings simultaneously
- ✓ The following IEEE1588 v.2 (PTPv.2) based precision time synchronization profiles are standard: default 1588, G.8265.1 and G.8275.1
- ✓ Energy saving with Energy Efficient Ethernet 'EEE' technology
- ✓ Radius - centralized authentication
- ✓ Conformance Class A protocol support
- ✓ Ethernet OAM support (Link OAM and Service OAM)
- ✓ Optional I/O functions: interface 1x opto-isolated digital input, 2x NO/NC relay outputs
- ✓ 1-Wire interface for measuring temperature and humidity and for communication with the MOD-EXT module
- ✓ Access security SNMPv3, HTTPS, SSH
- ✓ Operating temperature from -40 to +85°C
- ✓ IP-40 metal housing
- ✓ DC redundant power supply

Optional features

- ✓ **PoE ÷ PoE ++/High PoE (802.3bt)** support up to 90W per UTP port (all ports max. 240W), **POE Watchdog**.

Licensed Features

- ✓ An extension in **IEEE 1588-2008v.2 (PTPv2)** to include **Power Profiles** ; real-time synchronization for energy applications in accordance with **IEEE C37.238-2011, C37.238-2017 standards; IEC61850-9-3**

Features of Hyperion-105.2

Reliable

The Hyperion-105 switch has been designed to withstand extreme environmental conditions. We have made a device that meets the environmental standards for data transmission devices, additionally we guarantee the reliability of operation at temperatures from -40° to +85°C with met conditions.

Sure

Hyperion-105 series switches are equipped with two power connectors. This guarantees continuous operation of the device and reduces the likelihood of transmission interruptions by connecting two power sources. On the other hand, on the RJ45 ports, we installed ITU-T K.44 4kV 10/700us surge protectors as a standard for safety.

Easy to use

We have designed the user interface so that it is maximally user-friendly for the network administrator and installer. From the very first moment, you will find the configuration settings in an intuitive way, despite the many functionalities. You can configure the switch through a secure interface , preparing configuration files in advance and updating e.g. on a large group of devices at the same time. Access, of course, is via a secure https connection , centralized RADIUS authentication.

Just what you need

You choose from many versions of the device that we have created in response to the needs of our customers. There are 4x to 8x electrical ports available, with a throughput of 4 ports 10/100/1000 Mbps , or 4x/8x 10/100 Mbps . In addition, we have equipped the switches with 2 or 4 SFP ports, in which you can install any SFP module with a transfer rate of 100/1000 Mb/s or even 2.5 Gb/s. This flexibility and 2.5G transfer allows you to think calmly about building large networks as well as their free expansion in the future.

Safe

Security such as https , SNMPv3, SSH allow you to configure and control access for your application. Storm mechanism implemented control will avoid unwanted traffic and network congestion.

With a communication platform

Bitstream switches can be managed through the BTNet platform . This environment makes it easy to build a network topology in a logical way. After a short configuration, you can manage your network and devices from other manufacturers from anywhere in the world.

Protection

When creating our devices, we could not forget about the need to protect the connection. Hyperion-105 series switches are equipped with protocols compliant with the ITU-T G.8032 standard, enabling operation with redundancy of the transmission path with reconfiguration time less than 20ms. Moreover, the device implements standard STP, RSTP, MSTP and Chain protection protocols enabling protection through an existing network.

Strong

The switches can deliver up to 240W to external devices. On electrical ports, the maximum power that you will deliver to a single device is 90W in 802.3af/at/bt modes , additionally a switch thanks to the WatchDog PoE function will monitor the status of devices for you.

