BITSTREAM®

Leader of time synchronization and data transmission solutions


# *Time server*

# QUAZAR-200

*Precise time synchronization in an industrial environment*

Solid

Easy to configure

Guaranteeing time synchronization

Precise

# QUAZAR-200 - *industrial time server*

## Industrial Time Server with GPS module equipped with 4-port 10 Gigabit Ethernet switch and optional 8x 10M/100M/1G RJ45 or 8x 100M/1G SFP interfaces

- ✓ Managed time server for network synchronization equipped with interfaces of 4 SFP+ 1/2.5/10Gbps slots and 1x RJ45 10/100/1000Mbps ports; 1x PPS IN; 1 PPS OUT; 1x 10MHz IN/10MHz OUT; 1 x E1 G703/G.704; 1x ToD IN/ToD OUT optionally equipped with additional interfaces of 8x (10M/100M/1G) RJ45 or 8x 100M/1G SFP
- ✓ Supported synchronization protocols PTPv.2, NTP, SNTP, ToD, SSM, SyncE,
- ✓ Supported PTP profiles: PTPv2 default IEEE 1588; ITU-T G.8275.1; ITU-T G.8275.2; ITU-T G.8265.1; IEC 61850-9-3; IEEE C37.238-2011 and 2017
- ✓ GNSS PPS signal precision: ±40ns (Clear sky),
- ✓ Mutisystem receiver for GPS, Gallileo, Glonass, Beidou systems
- ✓ Additional NMI UTP RJ45 10/100Mbit/s management port
- ✓ Support for STP, RSTP and MSTP protocols.
- ✓ ITU-T G.8032 ERPS support, connection reconfiguration in <20ms, up to 64 rings simultaneously
- ✓ IEEE 1588-2008v.2 (PTPv2) standard: precision time synchronization protocol, hardware time stamping with 1588 profile
- ✓ Energy Saving with Energy Efficient Ethernet (EEE).
- ✓ Support for PROFINET Conformance Class A protocol
- ✓ Ethernet OAM support (Link OAM and Service OAM)
- ✓ DDMI - SFP module monitoring function
- ✓ Standard equipped with I/O functions: interface 4 inputs and 2 outputs 'cc' for monitoring, alarms and control purposes
- ✓ Management IPv4, IPv6, Web, telnet, SSH and console, SNMP v1,2,3
- ✓ Access security SNMPv3, HTTPS, SSH and IEEE802.1x, Radius, Tacacs+ - AAA
- ✓ Switch designed in accordance with the requirements of IEC61850-3, IEEE1613 standards for substations
- ✓ Operating temperature: -40 to +85°C when conditions are met
- ✓ Rugged metal housing for DIN rail mounting
- ✓ Power supply 36-60 VDC or 80-360 VDC/75-270 V AC

# Features QUAZAR-200

## Solid

QUAZAR-200 industrial time server is designed to meet the operation in extreme environmental conditions. We have made the device to meet the IEC61850-3, IEEE1613 standards for data transmission devices, in addition, we provide a guarantee of reliable operation at temperatures of -40° to +85°C with the conditions met.

## Easy to configure

In creating the devices, BitStream could not forget to provide the user with intuitive and simple configuration. Thanks to the built-in HTTP server, SSH, RS232 console and SNMPv.3 agent, configuration of the device's parameters can be done via a web browser or using the CLI command line.

## Guaranteeing network synchronization

As standard, the device supports the IEEE1588v2 PTP protocol with the support of the G.8275.1 and default 1588 telecommunication profile. Thanks to the additional license, you can implement the Power Profile IEEEC37.238-2011, IEEC37.238-2017, IEC61850-9-3, which will ensure precise time synchronization for applications in the energy sector with high demands on real-time operation, and thanks to the SYNCE license enabling the Synchronous Ethernet function, G.8261, ensuring precise synchronization of internal clocks of devices using frequency..

## Precise

Quazar-200 time server is designed to guarantee high time precision. GNSS PPS signal precision: +/-40ns (Clear sky).

