

## 6890 Product Series

### GNSS Network Time Server

The 6890 product series are fully featured network time server systems for NTP (Network Time Protocol) supporting the Global Navigation Satellite Systems (GNSS) GPS, Galileo, GLONASS, and BeiDou for precise and reliable time synchronization at highly competitive pricing.



### Key Features

- Small form factor housing for DIN rail mounting according to DIN EN 60715 TH35
- GPS, Galileo, GLONASS, and BeiDou time sources for reliable satellite synchronization
- Power supply with Power over Ethernet (PoE) and/or 24VDC power supply redundancy
- Synchronization of IEC 61850 compatible devices
- Typical NTP time stamp accuracy <math>< 100 \mu\text{s}</math>
- IEC 62439-3:2016 Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR) option

The 6890 product series network time server systems feature a compact design with small form factor housing for DIN rail mounting. With its integrated 72-channel GNSS receiver for GPS, Galileo, GLONASS, and BeiDou reliable satellite time signal evaluation is ensured even under challenging installation conditions of the GNSS antenna system.

The network time server systems are ideal for everyone searching for a space-saving and budget-friendly solution for network time synchronization using Network Time Protocol (NTP).

Redundant network connections easily can be implemented using the integrated port aggregation / bonding / NIC teaming feature or with optional activation of the Parallel Redundancy Protocol (PRP) / High-availability Seamless Redundancy (HSR) feature according to IEC 62439-3:2016 specification.

The systems are available with power supply via Power over Ethernet (PoE) and feature a redundant power input for connection of 24VDC power source for enhanced availability.

## Time Signal Reliability

- Reduction of GPS / GNSS vulnerability by application of anti-jamming and anti-spoofing technologies at the signal receiver
- Redundant multiple validation of the available synchronization signals for error-free and leap-free timing signal evaluation
- Automatic handling of leap second and week rollover

## System Configuration and Monitoring

- huma® web edition, HTTPS web interface
- Integrated event log
- Diagnostics and monitoring via SNMP v2c and v3 read operations (MIB II, **hopf** private enterprise MIB, NTPv4 MIB, IEC-62439-3 MIB)
- Event notification using SNMP traps, email messaging and / or external SYSLOG server

## Enhanced IT/OT Security

- Separation of the diagnostic and operational / productivity network for enhanced security with built-in firewall for provision of barrier against network-based intrusions
- Role based access control (RBAC) with support of LDAP and RADIUS authentication according to IEC 62351-8:2020

The 6890 product series time synchronization systems feature on receiver and firmware level consistency checks and statistical tests such as automatic gain control (AGC), clock error, signal quality, signal power, propagation delay and the angle of arrival in order to safeguard error free and leap free time signal evaluation.

In case of signal loss due to antenna failure or identification of time signal mismatch (e.g. due to jamming or spoofing attacks) the time synchronization module clock automatically switches to the integrated oscillator holdover ensuring the oscillator dependent freewheeling accuracy.

The network time server systems are equipped with integrated management controller software which allows easy configuration and monitoring using the **hopf** unified management application **huma® web edition** which features secure access to the system via an intuitive to use state-of-the-art web interface.

The system continuously monitors the health status and the integrated time synchronization module. It collects diagnostic and statistical data for the integrated event log and for real time notification of critical events to external IT management systems using email messaging, SNMP traps or external SYSLOG server.

The current demand for the convergence Information Technologies (IT) and Operational Technologies (OT) in critical infrastructure requires to ensure security and reliability in compliance with regulatory requirements. The system design of the 6890 product series allows separation of operational and productivity network for enhanced security with the built-in firewall feature that adds increased security against network-based intrusions by limiting access to the minimum necessary network connections and services.

Role based access control according to the most up-to-date standards safeguards secure access to the system by authorized staff.

## 6890 Product Series Systems

### Base System

FG6890G01

GNSS Network Time Server for DIN rail mounting with:

- Input voltage: 24VDC (connection via screw terminal) and/or PoE+ (connection via ethernet interface ETH0)
- Housing 25x100x117mm (WxHxD) with mounting for DIN rail according to DIN EN 60715 TH35
- Protection class according to DIN EN 60529: IP20
- 72-channel GNSS receiver for GPS, GLONASS, BeiDou, Galileo with connection via SMA connector (female)
- Time Server with 2 ethernet interfaces 10/100/1000Base-T according to IEEE 802.3 with connection via RJ45-connector for output of:
  - NTP/SNTP v4.2.x (RFC 5905)
- System Monitoring / Alarming:
  - SNMPv2c/v3, SNMP Traps (MIB II, **hopf** Private Enterprise MIB, NTPv4 MIB, IEC-62439-3 MIB)
  - E-mail Notification
  - Syslog Messages to external Syslog server
- Port aggregation / bonding / NIC teaming of LAN port ETH0 and ETH1 with support of IEEE 802.3ad
- Tagged VLANs according to IEEE 802.1Q
- Configuration of static routing table
- Configuration via huma® web edition (HTTP/HTTPS), SSH