Technical specifications

Supported transmission standards:

- ✓ IEEE 802.3u 100Base-TX Fast Ethernet
- ✓ IEEE 802.3 10Base-T 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 - power per port 30W maximum on all ports 240W
- ✓ IEEE 802.3at PoE ++ - power per port 90W (Option only available on Hyperion-105.2-5), maximum on all ports 240W
- ✓ IEEE 802.3bt High PoE - power per port 90W maximum on all ports 240W
- ✓ ITU K.44 - Secondary overvoltage protection on RJ-45 only in the transmission path, 4kV, 10/700us in accordance with the requirements: Resistibility tests for telecommunication equipment exposed to overvoltages and overcurrents – Basic Recommendation

Supported protocols

- ✓ IPv4, IPv6, ARP, ICMP, TCP, UDP, DNS
- ✓ IGMP v1, v2, v3, MLD v1, v2, GVRP,
- ✓ SNMP v1/v2c/v3, DHCP Client,
- ✓ NTP, SMTP, RMON,
- ✓ HTTP, HTTPS, Telnet, SSH v2, Syslog ,
- ✓ EtherNet /IP, SNMP Inform, LLDP,
- ✓ NTP server/ client
- ✓ IEEE1588 PTPv2 (only available in version 105.2)
- ✓ MIB-II, Ethernet-Like MIB
- ✓ PROFINET Conformance Class
- ✓ Radius centralized password management
- ✓ 1-wire

Supported standards, recommendations and directives for EMC, safety*

PN-EN 55011:2016	Urządzenia przemysłowe, naukowe i medyczne	Charakterystyki zaburzeń o częstotliwości radiowej - Poziomy dopuszczalne i metody pomiaru.
PN-EN 55035:2017-09	Kompatybilność elektromagnetyczna urządzeń multimedialnych	Wymagania dotyczące odporności
PN-EN IEC 62368-1:2020-11	Urządzenia techniki fonicznej/wizyjnej, informatycznej i telekomunikacyjnej	Część 1: Wymagania bezpieczeństwa
PN-EN 60825-1:2014-11	Bezpieczeństwo urządzeń laserowych Część 1: Klasyfikacja sprzętu i wymagania.	
EMC 2014/30/UE	Dyrektywa kompatybilności elektromagnetycznej EMC.	
LVD 2014/35/UE	Dyrektywa niskonapięciowa LVD.	
IEC 61000-4-2	Kompatybilność elektromagnetyczna (EMC)	Część 4-2: Metody badań i pomiarów - Badanie odporności na wyładowania elektrostatyczne.
IEC 61000-4-3	Kompatybilność elektromagnetyczna (EMC)	*Część 4-3: Metody badań i pomiarów - Badanie odporności na promieniowane pole elektromagnetyczne o częstotliwości radiowej.*
IEC 61000-4-4	Kompatybilność elektromagnetyczna (EMC)	Część 4-4: Badanie odporności na serie szybkich elektrycznych stanów przejściowych.
IEC 61000-4-5	Kompatybilność elektromagnetyczna (EMC)	Część 4-5: Metody badań i pomiarów -- Badanie odporności na udary.
IEC 61000-4-6	Kompatybilność elektromagnetyczna (EMC)	Część 4-6: Metody badań i pomiarów -- Badanie odporności na zaburzenia przewodzone, indukowane przez pola o częstotliwości radiowej.
IEC 61000-4-8	Kompatybilność elektromagnetyczna (EMC)	Część 4-8: Badanie odporności na pole magnetyczne o częstotliwości sieci elektroenergetycznej.
IEC 61000-4-11	Kompatybilność elektromagnetyczna (EMC)	Część 4-11: Badania odporności na spadki napięcia, krótkie przerwy i zmiany napięcia.
IEC 61000-4-12	Kompatybilność elektromagnetyczna (EMC)	Część 4-12: Metody badań i pomiarów -- Badanie odporności na tłumione przebiegi sinusoidalne.
IEC 61000-4-29	Kompatybilność elektromagnetyczna (EMC)	Część 4-29: Badanie odporności na spadki napięcia, krótkie przerwy i zmiany napięcia na przyłączu zasilania prądu stałego.

