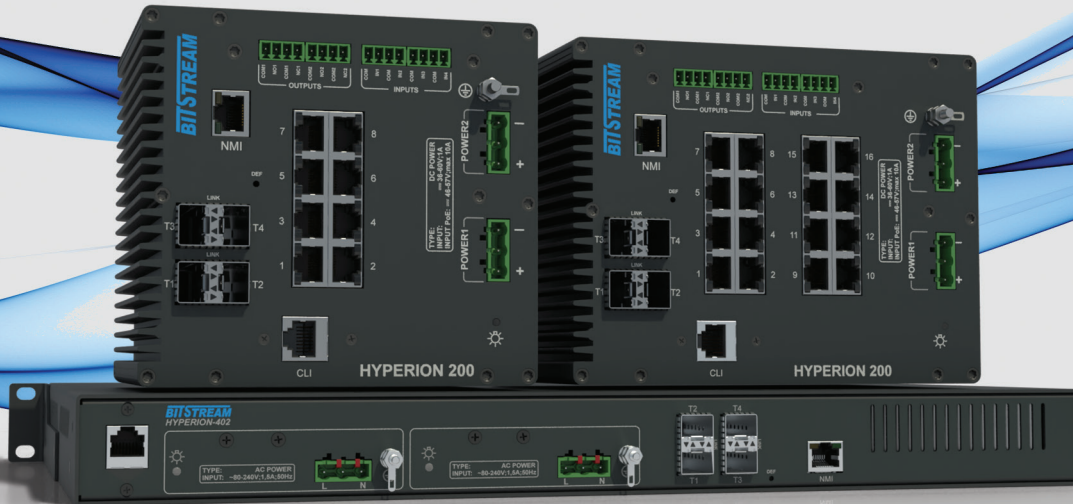# BITSTREAM®

Leader in time synchronisation and data transmission solutions

PRODUCTS CATALOG

Industrial solutions

Managed industrial modular ethernet switch and master clock in one for maximum flexibility

- ✓ Master clock GPS for synchronization with the OCXO oscillator with high stability +/- 2ppb and with the support stability: +/- 1.5us for a minimum of 4h
- ✓ Switch equipped with 8/16/24/32 RJ45 10M / 100M / 1Gbps ports or SFP 100M / 1Gbps slots and 4x SFP / SFP + 100M / 1G / 2.5G / 10Gbps
- ✓ IEEE 1588-2008v.2 (PTPv2): Precise time synchronization protocol, hardware-based hardware time stamping with 1588 profile
- ✓ Power Profile IEEEC37.238-2011, IEEEC37.238-2017
- ✓ Synchronous Ethernet G.8261
- ✓ Up to 14 ports with PRP mechanism of redundancy
- ✓ Safe transmission using IEEE 8902.1ae MACsec
- ✓ SNMPv3, HTTPS, SSH access security
- ✓ Switch compliant with the requirements of IEC61850-3, IEEE1613
- ✓ Operating temperature: -40 to +85°C
- ✓ Rugged 1U 19" metal enclosure
- ✓ Redundant power supply 75 - 270VAC, 80 - 360VDC or 36 - 60VDC

All in one
The Hyperion-500 switch, thanks to its modular structure, allows the implementation of many technologies such as GPS PTPv2 time sources, REDBOX PRP / HSR on up to 14 loops, MACsec encryption and many others.

Reliable
The Hyperion-500 switch was designed to operate in the most extreme environmental conditions.
The series complies with IEC 61850-3, IEEE 1613 standards.
The switches also enable power sharing between two AC / DC power supplies.

Precise
Thanks to the use of highly stable oscillators such as OCXO or RUBIDIUM, the time source module ensures reliability even during long-term loss of GPS signal.

QUAZAR-500

The ideal device for precise monitoring of the quality of synchronization signals.