### Firmware Activation Options

LI6890A01

Activation key for activation of the following feature for product series 6890:

- Support for Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR) according to IEC 62439-3:2016 for use as Dual Attached Node (DAN)
- Serial number dependent activation key for one (1) time server module, available with purchase of device or for activation later on site



front view

rear view

## Extension Modules

FG6891I01

Extension Module for 6890 product series base systems with:

- 2 channel IRIG-B output via 2x SMA connector (female), each channel individually configurable:
  - DC level shift (DCLS) (pulse width coded without carrier) at 5V active / 5V TTL signal level
  - Sine wave carrier (amplitude modulated), 1kHz carrier frequency
  - Manchester modulated, 1kHz carrier frequency
- Applicable IRIG-B standards:
  - RCC IRIG STANDARD 200-04
  - RCC IRIG STANDARD 200-16
  - IEEE 1344-1995
  - IEEE C37.118-2005
  - IEEE C37.118.1-2011
  - IEEE C37.118.1a-2014
  - IEEE/IEC 60255-118-1-2018
  - AFNOR NF S 87-500 (2007)
- 1 channel PPS (pulse per second) output via SMA connector (female), 5V active / 5V TTL signal level



*FG6890G01 with extension module FG6891I01 mounted on DIN rail*

## Applied Standards

### Electromagnetic Compatibility

IEC 61000-4-2:2008	Electromagnetic compatibility (EMC) – Part 4-2: Testing and measurement techniques – Electrostatic discharge immunity test
IEC 61000-4-4:2012	Electromagnetic compatibility (EMC) – Part 4-4: Testing and measurement techniques – Electrical fast transient/burst immunity test
IEC 61000-4-5:2014/A1:2017	Electromagnetic compatibility (EMC) – Part 4-5: Testing and measurement techniques – Surge immunity test
IEC 61000-4-6:2013	Electromagnetic compatibility (EMC) – Part 4-6: Testing and measurement techniques – Immunity to conducted disturbances, induced by radio-frequency fields
IEC 61000-6-2:2016	Electromagnetic compatibility (EMC). Part 6-2: Generic standards – Immunity for industrial environments
IEC 61000-6-3:2006/A1:2010	Electromagnetic compatibility (EMC) – Part 6-3: Generic standards – Emission standard for residential, commercial and light-industrial environments
EN 55032:2015 /A11:2020	Electromagnetic compatibility of multimedia equipment – Emission Requirements (class B)

### Safety

IEC 62368-1:2014/AC:2015	Audio/video, information and communication technology equipment – Part 1: Safety requirements
IEC 60529:1989/A1:1999 /A2:2013	Degrees of protection provided by enclosures (IP Code)

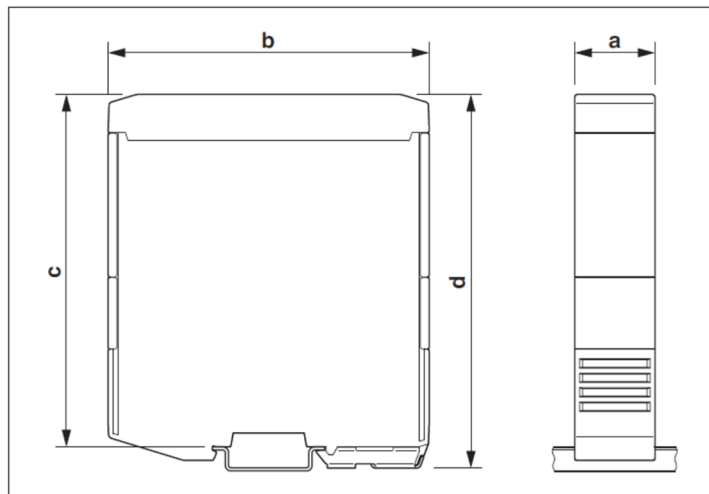
### Radio Equipment and GNSS receivers

EN 301 489-1 V2.2.3 (2019-11)	Electromagnetic Compatibility (EMC) standard for radio equipment and services – Part 1: Common technical requirements – Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU
EN 301 489-19 V2.1.1 (2019-04)	Electromagnetic Compatibility (EMC) standard for radio equipment and services – Part 19: Specific conditions for Receive Only Mobile Earth Stations (ROMES) operating in the 1,5 GHz band providing data communications and GNSS receivers operating in the RNSS band (ROGNSS) providing positioning, navigation and timing data – Harmonized Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU
EN 303 413 V1.2.1 (2021-04)	Satellite Earth Stations and Systems (SES) – Global Navigation Satellite System (GNSS) receivers – Radio equipment operating in the 1164 MHz to 1300 MHz and 1559 MHz to 1610 MHz frequency bands – Harmonized Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

