BITSTREAM®

Leader of time synchronization & data transmission solutions

TIME SERVER
QUAZAR-500

Precise monitoring of synchronization signal qualitynización

Multitasking

Stable

Guaranteeing data monitoring

Solid

QUAZAR-500

Manageable Network Synchronization Quality Analyzer with Time Server

- ✓ Managed network synchronization analyzer equipped with 4 SFP+ 1/2.5/10Gbps slots and 1 or 8 SFP+ 1/2.5/10Gbps slots and 2x RJ45 10/100/1000Mbps ports or 12 SFP+ 1/2.5/10Gbps slots 3x RJ45 10/100/1000Mbps ports (version with 12 slots only in 2U casing)
- ✓ Qualitative analysis of up to 4 or 8 or 12 IEEE1588 PTPv.2 clock domains for profiles G.8275.1 (Telecommunications) and C37.238 (Energy)
- ✓ Qualitative analysis of up to 2 or 4 or 6 Synchronous Ethernet clock domains along with analysis of ITU.T - G8264 SSM messages.
- ✓ Built-in time server PTPv.2, NTP, SyncE, SNTP. ToD, PPS, 10MHz, G.703/G.704
- ✓ GNSS-synchronized time base reference accuracy better than ±15ns (Clear sky)
- ✓ Precise local OCXO or DOCXO oscillators for long-term holdover
- ✓ High-performance CPU for system management
- ✓ Built-in LCD display for reading selected parameters
- ✓ Multisystem GNSS receiver supporting GPS, Gallileo, Glonass, Beidou
- ✓ Radius authentication,
- ✓ Internal data memory for local data archiving (up to 72 hours of data)
- ✓ IPv4, IPv6, WWW, SSH and local CLI console management, SNMP v1/v2c/v3,
- ✓ Operating temperature: -5 to +60°C
- ✓ Redundant power supply 80-350V DC, 75-240V AC or 36-60V DC

Features of the Quazar-500

Multitasking

Quazar-500 Network Synchronization Quality Analyzer in its basic version offers the ability to monitor parameters such as PTP 2WAY TE, PTP datasets, SyncE TIE, SyncE MTIE, SyncE TDEV, SSM(change logging). Also enabling network synchronization using signals such as: Ethernet; PPS; 10MHz; E1 G703/G.704; ToD

Easy to set up at

While creating the devices, BitStream could not forget about providing intuitive and simple configuration. With a built-in HTTP and SSH server, RS232 console and SNMPv.3 agent, configuration of the device parameters can be done via a web browser or using the CLI command line.

Stable

The VH version of the Quazar-500 probe features a precision local DOCXO generator with -40 to +85°C stability of ±0.03 ppb and a holdover time of ±1.5 µs at constant temperature for a minimum of 54 hours. OCXO oscillators are also available.

Precise

The Quazar-500 time server is designed to provide the highest precision possible. The precision of the reference time base synchronized with GPS is better than ±15ns (Clear sky).

Guaranteeing data monitoring

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

Solid

The Quazar-500 has been designed to operate in a variety of environments. The robust IP-30 enclosure provides protection against external factors, additionally the device is adapted to operate in temperature range from -5°C to +60°C. Optional redundant power supply ensures stable operation in case of power supply failure, additionally supported by Load Balance function.

Technical specification

General specification of supported standards and protocols

- ✓ IEEE 802.3u 100Base-TX Ethernet,
- ✓ IEEE 802.3ab 1000Base-T,
- ✓ IEEE 802.3z Gigabit Fiber,
- ✓ IEEE 802.3ae 10GBASE-SR/LR/ER/ZR (SFP+) 10 Gigabit Ethernet.

Network synchronization server

- ✓ Depending on the version it can be equipped with on-board generator OCXO, DOCXO with different parameters,
- ✓ Synchronization via IEEE 1588-2008 v2 PTP
  - Standard support for synchronization with Default 1588, G.8275.1, G.8265.1 profiles,
  - Optional additional license support for synchronization with IEC 61850-9-3, IEEE C37.238-2011 or 2017 profiles
    - MC (Master Clock) with time error typically 40ns
    - BC (Boundry Clock) with time error with SyncE typically <100ns
- ✓ Synchronous Ethernet, G.8261, G.8282, G.8264
- ✓ NTP and SNTP synchronization
- ✓ Additional synchronization support signals
    - 1 x PPS_IN and 1 or 4 x PPS_OUT;
    - 1 x 10MHz_IN and 10MHz_OUT
    - 1 x E1 G703/G.704
    - 1x ToD_IN/ToD_OUT