Guaranteeing data monitoring

Quazar-500 has a built-in memory for data archiving, allowing for local storage of measurement statistics up to 72h.
The built-in LCD display allows you to read selected parameters directly on the device. The BitStream company also offers dedicated software enabling the presentation of results in the form of statistics, logs and charts.

Precise

The Quazar-500 time server has been designed to guarantee the highest precision of time. Accuracy of the GPS-synchronized reference time is better than +/- 15ns

Stable

The best version of Quazar-500 time servers are equipped with a precise, local OCXO oscillator with a stability of +/- 0.2 ppb, which guarantees that the time is maintained for a minimum of 72 hours.

- *Managed network synchronization quality analyzer equipped with 4 / 8x SFP + slots (1G / 2.5G / 10Gb / s)*
- *Qualitative analysis of up to 8 IEEE1588 PTPv.2 clock domains for profiles G.8275.1 (Telecommunications) and C37.238 (Energy)*
- *Qualitative analysis of up to 4 clock domains of Synchronous Ethernet with the analysis of SSM ITU.T - G8264 messages.*
- *Built-in PTPv.2, NTP, SyncE, SNTP time server. ToD, PPS, 10MHz, G.703 / G.704*
- *Accuracy of GPS-synchronized reference time better than +/- 15ns*
- *Precise local OCXO oscillator for hold purposes*
- *High-performance CPU for system management*
- *Built-in LCD display for reading selected parameters*
- *Multi-system GPS receiver, Gallileo, Glonass, Beidou*
- *IEEE802.1x, Radius, Tacacs + - AAA authentication*
- *Internal data memory for local data archiving (up to 72h of data)*
- *IPv4, IPv6, WWW, telnet, SSH and local console CLI, SNMP v1 / v2c / v3 management,*
- *Working temperature: -5 to + 60 ° C*
- *Redundant power supply 80-360 V DC, 75-270 V AC or 45 - 60V DC*

*Designed for high performance
and to meet the challenges that industrial
industrial equipment for as long as possible.*

- ✓ *Switches equipped with 8/16/24/32 RJ45 10M/100M/1Gbps ports
  or 100M/1G SFP slots and 2/4x SFP/SFP+ 100M/1G/2.5G/10Gb slots*
- ✓ *Support ITU-T G.8032 Ethernet ring*
- ✓ *IEEE 1588-2008v.2 (PTPv2): Precise time synchronization protocol, hardware-based
  hardware time stamping with 1588 profile*
- ✓ *Extension to Power Profile IEEEC37.238-2011, IEEEC37.238-2017*
- ✓ *Synchronous Ethernet G.8261*
- ✓ *Reflectometer test for used pairs in UTP cable*
- ✓ *Transmission security using IEEE 802.1ae MACsec*
- ✓ *Access security SNMPv3, HTTPS, SSH*
- ✓ *Authentication IEEE802.1x, Radius, Tacacs+ - AAA*
- ✓ *PROFINET Conformance Class A support*
- ✓ *Support for Ethernet OAM (Link OAM and Service OAM)*
- ✓ *Switch designed according to IEC61850-3, IEEE1613 requirements*
- ✓ *Operating temperature: -40 to +85°C*
- ✓ *Rugged 1U 19" metal enclosure*
- ✓ *Redundant power supply 75 - 270VAC, 80 - 360VDC or 36 - 60VDC*
- ✓ *Switch version with interchangeable power supply modules 36 - 60V DC
  or (75 - 270VAC, 80 - 360VDC) hot-swap type*

Solid

*Hyperion-402 switch is designed to cope with
under extreme environmental conditions. The switch series meets
IEC 61850-3, IEEE 1613 standards for data transmission equipment,
thanks to which they guarantee reliable operation in temperatures
from -40° to +85°C. Some models also allow the replacement of
power supplies without interrupting operation.*

