BITSTREAM®

Lider rozwiązań synchronizacji czasu i transmisji danych

Grand Master Clock

QUAZAR-100

Reliable **Easy to Use** **Compact** **Durable**

V2.02

QUAZAR 100

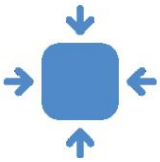
Grand Master Clock for outdoor use, synchronized by GPS and powered by PoE

- ✓ Integrated 72-channel high-precision GNSS receiver with GPS, GLONASS, BeiDou support, Galileo
- ✓ GNSS receiver sensitivity (max/min): -167dBm/-159dBm with LNA option GNSS PPS signalprecision: ±40ns (Clear sky)
- ✓ IEEE 1588-2008v.2 (PTPv2): precision time synchronization protocol, with hardware support; precise time synchronization for real-time applications with profile support such as IEEE C37.238-2011 or 2017 Power Profile, IEEE61850-9-3, ITU-T G.8265.1, ITU-T G.8275.1 (L2 multicast), ITU-T G.8275.2 (L3 unicast), Telecom 2008 over Ethernet
- ✓ OCXO generator with stability in the temperature range -40 to +70°C at the level of ±20 ppb and holdover time in the range of ±1.5 µs at constant temperature for 0.5 hour.
- ✓ UTP 100/1000Mbit/s interface with M12 connector, IP65 waterproof Synchronous Ethernet (SyncE) support - ITU-T G.8261 and ITU-T G.8264
- ✓ Hardware and software SSM support for Synchronous Ethernet,
- ✓ Built-in NTP/SNTP server
- ✓ Structure designed in accordance with the requirements of IEC61850-3, IEEE1613 standards. IP management, HTTP, telnet, SSH, SNMP v1/v2c/v3,
- ✓ Power supply: PoE IEEE802.3af PD via STP/UTP twisted pair
- ✓ Optional STP/UTP patch cord up to 100m with M12-RJ45 connectors
- ✓ Integrated ITU-T K-44 surge protection only for the transmission path.
- ✓ Operating temperature -40 to +70°C,

Benefits of Quazar-100

Reliable

The Quazar device also offers network synchronization functionalities using the IEEE 1588v2 Precision Time Protocol (PTP) and Synchronous Protocols.
Ethernet (SYNCE) or Network Time Protocol (NTP), which uses a precise GNSS receiver for synchronization.



Compact

Thanks to the compact design and the integrated GPS receiver antenna module and the use of an Ethernet interface with PoE PD power supply, there is no need to use additional antenna or power cables. This solution allows the Grand Master Clock server to be installed at a considerable distance from possible interference, thus increasing the precision of the GNSS receiver. The small size of the device allows it to be easily installed in hard-to-reach places.

Durable

The Quazar-100 device has been designed to operate in difficult conditions. The IP-65 waterproof housing provides protection against external factors, and the device is also designed to operate in the temperature range from -40°C to +70°C and humidity (without condensation) up to 95%.

Stable

Grand Master Clock Quazar-100 in the standard version is equipped with an OCXO oscillator with stability in the temperature range -40 to +70°C at the level of ±20 ppb and holdover time in the range of ±1.5 µs at constant temperature for 0, 5 hours.

Easy to use

Integrated management functions via HTTP, TELNET / SSH and SNMPv.3 agent enable configuration of device parameters via a standard web browser or command line and constant monitoring of alarms from any management platform equipped with the SNMP protocol, e.g. BTNET.

Protected

When creating our devices, we couldn't forget about their safety.
For protection purposes, an ITU-T K.44 - 4kV 10/700us surge protection device was installed for the transmission path.

Technical Specifications

Ethernet interface

1x port LAN 10/100M/1000Mbps, M12 (8-pin), ÿ
Patchcord M12-RJ45 STP lub UTP o wskazanej dÿugoÿci do 100m. ÿ IEEE
802.1Q VLAN ÿ IEEE
802.3 10Base-T Ethernet, ÿ IEEE
802.3u 100Base-TX ÿ IEEE
802.3ab 1000Base-T, ÿ IEEE
802.3az Energy Efficient Ethernet

GNSS receiver for clock synchronization

72-channel GNSS receiver compatible with various systems, ÿ
GNSS receiver sensitivity: -167dBm/-159dBm with LNA option ÿ
GNSS PPS signal precision: +/-40ns (Clear sky)

Time and frequency accuracy

Frequency accuracy: ±20 ppb
Time accuracy <± 100ns under cloudless sky
Holdover: holdover time ±1.5 µs at constant temperature for 0.5 hour (<3ms per day)

Network synchronization

NTP (Network Time Protocol) time server
- NTP they stratum 1
- Monitoring of connected clients
- Support for SNTP protocol

IEEE 1588-2008 Standard for precision clock synchronization protocol
- ITU-T **G.8265.1** Default profile •
ITU-T **G.8275.1** Full time mode
- ITU-T **G.8275.2** Partial time mode •

IEEE **C37.238-2017** Power Profile - Standard profile used in the IEEE 1588 Precision Time Protocol for applications in substation systems, • IEC **61850-9-3** Networks and communication systems for energy automation - Part 9-3:
Precision time protocol profile for power utility automation,
Standard for a **Synchronous Ethernet** • ITU-T **G.8261** – Aspects of timing and synchronization in packet networks • ITU-T **G.8260** – Definitions and terminology for synchronization in packet networks • ITU-T **G.8264** – Distribution of timing information via packet networks