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

Ethernet interfaces

- ✓ Ethernet connectors: 8/4x 10/100 Mbps RJ45 or 4x 10/100/1000 Mbps RJ45 and 2/4x 100/1000/2500Mbps SFP (2x SFP 2.5 Gbps ports) (speed 100Mb/s on the optical interface works only with optical SFP inserts)
- ✓ QoS : Support 8 physical queues, Weighted algorithm Round Robin and Strict queuing priority . Priority settings based on: PCP priorities
- ✓ 802.1p, DSCP/ ToS , port priority settings, ability to configure priorities based on port numbers
- ✓ TCP/UDP
- ✓ VLAN: 4096 VLAN entries, 802.1Q, 802.1QinQ, private VLAN, VLAN translation
- ✓ Throughput control: inbound filtering for Broadcast, Multicast, Unknown DA or all packets, outbound filtering for all packet types, throughput 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: Monitor traffic on selected ports
- ✓ IEEE 802.3az: Energy Efficient Ethernet, 4 power saving modes
- ✓ ITU K.44 - secondary overvoltage protection on RJ45 ports only in the transmission path, 4kV, 10/700us
- ✓ 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 - AAA
- ✓ Security: HTTP/HTTPS, SSL/SSH,
- ✓ Network Redundancy:
  - ✓ ITU-T G.8032 Ethernet Ring (ERPS) <20ms
  - ✓ IEEE 802.1D Spanning Tree (STP)
  - ✓ IEEE 802.1D-2005 Rapid Spanning Tree Protocol (RSTP)
  - ✓ IEEE 802.1s Multiple Spanning Tree Protocol (MSTP)

Network synchronization

- ✓ NTP protocol in server/client mode and SNTP
- ✓ IEEE1588 v.2 (PTPv.2) based precision time synchronization profiles: 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
  - ✓ borders clock (BC) ;
    - Time error for BC (Boundary clock) typically < 200ns

MTBF

- ✓ Time: 649000 hours
- ✓ Standard: Telecordia , SR-332

Management

- ✓ SNMPv1/2c/3, SSH, TELNET
- ✓ HTTP/HTTPS protocol - management via a web browser
- ✓ " Privilege level " - permission level configuration - read/write, independently configured for many users

Optional IO module

Outputs interface

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

Input interface

- ✓ Number of inputs - 1
- ✓ Input type - digital, potential-free, opto-isolated
- ✓ Connector: screw

Optional IO1W module:

- ✓ 2x 1-Wire interface:
  - ✓ speed 0 - 16.3 kbps
  - ✓ Range ≤ 100m
  - ✓ Connector: screw; 8x pins
- ✓ Input dedicated to MOD-EXT module or T/H sensor.

Physical characteristics

- ✓ Dimensions: 135x124x65mm
- ✓ Weight: 0.90kg
- ✓ Can be mounted on a DIN TH35 rail
- ✓ IP-40 metal housing

Work environment requirements

- ✓ Operating temperature: -40 to +85°C with air flow of at least 0.4m/s
- ✓ Operating temperature: -40 to +70°C with air flow of at least 0.0m/s
- ✓ Working time at a maximum temperature of +85°C is up to 16 hours
- ✓ Standard operating humidity: 0 to 95% (non-condensing)
- ✓ Type of location: class C in accordance with the PN-EN 60870-2-2 standard - sheltered locations
- ✓ Degree of protection in accordance with IP-40

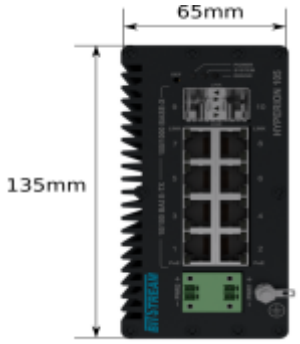
Power

- ✓ DC redundant power supply, 20-60V DC, isolated
- ✓ Two screw power inputs, redundant power supply
- ✓ PoE÷HiPoE function requires a power supply in the range of 45-57V DC