Easy to operate

*We have designed the user interface to be as user
friendly for the network administrator and installer.
From the very first moment intuitive way to configure the device.
The switch is configured via a secure interface, and pre-prepared
configuration files make it possible to update e.g. a large number
of devices at the same time. Access takes place via a secure https
connection and centralised RADIUS authentication.*

The one you need

*You choose from many versions of the device that we have created
in response to our customers' needs. The available options are
devices with 4x 1/2.5/10 Gbps and 8/16/32x 10M/100M/1G RJ45
PoE ÷ PoE++ interfaces or 8/16/32x 100M/1G SFP and
Quadbox function with PRP support.*

HYPERION-200

Solid

The Hyperion-200 switch is designed to withstand extreme environmental conditions. The switch series complies with the IEC 61850-3, IEEE 1613 standards for data.
The switch series meets the IEC 61850-3, IEEE 1613 standards for data transmission equipment in temperatures from -40° to +85°C.
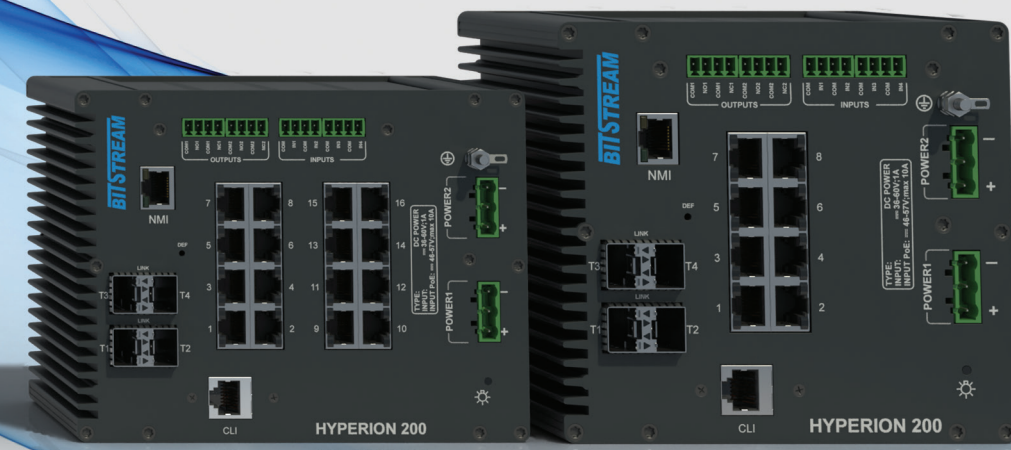
Transmission protection

When creating our devices, we could not forget about the need to protect connection. In addition to the standard redundancy protocols and the ITU-T G.8032 compliant ring, Hyperion-200 switches offer much more. Thanks to the implemented PRP and HSR protocols, the device will allow you to transmit data without packet loss.

With communication platform

The switches can be managed via the BTNet platform.
The software makes it easy to build a network topology in a logical way. After a short configuration you can manage from any your network and implemented third-party devices from anywhere in the world implemented into it.

✓ *Switch equipped with 4x SFP/SFP+ 10/2.5/1Gbps slots and 8/16x RJ45 10M/100M/1Gbps ports or 100M/1Gbps SFP slots*
✓ *Support for ITU-T G.8032 ERPS, connection reconfiguration in <20ms*
✓ *PRP support (IEC 62439-3 Clause 4) on all ports or optional Quadbox feature*
✓ *HSR (IEC 62439-3 Clause 5) security support on dedicated ports*
✓ *IEEE 1588-2008v.2 (PTPv2): Precise time synchronization protocol, Hardware time stamping with 1588 profile*
✓ *Extension to Power Profile IEEEC37.238-2011, IEEEC37.238-2017*
✓ *Synchronous Ethernet G.8261*
✓ *Energy Saving with Energy Efficient Ethernet (EEE)*
✓ *Secondary surge protection as standard in UTP modules on RJ-45 ports, ITU-T K.44 4kV 10/700us*
✓ *Standard equipped with I/O functions: interface 4 inputs and 2 'cc' outputs for monitoring, alarms and control*
✓ *Access security SNMPv3, HTTPS, SSH and IEEE802.1x, Radius, Tacacs+ - AAA*
✓ *Switch designed in accordance with IEC 61850-3, IEEE 1613*
✓ *Operating temperature -40 to +85°C*
✓ *Robust metal housing for DIN rail mounting*
✓ *Power supply 36-60 VDC or 80-360 VDC/75-270 V AC*

Its multifunctionality simplifies your network.

