BITSTREAM®

Leader of time synchronization & data transmission solutions

Monitoring probe
QUAZAR-700

Precise monitoring of the quality of synchronisation signals and time server function.

Multitasking

Stable

Guaranteed data monitoring

Robust

QUAZAR-700

Manageable probe to monitor network synchronization quality with time server function

- ✓ Manageable monitoring probe equipped depending on version with interfaces 4 or 8 SFP+ 1/2.5/10Gbps slots and 1x or 2x RJ45 10/100/1000Mbps ports; 1x PPS IN; 1 or 4x PPS OUT; 1x 10MHz IN/10MHz OUT; 1 x E1 G703/G.704; 1x ToD IN/ToD OUT; 2 or 4x IRIG-B DLCS; 2 or 4x IRIG-B AM 1kHz; 2x PPS ST FO 850nm
- ✓ 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
- ✓ High-performance CPU for system management
- ✓ Built-in LCD display for reading selected parameters
- ✓ Qualitative analysis of up to 4 IEEE1588 PTPv.2 clock domains for G.8275.1 (Telecommunications) and C37.238 (Energy) profiles
- ✓ Qualitative analysis of up to 2 clock domains of Synchronous Ethernet with analysis of SSM ITU.T - G8264 messages.
- ✓ Monitoring of TE (Time error) and MTIE (Time Interval Error) and possibility of graphical presentation of TE and MTIE graphs
- ✓ Precision of reference time base synchronized from GNSS systems better than +/-15ns (Clear sky)
- ✓ Mutisystem receiver for GPS, Gallileo, Glonass, Beidou systems
- ✓ Built-in precision local oscillator depending on version OCXO, DOCXO, RUBID* for long term holdover state support
- ✓ Supported synchronization protocols PTPv.2, NTP, SNTP, ToD, SSM, SyncE, Sabits, NEMEA, NTRIP, RTCM, IRIG-B
- ✓ Automatic creation of measurement data files for local data archiving
- ✓ IEEE802.1x authentication, Radius, Tacacs+ - AAA
- ✓ IPv4, IPv6, Http, Https, SSH and local CLI console management, SNMP v1/v2c/v3,
- ✓ Operating temperature: -5 to +60°C
- ✓ Redundant power supply 80-350 V DC, 75-240 V AC or 45 - 60V DC

* - Option available by contacting the manufacturer

V 2.05

Features of Quazar-700

Multitasking

The Quazar-700 managed monitoring probe 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). In addition, the ability to work as a time server enables network synchronization using the following signals: Ethernet; PPS; 10MHz; E1 G703/G.704; ToD IRIG-B DLCS; IRIG-B AM 1kHz; PPS FO MM 850nm and additionally IEEE 1588-2008 v2 PTP with MC or BC modes,

Easy to set up

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.

Stable

The VH version of the Quazar-700 time servers feature a high-precision local DOCXO generator with a stability over the -40 to +85°C temperature range of ±0.03 ppb and a holdover time of ±1.5 µs at constant temperature for a minimum of 54 hours. RUBID* or OCXO oscillators are also available.

Precise

The Quazar-700 time server is designed to guarantee the highest possible time precision. The precision of the reference time base synchronized with GPS is better than +/-15ns (Clear sky).

Guaranteeing data monitoring

The Quazar-700 has built-in memory for data archiving allowing local storage of measurement statistics for up to 72h. A built-in LCD display allows reading selected parameters directly on the device. BitStream also offers dedicated QUAZARNET software for presentation of results in the form of statistics, logs and graphs.

Solid

The Quazar-700 device is designed to work in harsh conditions. The durable IP-30 enclosure provides protection against external factors, in addition, the device is designed to operate in a temperature range of -5°C to +60°C. Optional redundant power supply ensures stable operation in case of failure of one of the power supplies, further supported by Load Balance function. .