Power supply via twisted pair Ethernet in PD mode

IEEE 802.3af standard,
Power consumption: 12W per pin 4/5 (+), pin 7/8 (-)
Power supply range: 22 - 60V DC via power injector or PoE PSE

Management

IPv4, IPv6
HTTP/HTTPS, telnet, SSH, SNMP v1/v2c/v3, SNMP trap

Physical features

Dimensions: outer diameter: 90mm; height 135 mm
Weight: 0.3 kg
Housing: waterproof plastic housing with IP65 protection rating

Environmental conditions

Operating temperature: -40 to -70°C
Humidity during operation (non-condensing): up to 95%

Supported EMC and safety standards, recommendations and directives*

PN EN 55035:2017-09	Electromagnetic compatibility of multimedia devices	Immunity requirements
PN-EN IEC 62368-1:2020-11	Audio/video, IT and telecommunications equipment	Part 1: Security requirements
PN EN 55011:2016	Industrial, scientific and medical equipment	Characteristics of radio frequency disturbances - Permissible levels and measurement methods.
PN EN 60825-1:2014-11	Laser Safety Part 1: Equipment Classification and Requirements.	
IEC 61000-4-2	Electromagnetic compatibility (EMC)	Part 4-2: Test and measurement methods - Electrostatic discharge resistance 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 of immunity to a series of fast electrical transients
IEC 61000-4-5	Electromagnetic compatibility (EMC)	Part 4-5: Test and measurement methods - Impact resistance test
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: Test of resistance to frequency field of magnetic power networks
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 -- Testing the resistance to damped sinusoidal waveforms
IEC 61000-4-29	Electromagnetic compatibility (EMC)	Part 4-29: Test for immunity to voltage drops, short interruptions and voltage changes at the DC power supply connection
IEC 61850-3:2014	Communication systems and networks for the automation of electric power companies - Part 3: General requirements	
IEEE 1613-2009	IEEE Standard for Environmental and Test Requirements for Network Communications Equipment Installed in Electric Power Substations	

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

Mechanical drawing

Signs

QUAZAR-100-X-(Z)-(Y)

Quazar-100	X	(WITH)	(AND)
GNSS Master Clock with support for IEEE 1588 v2 PTP, SYNCE, OCXO generator and built-in M12 connector without cables.	M12		
GNSS Master Clock with support for IEEE 1588 v2 PTP, SYNCE, OCXO generator and built-in M12 connector and patch cord included.	PGT1		
Specification of a patch cord terminated with M12-RJ45 connectors			
version without patchcord where		2	
LL is the length of the FTP twisted pair for outdoor applications Power system:		STP(LL)3	
version without power injector			
external power supply device power injector with 2x RJ45 and 1x PoE (up to 15W)			PINJ-2UG

Legend

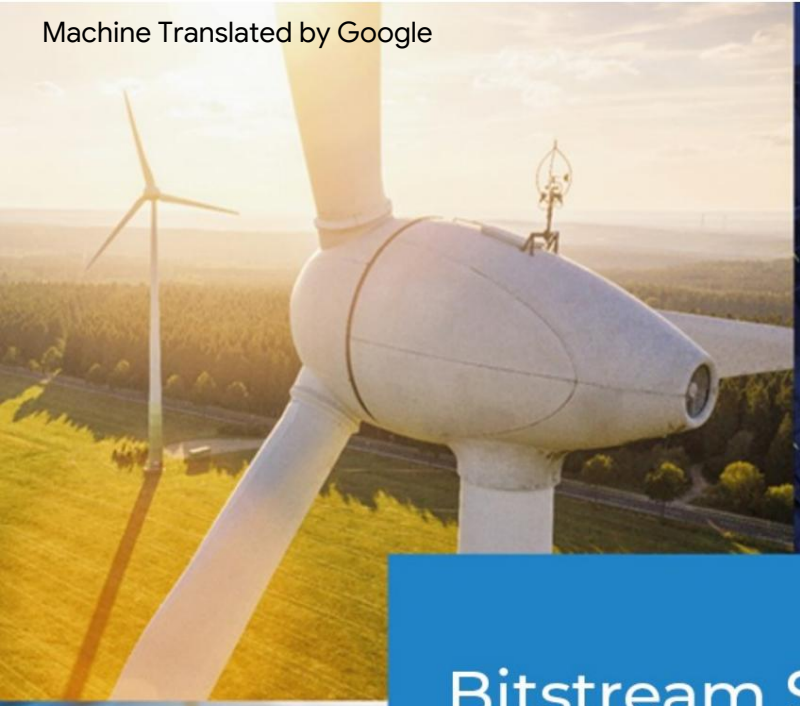
1 – please specify the patchcord specification in the **Z** field
2 – no symbol if only the version with an M12 connector is selected
3 – cable length specified in the LL field, with a maximum cable length of up to 100m

Additional accessories

Dedicated external power injector device - PINJ-2UG

ATTENTION:

It is possible to purchase a ready-made set, i.e. the Quazar-100 device with an external power injector, add the "PINJ-2UG" marking to the Quazar code.

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