The one you need

You choose from among the many versions of the device that we have created in response according to the needs of our clients.
Device options are available with different number of RJ45 and SFP interfaces. The switch can act as well serial port server function, control devices connected to the relay outputs and transmit information about the environmental conditions at your facility.
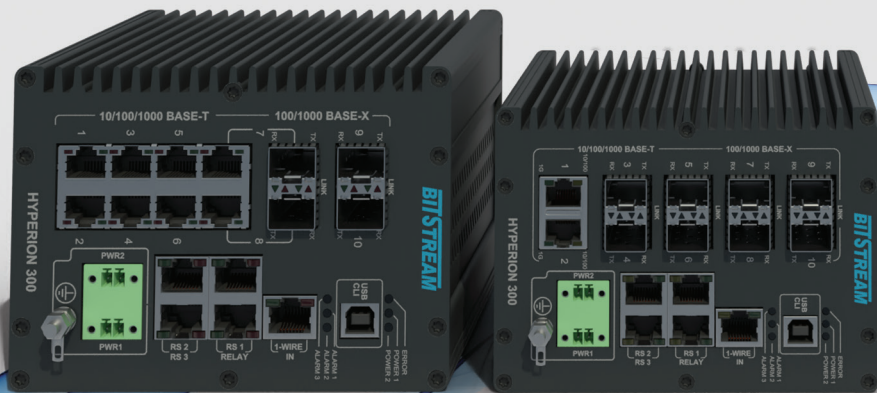
Easy to operate

We have designed the user interface to be as user friendly for the network administrator and installer. From the very first moment intuitive way to configure the device.

Safe

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

Designed to pass the test of reliability in the toughest conditions.

Solid

Hyperion-105 complies with IEEE 1613 standards for data communication equipment standards for data transmission equipment. In addition, we provide a guarantee of reliable operation temperatures from -40° to +85°C.

Reliable

Hyperion-105 series switches are equipped with two independent power supplies. This guarantees continuous operation and avoidance of transmission interruptions, thanks to two power sources. Safety of RJ45 ports is guaranteed by use of surge protection ITU-T K.44 4kV 10/700us.

Powerful

The switches can supply up to 240W to external devices. The maximum power delivered by a single Ethernet port to a device is 90W. However, the implemented PoE WatchDog will keep an eye on the status of devices for you

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- ✓ *Switch with 2x SFP 100/1000M/2.5Gbps, 2/6x SFP 100/1000Mbps,*
- ✓ *8/2x RJ45 10/100/1000Mb/s and additional control and measurement interfaces*
- ✓ *PoE÷PoE+ support up to 30W per port, power on all ports up to 240W, PoE watchdog*
- ✓ *Support of ITU-T G.8032 Ethernet ring*
- ✓ *Power Profile extension IEEEC37.238-2011, IEEEC37.238-2017*
- ✓ *Synchronous Ethernet G.8261*
- ✓ *Optional control and measurement functions: 3x RS232/485 virtual-com interface, 1-Wire (T/H), 2x digital inputs, 4x relay outputs*
- ✓ *Radius - centralised authentication*

- ✓ *PROFINET protocol support Class A, DNP3 and DLMS*
- ✓ *Support for Ethernet OAM (Link OAM and Service OAM)*
- ✓ *SNMPv3 access security HTTPS, SSH*
- ✓ *Operating temperature -40 to +85°C*
- ✓ *Robust metal enclosure IP-30 DIN*
- ✓ *Redundant DC power supply*