Network synchronization monitor

- ✓ Depending on the version it can be equipped with on-board generator OCXO, DOCXO with different parameters,
- ✓ Synchronization via IEEE 1588-2008 v2 PTP
    - Standard support for synchronization with Default 1588, G.8275.1, G.8265.1 profiles,
    - Optional additional license support for synchronization with IEC 61850-9-3, IEEE profiles
- ✓ PTP datasets (minimum logging: GrandmastrID, clock class, clock accuracy, priority2, steps removed)
- ✓ Monitoring TE (Time error) and MTIE (Time Interval Error) for PTPv2 and SyncE,
- ✓ SSM SyncE (change logging)
- ✓ Optional within the license to monitor PPS & ToD in ITU G.827 format
- ✓ Time error (TE) graph presentation in GUI (www) for PTP and SyncE
- ✓ Monitoring possible interference in Spoofing and Jamming for GNSS module

Ethernet interface

- ✓ Ethernet Connectors in 19" RACK 1U chassis: 4 SFP+ 1/2.5/10Gbps slots and 1x RJ45 1Gbps port
- ✓ Ethernet connectors in 2U 19" RACK: 12 SFP+ 1/2.5/10Gbps slots and 3x RJ45 1Gbps ports

Management

- ✓ IPv4, IPv6, ARP, ICMP, TCP, UDP, DNS
- ✓ NTP server/client
- ✓ http, https, SSH, SNMP v1/v2c/v3
- ✓ EAP, RADIUS authentication function
- ✓ Local (Ethernet/RS-232) and Remote CLI or Ethernet
- ✓ System log of events and alarms
- ✓ Built-in LCD display

GNSS module

- ✓ Antenna input with support for active antennas with SMA connector
- ✓ RS422 interface for ToD (Time-of-Day) signal with RJ45 connector, input and input signal
- ✓ Coax interface (PPS) with SMA connector, input and input signal
- ✓ 184 channel multi-band GNSS receiver with GPS, GLONASS, BeiDou, Galileo
- ✓ GPS receiver sensitivity: -167dBm/-160dBm with LNA option
- ✓ High precision PPS GPS receiver: ±15ns (Clear sky)
- ✓ Presentation of the location of satellites of supported GNSS systems on a virtual horizon
- ✓ Can be equipped with stable on-board generators with different parameters:
    - OCXO generator with ±1 ppb stability over the -40 to +85°C temperature range and holdover times of ±1.5 µs at constant temperature for 8 hours, ±8 µs at constant temperature for 12 hours,
    - OCXO generator with a stability over the temperature range of -40 to +85°C of ±0.2 ppb and a holdover time of ±1.5 µs for a minimum of 72 hours at a constant temperature
    - DOCXO generator with a stability of ±0.03 ppb over the temperature range of -40 to +85°C and a holdover time of ±1.5 µs at constant temperature for a minimum of 54 hours

Environmental requirements

- ✓ Operating temperature: -5 to 60°C
- ✓ Standard ambient humidity during operation: 5%-95%
- ✓ 1U chassis weight: 3 kg,
- ✓ 1U enclosure dimensions [mm]: 450 x 355 x 44
- ✓ 2U enclosure dimensions [mm]: 450 x 355 x 88

Power supply

- ✓ Voltage range: 80-350VDC, 75-240VAC
- ✓ Voltage range: 36-60 V DC
- ✓ Connector: screw - Terminal block
- ✓ Load balance support for redundancy

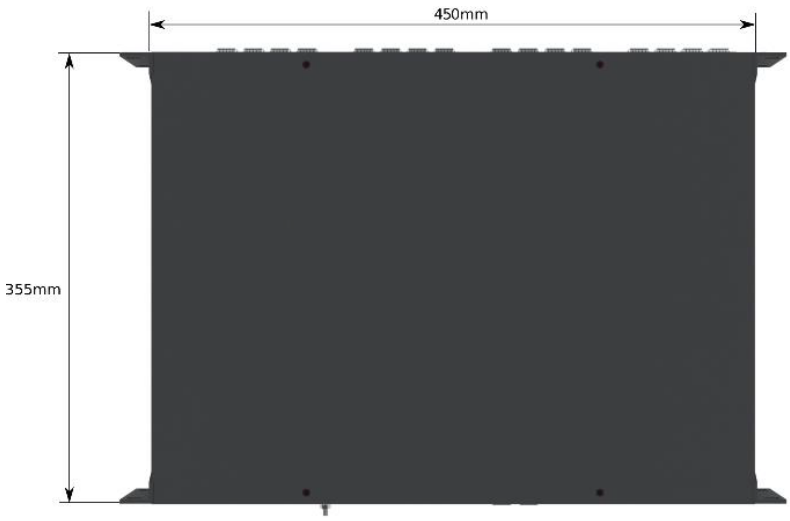
Supported standards, recommendations and directives EMC, safety*