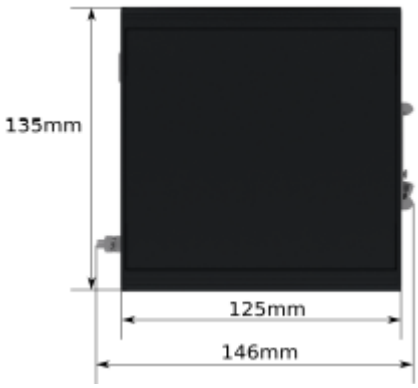
PoE powered

- ✓ Compliant with IEEE802.3af, IEEE802.3at, IEEE802.3bt
- ✓ Power available per port up to 90W
- ✓ For 55VDC power supply, the maximum total PoE power is 240W
- ✓ Hyperion-105.2-5 available (IEEE802.3at) PoE ++ up to 90W

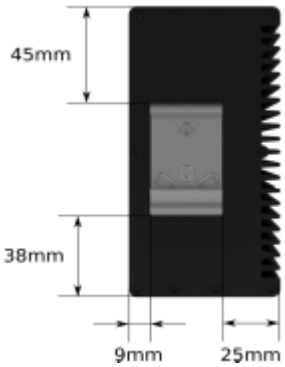
Mechanical drawing



View - front



Side view



View - back

Product code

HYPERION-105.2-Y-(IO)-(Z)-K-U

Hyperion-105.2	Y	(IO)	(Z)	K	U
Versions available					
8xRJ45(10/100M) + 2xSFP (100M/1G/2.5G)	1				
4xRJ45(10/100M) + 2xSFP (100M/1G/2.5G) + 2xSFP(100M/1G)	3				
4xRJ45(10/100/1000M) + 2xSFP(100M/1G/2.5G) + 2xSFP(100M/1G)	5				
Additional interfaces					
standard version		-			
1x digital input, 2x relay outputs		IO			
2x 1-wire interface dedicated to the MOD-EXT module or T/H sensors		IO1W			
PoE option					
no PoE			-		
4x PoE ++ (802.3at) PSE			S4P2 [3]		
4x High PoE (802.3bt) PSE			S4P2b [2]		
8x High PoE (802.3bt) PSE			S8P2b		
Overvoltage protection					
4kV 10/700µs ITU K.44 on RJ 45 ports				K [4]	
Power					
Redundant power supply 20 to 60V DC, isolated PoE requires power supply 45 to 57V DC PoE + 802.3at (up to 30W) 52 to 57V PoE ++ 802.3at (up to 60W) 55 to 57V High PoE 802.3bt (up to 90W) 55 to 57V					77p [1]

Legend

1 – for the PoE version , the maximum power available on all RJ45 ports is 240W
2 - option not available in Hyperion-105.2-1
3 - option available only on Hyperion- 105.2-5
4 – ITU K.44 protection only in the transmission path

Sample markings

HYPERION-105.2-1-S8P2b-K-77p

Hyperion 105.2 with 8xRJ45(10/100M) interface with HIGH PoE up to 90W + 2xSFP (100M/1G/2.5G), but the total power on all PoE ports cannot exceed 240W, standard built-in surge protection secondary 4kV 10/700µs ITU K. 44 on the RJ45 ports only in the transmission path, as standard support for precise time synchronization profiles based on the IEEE1588 v.2 (PTPv.2) standard: default 1588, G.8265.1 and G.8275.1, redundant power supply 20-60V DC (for PoE ++ 55-57V)

HYPERION-105.2-1-K-77p

Hyperion 105.2 with 8xRJ45(10/100M) + 2xSFP (100M/1G/2.5G) interface, standard equipped with secondary 4kV 10/700µs ITU K.44 surge protection on RJ45 ports only in the transmission path, standard support for precise time synchronization profiles based on based on IEEE1588 v.2 (PTPv.2) standard: default 1588, G.8265.1 and G.8275.1, redundant power supply 20-60V DC

Hyperion-105.2 switch extension license

1. **PTP SYNCHRONIZATION LICENSE with POWER PROFILE -** license extending the IEEE1588 PTPv2 protocol with the POWER PROFILE profile - IEEC37.238-2011, IEEC37.238-2017 and IEC61850-9-3 for precise time synchronization, among others, for use in the power industry.