- ✓ *The switch can be equipped with 4/8x RJ45 10/100Mbps or 4x RJ45 10/100/1000Mbps and 2/3/4x SFP 100M/1000M/2.5Gbps (2x SFP ports)*
- ✓ *PoE÷PoE++ support up to 90W per port, up to 240W per device, PoE watchdog*
- ✓ *Secondary surge protection on RJ-45 ports, ITU-T K.44 4kV 10/700us*
- ✓ *Ring support 'ITU-T G.8032' reconfiguration < 20ms*
- ✓ *Optional feature: PTPv2 'IEEE1588v2'*
- ✓ *Energy Saving with Energy Efficient Ethernet 'EEE' technology*
- ✓ *Radius - centralized authentication*
- ✓ *PROFINET Conformance Class A support*
- ✓ *Support for Ethernet OAM (Link OAM and Service OAM)*
- ✓ *Optional I/O functions: 1x digital opto-isolated input 2x NO/NC relay outputs*
- ✓ *Access security SNMPv3, HTTPS, SSH*
- ✓ *Operating temperature from -40 to +85°C*
- ✓ *Metal enclosure IP-40*
- ✓ *Redundant DC power supply*

Designed for demanding users,
who want to keep everything under control.

A unique solution for encrypting
network traffic.

## With a platform for communication
Setebos-2 can be managed via the BTNet platform. The software software makes it easy to build a network topology in a logical way. After a short configuration you can manage your network from anywhere in the world and third-party devices implemented into it.

Easy to operate
We have designed the user interface to be as user friendly for the network administrator and installer. From the very first moment intuitive way to configure the device.

Safe
Cerberus provides the ability to encrypt the data transmission link layer two, it does so by exchanging keys and authenticating mutual authentication of nodes that take part in the communication process. Macsec encrypts not only IP traffic but also layer two protocol headers.
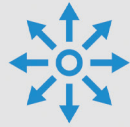
Solid
Cerberus is designed to withstand extreme environmental conditions. The device meets the standards of IEC 61850-3, IEEE 1613 for data communication equipment.

- *Control and measuring unit 10/100Mbit/s Ethernet, GSM - management/monitoring*
- *1-wire interface for external sensors, temperature, humidity, other measured values, dew point calculation or multi-point external temperature monitoring*
- *Control of relay outputs, NO/NC connectors*
- *Digital inputs with dry contact optoisolation*
- *3x RS232/RS485/RS422 interfaces with galvanic separation, to transfer RS contact management of external devices or for communication with sensors, including virtual-com, SSH console*
- *Building automation control with external mobile application (tablet, telephone) or PC application*
- *Possibility of connecting expansion modules: additional inputs, outputs, measurements of quantities, external voltage measurement 0-60V DC*
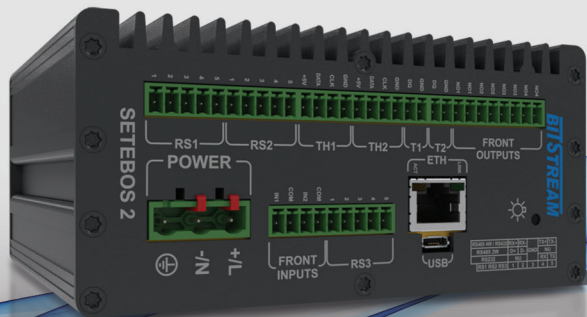
- *Remote reading of device parameters and statuses via Modbus/TCP protocol*
- *Management HTTP/HTTPS, SNMP/SNMPv3, SMTP, TELNET/SSH, SNTP, Syslog*
- *Operating temperature from -40 to +70°C*
- *Robust metal housing IP-30 DIN*
- *DC power supply*