* - Option available by contacting the manufacturer

Technical specifications

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 Monitoring and Network Synchronization

- ✓ The device can be equipped with an on-board generator OCXO or DOCXO or RUBID
- ✓ Synchronization 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
  - 2 or 4x IRIG-B DLCS
  - 2 or 4 x IRIG-B AM 1kHz
  - 2 x PPS ST FO MM 850nm
- ✓ Supported synchronization protocols
  - NTP and SNTP ; ToD; SSM; Sabits; NEMEA; NTRIP; RTCM; IRIG-B
- ✓ The following IEEE1588 v.2 (PTPv.2)-based precision time synchronization profiles are hardware-supported on the device: Default1588, G.8265.1, and G.8275.1,
  - MC (Master Clock) with time error typically 40ns
  - BC (Boundry Clock) with time error with synchronization by SyncE typically < 50ns
  - SC (Slave Clock) with time error with synchronization by SyncE typically < 50ns
  - TC (Transparent Clock)
- ✓ Monitoring of possible Spoofing and Jamming interference for GNSS module
- ✓ PTP datasets (logging minimum: GrandmastrID, clock class, clock accuracy, priority2, steps removed)
- ✓ Real-time monitoring of TE (Time error) and MTIE (Time Interval Error) for PTPv2 and SyncE,
- ✓ Presentation of real-time TE (time error) graphs in GUI (www) for PTP and SyncE
- ✓ Automatic creation of measurement data files with the possibility of archiving the data in the local memory of the device.
- ✓ Dedicated QUAZARNET software - optional system to extend diagnostics and visualization of measurement data
- ✓ The following features are available under the license :
  - PPS & ToD monitoring in ITU G.827 format 1
  - RFC2544 performance tests and ITU-T Y.1564 service tests with MPLS-TPa protocol support
  - PTP v2 synchronization with IEC 61850-9-3, IEEE C37.238-2011 or 2017 profiles
  - Synchronous Ethernet, G.8261, G.8262, G.8264

GNSS module

- ✓ Built-in multi-band GNSS receiver that works with GPS, GLONASS, BeiDou, Galileo systems
- ✓ Antenna input with support for active antennas with SMA connector
- ✓ RS422 interface of ToD (Time-of-Day) signal with RJ45 connector, input and input signal
- ✓ Coax interface (PPS) with SMA connector, input and input signal
- ✓ GPS receiver sensitivity: -167dBm/-160dBm with LNA option.
- ✓ High precision GNSS PPS receiver: +/-15ns (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 +/-1 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 a stability over the temperature range of -40 to +85°C of +/-0.2 ppb and a holdover time of ±1.5 µs at constant temperature for a minimum of 24 hours,

- DOCXO generator with -40 to +85°C stability of ±0.03 ppb and holdover time of ±1.5 µs at constant temperature for a minimum of 54 hours,
- RUBID* generator with stability over the temperature range -40 to +85°C of ±0.5 ppb and holdover time of ±1.5 µs at constant temperature for a minimum of 83 hours

Network security

- ✓ EAP, RADIUS

IRIG-B interface

- ✓ The IRG-B module implements the functionality of providing time synchronization using the PPS (Pulse Per Second) protocol in a form compatible with IRIG standard 205-87. The module will be installed in Quazar 700 devices. The number of interfaces depends on the version of the device enclosure
- ✓ Number of interfaces in a 1U 19" device:
  - 2x IRIG-B DCLS - unmodulated 100Hz - 50 Ohm BNC connector;
  - 2x IRIG-B AM - modulated 1kHz - BNC connector 600 Ohm;
  - 2x PPS - HFBR transmit transceivers; ST 850 nm connector with 50/125 or 62.5/125 um optical fiber
- ✓ Number of interfaces in a 2U 19" device:
  - 4x IRIG-B DCLS - unmodulated 100Hz - 50 Ohm BNC connector;
  - 4x IRIG-B AM - modulated 1kHz - BNC connector 600 Ohm;
  - 2x PPS - HFBR transmit transceivers; ST 850 nm connector with 50/125 or 62.5/125 um optical fiber
- ✓ IRIG-B DCLS Interface:
  - Output voltage: 5 V;
  - Output current: min. 100 mA;
  - Output accuracy relative to UTC: ± 100 ns;
- ✓ IRIG-B AM interface:
  - Output voltage: 5 V;
  - Accuracy of output relative to UTC: ± 1 µs.