## Technical Specifications

### Mechanical Data

Housing	for 35mm DIN rail mounting according to DIN EN 60715 TH35
Dimensions	Width (a): 25.0 mm (0.98 inch) Height (b): 100.0 mm (3.94 inch) Depth (c): 110.0 mm (4.33 inch) Depth (d): 116.6 mm (4.59 inch)
Material	polyamide
Color (RAL)	light gray (7035)
Flammability class according to UL 94	V0
Protection Class	IP20 according to DIN EN 60529
Weight	0.2 kg (0.44 lbs)



### Environmental Conditions

Operating Temperature	-25 °C to +70 °C (-13 °F to +158 °F) internal cabinet temperature
Storage Temperature	-40 °C to +85 °C (-40 °F to +185 °F)
Operating Altitude	up to 2,000 m (6,562 ft) above sea level
Relative Humidity	5 to 95 % (non-condensing) at 40 °C (104 °F)



### Power Supply

Power over Ethernet	PoE+ according to IEEE 802.3bt (Type 1 PD, Class 0), connection via ethernet interface ETH0
Redundant voltage supply	nominal voltage 24 VDC, (19.2-28.8 VDC) connection via screw terminal
Power consumption $P_{max}$	10 W

### GNSS receiver / accuracy

Receiver Type	72-channel GNSS receiver for GPS, GLONASS, BeiDou, Galileo
Signal evaluation	GPS L1C/A, GLONASS L1OF, BeiDou B1I, Galileo E1B/C
Sensitivity	Tracking: -166 dBm Warm start: -157dBm Cold Start: -148 dBm
Synchronization time TTFF (Time to First Fix)	Warm start: <2 s Cold start: <30 s First initialization: <750 s (without valid leap second information)
Antenna connection	Antenna power feed for active antennas, $U_b = 5$ VDC / max. 70 mA Connection via SMA connector, female
Internal PPS pulse on GNSS reception	$\leq \pm 20$ ns (after 5 minutes GNSS reception with clear sky view)
Freewheel accuracy	Drift at constant temperature +20 °C: after 1h: 42 $\mu$ s after 24h: 1 ms
Internal backup clock (RTC)	+5 ppm / -45ppm for constant temperature in the range +10 °C to +50 °C





## Network Standards and Protocols

### General standards and protocols

- IEEE 802.1Q VLANs
- IEEE 802.3 Type 10BASE-T
- IEEE 802.3ab 1000BASE-T
- IEEE 802.3ad Link Aggregation Control Protocol (LACP)
- IEEE 802.3bt Power over Ethernet
- IEC 62439-3 Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR)
- RFC 768 User Datagram Protocol (UDP)
- RFC 791 Internet Protocol, Version 4 (IPv4)
- RFC 792 Internet Control Message Protocol (ICMPv4)
- RFC 793 Transmission Control Protocol (TCP)
- RFC 826 Address Resolution Protocol (ARP)
- RFC 1035 Domain Names (client)
- RFC 1918 Address Allocation for Private Internet
- RFC 4443 Internet Control Message Protocol (ICMPv6)
- RFC 2131 Dynamic Host Configuration Protocol (DHCPv4)
- RFC 3484 Default Address Selection for Internet Protocol version 6 (IPv6)
- RFC 3596 DNS Extensions to Support IP Version 6
- RFC 8200 Internet Protocol, Version 6 (IPv6)
- RFC 8415 Dynamic Host Configuration Protocol for IPv6 (DHCPv6)

### Device and Network Management

- RFC 1098 A Simple Network Management Protocol (SNMP)
- RFC 1155 Structure and Identification of Management Information for TCP/IP-based Internets
- RFC 1213 Management Information Base for Network Management of TCP/IP-based internets: MIB-II
- RFC 2578 Structure of Management Information Version 2 (SMIv2)
- RFC 2579 Textual Conventions for SMIv2
- RFC 3411 An Architecture for Describing Simple Network Management Protocol (SNMP) Management Frameworks
- RFC 3412 Message Processing and Dispatching for the Simple Network Management Protocol (SNMP)
- RFC 3413 Simple Network Management Protocol (SNMP) Applications
- RFC 3414 User-based Security Model (USM) for version 3 of the Simple Network Management Protocol (SNMPv3)
- RFC 3418 Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)