## Safe

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

## 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
- ✓ 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 - only da version equipped with 8x RJ45 module (10M/100M/1G)
- ✓ Optional: Extension with Power Profile IEEEC37.238-2011, IEEEC37.238-2017, IEC61850-9-3
- ✓ Optional: Synchronous Ethernet, G.8261: (Timing and synchronization aspects in packet networks

## Supported protocols

- ✓ IGMP v1, v2, v3, MLD v1, v2, GMRP, GVRP,
- ✓ SNMP v1/v2c/v3, DHCP Client,
- ✓ NTP, SMTP, RMON,
- ✓ HTTP, HTTPS, Telnet, SSH v2, Syslog,
- ✓ EtherNet/IP, SNMP Inform, LLDP,
- ✓ IEEE1588 PTPv2, Ipv6, NTP Client,
- ✓ MIB-II, Ethernet-Like MIB PROFINET Conformance Class A

## Supported standards, recommendations and directives EMC, safety*

| | | |
|---|---|---|
| **EN 55032:2015-09** | Electromagnetic compatibility of multimedia devices | *Emission requirements.* |
| **EN 55024:2011** | Electromagnetic compatibility of multimedia devices | Resistance requirements |
| **EN 60825-1:2014-11** | Safety of laser devices | Part 1: Equipment classification and requirements. |
| **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 |

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

## 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 - standard support for synchronization with G.8275.1 or default 1588 telecommunications profiles in peer to peer, end to end and one step or two step modes
  - Time error for Master clock mode typically 40ns
  - Time error for BC (Boundary clock) mode typically < 200ns
  - Time error for BC (Boundary clock) mode with SyncE typically <100ns
  - Slave
- ✓ Optional synchronization with Power Profiles IEEEC37.238-2011, IEEEC37.238-2017 and Power Utility Profile IEC/IEEE 61850-9-3
- ✓ Optional, also Synchronous Ethernet, G.8261: (Timing and synchronization aspects in packet networks)

## Time synchronization input/output interface module

- ✓ 1PPS (One Pulse Per Second) signal input/output
- ✓ 10Mhz clock signal input/output
- ✓ ToD (Time-of-Day) input/output - reconfigurable output to IRIG-B signal

## GPS receiver for clock synchronization

- ✓ 72 channel receiver compatible with GPS, GLONASS, BeiDou, Galileo systems
- ✓ Antenna input with SMA connector and support for active antennas
- ✓ GPS receiver sensitivity: -167dBm/-159dBm with LNA option.
- ✓ GNSS PPS signal precision: +/-40ns (Clear sky)
- ✓ Can be equipped with stable on-board generators with different parameters:
  - OCXO generator with stability in the temperature range of -40 to +85°C of +/-20 ppb and holdover time of ±1.5 µs at constant temperature for 0.5 hours
  - OCXO generator with stability in the temperature range of -40 to +85°C of +/-2 ppb and holdover time of ±1.5 µs at constant temperature for 8 hours, within ±8 µs at constant temperature for 12 hours,
  - OCXO generator with -40 to +85°C stability of +/-0.2 ppb and holdover time of ±1.5 µs for a minimum of 72 hours
- ✓ Supports IEEE 1588 v2 Precision Time Protocol
- ✓ Supports G.8261 Synchronous Ethernet (SyncE)

## Ethernet Interfaces

- ✓ Ethernet Connectors:
- ✓ 4 x 1G/2.5G/10Gbps SFP+ optional 8 RJ45 10/100/1000Mbps ports or 8x SFP 100M/1000M slots (100Mb/s speed on Optical Interface only works with optical SFP)
- ✓ Non-blocking switching matrix: 160Gbps
- ✓ 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 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
- ✓ 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 traffic on selected ports
- ✓ IEEE 802.3az: Energy Efficient Ethernet, reduced power consumption, 4 modes
- ✓ Security: HTTP/HTTPS, SSL/SSH, monitoring optical link parameter changes for violations, IEEE 802.1x Port Based Network Access Protocol, EAP, TACACS+; RADIUS authentication, authorization and accounting functions - AAA
- ✓ Port Trunk: IEEE 802.3ad LACP or static aggregation
- ✓ RMON, MIB II, Port mirroring, DNS, NTP, 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)

## 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

## Device start time

- ✓ Fully operational after a cold start after 30 seconds maximum. Takeoff time does not include synchronization with GNSS systems.