- *Managed Industrial 10/100/1000 BASE-TX Fibre Optic Converter/switch with 100/1000 BASE-X SFP optical interface*
- *IEEE 802.1 MACsec encrypted data transmission with secure authentication with secure authentication and 128-bit AES key exchange*
- *Optional PoE÷PoE++ with up to 90W support, PoE watchdog*
- *Time synchronisation protocol PTPv2, IEEE 1588*
- *Synchronous Ethernet G.8261*
- *L2 switch operation - store and forward*
- *STP, RSTP and MSTP protocol support*
- *IEEE 802.1x authentication, Radius, Tacacs+*
- *Optional UTP link test using TDR technology*
- *Dual converter option in one housing*
- *Operating temperature from -40 to +70°C*
- *Power supply: 9-60 V DC*

Designed to pass the reliability test even under the toughest conditions.

Compact and precise time synchronisation
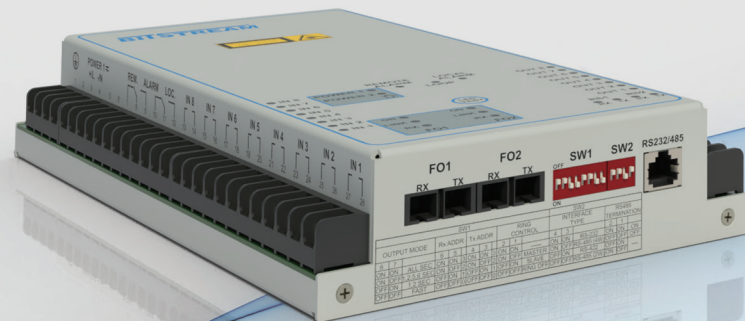
Multifunctional
It is a tele-security device designed to multiplex up to eight I/O interfaces and an RS-232/RS485/422 interface over fibre. The device supports various connection topologies, including point-to-point, bus or ring.

Fast and reliable
Transparent data transmission opens up many application possibilities. The potential of the BS-MX-110 comes from minimising the delay or transmission without interfering with the structure of the data transmission.

Precise and solid
The Quazar-100 time server is designed to meet the stringent requirements of mobile operators and smart grid applications. Thanks to its compact and environmentally resistant housing housing and a rugged receiver, it will prove its worth where standard clocks are not able to meet the user's requirements.

- Fibre optic multiplexer 8x I/O and 1/2x RS232/422/485
- Transmission over fibre optic cable of states from 8 inputs to 8 NO/NC analogue outputs
- Input trigger parameterization from 12V to 250V
- Galvanic isolation of inputs and outputs
- Interference filtering on four inputs according to ESI 48-4 EB2
- FAST & SECURE functions for handling the inputs
- NO/NC alarm contact
- RS232/485/422 serial interface
- Operation in ring and bus topology
- Addressing of the receiving and transmitting part of the device
- Configuration via DIP-SWITCH or console via RS232
- Wide range of supply voltage

- Integrated 72 channel high precision GNSS receiver with GPS/QZSS support, GLONASS, BeiDou, Galileo
- IEEE 1588-2008v.2 (PTPv2): Precise time synchronization protocol, with hardware support; precise time synchronization for real-time applications Precise time synchronization for real-time applications with support for profiles such as IEEE C37.238-2011 or 2017 Power Profile, IEEE61850-9-3, ITU-T G.8265.1, ITU-T G.8275.1, ITU-T G.8275.2 (L3 unicast), Telecom 2008 and Ethernet by default
- Stable OCXO oscillator with precision depending on module version (standard stability +/-20ppb, holdover +/-1.5us@0.5h)
- 100/1000Mbit/s UTP interface with M12 connector with IP65 waterproofing
- Synchronous Ethernet G.8261
- Built-in NTP server
- Designed in accordance with the requirements of standards IEC 61850-3, IEEE 1613.
- Integrated surge protection ITU-T K-44 and integrated lightning arrester.