Ethernet synchronization interface

- ✓ Ethernet connectors in 19" RACK 1U chassis: 4 slots or 8 SFP+ 1/2.5/10Gbps slots and 1x RJ45 1Gbps port depending on the version selected
- ✓ Ethernet connectors in 19" RACK 2U chassis: 4 slots or 8 SFP+ 1/2.5/10Gbps slots and 1x 1Gbps RJ45 port depending on the version selected

Management

- ✓ IPv4, IPv6, ARP, ICMP, TCP, UDP, DNS
- ✓ NTP server/client
- ✓ SSH, http, https, SNMP v1/v2c/v3
- ✓ Local (Ethernet/RS-232) and remote CLI
- ✓ System log of events and alarms
- ✓ Readout of selected parameters on the built-in LCD display

Work environment requirements

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

Power supply

- ✓ Voltage range: 80-350VDC, 75-240VAC
- ✓ Voltage range: 45-60 V DC

* - Option available by contacting the manufacturer

- ✓ Connector: screw - Terminal block
- ✓ With power redundancy version, Load Balance support

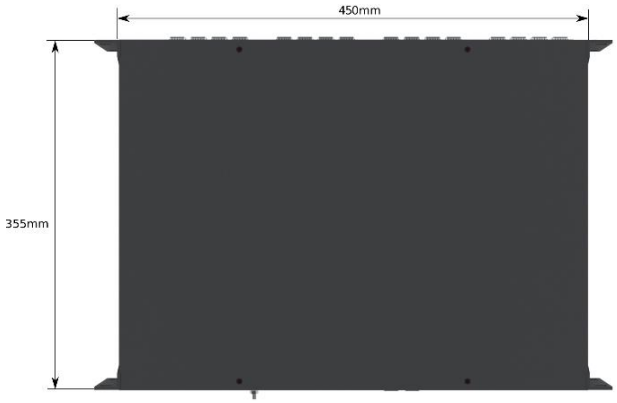
Supported standards, recommendations and directives EMC, safety[&]

EN 55024:2011/A1:2015-08	Electromagnetic compatibility (EMC)	IT equipment Immunity characteristics - Permissible levels and methods of measurement.
EN 55022:2010/AC:2011	Electromagnetic compatibility (EMC)	Information technology equipment. Radio disturbance characteristics. Methods of measurement and permissible levels.
EN 60950-1:2007/A2:2014-05	Information technology equipment	Safety - Part 1: Basic Requirements
EN 55011:2012	Industrial, scientific and medical equipment	Radio frequency disturbance characteristics - Permissible levels and methods of measurement.
EN 60825-1:2014-11	Safety of laser equipment Part 1: Equipment classification and requirements.	
EMC 2004/108/WE	Electromagnetic Compatibility Directive.	
LVD 2006/95/EC	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
IEC 61850-3	Communication networks and systems for power plant automation	
IEEE 1613-2009	IEEE standard on environmental and test requirements for network communication equipment installed in substations	