## MTBF

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

## Management

- ✓ IPv4, IPv6, ARP, ICMP, TCP, UDP, DNS
- ✓ SSH, http, https, SNMP v1/v2c/v3
- ✓ Local (Ethernet/RS-232) and remote CLI
- ✓ System log of events and alarms
- ✓ "Privilege level" - Privilege level configuration - read/write, configured independently for multiple users w

## Power supply

- ✓ DC 36-60V power supply
- ✓ Power supply DC 80-350V; AC 75-240V
- ✓ Screw connector for AC or DC power supply
- ✓ Total power consumption - <40W

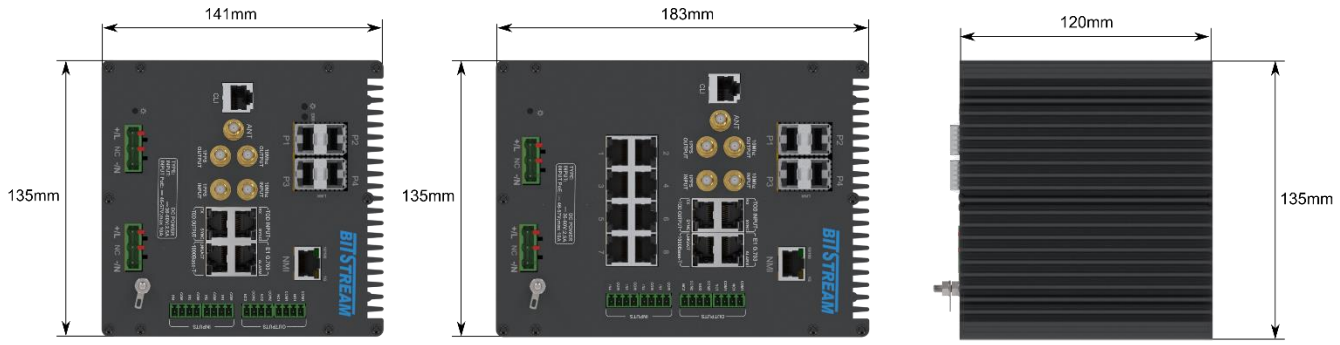
## Physical characteristics

- ✓ DIN rail or free-standing mounting
- ✓ Dimensions [141 mm or 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

View - side

## Product code

**QUAZAR-200-Y-(L)-R-(K)-U**

| QUAZAR-200 | Y | (L) | R | (K) | U |
|---|---|---|---|---|---|
| 4x SFP / SFP+ (1G/2.5G/10G) + 1x module | 5 | | | | |
| 8x RJ45 (10M/100M/1G) + 4x SFP/SFP+ (1G/2.5G/10G) + 1x module | 6 | | | | |
| 8x SFP (100M/1G) + 4x SFP/SFP+ (1G/2.5G/10G) + 1x module | 7 | | | | |
| **Routing functionality** | | | | | |
| static routing | | L3 | | | |
| **Optional modules** | | | | | |
| GPS receiver with GPS antenna input with OCXO generator with ±20 ppb stability with sustained stability for a minimum of 0.5 hours | | | GPS1OCXO-L | | |
| GPS receiver with GPS antenna input with OCXO generator with ±1 ppb stability with sustained stability for a minimum of 8 hours | | | GPS1OCXO-M | | |
| GPS receiver with GPS antenna input with OCXO generator with ±0.2 ppb stability with sustained stability for a minimum of 72 hours | | | GPS1OCXO-H | | |
| **Additional features** | | | | | |
| Standard built-in secondary 4kV 10/700µs ITU K.44 surge protection on RJ-45 ports for the transmission path | | | | K[1] | |
| **Power supply** | | | | | |
| Power range: 36-60VDC, | | | | | 7 |
| Power range: 80-350V DC, 75-240VAC | | | | | C |

1- option available only for version equipped with 8x RJ45 module (10M/100M/1G)

## Additional accessories

| Designation | Transmission speed | Wavelength | Fiber optic type | Distance | Insert type | Connector type | Operating temperature | Comments |
|---|---|---|---|---|---|---|---|---|
| BTPP-85192-SRT | 10 Gbps | 850 nm | MM | 300 m | SFP+ | LC | -40~80 ° C | --- |
| BTPP-31192-LRT | 10 Gbps | 1310 nm | SM | 10 km | SFP+ | LC | -40~80 ° 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 | |
| | | | | | | | | |
| BTE-GB-P1RT | 10/100/1000 Mbps | 100m (UTP-5) | --- | | Copper SFP | 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 | |
| ZAS-48V55-120-R-T | 48 - 55 V | 120 | 6 | 3 | 1 | 1 | -20°C ~ +70°C | |
| ZAS-48V55-240-R-T | 47 - 56 V | 240 | 13 | 6 | 3 | 2 | -20°C ~ +70°C | |
| ZAS-48V55-480-R-T | 47 - 56 V | 480 | 30 | 14 | 7 | 4 | -20°C ~ +70°C | |
| ZAS-48V55-960-R-T | 48 - 55 V | 960 | 60 | 30 | 15 | 8 | -20°C ~ +70°C | |

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

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