PN-EN 55035:2017-09	Electromagnetic compatibility for multimedia equipment	Resilience Requirements.
PN-EN 55032:2015-09	Electromagnetic compatibility for multimedia equipment	Emission Requirements.
PN-EN IEC 62368-1:2020-11	Audio/visual, information technology and telecommunications equipment	Part 1: Safety requirements
PN-EN 55011:2016	Industrial, scientific and medical equipment	Radio frequency disturbance characteristics - Limits and methods of measurement.
PN-EN 60825-1:2014-11	Laser equipment safety Part 1: Equipment classification and requirements.	
EMC 2014/30/EC	Electromagnetic Compatibility Directive.	
LVD 2014/35/EC	Low Voltage Directive.	
IEC 61000-4-2	Electromagnetic Compatibility (EMC)	Part 4-2: Test methods and measurements - ESD immunity test
IEC 61000-4-3	Electromagnetic Compatibility (EMC)	Part 4-3: Test and measurement methods - Testing for immunity to radiated radio frequency electromagnetic fields
IEC 61000-4-4	Electromagnetic Compatibility (EMC)	Part 4-4: Test for immunity to a series of fast electrical transients
IEC 61000-4-5	Electromagnetic Compatibility (EMC)	Part 4-5: Test and measurement methods - Impact test
IEC 61000-4-6	Electromagnetic Compatibility (EMC)	Part 4-6: Test and measurement methods - Immunity test for 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: Testing for resistance to voltage dips, interruptions and voltage changes
IEC 61000-4-12	Electromagnetic Compatibility (EMC)	Part 4-12: Test and measurement methods - Immunity test for damped sinusoidal waveforms
IEC 61000-4-29	Electromagnetic Compatibility (EMC)	Part 4-29: Testing for immunity to voltage dips, interruptions and voltage changes at a DC power connection

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

Mechanical drawing

Dimensions for 1U/2U version

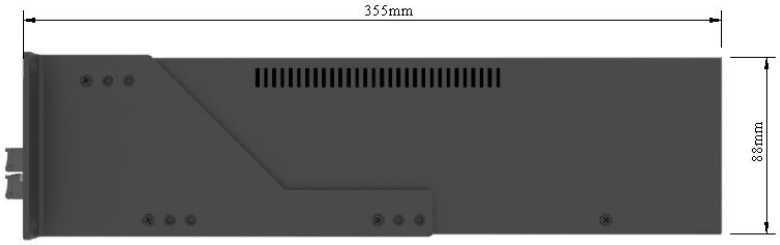


View - top

Dimensions for 1U version

View - Side

Dimensions for 2U version



View - Side

Labels

QUAZAR-500-X-D-Y-Z

Quazar	500	X	D	Y	Z
Device in 1U 19" enclosure	500				
Device in 2U 19" enclosure	502				
Device version					
4x SFP+ 1/2.5/10G slot - **not offered** and replaced with version #3		1			
8x SFP+ 1/2.5/10G slot - **not offered** and replaced with version #4		2			
4x SFP+ 1/2.5/10G slot and 1x RJ45 10/100/1000Mbps port		3			
8x SFP+ 1/2.5/10G and 2x RJ45 10/100/1000Mbps ports		4			
12x SFP+ 1/2.5/10G and 3x RJ45 10/100/1000Mbps ports		12[1]			
Generator model					
Built-in OCXO generator			OCXO		
Built-in DOCXO generator			DOCXO		
Generator version					
OCXO generator with ±20 ppb stability - **version not offered**				L	
OCXO generator with ±1 ppb stability and a holdover of ±1.5 µs for 8 hours,				M	
OCXO generator with ±0.2 ppb stability and holdover of ±1.5 µs for 24 hours				H	
DOCXO generator with ±0.03 ppb stability and holdover of ±1.5 µs for 54 hours				VH	
Power supply version					
power supply 80-350VDC, 75-240VAC					C
power supply 36-60 VDC					7
redundant 36-60 VDC power supply					77p

1 - option available only for QUAZAR-502 in 2U casing

Example designations:

- ✓ Quazar-500-3-DOCXO-VH-C
- ✓ Quazar-500-4-OCXO-M-77p

Licenses

List of licenses for the QUAZAR-500 probe

- ✓ **ADVANCED MONITORING LICENSE** - license for additional NETWORK MONITORING functionality for Synchronous Ethernet G.8261 and PPS & ToD in ITU G.827 format .
- ✓ **SYNCE LICENSE - Synchronous Ethernet G.8261 - A** license to add Synchronous Ethernet G.8261 (Timing and synchronization aspects in packet networks) functionality, providing precise frequency-based synchronization of internal device clocks for power applications, among others.
- ✓ **PTP SYNCHRONIZATION LICENSE WITH POWER PROFILE** - License that extends the IEEE1588 PTPv2 function with POWER PROFILE - IEEEC37.238-2011, IEEEC37.238-2017 and IEC61850-9-3 for precise time synchronization for use in the power industry, among others

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