[&] - The scope and list of supported standards may change as the device evolves

Mechanical drawings

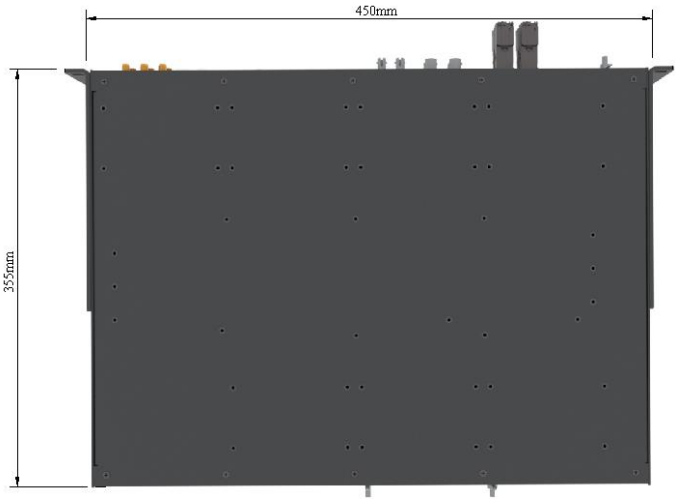
Dimensions for 1U version



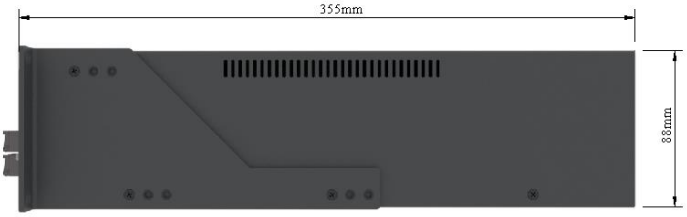
View - top

View - side

Dimensions for 2U version



View - top



View - side

* - Option available by contacting the manufacturer

Product code

QUAZAR-700-X-D-Y-R-Z

Quazar-700	700	X	D	Y	R	Z
Device in 1U 19" housing	700					
Device in 2U 19" housing	702					
Device version						
4x SFP+ 1/2.5/10G slot and 1x RJ45 10/100/1000Mbps port		3				
8x SFP+ 1/2.5/10G slot and 2x RJ45 10/100/1000Mbps port		4[B]				
Generator model						
Built-in OCXO generator			OCXO			
Built-in DOCXO generator			DOCXO			
Built-in RUBID generator			RUBID[A]			
Generator version						
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		
RUBID* generator with ±0.5 ppb stability and holdover of ±1.5 µs for 83 hours				VVH		
Special modules						
Standard version without module					-	
IRIG-B module with 2x BNC non-modulated, 2x BNC modulated and 2x multimode optical interfaces for 850nm wavelength with ST connectors					IRB1[C]	
IRIG-B module with 4x BNC non-modulated, 4x BNC modulated and 2x multimode optical interfaces for 850nm wavelength with ST connectors					IRB2[A]	
Power version						
power supply 80-350VDC, 75-240VAC						C
power supply 45-60 VDC						7
redundant power supply 45-60 VDC						77p

[A] - option available only in QUAZAR-702-3 2U enclosure
[B] - option available in QUAZAR-700 version in 1U enclosure and in 2U enclosure without IRB module
[C] - option not available on QUAZAR-700-4 in 1U chassis with 8 SFP+ slots

Example designations:

- ✓ Quazar-700-3-OCXO-M-7
- ✓ Quazar-702-3-DOCXO-VH-IRB2-7
- ✓ Quazar-700-4-OCXO-H-7

* - Option available by contacting the manufacturer

Licenses

Summary of licenses that extend the capabilities of the QUAZAR-700 server

- ✓ **ADVANCED MONITORING LICENSE** - a license for additional NETWORK MONITORING functionality for Synchronous Ethernet G.8261 and PPS & ToD in ITU G.8271 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 synchronization of internal clocks of devices using frequencies for use in power generation, among other applications.

- ✓ **PTP SYNCHRONIZATION LICENSE with POWER PROFILE** - License to extend in the IEEE1588 PTPv2 protocol with POWER PROFILE - IEEEC37.238-2011, IEEEC37.238-2017 and IEC61850-9-3 for precise time synchronization among others for use in the power industry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