- RFC 3584 Coexistence between Version 1, Version 2, and Version 3 of the Internet-standard Network Management Framework
- RFC 4250/4251/5252/4253/4254 The Secure Shell (SSH) Protocol
- RFC 5321 Simple Mail Transfer Protocol
- RFC 5424 The Syslog Protocol
- RFC 7540 Hypertext Transfer Protocol Version 2 (HTTP/2)
- **hopf** Private Enterprise MIB

### Security / Authentication

- IEC 62351-8 Power systems management and associated information exchange - Data and communications security - Role-based access control
- RFC 4510/4511/4512/4513/4514/4515/4516/4517/4518/4519/4520 Lightweight Directory Access Protocol (LDAP)
- RFC 2865 Remote Authentication Dial In User Service (RADIUS)
- RFC 2866 RADIUS Accounting

### Time Synchronization

- RFC 5905 Network Time Protocol Version 4: Protocol and Algorithms Specification
- RFC 5906 Network Time Protocol Version 4: Autokey Specification
- RFC 5907 Definitions of Managed Objects for Network Time Protocol Version 4 (NTPv4)

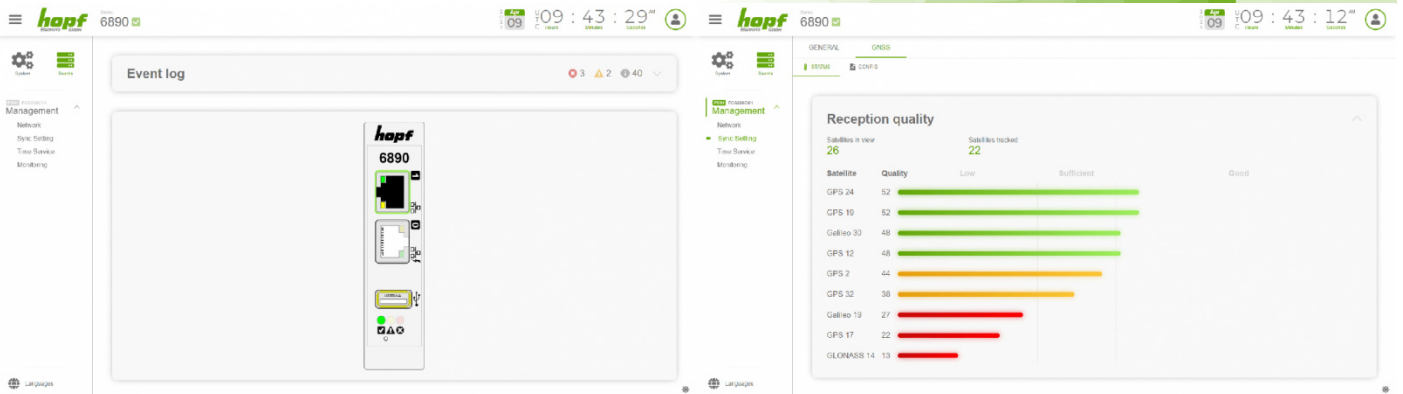
## huma® web edition software

huma® web edition – **hopf** unified management application – is the highly flexible, versatile, secure, and easy-to-use system configuration and management software that is integral part of each system’s management controller hardware. The software is accessible using the local computer’s web browser and network connection.

### System requirements

Web browsers	Google Chrome (Version > 89), Microsoft Edge (Version > 89), Mozilla Firefox (Version > 87), Opera (Version > 75), Brave (Version > 1.23)
Browser technology support	HTML5, CSS3, JavaScript enabled, ECMAScript 2016, Local Storage (min. 1MB)

- State-of-the-art user interface
- At-a-glance status information
- Realtime event notification
- Role-based user authentication
- Secure system configuration management and firmware update



Referring to the information in this product sheet: After the editorial deadline of this publication, October 20, 2021, changes may have been made to the product. Subject to changes of structural or design changes, changes to the scope and scale of discounts by the manufacturer during the delivery period as long as the changes or deviations are reasonable under consideration of the interest of the seller to the buyer. Errors and technical data are subject to change without prior notice.

All rights reserved. © hopf Elektronik GmbH, Nottebohmstrasse 41, 58511 Luedenscheid, Germany