Additional accessories

Designation	Transmission speed	Wavelength	Fiber type	Distance	Cartridge type	WDM	Connector type	Working temperature	Comments
BTP-8524-S5TD	1.25 Gb/s	850nm	MM	550 m	SFP	———	LC	-40~85°C	———
BTP-3124-L2TD	1.25 Gb/s	1310nm	MM/SM	2/20km	SFP	———	LC	-40~85°C	———
BTP-3124-L4TD	1.25 Gb/s	1310nm	SM	40 km	SFP	———	LC	-40~85°C	———
BTP-5524-L8TD	1.25 Gb/s	1550nm	SM	80 km	SFP	———	LC	-40~85°C	———
BTPP-85192-SRT	10 Gb/s	850 nm	MM	300 m	SFP+	———	LC	-40~85°C	support 2.5Gbps
BTPP-31192-LRT	10 Gb/s	1310 nm	SM	10 km	SFP+	———	LC	-40~85°C	support 2.5Gbps
BTP-8503-02TD	155Mb/s	850nm	MM	2 km	SFP	———	LC	-40~85°C	———
BTP-3103-02TD	155 Mb/s	1310nm	MM	2 km	SFP	———	LC	-40~85°C	———
BTP-3103-L2TD	155 Mb/s	1310nm	SM	20 km	SFP	———	LC	-40~85°C	———
BTPB-3503L-L2TD	155 Mb/s	1310/1550nm	SM	20 km	SFP	YES	LC	-40~85°C	———
BTPB-5303L-L2TD	155 Mb/s	1550/1310nm	SM	20 km	SFP	YES	LC	-40~85°C	———
BTPB-3524S-L2TD	1.25 Gb/s	1310/1550 nm	SM	20 km	SFP	TAK	SC	-40~85°C	———
BTPB-5324S-L2TD	1.25 Gb/s	1550/1310 nm	SM	20 km	SFP	TAK	SC	-40~85°C	———
BTE-GB-P1RT	10/100/1000 Mb/s				copper	———	RJ-45	-40~85°C	———
BTE-GB-P3RT	1000 Mb/s				copper	———	RJ-45	-40~85°C	———
LT-19-TS-35-02	rack mounting . Dimensions: 19" x 3U x 202-302mm (adjustable depth). Weight: 2.5kg. 7pcs Hyperion-105 devices positioned vertically.								
Sensor T/H-2/5/10	temperature and humidity measurement, cable length up to 2/5/10 meters								
MOD-EXT-6I2O3V-H105	External module extending IO functions with digital inputs and digital outputs as well as voltage measurement inputs, operating temperature: -40~ +70°C, power supply 9-60V DC **(NOTE - only for HYPERION-105-Y-IO1W version)**								

List of proposed power supplies for BITSTREAM devices

Power supply designation	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)	Working temperature C-standard T-industrial	COMMENTS
	DC	IN						
ZAS-24-25-W-T	24 V	25	0	0	0	0	-30°C ~ +70°C	No PoE support
ZAS-48-25-W-T	48 V	25	1	0	0	0	-30°C ~ +70°C	PoE support
ZAS-48V56-40-R-T	48 - 56 V	40	2	1	0	0	-20°C ~ +70°C	No PoE support
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	48 - 55 V	240	14	7	3	2	-25°C ~ +70°C	PoE support

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


Bitstream S.A.

Mełgiewska St. 7/9
20-209 Lublin, Poland
Vat: 946-250-85-88
Tel. +48 81 743 86 43
Fax +48 442 02 98
info@bitstream.pl
www.bitstream.pl/en